THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

DEVELOPMENT AND DESTABILIZATION

THE SELECTIVE ADOPTION OF ICTS IN ETHIOPIA

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DECLARATION

I certify that the thesis I have presented for examination for the PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extent of any work carried out jointly by me and any other person is clearly identified in it).

ABSTRACT

This thesis questions and examines the role Information and Communications Technologies (ICTs) are playing in the political transitions of developing countries. While there is much discussion about the contribution of ICTs in promoting economic growth and supporting the democratisation process, there is less understanding of the ways in which ICTs are often re-interpreted, re-defined and re-shaped to fit political and cultural contexts that are substantially different from those of their origin.

Focusing on the case of Ethiopia, I analyze one of these processes of selective adoption, examining which components of ICTs have been endorsed and proactively promoted by the government of Ethiopia, which have been constrained or inhibited, and for what reasons. I build on a conceptual framework that combines critical insights from different forms of constructivism, especially as they have emerged in international relations and in the history of technology tradition. I offer a new approach that reframes ICTs from consensual objects with an agreed set of characteristics and possible effects to nodes surrounded by conflict, which can be appropriated or resisted by different actors to pursue potentially competing goals.

This thesis draws on extensive fieldwork and employs a variety of methods that have allowed me to analyse both the discursive and the material elements intervening in the adoption and adaptation of ICTs in Ethiopia. The research progressed through an iterative comparison between conceptualizations emerging from interviews with individuals who shaped the path of ICTs in the country, as well as from other textual material, and observations of how the technical artefacts were actually implemented. This process made it possible to understand how the complex nation building project pursued by the government of Ethiopia motivated the development of two large scale ICT projects, known as Woredanet and Schoolnet, and led to the marginalization of alternative uses of ICTs promoted by other components of society, such as the private sector, Ethiopians in the diaspora and international organizations.

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ACRONYMS

AAU – Addis Ababa University
ADF – African Development Forum
ADSL – Asymmetric Digital Subscriber Line
AISI – African Information Society Initiative
ANDM – Amhara National Democratic Movement
ANT – Actor-Network Theory
APDO – Afar People's Democratic Organization
AVI – Audio Video Interleave
BBS – Bulletin Board Systems
BCX – Business Connexion
BGPDUF – Benishangul-Gumuz Peoples Democratic Unity Front
BITE – Bringing Internet to Ethiopia
BoD – Broadband on Demand
BPR – Business Process Re-engineering
CEA – Commissariat à l'Énergie Atomique
CPJ – Committee to Protect Journalists
DOT Force – Digital Opportunity Task Force
DW – Deutsche Welle
EBA – Ethiopian Broadcasting Authority

ECA – See UNECA
ECSC – Ethiopian Civil Service College
EDF – Électricité de France
EFFORT – Endowment Fund For The Rehabilitation of Tigray
EFOSSNET – Ethiopian Free and Open Source Software Network
EICTDA – Ethiopian ICT Development Agency
EITPA – Ethiopian IT Professional Association EMA Educational Media Agency
ENA – Ethiopian News Agency
EPDM – Ethiopian Peoples' Democratic Movement
EPLF – Eritrean People Liberation Front
EPRDF – Ethiopian People's Revolutionary Democratic Front
EPRP – Ethiopian People Revolutionary Party
ETC – Ethiopian Telecommunication Corporation
ETV – Ethiopian Television
FAO – Food and Agriculture Organisation
GATT – General Agreement on Tariffs and Trade
GEQUIP – General Education Quality Improvement Program Project
GIIC – Global Information Infrastructure Commission
GPDF – Gambella People's Democratic Front
GDP – Gross Domestic Product
GDLN – Global Development Learning Network
GSTIT – Graduate College of Telecommunication and Information Technology
HNL – Harari National League
HNS – Hughes Network Systems
ICT – Information and Communication Technology
ICTAD – ICT Assisted Development
IDRC – International Development Research Centre
IFIP – International Federation of Information Processing
ILO – International Labour Organization
INGO – International Non-Governmental Organizations
IP – Internet Protocol
ISOC – Internet Society
ISP – Internet Service Provider
IT – Information Technology
ITU – International Telecommunication Union
LAN – Local Area Network
LTS – Large Technical System
Kbps – Kilobyte per second
Mbps – Megabyte per second
MCU – Multipoint Control Unit
MEISON – All-Ethiopia Socialist Movement
MLLT – Marxist-Leninist League of Tigray
MXM – Media Xchange Manager
NGO – Non-Governmental Organization
NCBP – National Capacity Building Programme
NICI – National Information and Communication Infrastructure
NWICO – New World Information and Communication Order
OECD – Organisation for Economic Co-operation and Development

OLF – Oromo Liberation Front
OLPC – One Laptop per Child
ONLF – Ogaden National Liberation Front
OPDO – Oromo People's Democratic Organization
PADIS – Pan African Development Information System
PSCAP – Public Sector Capacity Building Program
PICTA – Partnership for ICTs in Africa
UNECA – United Nations Economic Commission for Africa
REST – Relief Society of Tigray
RSF – Reporters Sans Frontières
RFP – Request For Proposal
SCOT – Social Construction of Technology
SIDA – Swedish International Development Cooperation Agency
SPDF – Somali People's Democratic Front
SMS – Short Message Service
SNNP – Southern Nations Nationalities and People
TPLF – Tigray People's Liberation Front
UEDF – United Ethiopian Democratic Forces
UNDP – United Nations Development Programme
UNESCO – United Nations Educational Scientific and Cultural Organization
UNESCO-IICBA – UNESCO's International Institute for Capacity Building in Africa
USAID – United States Agency for International Development
VOA –Voice of America
VoIP – Voice over Internet Protocol
VSAT – Very Small Aperture Terminal
WEF – World Economic Forum
WPE – Workers Party of Ethiopia
WSIS – World Summit of Information Society
WTO – World Trade Organization
ZTE – Zhong Xing Telecommunication Equipment

CHAPTER 1 – INTRODUCTION

Information and Communication Technologies (ICTs), particularly the Internet, have been framed by many donor governments and international organizations as powerful resources for reducing poverty and challenging despotic regimes.[1] Since national and international leaders vowed to fight the digital divide – the gap that separates those who have from those who do not have access to ICTs – the diffusion of digital technologies in poor states has been framed both as a driver of economic development and as a promoter of democratic values.[2]

The evidence that new technologies are supporting economic development in poor countries is contested. Rather than simply activating virtuous processes of growth, ICTs have interacted with existing resources, offering specific advantages in niche markets and in countries with a pre-existing favourable environment for the proliferation of knowledge intensive labour (OECD, 2004; Pohjola, 2001). But even in the absence of clear evidence of ICTs' contribution to economic development, investments in technology for poverty reduction, e-education or e-health continue and most states and international organizations are deeply optimistic and committed to further ICT implementation for development. An example of this commitment can be found in the address of former UN Secretary General Kofi Annan to the UN ICT task force on 30 September 2002, when he maintained that "there is a vast potential for investment growth in the developing countries. Information and communication

[1] The early faith in the power of ICTs to transform economics and politics is captured in the words of two former US presidents sitting on opposite sides of the political spectrum. Republican president Ronald Regan affirmed in his speech at London's Guildhall on 14 June 1989. "Technology will make it increasingly difficult for the state to control the information people receive [...] The Goliath of totalitarianism will be brought down by the David of the microchip". Seven years later, Democratic president Bill Clinton declared in Knoxville, on 10 October 1996 that "if we don't broadly share the knowledge and the technology that is developing, it could work to promote inequality, frictions, anxieties among people. But if we do it right, it can be a great force to help us meet our challenges and protect our values together". Clinton's perspective, originally intended to refer to the domestic digital divide, soon defined his global strategy (Gunkel, 2003).

[2] At the turn of the millennium many international fora promoted plans to make use of digital technologies for the benefit of humanity. A list of the major initiatives is presented in section 1.1.

technologies can help us turn this potential into concrete opportunities that will help the poor work their way out of poverty, while at the same time benefiting the world community as a whole".[3]

At the same time, an increasing number of cases of censorship, arrests and restrictions related to the use of ICTs is progressively contradicting the hypothesis that the Internet would progress in tandem with the diffusion of civic and political rights and the downfall of autocracies. Governments around the world have proved extremely efficient in diffusing the threats posed by ICTs to their authority and in silencing unwanted criticism. Together with the growth of networked citizens, both the quantity and intensity of online censorship have increased, suggesting that in the 'Information age' a less open model of information flow is possible and may be flourishing.[4]

The arguments presented in this thesis offer a more nuanced understanding of these phenomena focusing, in particular, on how state actors in developing countries have influenced technology adoption and favoured the diffusion of certain uses of ICTs, while discouraging others. Why is it, for example, that the discourse on the role ICTs play in development has been embraced actively and is still popular among leaders in Africa, Asia and Latin America, while the democratization rhetoric often has been rejected or challenged? And what are the implications this selective approach may have for the practical implementation of technology in the developing world?

This thesis responds to the call for a deeper understanding on how power, at the local and at the international levels, as embedded in artefacts and exercised in social relations, influences the adoption and adaptation of new technologies (Mansell, 2006). It shares an interest in explaining how politics intervenes in motivating decisions commonly interpreted as being merely technical (Wilson III,

[3] The speech was delivered at the 3rd meeting of the UN ICT Task force, at UN headquarters in New York. Part of it is available at http://news.bbc.co.uk/1/hi/technology/2295711.stm Last time accessed 12.02.2010.

[4] Numerous reports have been published by the Opennet Initiative, supported by the Universities of Toronto, Oxford, Cambridge and Harvard, showing how the filtering of Internet content has increased in the past years. The reports can be accessed at http://www.opennetinitiative.org

2004; Wilson III & Wong, 2007).[5] It is driven by the necessity of understanding how ICTs are integrated in locations that are different from those of their invention and thus further away from particular normative perspectives (Unwin, 2009b; Warschauer, 2003). It asks a fundamental question about why ICTs developed the way they did in a particular context instead of taking a normative approach and asking how ICTs could better serve a real or imagined need or perform a particular function in a specific context.

Through exploring the evolution of ICTs in Ethiopia, I examine how a semi-authoritarian, yet developmentally oriented regime, has actively sought to mediate the – either real or imagined – destabilising aspects of ICTs while embracing them as a tool for development. The central question I ask is the following: why and how have ICTs been re-interpreted, re-defined and re-shaped in Ethiopia?

Ethiopia is one of the world's poorest nations.[6] It is the largest recipient of development aid in Africa.[7] And, partly because of its strategic location in the Horn of Africa, it has a preferential relationship with Western powers.[8] However, the picture that emerges from a close look at how ICTs have taken shape in Ethiopia appears dramatically at odds with what these premises would otherwise suggest. Despite its limited resources, the Ethiopian government has spent hundreds of

[5] "One of the most unexpected conclusions that I have drawn from my visits to dozens of countries is that in developing countries the information revolution is viewed as a highly political affair and not as a technical challenge" (Wilson III, 2004, p. 6)

[6] Between 2004 and 2008 Ethiopia's GDP per capita ranked it either at the 170th or 171st position out of 182 countries (UNDP, 2005, 2006, 2008, 2009).

[7] Between 2004 and 2008 Ethiopia's Overseas Development Assistance, the measure used by the Organization for Economic Cooperation and Development (OECD) to assess donor's countries contributions to developing countries, has almost doubled, reaching more than three billion dollars in 2008 and ranking Ethiopia as the major recipient of donors' funds in the continent (OECD, 2009). According to the same agency, in 2008 the only countries receiving more funds were Iraq with almost ten billion, and Afghanistan, with almost five (OECD, 2009).

[8] Ethiopian Prime Minister Meles Zenawi was greeted by former American President Bill Clinton as belonging to a new generation of African leaders and was selected by former British Prime Minister Tony Blair as the only serving African prime minister as a member of his Commission for Africa.

million of dollars to equip every secondary school classroom along with most government offices with plasma TV screens to receive information through satellite connections. These systems were not funded through donor money, but by the Ethiopian treasury and were implemented despite the opposition of the representatives of the international community in Addis Ababa. However, despite these heavy investments in ICTs, Ethiopia continues to score very poorly along most of the prevailing indicators used by international and donor organizations to assess the progress of the information society: it has one of the lowest levels of Internet and mobile penetration on the continent, it has not liberalized its telecommunication market, and it pervasively filters political content online.[9]

Examining why and how ICTs have been re-interpreted, re-defined and re-shaped means focusing on what ICTs have actually become rather than on what they could or should have been. This challenges assumptions about what represents a success or a failure in the application of ICTs for development that characterizes a large share of the literature. For example, using a satellite to connect government offices in remote areas to resources available in the capital might be considered a positive achievement. But what if most of the bandwidth is used by the Prime Minister and other cadres to instruct elected officials on what the party line is? Fundamental disagreements between donor agencies and a national government about how to use ICTs for education might be a sign of a likely failure to apply new technologies in schools, unless they become the reason for that government to take full ownership for installing some of the newest technologies in every secondary classroom. Finally, blocking websites and blogs as well as preventing people from using the Short Message Service (SMS) through their mobile phones might be

[9] According to the International Telecommunication Union (ITU), in 2004 only 0.1% of the Ethiopian citizens had access to the Internet, while 0.4% had access in 2008. Apart from the Democratic Republic of Congo, every other country in Africa scored higher along this dimension (ITU, 2009). A similar situation could be registered for the access to mobile telephones. In 2004, 0.1% of Ethiopian citizens had a subscription to the only mobile operator, while 3.7% had one in 2008 . Only Eritrea and the Central African Republic did worse (ITU, 2009). According to the Opennet Initiative, in 2007 Ethiopia was the only country in Sub-Saharan Africa to pervasively filter Internet content for political reasons (Opennet Initiative, 2007).

interpreted as blunt acts of censorship. But the judgment may change if some of those online spaces are actively promoting ethnic hatred and the SMS is used to organize potentially violent protests in a tense period of the history of a country.

Asking why and how ICTs have been re-interpreted, re-defined and re-shaped shifts the attention from prescribing what developing countries need, or lack, or whether they perform well according to preset standards, to focusing on what differentiates international norms and their local application. It recognizes the existence of preferred readings, defining how ICTs could and should be used, and alternative ones, possibly leading to the transformation of new technologies in contexts that are different from those of their invention. In the next two sections I explore these different dimensions, illustrating first how ICTs have been framed in the international policy discourse, suggesting particular readings while discouraging others, and, second, what has resulted from their selective appropriation in Ethiopia. After introducing the theory and methods in Chapters 2 and 3, the rest of the thesis will investigate the factors that have led to the re-interpretation, re-definition and re-shaping of ICTs in Ethiopia and what have been the means employed to make these transformations possible.

1.1 Technology and its potential

Since the 1990s the increasing diffusion and popularity of the Internet stimulated a new wave of programmes advocating the use of the latest technology to address the problems of poor nations. Ethiopia, along with most developing countries, became the target of campaigns coordinated by new and old institutions that aimed at teaching how ICTs could be used for economic, social and political change. At the G8 summit held in Okinawa in July 2000 a *Digital Opportunity Task Force*, also known as the DOT Force, was launched to fight the increasing inequalities in the distribution of digital wealth. In the business sector the Global Business Dialogue on Electronic Commerce, a partnership of global corporations aimed at influencing policy issues, created a *Digital Bridges Task Force*, and this

was soon echoed by the Davos World Economic Forum's establishment of a *Bridging the Global Digital Divide Task Force*. A year later, in November 2001, the UN established its own ICT task force to perform similar tasks under a wider multilateral umbrella. This period was also characterized by a proliferation of policy papers stressing the relevance of ICTs for development. The World Bank focused on the issue in three, almost consecutive, annual development reports, including *Infrastructure for Development* (1994), *The State in a Changing World (*1997) and *Knowledge for Development* (1998). The International Telecommunication Union (ITU) in 1996 issued *The African Green Paper* (ITU, 1996), as a follow up to its famous Maitland report (ITU, 1985) and used the occasion to update its recommendations on telecommunications incorporating the developments introduced by the advent of the Internet. The United Nations Development Programme (UNDP) and the International Labour Organization (ILO) followed in 2001 with *Making New Technologies Work for Human Development* and *Life at Work in the Information Economy.* These documents were also accompanied by dozens of other studies published by specialized institutions, such as the International Development Research Centre (IDRC), the Benton Foundation and the Global Knowledge Partnership.

During this period, which culminated in the World Summit on Information Society (WSIS) in Geneva (2003) and Tunis (2005), different voices competed to define what ICTs could do for development, how they could optimally be employed and whose responsibility it was to promote their diffusion. Within the UN system, different organizations focused on particular aspects of the ICTs for development discourse. While The World Bank, for example, stressed how revolutionary new technologies could be when used for fighting poverty, the UNDP preferred to highlight how global inequalities in the distribution of ICTs could further marginalize the least developed countries (Wilson III, 2004). Most international organizations, however, operated within a common, largely deterministic, framework, seldom considering the criticism that emerged over the years about the shortcomings of framing technology simply as a driver of development (Mansell, 2006; Nulens & Van Audenhove, 1999; Padovani & Nordenstreng, 2005; Raboy, 2004; Schech, 2002; Sosale, 2008).

The approach taken by international organizations depicted technological artefacts and new ideas as independent variables, as elements that could move into a perceived vacuum and start producing the desired effects once planted. In its report, the UNDP affirmed that "investments in technology can equip people with better tools and make them more productive and prosperous." (United Nations Development Programme, 2001, p. 2). The World Bank complemented the statement by stressing that "knowledge is like light. Weightless and intangible, it can easily travel the world, enlightening the lives of people everywhere" (World Bank, 1998, p. 1). In the same reports some of the applications of ICTs and the effects they could produce were clearly indicated as more probable and more beneficial than others. When illustrating the applications of new technology to political life, for example, greater participation and democratization were cited as the likely outcomes. As the Human Development Report illustrated:

> Like the printing press of earlier centuries, the telephone, radio, television and fax of the 20th century opened up communications, reducing isolation and enabling people to be better informed and to participate in decisions that affect their lives. Tied to these technologies is the free media, a pillar of all functioning democracies (UNDP, 2001, p. 29)

In the economic domain, ICTs were described as producing the greatest benefits when introduced in the context of liberalized and global markets. According to The World Bank:

> Developing countries have tremendous opportunities to grow faster and possibly to catch up with the industrial countries. To take advantage of these opportunities in a fast-moving global economy, developing countries [...] must be open to new ideas and capture the benefits of technological progress. Some countries have recognized the potential of the global economy and have defined clear strategies to take advantage of it. Others will have to accept the reality of globalization more quickly than they might wish (World Bank, 1998, section 1.4)

Facing political and economic pressure from the US government and the private sector, even organizations that for a long time supported the primacy of the state in controlling and managing the telecommunication sector, started advocating a new model, where private operators had to take a greater role in the sector. As the International Telecommunication Union argued in its *African Green Paper*:

> There has been a widespread move towards liberalization of economic activities, opening avenues for private initiatives and enhanced competition. [...] This implies reconsidering the role of the state, which henceforth should center on good governance and basic regulatory functions. As a corollary to the globalization and competitive dynamics of the economy, any country wishing to thrive in this environment must organize itself properly or else take the risk of plunging the majority of its population into poverty (ITU, 1996, p. 17)

In general, the range of applications proposed in reports and other policy documents, was based on a mix of normative indications largely derived from how ICTs were employed in rich countries, and assumptions about how rational actors in developing countries would make use of the new resources. The following excerpt, from the African Information Society Initiative (AISI) framework, summarizes this tendency:

> The emerging global information infrastructure, the process of making connectivity available to everyone on the planet, is making the following possible: Students study and research using computers, multimedia and networks; Doctors diagnose, aided by information accessed through global networks; Decision support systems for debt management help cut external debt by up to 50 per cent; Drought and famine warnings arrive in time to change planting times; Businesses compete more effectively with timely and accurate market information; Transport costs are reduced, also resulting in less pollution; Cultural heritage is captured electronically, documented and globally disseminated (UNECA, 1996, section 7)

The ways in which ICTs could achieve these goals were pinpointed in most documents by describing various success stories from all over the world, from

students in Costa Rica, Brazil, Thailand and South Africa accessing computers to enjoy a more interactive learning experience, to electronic forums used in the Philippines to coordinate the reactions to the impeachment trial of a former President (UNDP, 2001); from farmers in Sri-Lanka employing telephones to better place their products (ITU, 1985), to small businesses in Vietnam or Panama growing through e-commerce (World Bank, 1998).

Overall, the policy discourse articulated through these and similar documents, supported uses of ICTs aimed at making developing countries more modern, democratic and integrated into the global economy. It was insistent and persistent. It was relatively more uniform than other discourses that emerged at the international level to tackle problems of similar scale (Nulens & Van Audenhove, 1999). However, as the next section illustrates, it did not always lead to applications which closely followed the prescriptions indicated at the international level. Even the countries that were the most dependent on international aid demonstrated a certain capacity to resist some of the prescriptions articulated by international organizations and to develop ICTs in accordance to their specific development path, marginalizing some aspects of the ICT for development discourse, while magnifying others.

1.2 Technology and its application in Ethiopia

Since the early 1990s, in the same period international organizations were defining a new agenda to encourage the use ICTs in developing countries, Ethiopia was experiencing a challenging political transition. Ethiopia's government was engaged in the difficult task of rebuilding the nation after more than fifteen years of civil war. The new ruling party, the Ethiopian People's Revolutionary Democratic Front (EPRDF), had emerged victorious from the long struggle against the Derg, the communist military dictatorship headed by Mengitsu Haile Mariam, but it had to transform its military success into a broader mandate to govern. As a minority government, the EPRDF had a daunting task of uniting a country fractured by war and rebuilding central and local governments that were capable of managing the transition and the accompanying expectations of political reform.

The EPRDF's past was rooted in the fight for the rights of the people living in Tigray, a region in northern Ethiopia, constituting only 5.8% of the total population. The capture of the state required new strategies to demonstrate that all disparate components of an ethnically diverse country, and not just Tigreyans, would be represented. Political reform and development had to be pursued at the same time to make a stable transition possible. Different measures were adopted to reach the goal, from the reform of the civil service to the promotion of symbolic events such as flag days and other celebrations of the "unity in diversity" motto.

Given the concurrent international attention created around ICTs and their potential of supporting socio-economic development, it was likely that the new technologies would be included in the ambitious plans for the country's transformation. However, as their later applications showed, this happened in directions that were significantly different from those illustrated in the reports, frameworks, and green papers of the kinds illustrated above. Taking for example the AISI framework quoted above as a reference point, very little of what the document considered possible was implemented in Ethiopia: in one of the countries most affected by famine no warning system was developed; no incentives were created for businesses to use ICTs, no projects were launched to use new technologies for health related purposes. The neglect in these areas, however, was matched by very large investments in other, unique, ICT-based projects. Hundreds of million of dollars were spent to create Woredanet and Schoolnet, two systems using Internet Protocol (IP) based satellite connections and plasma TV screens to reach all corners of the country with information coming from its centre. The two systems were government financed and implemented in collaboration with Cisco Systems and Hughes Networks, two companies based in the USA and providing network solutions and satellite connectivity, respectively.

Woredanet – Amharic for the "network of district administrations" – was designed to link the central government with the eleven regional and 550 district administrations and to provide different services, such as Internet connection, e-mail service, and Voice-over-IP. Since its installation, however, the most common use of the system has been videoconferencing. Through 42 inch plasma TV screens (as shown in Fig. 1.1), ministers, high level civil servants and trainers in the capital, have

been communicating with the local governments in the peripheries of the state instructing and training local officials on what they should be doing and how. All the servers necessary to manage the videoconferencing services as well as other services offered by the system were installed in the office of the Prime Minister, from where a transmission could be initiated at any time, while the peripheral nodes had to be authorized to use the services.

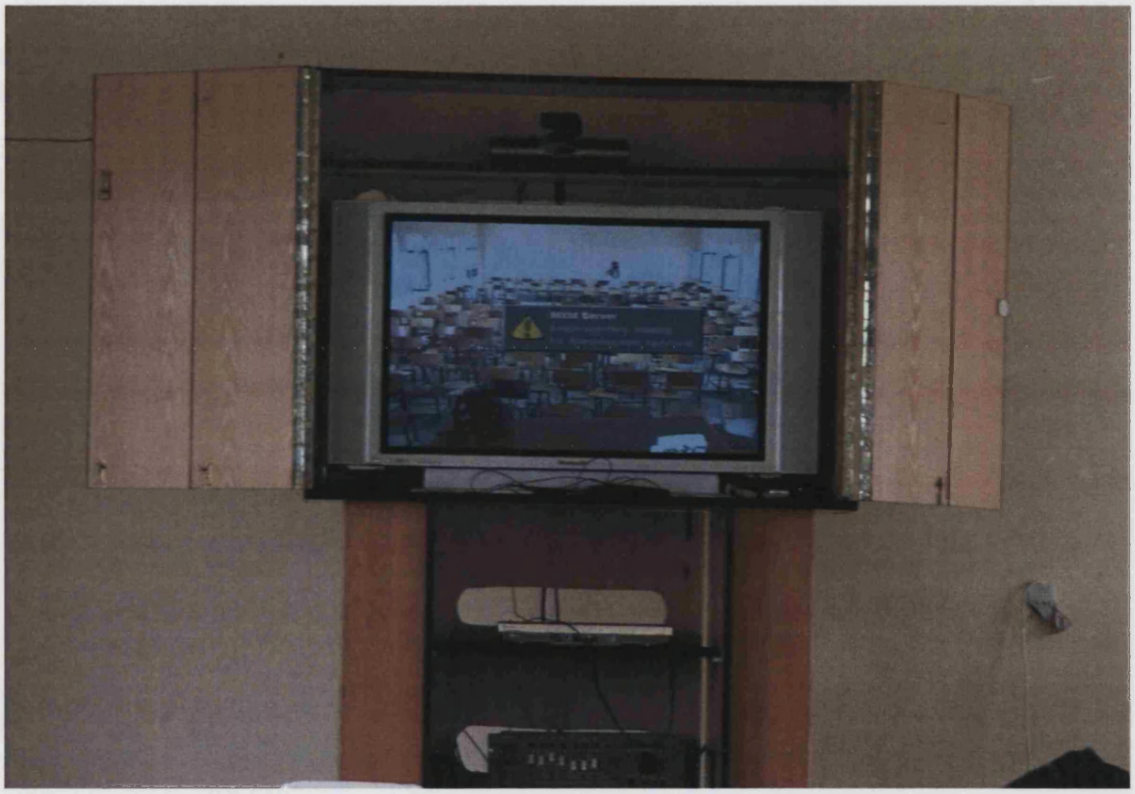

Fig. 1.1 The Woredanet equipment, composed of, from top to bottom, a video-camera, a plasma TV screen, a decoder, an amplifier/equalizer (© Author)

Schoolnet was a similar system (see Fig. 1.2). It was created to broadcast pre-recorded classes in a variety of subjects, from mathematics to civics, to all secondary schools in the country. During school vacations, however, the system has also been used to broadcast messages from the political leadership in Addis Ababa to selected groups of individuals, including teachers. As of 2008, 775 schools were connected and 16,686 plasma TV screens had been installed.[10]

[10] Source: Educational Media Agency (EMA), Addis Ababa.

The two systems were developed under the authority of the newly created Ministry for Capacity Building which delegated the Schoolnet operation to the Educational Media Agency (EMA), and the implementation and management of Woredanet to the Ethiopian ICT Development Agency (EICTDA). The latter represented a new kind of institution in the Ethiopian landscape. Established with the specific intent of coordinating most of the ICTs related activities in the country, it was significantly better resourced than many other Ethiopian agencies, both in terms of capital and human resources. It was hosted in one of the newest buildings of the capital, and aimed to be a symbol of a more modern style of state administration.

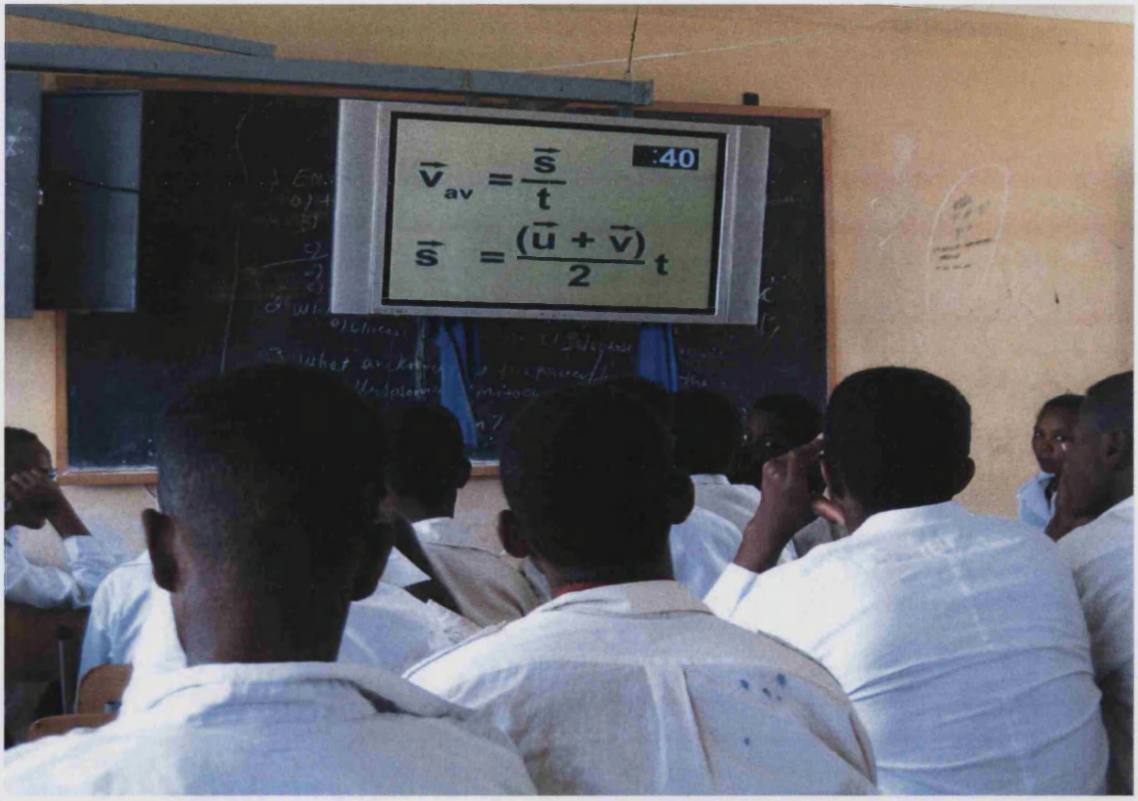

Fig. 1.2 The Schoolnet equipment, the decoder in this case is in a separate room and can work only to receive and not to send signals (© Author)

Schoolnet and Woredanet, as well as the institutional environment in which they emerged, showed a significant commitment to the use of ICTs despite Ethiopia's limited financial resources. At the same time, they were also illustrative of how new technologies could be applied in a very selective manner. As briefly

indicated above, beyond the two systems and the remarkable efforts made to install the equipment necessary for a videoconference or a broadcast in even the most remote villages, the Ethiopian ICTs landscape appeared quite desolate.

According to the most recent data available, in 2007, the country was still relying almost entirely on slow and unreliable dial-up connections which for a country of more than 70 million people had just surpassed 30,000 subscriptions. There were only 629 broadband subscribers (EICTDA, 2009; Selam Development Consultants, 2007). In its determination to retain a government monopoly over telecommunications, the Ethiopian government seemed not only to have failed to create the conditions for local entrepreneurs to reap the benefits of global economic markets, but even to have worked actively to prevent this from happening. The monthly fees charged by the Ethiopian Telecommunication Corporation for a broadband connection ranged from USD 200 a month for a 64 Kbps, just a little bit faster than a dial-up, to more than USD 5,000 for 2 Mbps (EICTDA, 2009; Selam Development Consultants, 2007). Despite the fact that the costs for a connection have dropped dramatically elsewhere on the continent, partly as a result of greater availability of bandwidth worldwide, in Ethiopia they have remained the same for a long time and there appears to be little intention to reduce them in the near future (EICTDA, 2009). In addition, most of the political blogs, especially those backed by opposition members and by vocal critics of the Ethiopian diaspora, have been blocked, preventing important voices from participating in the local political debate.

These examples of ICT adoption in Ethiopia offer a complex puzzle to the researcher. At the beginning of the new millennium the country emerged as a laboratory where new applications of ICTs were advanced, for better or for worse, combining global tools and local needs, apparently resisting preferred readings to allow alternative ones to emerge. The international community appeared to have encouraged ICTs to be a national priority, but soon lost its capacity to influence their application in a country still marred by poverty and engaged in a complex political transition.

This thesis seeks to examine why and how the discrepancy between international and local discourses emerged and which actors and resources have

made the subsequent reshaping of ICTs possible. It also highlights some of the implications the selective adoption of ICTs has had, with a particular focus on how it played out in the political realm. In the next section an overview of how this exploration evolved is presented, spanning from the construction of a conceptual framework capable of capturing the complexities of the transformations of ICTs in Ethiopia to the engagement in the field. The significance of the contributions that this study of the evolution of ICTs in Ethiopia offers to ICT for development and international relations scholars is suggested.

1.3 An overview

The conceptual framework I developed and applied to provide answers to the puzzle presented by the Ethiopian case is illustrated in the next chapter. It combines arguments drawn from the history of technology tradition and from constructivism in international relations which have challenged deterministic approaches to studying the influences between the technical and social, in the first instance, and the relations among the international, the national and the local, in the second. The conceptual framework emerging from their combination enables politics to be appreciated as a force structuring both the interactions among actors (i.e. international institutions, local governments, and civil society organizations) and between actors and technical artefacts. It allows elements usually studied in isolation (i.e. institutions, technical objects, laws, and political programmes) to be analyzed as components of a larger technopolitical regime, a term coined by historian Gabrielle Hecht (1998), to stress how technology can be employed to pursue political goals. Chapter 2 also illustrates how, by applying this conceptual framework, the main research question – why and how ICTs have been re-interpreted, re-defined and re-shaped in Ethiopia – has been further refined into two more specific sub-questions, asking:

- What factors have influenced the development of different technopolitical regimes based on ICTs in Ethiopia – such as donor pressure, internal agenda and international standards – and to what degree?

- What actors have made a selective adoption of ICTs in Ethiopia possible and what resources have been mobilized to enhance particular aspects of ICTs, while marginalizing others?

Asking these questions means reframing ICTs, not as consensual objects, as they have been assumed to be in most of the literature on ICTs for development, but as nodes surrounded by conflict and resistance. Answering them requires analysing a variety of competing views held by different actors on what technology is and what it should be as well as locating the concrete applications that have turned some of these views into reality while marginalizing others.

Chapter 3 describes the methods that have been employed to perform these tasks, mapping the actors, the discourses and the artefacts that have characterized the Ethiopian path towards ICTs, and connecting them together. It illustrates how the research evolved through a progressive engagement in the field, employing techniques for data collection and data analysis that allowed a comparison between the discourses articulated at the political level and their materialization into specific technopolitical regimes. Oral history techniques, the observation of technical artefacts, and the analysis of textual materials have been combined. The data have been integrated and analysed using a grounded theory approach, progressively reconstructing the evolution of a national technopolitical regime based on systems like Schoolnet and Woredanet, and developing an understanding of what motivated it and made its realization possible. The same approach led to the identification and analysis of other technopolitical regimes that emerged in Ethiopia to complement, patch, or oppose the one developed by the government.

Chapters 4 and 5 assess the discourses that influenced the appropriation and adaptation of ICTs in Ethiopia. Chapter 4 analyzes the discourses advanced by the international organizations that played the most important role in "bringing" ICTs to

Ethiopia and the reactions they produced among various local actors. In addition to illustrating how the same technologies could produce a variety of interpretations, the chapter also roots these interpretations in long-term paths of technology adoption which characterized what could be called an Ethiopian approach towards the telephone, the radio and the first computers. It concludes by indicating how local actors, other than the state, were marginalized in their attempts to influence the trajectory of ICTs in the country, leaving the government as the major player in making ICTs what they later became in Ethiopia. Chapter 5 builds on Chapter 4, examining more specifically the discourses embraced by the Ethiopian government representatives which appeared to have influenced the development of ICTs in the country. Similar to the previous chapter, it does not concentrate exclusively on the present, but engages in a longer term analysis of how these discourses originated, dating back from when the current leaders were fighting against the military dictatorship of the Derg which ruled Ethiopia between 1974 and 1991, and evolved, interacting with new challenges and new opportunities.

Chapters 6 and 7 turn to more technical aspects. Chapter 6 investigates how a national technopolitical regime based on Woredanet and Schoolnet emerged in Ethiopia. It analyses the design and functioning of the two systems, explaining how specific features were not simply motivated by technical issues, but were the enactments of political goals through the use of technology. The evolution of the two systems is described and connected to the discourses analyzed in the previous chapters. Chapter 7 is the last empirical chapter and it analyses the technopolitical regimes that actors other than the state tried to develop in order to oppose, complement or "patch" the national regime. These attempts, and some of artefacts and practices they originated, are shown to have represented a way to fight politics through technology, articulating alternative views of how ICTs could be employed, but also of how the Ethiopian state should be run.

In Chapter 8 the case studies and arguments put forward throughout the thesis are analyzed in accordance with the conceptual framework presented in Chapter 2. The main research question and the two sub-questions are answered by connecting discourses and artefacts, actors and resources that influenced and guided the evolution of ICTs in Ethiopia. Finally, Chapter 9 concludes by illustrating the

contributions of this study to the ICT for development literature, as well as to the international relations and history of technology traditions. It also highlights possible paths for future research.

1.4 Conclusion

The contribution of this study is intended to be twofold. On the one hand, it reconstructs the history of the development of ICTs in Ethiopia since the advent of a new political regime led by the EPRDF. It presents the history of how one of the poorest countries in the world became a laboratory where global tools and local needs were combined under the control of a government struggling to affirm its legitimacy. By exploring the connections between different actors operating at the local and at the international level, and between these actors and a variety of discourses on ICTs as well as on society at large, this research promotes a richer understanding of the politics of the country and of the ways in which it relates to the international system. On the other hand, the Ethiopian case offers the opportunity to develop and apply an innovative conceptual and methodological framework stressing the conflictual nature of ICTs. As will be illustrated in the next chapter, this framework is inspired by concepts and insights drawn from several theoretical traditions as well as by the puzzle presented by the evolution of ICTs in Ethiopia. Its application arguably can be extended to less dramatic cases of re-definition, re-interpretation and re-shaping of ICTs, allowing the researcher to capture phenomena that have been overlooked in a literature that is generally overly focused on analyzing countries according to how they are employing a given set of artefacts.

CHAPTER 2 – CONSTRUCTING NEW TOOLS TO UNDERSTAND THE ADOPTION OF ICTS IN DEVELOPING COUNTRIES

This chapter elaborates the theoretical foundations on which the analysis of how ICTs in Ethiopia have been reshaped is developed. I begin by examining the assumptions that have characterized the rhetoric about technology and its potential to transform societies in the developing world. The wave of campaigns to promote the use of Information and Communication Technologies (ICTs) that characterized the 1990s and early 2000s is placed in the context of earlier attempts to use ICTs to make developing countries more modern, democratic and integrated into a globalized world. The discourses advanced internationally, both at the policy level and among mainstream scholars, are then critically assessed by reviewing the literature and illustrating how different traditions challenged the idea of ICTs as simply impacting on developing countries. Building on this assessment, I then elaborate a conceptual framework that can enable researchers to better understand the transformations ICTs undergo in their transfer to locations that are different from those of their invention. By using concepts emerging from the history of technology tradition as well as from the constructivist school in international relations, a set of conceptual tools is generated to examine how ICTs, both in their material and discursive aspects, are resisted, negotiated, and inserted into pre-existing networks of technologies and power. Within this framework ICTs cease to be consensual objects with an agreed set of characteristics and are opened up to the possibility of being appropriated by different actors to support competing hegemonic projects.

2.1 Technology as a modernizing, democratizing and globalizing force

> Information and Communication Technologies (ICTs) have an immense impact on virtually all aspects of our lives. The rapid progress of these technologies opens completely new opportunities to attain higher levels of development. The

> capacity of these technologies to reduce many traditional obstacles, especially those of time and distance, for the first time in history makes it possible to use the potential of these technologies for the benefit of millions of people in all corners of the world (World Summit on the Information Society, 2003, p. 2)

Policy documents such as the World Summit on the Information Society (WSIS) Geneva Declaration of Principles quoted above frame ICTs, and the contributions they might provide to developing countries, as being radically different from everything that has come before. However, if the artefacts described in these documents are arguably new, the drive to use them "for the benefit of millions of people in all corners of the world" represents the most recent expression of a long-term interest in applying ICTs to development. It re-articulates older ideas about technology as a modernizing, democratizing and globalizing agent, which have inspired projects and programmes in the developing world for a long time. A sample of these ideas is presented below, illustrating how they initially emerged in the policy debate and how they continue to influence it, characterizing newer ICTs and their applications in developing contexts.[11]

Modernization theory is probably the most powerful paradigm that, over time, has influenced interventions in developing countries. It dates back to the coining of the term "development", when modernization was framed as one of the main forces that should lead to "the improvement and growth of underdeveloped areas" (Truman, 1949). At the same time technology became one of its most powerful symbols. As president Truman said in his inaugural address, "greater production is the key to

[11] I define ICTs as all those technologies that are used to capture, store, process, share and disseminate information. This definition resonates with the extensive one advanced by key authors in the field of ICTs, such as Castells (1996) and Mansell (1996; 1998) as well as with that proposed by the United Nations Economic Commission for Africa (UNECA). According to the UNECA "ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, and other related information and communication activities" (UNECA, 1999). Within this context, I consider newer ICTs those such as the Internet and mobile telephony which started to spread globally since the 1990s.

prosperity and peace, and the key to greater production is a wider and more vigorous application of modern scientific and technical knowledge" (Truman, 1949). According to modernization scholars, the process of development should be characterized by a number of steps similar to those that Western Europe and North America had experienced. It claimed that other countries had to pass, or should be helped to pass, through the same stages if they were to achieve economic and social well-being (Rostow, 1960; Rostow & Millikan, 1957). Rogers, in his early works (1962), adopted this scheme to examine the processes of technological innovation, showing how adopters of an innovation or idea could be categorized along a scale from innovators and early adopters to late adopters and laggards. The underlying concept of progress was mostly that of a movement from centres to peripheries, along which it was assumed new objects and techniques could rarely be challenged or modified.

In the same period Schramm and Lerner popularized similar ideas in the field of communication, advocating that mass media, especially radio, could be used as tools to bring modernity to marginal communities by educating and teaching people Western values and thinking. Lerner (1958), studying the effects of communication in the Middle East, developed the concept of a natural empathy linking populations in different corners of the world, that through the mass media could have a progressive detachment from traditional cultures and poverty to embrace Western values and development. Schramm (1964) stressed the mandate of local governments and donor agencies in promoting development through the use of the radio and that the press could be employed not just to inform, but, more importantly, to educate local populations in agriculture, health and other key development areas.

This linear approach to development has been heavily criticized (Mansell, 1982), empirically (McMichael, 1996), and theoretically because of its Western bias (Mattelart, 2000; Unwin, 2009a). After decades of interventions poor countries did not progress as planned (McMichael, 1996) and communications did not have the expected impact (Bourgault, 1995). Nevertheless modernization has continued to influence development circles. The later advent of digital technologies represented an occasion to rediscover some of its claims. The unique features of new ICTs such as the Internet, including their interactivity, lack of hierarchy, or capacity to integrate in

different sectors, were interpreted as being capable of providing the boost developing countries were said to be lacking.[12] Rostow's stages were resurrected to claim that ICTs would allow states to "leapfrog" some steps in development, leading directly to the knowledge era or, in a softer version, to skip inferior, less efficient and more expensive technologies and move directly to more advanced ones (World Bank, 1998).

The discourse on modernization was often accompanied by a complementary one on the *democratizing* potential of technology for developing countries. The claims about a connection between science, technology and democracy had a long history in Western thought, and the Second World War had given them new vigour. "Science and technology, in the hand of the free man had saved the world for democracy. Science was held to be intimately a weapon of democracy, and democracy a friend of science" (Macleod, 1997, p. 377). Robert Merton in his famous *Note on Science and Democracy* (1942) had described how a scientific ethos could stand against both Nazi and Soviet authoritarianism and his argument would later be turned to the struggles against other forms of political oppression in Africa, Asia and Latin America (Mendelsohn, 1989). Modernization scholars such as Rostow and Millikan (1957) easily could connect the rationality inspiring modern science and technology to the promotion of democratic institutions in developing countries. Their arguments, however, were not simply motivated by a dispassionate interest in the rights of the poor or in using modern tools to improve their living conditions. They had a precise role in the Cold War balance. As Allen and Hecht pointed out:

> Because both modernization and democracy – by virtue of their foundations in scientific and technical rationality – were construed as non-ideological, aid to the "Third World" enacted through "technical assistance" was itself portrayed as neutral with respect to the political issues which rouse men's passions. "Modernizers" intended Western technology to produce economic growth in a

[12] In economics ICTs often have been referred to as General Purpose Technologies, because of their adaptability and capacity of contribute to different sectors of the economic life. See for example *Genereal purpose technologies: "engines of growth?* (Bresnahan & Trajtenberg, 1995).

> manner that could soar above passion, fraction, and political dispute. In this way, economic and technical aid also served as a powerful weapon in the Cold War fight against communism. Modernization theory justified interventions that might otherwise be construed as neo-colonial. (Allen & Hecht, 2001, pp. 9-10)

This rhetoric survived the height of the Cold War and was reinforced by the advent of the Internet, which added a further dimension to the belief in the power of technology in promoting democratization. This was connected to the very architecture of the medium, its rhizomatic structure with no centre, only nodes and connections.[13] Because of the protocols and standards the Internet is based on, no priority can be given to the transmission of content – it does not matter if an email is sent by a president or by a teenager, it will be given the same rights to reach its destination.[14] This image, that information is free to flow without hierarchy or constraint, promoted egalitarian ideals based on the supposed capacity of the network "logic" (Castells, 2001) to transform the off-line world, putting those in power at risk of losing their privileges and the marginalized in a better position to leverage their claims (UNDP, 2001).

A third powerful discourse that contributed to positioning ICTs in a development context is that of *globalization.* Differently from modernization and democratization, globalization as a concept emerged only in the 1980s, but many of the meanings later attached to it, such as the increasing interconnectedness of national economies (Ōmae, 1990), the progressive interlinking of individual lives (Giddens, 2000), and the greater circulation of information (Castells, 1996) already

[13] The concept of rhizome was initially advanced by Deleuze and Guattari (1987), as a critique of the hierarchical idea of knowledge articulated in tree-like models. It was later adopted by authors such as Levy (1998) to show how the Internet represented the realization in practice of this abstract model.

[14] This fact that every bit of information moving through the Internet is treated equally, on the basis of a logic of "first come, first served" is known as net neutrality. It is only the end user who pays for receiving a more or less fast connection, while no content provider is charged for the delivery of its content.

had been variously employed to shape key policies targeting developing countries.[15] The creation of the Bretton Woods institutions, The World Bank, the International Monetary Fund, and the General Agreement on Tariffs and Trade (GATT), was presented as being driven by the belief that greater market integration eventually would benefit every country in the world, including the poorer ones. The birth of the United Nations also was motivated by the idea that some aspects of individual lives should be regulated, at last in principle, by universal institutions that could appreciate the global effects of individual actions. And the conviction that information should be left free to circulate independently of national borders, informed many post-war activities aimed at assisting countries in Africa, Asia and Latin America. Of all the policies, the latter is probably the one that had the most direct influence on the subsequent framing of ICTs for development, but, as various studies have shown (Carlson, 2003; Padovani, 2005; Raboy, 2004; Sosale, 2008), it was only through complex negotiations that it eventually prevailed over competing ideas about how information should be handled at the international level.

As Carlson (2003), Mansell and Nordenstreng (2007), and Sosale (2008) illustrated in their works on the global governance of communication, the "free flow of information" principle, strongly supported by the USA, initially emerged in contrast to two other powerful arguments. One was advanced by the USSR, claiming that greater powers should be given to individual states to control and stimulate communication flows. The other, supported by the non-aligned countries, those refusing to position themselves on either camp of the Cold War, lamented that the imbalance of resources between developed and developing nations was transforming, in practice, the "free flow of information" into a one-way flow of information. They requested new norms to protect poor nations from cultural imperialism and to favour the circulation of information originating from what was broadly defined as the global south. These positions openly competed during the debate promoted by UNESCO for the definition of a New World Information and Communication Order

[15] The term globalization started to be widely used in the 1980s. Theodore Levitt from Harvard University popularized the term with his article on *The Globalization of Markets* (1983), published in the Harvard Business Review. However, there is no clear-cut definition of globalization and different authors used the same term to refer to a variety of heterogeneous phenomena (Hopkins, 2002).

(NWICO) in the 1970s and 1980s. Despite the mediation efforts of the international commission chaired by Seán MacBride, the idea of a "free flow of information" prevailed: poor nations should be helped to develop through assistance from richer countries, without setting rules that hindered the free circulation of material and immaterial products.

The effects of these policy decisions could later be identified in the first large scale interventions of the Internet era aimed at bringing newer ICTs to developing countries, multiplying the channels for an unconstrained circulation of information as well as the number of access points. The information revolution was framed as splitting the world into information "have's" and "have-not's" and it was claimed that new interventions should be promoted to reduce the gap between the two groups.[16]

The three discourses on the modernizing, democratizing and globalizing potential of new technologies have been combined variously to define a shared doctrine in the use of ICTs for development. As will be discussed later in this chapter, rather than representing a simple description of reality, these discourses have enforced a hegemonic vision of what ICTs are and what kind of society they should contribute to building. This hegemonic vision has been endorsed and propagated mostly by private think-thanks, donor countries and international organizations. In addition, as much as earlier scholarship by authors such as Rostow, Schramm and Lerner helped provide theoretical backing for policy discourse, in the more recent phase of the application of ICTs to development, various scholars have reinforced the dominant discourse by theorizing how new technologies could produce the transformations described in international fora.

Authors such as Ithiel de Sola Pool (Pool, 1983, 1990) and Nicholas Negroponte (1995) applied the enthusiasm brought by the new wave of innovations experienced on the American West Coast to imagine new scenarios for the "Third World". Hudson (1984; 1990) and Parker (1976; 1981) focused on how telecommunications could help rural areas to better integrate with national and global economies, augmenting their productivity and increasing their chances to access

[16] For a history and critique of the concept see Gunkel (2003) and Gagliardone (2005).

educational and health services. Soete (1985) theorized how ICTs could allow developing countries to leapfrog stages of development and benefit from the opportunities disclosed by the "microelectronics revolution". In general, numerous scholars gathered at international conferences such as those organized by the International Federation of Information Processing (IFIP) to reflect on how ICTs could best be employed to produce a set of desired outcomes in various corners of the world, from Sub-Saharan Africa to Latin America and Asia (Bhatnagar & Bjorn-Andersen, 1990; Bhatnagar & Odedra, 1992).

Even if these authors did not claim to belong to the same school, the scholarship they produced was predominantly characterized by a set of common traits which progressively contributed to defining a mainstream approach in the study of ICT applications in developing countries (Tsui, 1991). They shared a manifest confidence in the benefits new technologies could bring to the poorest areas of the world. Most of their work commonly referred to ICTs as "impacting" on developing countries, and they were concerned about how these impacts could be maximized and measured. Many authors conceded that ICTs alone would not be enough to activate virtuous processes of growth and development, but they were deeply optimistic that they could contribute to positive processes of transformation. Hudson, Hardy and Parker, for example, appreciated that "it is likely that telecommunications can be most useful when acting as a complement to other forms of essential infrastructure including roads, utilities and administrative structures. There must be some minimum threshold of economic activity and social organization before there is likely to be much developmental return from telecommunications investment" (Hudson, Hardy, & Parker, 1982, p. 306). Recognizing that ICTs need to be integrated into wider material and social networks, however, rarely led these and other authors to question the relevance of the new tools for countries struggling with a wide array of challenges. On the contrary, it motivated claims for radical reforms and for the creation of enabling environments that would allow new technologies to produce the greatest possible effects. According to them, it was the socio-economic environment that had to adapt to the advent of ICTs, rather than the other way around.

Another common feature in most of the mainstream literature on ICTs for development was its reliance on rational choice theory to imagine how ICTs would be used in a developing context.[17] Selecting some of the most pressing problems identified by international organizations and imagining how ICTs could be put to work to contribute to their solutions, various authors came up with lists of potential applications in agriculture, health, education, and finance, etc. For example, according to Bhatnagar "industry in developing countries will have to adopt standards to move data electronically in their operations if they have to integrate into an international network of buyers and sellers; [...] if democracy has to survive and market economies have to work, a culture of open information will have to be built" (Bhatnagar, 1992, pp. 3-4). Or for Hudson, Hardy and Parker "two-way radios, radiotelephones, or satellite links can be used to summon help in an emergency. Telecommunications facilities in support of health care can be used for regular consultation for patients, ordering of medical supplies, following up on patients transferred to other facilities" (Hudson et al., 1982, p. 306).

In the policy debate, the discourses about the modernizing, democratizing and globalizing effects of ICTs are still prevalent. In academic circles, on the contrary, the optimism articulated in the 1980s and 1990s has been progressively superseded by more critical approaches (Wilson III, 2004). The growing visibility of ICTs in development programmes as well as the numerous possibilities to analyze concrete applications in developing contexts, motivated an increasing number of studies challenging the basic assumptions about leapfrogging, greater political participation and the benefits of global integration. A selection of these important works is offered

[17] Rational choice theory can arguably be considered the dominant theory in economics and has been increasingly used also by sociologists and political scientists to explain the most varied phenomena, from social stratification to voting preferences (Coleman, 1990; Scott, 1999). It is based on the assumption that individual actors make their choices calculating the costs and benefits of their actions. As a paradigm, rational choice has motivated fascinating research, attempting to unveil behavioural patterns that inform economic, social and political life. Criticizing it as a paradigm would be an untenable position, but what can be criticized is its superficial application in many studies of ICTs for development which embraced the philosophical premises of rational choice, but did little to test them at the empirical level.

below, categorized into three streams, according to the focus on the functional, cultural or political aspects of the use of ICTs in developing countries. This does not offer a complete overview of the criticisms that have been offered to the mainstream approach to ICTs and development. For example, dependency theory, which often has been presented as the strongest opponent to old and new forms of modernization (Carlson, 2003; Schech, 2002), is not considered here. The rationale for this choice is that I seek to build on scholarship whose aim is not to dismiss the idea that ICTs can contribute to development, but to allow researchers to offer more nuanced explanations of how ICTs do not impact, but instead interact and integrate in contexts that are different from those of their invention.

2.2 Contesting technology

> Media technologies, like all other technologies, have the social behind them, the social in front of them and the social embedded in them. We might talk of the media having such and such an effect, and we are not wrong to do so, but it needs to be remembered that media technologies emerge as material and symbolic objects and as catalysts for action, and are effective as such only through the deeds of individuals and institutions. It follows that those actions are political. They, of their very nature, involve a struggle over meaning and control: in design in development, in distribution and in use.
>
> The media, as cultural forces, are similarly political: subject to conflicts over access and participation; subject to conflicts over rights of ownership and representation; and vulnerable, always, to the uncertainties and unintended consequences of any and every act of communication. The media connect and separate in one breath. They include and simultaneously exclude. They offer freedom of expression and claim rights of surveillance and control. They are both enabling and disabling. They create new inequalities, just as they seek to eliminate old ones (Silverstone, 1999, pp. 145-146)

Silverstone was not the first to challenge the assumptions about the beneficial and linear nature of the "effects" produced by what he refers to here as "media", but can arguably be equated to ICTs, given the extensive definition of "media" he adopts

in *Why Study the Media* from which the quote above is taken.[18] Silverstone's more complex framing of technical artefacts effectively summarize the different aspects that have inspired more critical approaches to the study of ICTs: the recognition of their malleability, the understanding of how they embed values which are specific to particular cultural and social environments, and the appreciation of their political nature, of how they can be appropriated by different actors to support competing agenda. This section now turns to illustrating how key authors have addressed these aspects and how their critiques offer a basis upon which to build a conceptual framework to analyze how ICTs can be re-interpreted, re-defined and re-shaped in developing countries.

A common criticism directed at the attempts to use new technologies in developing countries originates from the claim that artefacts that have proved beneficial in North America or Europe would not necessarily have the same effects in different contexts (Adam, 1996; Grieve, 2004; Heeks, 2002; James, 2005; Madon, 2000, 2002; Qureshi, 1998; Unwin, 2009a; Walsham, 1993; Walsham, Symons, & Waema, 1988). The scholars that have contributed to this approach have predominately focused on the *functions* ICTs should perform in countries in Africa, Latin America or Asia in order to respond to the specific needs expressed in each locality. They have demanded that greater attention should be given the context in which newer technologies had to be inserted. They also stressed that there should be a better understanding of the existing capabilities of a country, so as to avoid designing programmes with little chance to succeed, either because of a lack of interest or because of the absence of the necessary skills and resources to implement them on the ground.

[18] The following is an example of how the word "media" is often equated by Silverstone to the definition of ICTs I adopt in this research. "We are in the midst [...] of a technological revolution far-reaching in its consequences, a revolution in the generation and dissemination of information. New technologies, new media, increasingly converging through the mechanism of digitization, are transforming social and cultural time and space. This new world never sleeps: 24-hour news casting, 24-hour financial services. Instant access, globally, to the Word Wide Web. Interactive commerce and interactive sociability in virtual economies and virtual communities. A life to be lived on-line" (Silverstone, 1999, p. 19)

Some of these criticisms have been indicative of an evolution rather than a departure from the mainstream (Madon, 2000, 2002; Qureshi, 1998). These authors have been less concerned about how to bring poor countries into the knowledge era, as the rhetoric of leapfrogging indicated, than with how to bring new technologies to poor countries to address their own problems. At the same time, their focus continued largely to be about how to measure effects and impacts, successes and failures.

Other, more substantial, criticisms focusing on the functions ICTs should perform if they are to help achieve goals such as poverty reduction and good governance, were characterized by greater attention to the failures witnessed both in the past and at present in the application of new technologies to developing contexts (Heeks, 2002; Walsham, 1993). Some of these critiques (Grieve, 2004; James, 2005) resonated with older debates on technological blending and on the design of Appropriate Technologies. The advocates of technological blending insisted that new artefacts should embrace, rather than displace, older ones, making use of traditional knowledge and habits and be appropriated as part of a more harmonious path towards progress (Bhalla & James, 1988; ILO, 1984). Similarly, the idea at the core of the Appropriate Technologies movement was that, if exported as conceived in the rich world, many new technologies would be of little use to fragile economies. They could even be disruptive in some cases, for example, forcing traditional craftsmen out of the market because they could not compete with newer forms of manufacturing (Carr, 1985; Stewart, 1987). Building on the idea of Intermediate Technologies proposed by Schumacher (1973), the supporters of Appropriate Technologies were suggesting the need to look for a local fit for new tools which could be capital saving, but also labour intensive, and allow large parts of the local population to progressively understand and master innovation rather than be forced into new programmes from above.

These traditions contributed by challenging the techno-determinism that saw ICTs as the drivers of processes of growth and transformation (UNDP, 2001; World Bank, 1998). They reframed ICTs as more flexible artefacts that could, and should, be re-shaped to adapt to different needs. Their interest in locating the most appropriate fit between given technologies and socio-economic contexts, however,

often overlooked other important factors that intervene in the re-shaping of ICTs. They privileged the technical over the political, normally excluding the analysis of the distribution of power in a given society, and among societies, to understand why certain technologies would be preferred to others.[19] Some of them similarly lacked adequate instruments to study technology adoption as a dynamic process, understanding the results of progressive negotiations among technology, in its material and discursive components, and changing socio-political contexts.

A different kind of criticism was directed to the *cultural* bias reproduced by the discourses on ICTs for development, and similarly reflected in the uses advocated as desirable by major international players. This mostly emerged from the scrutiny of official documents and publications aimed at defining clear priorities in the applications of ICTs worldwide and convincing stakeholders of their relevance. Observed through the lenses of discourse and content analysis, the policies and plans advanced by international organizations were found to be framing the market as the main, and often the only, driving force behind growth (Nulens & Van Audenhove, 1999); privileging business and technology rather than knowledge as the core characteristics of the information society (McKenna & Graham, 2000; Padovani, 2005; Padovani & Nordenstreng, 2005; Raboy, 2004; Rooney, 2005; Thompson, 2004); and favouring local elites (Alzouma, 2005), middle classes (Waller, 2008) and large multinational corporations (Leye, 2007) rather than the poor. In general, most of these authors charged the proponents of the new discourses with reiterating a modernization paradigm and presenting the West as the only development model for the rest of the world (Carlson, 2003; Leye, 2007; Mansell, 1982; Nulens & Van Audenhove, 1999; Ojo, 2004; Padovani, 2005; Padovani & Nordenstreng, 2005; Raboy, 2004; Thompson, 2004; Unwin, 2009a).

This scholarship contributed to unveiling the hegemonic character of many definitions of ICTs. It revealed how, in order to increase their capacity to influence

[19] If they illustrated the importance of finding a fit for a technology to be used appropriately, they normally limited the research on this fit to the material level, taking less account on the relevance of the political level, of the local acceptance or resistance to the discourses used to advance certain uses of technology and discourage others.

various audiences in both developed and developing countries, international organizations such as The World Bank (Thompson, 2004) or the United Nations Economic Commission for Africa (Nulens & Van Audenhove, 1999) made extensive use of technocratic language, presenting opinions as facts, mimicking the jargon of science and marketing, and framing weak arguments as truth (McKenna & Graham, 2000).[20] In this context, hegemony refers to what Gramsci (1951-1991) and Laclau and Mouffe (1985) and Hall (1998), more recently, defined as the attempt by a group to impose a specific interpretation of the material and social reality as natural, while ruling alternative ones out. As Laclau and Mouffe argued about the possibility of a hegemonic relation, "its very condition is that a *particular* social force assumes the representation of a *totality* that is radically incommensurable with it. Such a form of 'hegemonic universality' is the only one that a political community can reach" (Laclau & Mouffe, 1985, p. x, emphasis in the original).

Within this framework, the assertions of ICTs as modernizing, globalizing and democratizing tools cease to be simple descriptions of realty, and become attempts to force a particular worldview onto new subjects. The advocacy of a limited set of uses of ICTs becomes part of a wider power struggle that involves asserting specific discourses over others by 'the construction of a new ''common sense'' (Laclau and Mouffe 1985: 183). This interpretation of ICTs as elements that can be captured, in both their material and discursive components, in hegemonic struggles resounds with other concepts that are employed in this thesis to develop an innovative conceptual framework to study why and how ICTs are selectively appropriated in developing countries. This is elaborated in the next section in greater detail. However, it must be pointed out that the critical perspectives illustrated above, targeting official documents and declarations, operated in a somewhat selective way. They largely emerged as critiques of the West from the West, taking little account of how the discourses on ICTs were actually received and re-articulated in developing countries. This aspect limited their understanding of how some components of the discourses defined internationally resonated with those promoted at the local level. They also

[20] Connected to this kind of criticism, but from a political economy point of view were those authors who criticize ICT for development programmes through the lenses of dependency theory (Wade, 2002).

underestimated the problematic hegemonic discourses on ICTs produced by governments in developing countries, which similarly should be the subject of a critique when the ambition is to unveil patterns of oppression and domination. In contrast, I analyze the hegemonic discourses that intervened in the interpretation, definition and shaping of ICTs both at the international and at the local levels, in order to appreciate how discourses which aimed to be universal were received in a specific context, and how the power struggles characterizing a given social formation played a role in making a certain meaning accepted, while ruling others out.

A third source of criticism, partially extending the one argued above, can be located among scholars who stressed the *political* nature of technology. Much of this literature, relying on the longstanding debate in media and communication studies about the possibility of messages to produce contested and oppositional readings, laments the narrow focus on the impact of ICTs rather than their appreciation as potentially contested objects, open to both symbolic and technical negotiation (Mansell, 2006; Mansell & Silverstone, 1996; Mattelart, 2000; Schech, 2002; Silverstone, 1999). Mansell and Silverstone, for example, have highlighted the fact that ICTs are not simply objects but that they are also discourses. "ICTs are characterized by their double articulation: they are both machines and media. They carry both functional and symbolic significance" (Mansell & Silverstone, 1996, p. 9). Given that the discursive and technical features of technology interact with each other, influencing the acts of appropriation of, and resistance to, technology, the application of ICTs should be studied in relation to the resources mobilized both at the local and at the international levels to support specific political projects, while countering others.

From a different perspective, and looking at technology in general, the Social Construction of Technology (SCOT) approach has illustrated the multiplicity of interpretations that can surround an artefact, and the repercussions they can have on its design and redesign. SCOT evolved through the work of scholars that have been studying artefacts as diverse as bicycles (Bijker & Law, 1992), supersonic jets (Law & Callon, 1992), missile guidance systems (MacKenzie, 1990) and solar powered lamps (Akrich, 1992), but building on a shared vision of technologies, not as external

agents belonging to the realm of mere objects, but as "artifacts [which] embody social, political, psychological, economic and professional commitments, skills, prejudices, possibilities, and constraints" (Bijker & Law, 1992, p. 7). According to this definition, because of its complexity, a technical object can reach a stabilization only as a result of conflicts over meaning and control, where a variety of actors compete to influence both its construction and the construction of its users.

Some of the authors contributing to this tradition, however, either located their scholarship largely on a theoretical plane, (Mansell, 1982, 2004; Mattelart, 2000), or focused their research mostly at the micro and meso level, that of designers and users, organizations and families (Bijker, Hughes, & Pinch, 1987; Silverstone & Haddon, 1996). Their insights and the tools they developed are thus only partially useful to understand how the politics of technology operates at the level of states and of international systems and needs to be combined with other perspectives to adequately appreciate the magnitude of processes of national significance.

The three critical approaches illustrated so far, focusing on the functional, cultural and political aspects of technology, challenge the understanding of ICT application in developing countries as a simple transfer of technologies with a specific range of effects, and propose to analyze ICT adoption as part of more complex process of negotiation and progressive adaptation. IS scholars, as well as the advocates of blending technologies and the design of appropriate technologies, stressed how ICTs can be radically re-thought and re-designed in order to fit socio-political contexts that are different from those of their invention. The authors who analyzed large corpuses of documents produced by international organizations have stressed the hegemonic nature of some of the discourses animating them, and opened the doors to the investigation of possible alternative readings. At the same time, the focus on the political nature of technology, both at the macro and at the micro level, illustrates how artefacts are open to conflicts, whose outcomes depend on the network of power within which they becomes embedded.

These concepts are a starting point to develop a conceptual framework defining ICTs not as "black-boxes" and consensual objects, as described in the mainstream discourses illustrated above, but as nodes surrounded by difference and resistance.

Within this context I develop a new set of instruments derived from the history of technology scholarly tradition and, in particular, from those historians who studied large technical systems, such as electric or telecommunication networks, and from the constructivist school in international relations, with a special focus on the scholarship that analyzes how discourses are propagated by international actors and appropriated, or resisted, by local actors.

2.3 Technologies and politics in context: lessons from the history of technology

A large impetus of the hype that characterized the new wave of ICTs for development programmes in the 1990s reflected the lack of attention to the systemic nature of the new technologies. Computers connected to the Internet were perceived as multi-purpose terminals which could be used by individuals, firms or public administration offices to access the most up-to-date information, increase their productivity and communicate among themselves. The focus on the relative number of computers or hosts per inhabitant, reinforced the idea that it was mostly the amount of technology properly deployed that could turn a poor country into a member of the knowledge society (UNDP, 2001; World Bank, 1998). It was concealed, however, that these terminals were simply components, certainly the most visible, of larger systems, also made of institutions, laws, political parties, information carriers, etc. Framing newer ICTs as constituents and constitutive of "large technical systems", a term coined by Thomas Parke Hughes when he was studying electrification (1983), might have moderated the expectations about their revolutionary potential, suggesting how the phenomena experienced in the US or in Europe depended not simply on the diffusion of personal computers and fast connections, but on denser patchworks of heterogeneous technical and social artefacts.

"Large technical systems" is just one of several concepts proposed by Hughes and by other historians of technology who extended his research agenda, that can be applied fruitfully to the study of ICTs in developing contexts. Notions such as "seamless web", "style", "technopolitics" and "technopolitical regimes" can

similarly help in addressing questions about the reinterpretation and reshaping of technical artefacts. Those are addressed in detail below. Their strength lies in their grounding in studies of technologies of national relevance and scale, as well as in the importance they accord to culture and politics, not only micro-politics, connected to everyday interaction, but the politics of a nation and its identity.

Among Hughes' neologisms, *large technical system* (LTS) has had the greatest influence. It had a substantial impact on the history of technology, shifting attention from individual inventions or inventors to the system of relations in which every technology, but some more than others, is immersed. At the same time, it drew on earlier attempts to study technological innovations as historically grounded, and as part of complex processes involving heterogeneous actors and artefacts. The focus on the larger networks in which innovations takes place and technologies evolve, for example, resounded with the attention Schumpeter in his later works accorded to collective entrepreneurs as agents of change (Schumpeter, 1954-68). As part of his analysis of the mechanisms informing industrial capitalism, he recognized the increasing role that larger actors, such as corporations, had started to play in the process of technological and economic innovation. Similar to what would have later been the case with Hughes, this understanding was made possible by the appreciation of how innovation processes need to be studied in their historical context. As Schumpeter claimed "nobody can hope to understand the economic phenomena of any, including the present, epoch who has not an adequate command of historical *facts* and an adequate amount of historical *sense* or what may be described as *historical experience*" (Schumpeter, 1954-68, p. 12). Differently from Hughes, however, Schumpeter was still driven by a conception of innovation as pertaining almost exclusively to the realm of private initiative (Elam, 1993; Freeman, 1990), while Hughes later investigated more attentively the role state actors and politics play in the process of technological innovation and evolution.

The concept of LTS also helped hybridizing the discipline of history of technology with insights from sociology and by developing terms that could extend the research agenda to new phenomena emerging at the crossroad between the technical, the social and the political. According to one of Hughes' definitions, LTS

"interconnect components so diverse as physical artefacts, mines, manufacturing firms, utility companies, academic research and development laboratories, and investment banks. These components make up a system because they fall under a central control and interact functionally to fulfil a system goal, or to contribute to a system output" (Hughes, 1986, p. 287). Their heterogeneity can be perceived as problematic in detecting a clear object of analysis and alternative terms have been proposed by other historians to better identify specific assemblages (Joerges, 1988). Nevertheless, arguably, the utility of a definition like LTS resides in its capacity to open wider horizons beyond the isolated artefacts, rather than in its normative character. For Hughes there is no clear demarcation between the technical and the social. They are both part of a *seamless web*, connecting the acts carried out by social actors in relation to technology, the technical components that render the embeddedness of society into artefacts – technology as "society frozen" – and the material aspect of technology. (Hughes, 1986).

If an organizing principle can be identified in the concept of LTS, this is their problem solving capacity. In Hughes' words "technological systems solve problems or fulfil goals using whatever means are available and appropriate; the problems have to do mostly with reordering the physical world in ways considered useful or desirable, at least by those designing or employing a technological system" (Hughes, 1987, p. 53). This does not mean that they do it successfully. Technological systems often emerge as messier and more complex than originally expected, they have negative externalities, and are difficult to control and coordinate. Quite ironically, as pointed out by Joerges, "retrospective studies of LTS show that they never develop according to the designs and projections of dominant actors: LTS evolve behind the backs of the system builders" (Joerges, 1988, p. 26). However, because of their scale and scope, LTS tend to evolve even against the odds of their complexity, in ways smaller artefacts might not do. Railway systems or grids of nuclear plants would be much more difficult to dispose of than smaller technical objects, and would tend to be patched or rethought, rather than abandoned if problems arise.

Hughes analyzed the particular phases and phenomena that characterize the evolution of LTS when studying the case of electrification in Western societies (Hughes, 1983, 1987). In his later works he indicated how LTS can be similarly

appreciated when studying other technologies in fields as diverse as urban planning, aerospace or computing (Hughes, 1998). He identified six different moments in the development of a LTS, not necessarily occurring in the sequence in which they are presented: invention, development, innovation, transfer, growth, competition, and consolidation. For the kind of phenomena I analyze here, the local reshaping of ICTs, the most relevant is arguably what he referred to as the "transfer" phase, describing the stage when a technology reaches a country that is different from the one where it was invented.[21]

Hughes investigated the applications of new technology in different national contexts by borrowing from art historians the concept of *style,* emphasizing the possibility of variations of the "same" technology among different cultural and political environments. In the case of electrification, for example, he illustrated how the distribution of power plants in London and Berlin differed for no particular technical reasons, but responded to differences in the political and regulatory regimes characterizing Britain and Germany at the time of electrification. By analogy it can be argued, for example, that the different degrees of control exercised over online communication by state actors, as well the greater or lesser use of free software by public administrations are elements defining different styles in the application of ICTs in various countries in Africa, Asia or Latin America.[22]

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[21] It is also important to briefly reframe the advocacy of ICTs by developed countries as a result of a consolidation of a system attempting to grow beyond its limits. According to Hughes' conceptualization, when a system becomes consolidated it acquires momentum. It tends to develop inertia and it becomes opaque, perceived as regulated by very specific dynamics and closed to modification. Applying this concept, it can be said that ICTs, as framed by the discourses articulated at the international level, were presented as constituting high-momentum systems. As a consequence developing countries were asked to prepare an enabling environment to let the new technologies exercise their peculiar effects rather than being equipped with instruments with which they could open the black boxes and adapt them to their specific needs. As Hughes argued, "large systems with high momentum tend to exert a soft determinism on other systems, groups and individuals in society" (Hughes, 1987, p. 54).

[22] The focus on what Hughes identifies as the "transfer" phase also makes other concepts he developed less relevant here. The idea of *reverse salient* which he used to describe the uneven progression of LTS characterizing in particular their development phase, would be of little relevance

Hughes stimulated the production of a vast body of literature and motivated scholars to employ his concepts to research various types of LTS, from large projects such as telecommunications (Davies, 1996) or nuclear programmes (Hecht, 1998), to more limited and focused projects, such as air traffic (LaPorte, 1988) and videotext systems (Mayntz & Schneider, 1988). Within this scholarship, the concepts most applicable for analyzing the reshaping of ICTs in Ethiopia are those of "technopolitics" and of "technopolitical regimes" developed by Gabrielle Hecht in her study on the relationship between nuclear power and national identity in France (1998; Hecht, 2001).

The importance of a concept such as *technopolitics* is apparent in its capacity to challenge the supposed neutrality of technical artefacts. It focuses on the argument that technology can become part of a national discourse, and its elements can be captured by the "thickness" of a specific culture. Hecht extended Hughes' scholarship on the problem-solving nature of LTS that stresses their capacity to perform specific policies, in ways that are complementary to those usually employed by politicians. As Hecht explained:

> I use the term [technopolitics] to refer to the strategic practice of designing or using technology to constitute, embody, or enact political goals. Here I define technology broadly to include artifacts as well as nonphysical, systematic means of making or doing things. [...]
> Calling these hybrids "politically constructed technologies" is correct; however, it is not sufficient, because technologists intended them as tools in political negotiations. At the same time, these technologies are not, in and of themselves, technopolitics. Rather, the *practice* of using them in political processes and/or toward political aims constitutes technopolitics. Why not just call that practice "politics"? The answer lies in the material reality of the technologies. These technologies cannot be *reduced* to politics. The effectiveness of technologies as objects designed to accomplish real material purposes matters – among many other reasons – because the material effectiveness of technologies can affect their political effectiveness (Hecht, 2001, pp. 256-257).

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in answering questions about the re-shaping of technology where little innovation took place to solve problems emerging within LTS.

Hecht employed the term technopolitics to describe how different groups operating in France in the 1950s and 1960s used technology to represent and enact different visions of society. The quote below summarizes the key findings of her research. It also illustrates the usefulness of technopolitics as a concept stressing the conflictual nature of technology articulated in the SCOT tradition as well as by authors such as Silverstone (1999). It unveils how policy makers often perceive technology as an extension of their plans and ambitions, rather than as a neutral tool that responds to functional imperatives.

> G2 and EDF1 [*two different types of nuclear reactors*] were neither inevitable products of some inherent technological logic nor infinitely malleable products of political negotiation. Rather, each resulted from a seamless blend of political and technological goals and practices. The two reactors can thus be understood as technopolitics. CEA and EDF [*the two institutions presiding to the development of nuclear reactors*] technologists deliberately – even proudly – sought to make their technologies instruments and embodiments of politics. Politics and policy making gave the reactor projects significance, both within each regime and in the interactions each had with its surroundings. Thus, for example, EDF1 was important not because it would actually produce economically viable electricity (EDF's first truly commercially viable reactor, EDF4, went on line in 1969) but because it represented the first step in a nationalized nuclear program that would enact and strengthen the utility's ideology and its industrial contracting practices. At the same time, the technological form of their politics mattered. French military nuclear policy in the 1950s did not take the form of a ministerial decree; it took the shape of G2 (and other related technologies). This meant, for example, that in 1954 the assurances of the CEA's leaders that Marcoule reactors were both electricity-generating prototypes and plutonium producers enabled one prime minister to abstain from deciding about a bomb. Official French state policy declared a purely peaceful interest in atomic energy, while the CEA's actual technopolitics performed a military nuclear policy (Hecht, 2001, p. 270)

The analysis of the technopolitics embraced by state actors in France during the 1950s and 1960s also allowed Hecht to explore the relations between politics and nation building. Relying on the concept of "imagined communities" proposed by Anderson (1983), she illustrated how the emergence of artefacts of national significance was also instrumental in asserting a specific type of Frenchness, in making the "radiance of France" sustained by its nuclear programme a symbol of national prowess after the humiliation of the second world war. This example further substantiates the relevance of technology not just on a functional, but also on a symbolic plane, and its capacity to be charged by different meanings according to the context in which it is inserted.

Within Hecht's framework, technopolitics is performed through the creation of *technopolitical regimes*, a term she coined to describe the combination of technopolitics with Hughes' notions of LTS and style.[23] They represent both the medium and the outcome of a negotiation between a specific technology or assemblage, a cultural and political context and the actors who animate it and compete for power. "Technopolitical regimes are grounded in institutions, and they consist of linked sets of people, engineering and industrial practices, technological artifacts, political programs, and institutional ideologies which act together to govern technological development and pursue technopolitics" (Hecht, 2001, p. 257). The "same" technology can be developed, or adopted, by different actors through the creation different technopolitical regimes. This can happen across different countries but, as Hecht illustrated in the case of France, it is also frequent that within the same country two or more regimes compete to advance different political agendas and gain prominence in defining the standards and uses of a particular technology. As Hughes

[23] The reference Hecht uses to the word "regime" is largely connected to their significance in political theory. As she spells out "I have chosen the regime metaphor for three reasons. The first reason relates to the use of the term 'regime' in political parlance. [...] Second, 'regime' conveys the idea of a regimen, or prescription. [...] Third and last, 'regime' capture the contested nature of power" (Hecht, 1998, p. 17). This use of the term thus distances her research, and mine, from the technological regime literature, which, even though dealing with large systems and research across industries, is more concerned with the economic incentives to innovate, rather than with the politics of technology (Breschi, Malerba, & Orsenigo, 2000; Malerba & Orsenigo, 1996; R. Nelson & Winter, 1982).

pointed out "one of the primary characteristics of a system builder is the ability to construct or to force unity from diversity, centralization in the face of pluralism, and coherence from chaos. This construction often involves the destruction of alternative systems" (Hughes, 1987, p. 52). Different technopolitical regimes can coexist and continue to compete for extended periods of time, or the battle for the control of a particular technology can, on the contrary, end with the destruction or marginalization of alternative ones.

But how does this happen? How is it that a particular technopolitical regime can succumb, while another one thrives in a given context? In contrast with most of the literature on ICTs and development, many historians of technology have looked at power, both as embedded in artefacts and as exercised by social actors, to provide an answer. Rather than looking at how technologies are more or less successfully applied to reach a set of given goals or operate according to predefined standards, authors such as Hughes and Hecht, but also other historians like Joerges (1988; 1999), and Thomas (1988), framed technical artefacts as elements that constantly interact with the political and social forces that surround them and bear with them the results of this relationship. Allen and Hecht explained the link between power and technology while advancing their interpretation of the title of Hughes's famous work on electrification. They underlined,

> [...] the double meaning of *networks of power*: electricity drives machines, light bulbs, and tramways, but at the same time its constant flux in networks reflects and makes tangible the political life of nation-states. Thus electrical networks are "charged" with corruption in Chicago, with localism in London, and with centralized social democracy in Berlin (Allen & Hecht, 2001, p. 2, emphasis added).

Technical artefacts do not simply adapt to the networks of power in which they become immersed. They also act as vehicles for exercising power. As Allen and Hecht continue:

> Social choices shape technological development. But the resulting physical, financial, and institutional durability of systems means that, once developed,

> they – and the values they uphold – cannot be changed easily. As material manifestations of human choices, systems acquire momentum. In so doing they embody, reinforce, and enact social and political power. Thus, human power rides upon the history of things (Allen & Hecht, 2001, pp. 2-3).

Power thus has to be understood as a force flowing both through the social and the technical, establishing and performing authority by making specific meanings more widely accepted than others and certain assemblages more likely than alternative ones. Similar to other authors who have underlined the importance of the political and of power relationships in the study of technology (Mansell, 2006; Wilson III, 2004; Winner, 1980), Hughes and Hecht did not frame power as eminently social or technical, but suggested that it is only as performed in practice that its role and nature can be understood in a given social context.

Concepts such as LTS, technopolitics and technopolitical regimes add complexity to the study of ICTs for development and open new pathways for research. By analyzing technical transfer and appropriation as being located at the level of large systems, they allow us to better appreciate the influence bigger actors can exercise, the kind of resources they can mobilize and the types of outcomes emerging from these processes. Within this framework I suggest that greater agency can be accorded to local governments or companies, as well as greater capacity, not just of using technology differently, but of re-shaping it to support alternative plans. Borrowing post-structuralist terminology (De Certeau, 1984), it can be said that employing these concepts to study ICTs for development shifts the attention from the tactics adopted by agents in developing countries to resisting hegemonic discourses and demarcating spaces for alternative practices to the strategies adopted to support alternative discourses, in competition with those articulated at the international level.

However, if the instruments employed by Hughes and Hecht are valuable to understand why and how specific LTS develop at the country level, they are less adequate to appreciate the nexus between the national and the international. Their research focused on national systems, and, even when analyzed in a comparative perspective, it offered an insufficient account of the role played by international actors in advocating specific uses of technology. In contrast, to fully comprehend

why and how ICTs are re-shaped in developing countries, it is important to relate the discourses articulated at the international level to those emerging locally, and to study how compatible they are, who propagates them, who supports or resists their application and how the position of a country in the international system influences these processes. To answer these questions, I complement the concepts developed in the history of technology tradition with others that emerged in the study of international relations. I rely, in particular, on the constructivist tradition in IR, because of its focus on the propagation and appropriation of discourses and of its capacity to take into consideration both the material and the discursive components of ICTs, as I discuss in the next section.

2.4 Locating ICTs in an international perspective

As much as the history of technology, as practiced by Hughes and by scholars who extended his agenda, represents a critique of deterministic approaches to technology and is aimed at bringing greater nuance to the study of the relations between the technical and the social, the constructivist school in international relations emerged in opposition to similarly reductionist views. It challenged the traditional notion of the international system as a space where pre-social, atomistic actors, pursue pre-defined interests, with that of a society where actors interact, learn, and modify their own identities, interests, and behaviours as a result of the continuous social exchanges they engage in.[24] While neo-realism and neo-liberalism proponents based their analysis mainly on the material resources states can mobilize – in terms of armed forces, production capabilities, raw materials, etc. – and on the choices they make as rational actors, constructivists built their claims on an ideational view of the international world and on the power of ideas to shape interests and identities. As Alexander Wendt concluded in a seminal work on the social theory of international politics, "it makes more sense to begin theorizing about

[24] The first use of the term constructivism in international relations is attributed to Onuf, who used it in *World of our making* (1989), but it was Wendt's article *Anarchy is what states make of it* (1992) that popularized the new approach.

international politics with the distribution of ideas, and especially culture, in the system, and then bring in material forces, rather than the other way around" (Wendt, 1999, p. 371). Constructivists did not refuse the role material resources play, instead they problematized it. Within a constructivist framework technology can still be considered a resource that can produce certain outputs, but the value and relevance that are accorded to it will depend on its material as well as its discursive components.

Both constructivism in IR and the tradition of the history of technology outlined above are based on a constructivist ontology, framing social reality as the product of human thought and interactions. They similarly embraced the basic premises characterizing most variants of social constructivism and identified by Phillips and Jørgensen (2002), referring also to earlier works by Burr (1995) and Gergen (1985), as: a critical approach to determinism and a taken-for-granted knowledge; an historical and cultural specificity that compels one to study social phenomena in their context; the role of social process in creating and maintaining our understanding of the world; and the role of socially constructed worldviews in defining what is possible and what is not.[25] These principles have been adopted by constructivists in international relations to study the most varied sets of phenomena, from militarism in Japan (Katzenstein & Okawara, 1993), to the end of the Cold War (Checkel, 1997; Risse-Kappen, 1994), developmentalism in Latin America (Sikkink, 1991) and the role of UNESCO in promoting science bureaucracies (Finnemore, 1993). However, to respond to questions about the reinterpretation and reshaping of ICTs, the most useful body of literature explores how, in other issue areas, such as environmentalism, human rights, or foreign aid, discourses propagate and are resisted or embraced at the local level.

These puzzles have been addressed by focusing on different actors participating in the diffusion process: on international organizations (Finnemore,

[25] An early systematic expression of social constructivism was offered by Berger and Luckmann's influential *The social construction of reality* (1966), where the authors explained how it is through interaction that social meanings are created, shaping our perception of the social world and subsequently influencing our behaviours, in a circular process. As they affirm, "Society is a human product. Society is an objective reality. Man is a social product" (Berger & Luckmann, 1966, p. 79).

1996), NGOs (Keck & Sikkink, 1998), epistemic communities (Haas, 1992), or local institutions (Checkel, 1997; Sikkink, 1991). Various models have been proposed, stressing the importance of transnational relations, thus linking corporations and international NGOs to state and inter-state actors (Risse-Kappen, 1995a), or adopting a network metaphor to account for the relevance of non-traditional players, such as social movements (Keck & Sikkink, 1998). Within the diffusion path, different moments have been privileged, exploring the spaces where discourses originate (Adler, 1992), the mechanisms that preside over their dissemination (Strang & Meyer, 1993), and the fit they find in specific cultural and political environments (Klotz, 2006). A few common points, however, have emerged in this research and these can inform the investigation of discourses on ICTs for development.

The shift from the material to the discursive has allowed scholars to move from explanations based on the constraining capacities of the international system (i.e. state-actors are forced to adapt because of imbalances of power) to others stressing the constitutive force of the discourses that animate it (i.e. state-actors adopt a certain course of action because they see windows of opportunity in a specific area). These discourses have been framed as elements in flux which evolve and transform along the path from their initial development to their eventual adoption by new actors, and their diffusion may be encouraged by the active role played by state and non-state actors. As Martha Finnemore's research on science bureaucracies (1996) and Peter Haas' analysis of epistemic communities (1992) have illustrated, discourses do not just spread virally, but may be carried by groups or institutions – active teachers in Finnemore's terminology (1996) – advocating their selection. In this process, they usually become theorized (Strang & Meyer, 1993), they progressively lose contact with the place where they originated and take on meanings that make them applicable to a wider variety of cases. A notable example is offered by Finnemore, who has shown how in the 1960s and 1970s UNESCO was advocating the diffusion of science bureaucracies as bodies that could serve universal needs, despite the fact that they initially originated in the USA and in the UK to respond to a very local demand.

> The language used [by UNESCO] is prescriptive but not evaluative and in this sense is normative. UNESCO officials simply declared science policymaking to be necessary and good without seriously attempting to prove that this is in fact so. "States should make it their business" to coordinate and direct science. Or, as it was later expressed, "the development of science policy should be the responsibility of an organization the highest level of government in the country", and "the science policy programme of UNESCO is formulated on the basis of the principle that the planning of science policy is indispensable" for the coordination and promotion of scientific research. These assertions are not coupled with any evidence that such bureaucratic entities actually enhance science capabilities. In addition, the language is universal; it promotes these bureaucracies as good for all states, at all levels of scientific capability. (Finnemore, 1996, p. 55)

The theorization process is understood as facilitating the diffusion of discourses, abstracting them from the reference to a specific milieu and opening the doors to their adaptation. However, it is impossible to eliminate all the connotations they bring with them – even when they are partially hidden in artefacts – and "the degree of 'cultural match' between global norms and domestic practice [is] key in determining the pattern and degree of diffusion" (Checkel, 1999, p. 84). As Sikkik (1991), Checkel (1997) and Risse-Kappen (1995a) have argued, the actual forms discourses take at the local level depend on historical paths traced by a nation and on its political culture. Also, as discourses do not spread simply by themselves, they need carriers, "active teachers" to diffuse, the local match between them and a local context is not just there to be found, but it is actively constructed. Both diffusion and adaptation of discourses require agency and are not simply the results of their own characteristics.

While discussing the importance of the discursive over the material this thesis has privileged the term "discourse" over "idea", which is more commonly used by constructivists in international relations. The main reason is to enhance the coherence with other concepts used to build the conceptual framework, such as hegemony as described by Laclau and Mouffe (1985), which has been developed as part of their theory of discourse. It can be argued that key constructivist scholars in IR have often

referred to discourses, language and meaning to define the ideational components that permeate the international system. Finnemore's arguments on UNESCO's campaign on science bureaucracy quoted above (Finnemore, 1996, p. 55) are an example of how ideas have been connected to language. Similarly Laffey and Weldes (1997), when defining ideas as symbolic technologies, have framed them as a mechanism for the creation of meaning. Alexander Wendt on various occasions has linked ideas to discourse, claiming, for example that "in acknowledging the independent effects of material conditions it is also important not to lose sight of the discursive conditions that invest them with meaning" (Wendt, 2000, p. 393). One of the reasons why the ambiguity between ideas and discourses has not been resolved can be attributed to the association of discourses with post-structuralism which has emerged in IR in open opposition to the more positivist mainstream in the discipline, often with the result of cutting off the communication channels with it (Fierke, 2002). It is to keep these channels open and develop a middle ground that most constructivists, especially in the US, have preferred to drop explicit references to discourse and shift the discussion towards the less "polluted" definition of ideas. Another motif of vagueness in relating ideas and discourses is connected to the frequent confusion of discourse and language, which is interpreted as one specific articulation of ideas and often equated with everyday or spoken language. On the contrary, and relying on the theory of discourse advanced by Laclau and Mouffe (1985), I argue that discourse, broadly defined, goes beyond language, investing both physical objects and social practices with meaning. As Keller suggests, paraphrasing Laclau and Mouffe, discourses can be defined as "structured and structuring structures" (Keller, 2005, p. 1), aimed at making certain articulations of elements possible and meaningful, while ruling other possible configurations out.

A second central concept that has set constructivism apart from other traditions in IR, but has gained a certain consensus among scholars investigating the diffusion and localization of new discourses, concerns the role of the state as an agent of change. While recognizing the growing importance of multinational corporations, International Non Governmental Organizations (INGOs), and social movements in these processes, constructivists tried to avoid the divide between state and non-state

actors. Instead of a static vision of the international system, where resources either can be possessed by one agent or by another in a zero-sum game, they proposed a more fluid conception, where heterogeneous non-state institutions can coexist with strong states. The acknowledgement that other actors may be gaining power at the expense of the state has thus been coupled with the claim that states are still the medium through which change occurs. New discourses, policies or norms can be initiated by state actors, as well as by international organizations or private firms. The state, however, is still the entity that has to process and adopt them in order to make them relevant.

If this position has reached a certain consensus among constructivists, what has instead divided them along different fronts is how the identities of states and their internal structures influence the ways in which the new discourses are appropriated or resisted. To explain the great variation among states' responses to the demands of the intentional system Wendt stressed the role of their identities which he defined as "relatively stable, role-specific understandings and expectations about self" (Wendt, 1992, p. 397). Identities classify states according to how they structure their relations, internally, with their societies and, externally, with the international system. They are the result of long term paths of domestic and international political interactions. They inform states' interests and, consequently, their actions. For Wendt it is possible to distinguish between type (such as democratic, authoritarian, etc.) and role identities, which identify the role of a state in relation to others (such as enemy, hegemon, etc.). While he stressed the role of the international system in sanctioning different identities, authors such as Risse-Kappen preferred to explain variation referring to domestic structures, which "encompass the organizational apparatus of political and societal institutions, their routines, the decision-making rules and procedures incorporated in law and custom, as well as the values and norms embedded in political culture" (Risse-Kappen, 1995a, p. 20). In both cases, however, the focus is on those elements that can allow researchers to classify states into typologies that are useful to detect similarities and regularities in cross-case studies, but help little in understanding which specific elements of the political culture of a state, which discourses animating its society, influence the reinterpretation and reshaping of specific ideas and artefacts. Ethiopia, for example, has been classified as

belonging to the category of semi-authoritarian regimes (Aalen, 2006; Ottaway, 2003) that are characterized as "ambiguous systems that combine rhetorical acceptance of liberal democracy, the existence of some formal democratic institutions, and respect for a limited sphere of civic and political liberties with essentially illiberal or even authoritarian traits" (Ottaway, 2003, p. 3). While this classification is useful in highlighting some key aspects of the distribution of power in the country, and how its centralization affects the capacity of different actors to advance their own political plans, it does not capture the fundamental features of the political culture that influenced processes of resistance and reinterpretation. A state identity, as authoritarian or democratic, developed or developing, cannot be the main explanatory variable when the scope of the research is to detect the specific traits that a technopolitical regime has taken on.

The concept of state identity, while still relevant, is applied here in a broader and less defining fashion. According to Green, for example, "national identities are built from basic, primordial, and constructed elements such as a traditional territory or homeland, common myths and historical memories, a common public culture, a common set of rights and duties for members, and a common economy" (Green, 2002, p. 33). Katzenstein supported a similar understanding of identity and relied more heavily on cultural and political determinants to explain for example the form of militarism Japan developed in the aftermath of the second world war (Katzenstein & Okawara, 1993), and later its counterterrorism strategies (Katzenstein, 2003). This scholarship invites a deeper investigation of the specific discourses which may, or may not, be characteristic of other countries, but should be analyzed when the scope of the research is explaining why a country has taken a specific course of action, and what are its defining traits.

2.5 Other possible paths

Before choosing the history of technology tradition and constructivism in the IR as the primary foundation for building a conceptual framework, a number of other theories were explored as potential frameworks for the analysis of the interactions

between ICTs, local and international political actors, and development challenges. Some of these offer interesting insights into the dynamics described so far, but were progressively relinquished in order to maintain conceptual homogeneity and clarity. In addition, while they may be helpful in illuminating specific parts of the research, they could not address a sufficiently wide range of issues with consistency and balance.

As previously mentioned, SCOT, for example, was a possible tool for exploring how technology and human agents influence each other, emphasizing the political nature hidden in artefacts and analyzing how this produces responses among those in power. It offered instruments to deconstruct the technological determinism which pervades the mainstream approach to ICT for development studies and to accept that conflict is part of the process of innovation. The main problem with how SCOT and similar traditions relate to research of the kind presented in this thesis, is that their 'fine-grain' lens emphasizes the 'micro' aspects of human-technology interaction, failing to capture key issues at the 'meso' and 'macro' level.

Actor Network Theory (ANT) which together with SCOT is part of the Science and Technology Studies (STS) tradition, could also have been employed as a perspective to examine the opportunities and limits that the interaction between human and non-human agents gives rise to (Latour, 2005; Law & Hassard, 1999). ANT overcomes the division between human and non-human, inherited from the social sciences, opening up the possibility of dealing with specific assemblages where technology is not considered a priori as 'enabling' and 'fostering', and humans attributed pre-existing sets of interests and plans, simply enacted by ICTs. However, as Fine (2005) points out, even if ANT scholars claim to have removed the distinction between micro and macro, similarly to SCOT, they continued to locate their research primarily at the micro level. This tendency is visible in a number of studies that have been criticized by Walsham (1997) for concentrating on detailed descriptions of specific networks without paying attention to the broader social structures and processes within which they emerge. On the contrary, relying on concepts such as technopolitics and focusing on the nexus between discourses articulated at the local and at the international level, forces the researcher to look beyond the simple assemblage of actors and artefacts, extending the analysis to larger

socio-technical networks. In addition, even if attempts have been made to employ ANT in the study of ICTs in developing countries (Stanforth, 2007), ANT offers an intriguing perspective primarily in technologically dense societies, where the attribution of agency to artefacts may help to explain their influence on everyday life, while in a developing context some of its assumptions may be too audacious and complicated.

Constructivism was chosen over other traditions in international relations and comparative politics for several reasons that have already been explained, but one in particular is worth emphasizing: the conceptualization of discourses. As previously argued, in this research ICTs are considered not only as technical artefacts but also as discourses that influence policy and state action. Constructivists theorize discourses in a way that is compatible with the approach taken in this thesis, framing them as 'symbolic technologies', as representations and as social phenomena that shape decisions and plans (Laffey & Weldes, 1997). Neo-realism and neo-liberalism, in contrast, leave little space to the analysis of how discourse influences specific courses of action, and when some authors refer to ideas, they treat them simply as mental concepts or beliefs that are held by individuals (Goldstein & Keohane, 1993). This thereby excludes the possibility of analyzing, as this thesis does, the way narratives about technology but also about nation and culture, have implications on state behaviours and actions in the realm of ICTs.

2.6 A conceptual framework to study technology and politics in context

Examining the uses of ICTs for development by employing concepts offered by the history of technology and by constructivism in IR means reframing a process that has often been described as technologically-driven, where ICTs impact developing countries producing specific "effects", or society-shaped, where governments restrict some uses of technology because they are considered incompatible with a local culture or threaten political stability. It means analyzing the adoption of ICTs as a complex interplay where both local and international actors

and political and technical forces interact and negotiate to find a fixation of meanings and artefacts in a specific national context. To make this intricate process intelligible I integrate four main concepts that allow for the analysis of key actors, structures, and practices, while leaving other, less central, features in the background.

Conflict is the starting point

Rephrasing a claim Wendt made in the conclusion to his book on the *Social theory of international politics* (1999) and discussed above, it can be argued that:

> It makes more sense to begin theorizing about the role of ICTs for development by framing them as sites of conflicts and negotiations, and then look for a possible fit, rather than the other way around (assuming their neutrality to later appreciate resistances to their application).[26]

This argument contrasts with the idea embraced by many scholars and practitioners in the ICT for development field that the role of new technologies depends primarily on how they can optimally contribute to a set of pre-defined indicators, such as their support to growth in the GDP per capita, the enlargement of the educated population or the democratization of institutions. Even if these are noble goals, in many cases fundamental disagreements about what a technology is, which discourses it incorporates or should incorporate, and what purposes it may serve, take its implementation away from a simple application for a predetermined set of objectives. As Hecht (1998; 2001) illustrated in her research on nuclear power in France, technology can become part of the complex political plans pursued by different groups within the nation and be re-shaped so as to perform policies in ways that complement more traditional tools such the proclamation of a law or the creation of an institution.

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[26] The original sentence says that "it makes more sense to begin theorizing about international politics with the distribution of ideas, and especially culture, in the system, and then bring in material forces, rather than the other way around" (Wendt, 1999, p. 371)

This conflictual aspect is not isolated only to the national level. If a technology can become a component of the hegemonic plans advanced by a government, it can also be employed by international actors to advance their own hegemonic discourses. As illustrated in section 2.1, the use of ICTs for development has been charged with a variety of meanings by influential international players which, trying to frame those meanings as neutral or grounded in evidence, pursued the goal every hegemonic project is set to achieve: presenting a partial view of the world as taken-for-granted knowledge (Gramsci, 1951-1991; Laclau & Mouffe, 1985).

Therefore, when studying the application of ICTs in a developing country it makes more sense to begin by mapping the discourses that permeate the politics and culture of that country and how they relate to those that ICTs already have, rather than assuming that those articulated internationally will eventually prevail. This does not mean rejecting the idea that new technologies have functions and produce effects. As much as constructivists in IR do not refuse the roles military or industrial capacity plays, but advocate mapping the distribution of discourses first and subsequently bringing in the material forces, I similarly argue that it is more useful to start with a consideration of politics and then investigate the possibilities of using technology to reach a particular goal. The approach proposed in this thesis does not intend to replace those that already exist, but aims to complement them.

Technology is both material and discursive

As suggested by a concept like technopolitics, and similarly advanced by authors such as Mansell and Silverstone (1996), and, from a different perspective by the SCOT tradition (Bijker et al., 1987; Bijker & Law, 1992), technologies should be interpreted both in terms of their material and discursive components. Here the discursive element of technology is considered in two different, but interrelated and co-present, dimensions.

On the one hand, discourses are what invest the material world with meaning (Laclau & Mouffe, 1985). In its simplest form meanings are attached to artefacts as descriptions, manuals, and texts, telling users about the appropriate ways of operating a specific technical object. In many cases a technology when it is marketed

or when it is proposed, as has been initially the case for ICTs in developing countries, is not even visible. What are visible are only the potential and expected uses described by the advocates of its application. As Pinch, Ahmore and Mulkay have pointed out in their study of the discursive embeddedness of clinical budgeting systems, "technologies are often made available through texts, and the meaning given to a technology through such texts can vary from context to context (and/or audience to audience) [...] It is only by close attention to the different discursive contexts in which these definitions are offered and an examination of the rhetoric of technology that we can begin to understand the full richness of its multifaceted and interpretative nature" (Pinch, Ashmore, & Mulkay, 1992, p. 272). For the same technology, a multiplicity of possible discourses exists. However, their formulation is not the exclusive right of inventors or advocates. A new technology can be inserted into a different discursive realm that may develop different interpretations of its nature and use. Discourses are always in competition, looking for a closure that should make a certain meaning prevalent and others hardly possible. This is the reason why the same technology, the Internet for example, can be interpreted by some actors as liberating while by others as a threat. It is by investigating different discursive realms that these competing readings can be assessed.

On the other hand, technologies are not simply material elements, as a stone or a tree is, that need to be invested with specific discourses to acquire meaning. Because of their very nature as products of human activity, they also embed discourses that are enabling and constraining at the same time. Winner (1980) showed how certain prescriptions can be inserted into objects and work as well, if not better, than laws or warnings. Similarly, Hecht's notion of technopolitics illustrated how technologies represent a particular way to perform politics, allowing actors to reach goals that would not be attainable otherwise. Thus, in this study this duality will be taken into account by framing technologies and discourses as two complementary and co-present elements through which societies may change and may aim at changing other societies.

Discourses do not spread by themselves and require agency to diffuse and be implemented

Discourses may resonate with each other to varying degrees, and technologies may encounter acceptance or resistance at the local level. In any case the particular fit that a technology finds in each developing country is not simply there to be found, as the result of a static combination between given technologies and given discourses, but it is constructed by either local or international actors, or both. As Finnemore illustrated in the case of UNESCO's advocacy role in the diffusion of science bureaucracy, discourses to spread need to be carried by "active teachers" (1993; Finnemore, 1996). And, as complementarily shown by Risse-Kappen (1995a), Sikkink (1991) and Keck and Sikkink (1998), to become effective at the local level they need to find agents that endorse them and have the power to enact them on the ground. In many cases it is not simply one actor – a ministry, a company or an NGO – that has enough power or capacity to perform this task alone and winning coalitions need to be formed.

In the case of ICTs this process that has been analyzed by constructivist scholars in IR for the diffusion of new discourses, is further complicated by their material component. The fit needs to be found both at the discursive and at the material level. It can be the impossibility to unlock and reshape a particular technology considered to be both useful and harmful by an authoritarian government that prevents its acceptance, and the development of a greater capacity to control it that opens the door to its reception. In a country like China, for example, the increase of the number of Internet users has coincided with an increase in the capacity of the central government to prevent specific uses and favour others. It can be argued that in the absence of such a technical capacity, a similar diffusion might not have happened, at least not at the same pace. The capacity of local agents to insert in a "technology of freedom" some element of an authoritarian discourse created the possibility for a fit that could have not be found otherwise (Kalathil & Boas, 2003).

Technopolitical regimes are where the negotiations occur

The space where the negotiations and transformations described so far happen is what Hecht called a technopolitical regime (1998). It is an assemblage of discourses, artefacts, institutions, and actors connected to one another in looser or tighter ways to perform a particular goal or solve a particular problem. A technopolitical regime is an analytical construct. However, it can be perceived in its systemic nature not only by a researcher studying it, but also by the actors composing it, or against whom the regime stands. Different regimes may emerge around the "same" technology and compete for the definition of its standards and uses. In the case of Hecht's research on France's nuclear programme between the 1950s and the 1970s she identified the emergence of two regimes, a nationalist and nationalized, performing different sets of goals, grounded in different institutions, and pursuing a different kind of politics. The "same" technology was captured by competing discourses which profoundly affected the way in which it was used and the shape that it took.

ICTs can similarly become part of different technopolitical regimes and can be appropriated by a variety of actors to advance their own political aspirations. A technopolitical regime may emerge not only as the outcome of a negotiated process between a specific technology and a cultural and political context, but also as an instrument for competing actors to define the uses of that technology as well as advance their political agenda. The number and nature of these regimes cannot be defined a priori, but it is only though an in-depth investigation of the distribution of power in a given national context, of the discourses permeating it and of the actors advancing them that it is possible to reconstruct their features and purposes. As both Hughes and Hecht indicated, a technopolitical regime is both the expression of how power is distributed in a particular national context and an instrument for the exercise of power.

Observed through the conceptual framework highlighted above the main question informing this thesis, and thus "Why and how have ICTs been re-interpreted, re-defined and re-shaped in Ethiopia?" can be further specified as follow:

- What factors have influenced the development of different technopolitical regimes based on ICTs in Ethiopia – i.e. donor pressure, internal agenda, international standards – and to what degree?

- What actors have made the selective adoption of ICTs in Ethiopia possible and what resources have been mobilized to enhance particular aspects of ICTs while marginalizing others?

If conflict is assumed as the starting point, greater attention can be given not just to the fact that ICTs evolved in a direction that partially contrasted with the discourses articulated internationally, but to the specific factors that intervened in the conflict. Also, when reinterpreted as a process of mutual influence between the technical and the political, and not simply as more or less successful applications of given artefacts in new contexts, the analysis of how power is distributed and exercised can come to the forefront.

2.6 Conclusion

In this chapter a conceptual framework has been offered to analyze why and how ICTs can be re-interpreted, re-defined and re-shaped in developing countries. Starting with an exploration of what the dominant discourses about the applications of ICTs to development have been, both in policy and in selected academic circles, the chapter proceeded to criticize some of their assumptions, especially about ICTs "impacting" on developing countries. In particular, I have referred to authors explaining how new technologies, in both their material and discursive components, do not simply produce effects, but can themselves undergo significant transformations, adapting to locations that are different from those of their invention because of functional, cultural and political influences.

Building on this reformulation of what ICTs are and how they can become immersed in networks of discourses and power, analytical tools were combined drawing on the history of technology tradition and from constructivism in IR to

produce a conceptual framework that can better account for the complexity of ICTs, their material and discursive existence, and their conflictuality. This framework is used throughout this research to guide both the collection and analysis of the data, as will be illustrated in the next chapter in greater detail. It is also employed to structure the analysis of the main findings in Chapter 8 which are divided according to the four dimensions that comprise the framework including the conflictual nature of ICTs; their material and discursive character; the role of agency in negotiating the application of new discourses and artefacts; and the emergence of technopolitical regimes as a result of these negotiations.

CHAPTER 3 – RESEARCHING TECHNOLOGY IN CONTEXT

This chapter presents the methodology employed in this thesis to examine the reshaping of ICTs in Ethiopia. It starts by offering a personal and reflexive account of how and why the Ethiopian case became the subject of a structured investigation that was carried out combining case study research and a grounded theory approach. In the subsequent sections the specific methods that were used for collecting evidence are discussed, indicating how interview techniques, the observation of technical artefacts and the collection of textual material, from blog entries to newspaper articles, yielded data that were later integrated and analyzed. Finally, examples of the data analysis procedure are provided, indicating the principles that informed the presentation of the main findings.

3.1 Strategies for research: case study and grounded theory

The understanding of the reasons and practices that informed the adaptation of ICTs in Ethiopia developed through a progressive engagement in the field and with the collected evidence. The research started with broad observations of the uniqueness of applications of ICTs in the country and moved towards deeper and more precise explanations of what influenced the emergence of specific technopolitical regimes.

My first exposure to the uses of ICTs in Ethiopia was in early 2005 when I moved to Addis Ababa as a United Nations fellow assigned to work on ICTs, development and education for the UNESCO International Institute for Capacity Building in Africa (IICBA). A major contested issue at the time was the implementation of Schoolnet, the system using Internet Protocol (IP) based satellite connections to broadcast pre-recorded classes to secondary schools. I began my preliminary research by visiting some schools in Addis Ababa and interviewed a

number of teachers, deans and students. The system was very new as lessons had recently started to be broadcast only a few months before, in September 2004. This early research was not scientifically rigorous but it provided important insight into the system, including indications that most of the "targets", the students and teachers, were at odds with it. Schoolnet had been implemented without any consultation with the teaching staff, whose members were very concerned that they would be made redundant because technology had come to do their job. Students also had problems understanding programmes that used English as the medium of instruction.[27] The teachers and students were not alone in their frustration with Schoolnet. In monthly meetings organized by the donors and international organizations involved in education in Ethiopia, which I attended regularly as part of my job at UNESCO-IICBA, it was difficult to have ICT issues put on the agenda. The government had pushed hard for the new system to be put in place, without really seeking an agreement on the part of the donors.

The roll-out of Schoolnet occurred in the context of the larger events of 2005, during which the most contested elections in the history of Ethiopia were held. The pre-election period was characterized by an opening up of the spaces for the political debates, in the state-owned broadcast media, in the press and on-line. The expectations for a fair electoral process were high and the turnout on the election day, May 15, was unprecedented (Aalen & Tronvoll, 2009; Carter Center, 2005). Unfortunately, the counting the ballots and the proclamation of the results, which gave a large majority to the incumbent government, were significantly less transparent.[28] This caused protests in the main cities where, in most cases, the government responded with overwhelming force resulting in the death of hundreds of Ethiopians.[29] Tens of thousands of young men were rounded up and arrested. The

[27] It is worth noting that the first observations were made in the capital Addis Ababa, in schools located in the city centre, where the command of English, which is the compulsory medium of instruction in secondary education, should arguably be better than elsewhere in Ethiopia

[28] *Ethiopia election rows resurface* http://news.bbc.co.uk/2/hi/africa/4724755.stm, Last time accessed 14.04.10

[29] *Violence across Ethiopian capital* http://news.bbc.co.uk/2/hi/africa/4398806.stm, *Eyewitness: 'I couldn't help them'* http://news.bbc.co.uk/2/hi/africa/4400270.stm, *Ethiopian protesters 'massacred'* http://news.bbc.co.uk/2/hi/africa/6064638.stm Last time accessed 14.04.10

public criticism towards the government in the immediate aftermath of the elections and the organization of the protest were largely influenced by new media. Websites and forums populated by the Ethiopian diaspora incited citizens to revolt against the government and the Short Message Service (SMS) was used to mobilize crowds of people to protest. In response, the government quickly suspended the SMS and later started blocking oppositional websites, in both cases attributing the blockages to technical problems.

The use of ICTs in this context highlighted fundamental disagreements among different segments of the Ethiopian society in the interpretation of how the new tools could and should be used. Similarly, the condemnation by the international community of both the censorship imposed on the Internet and the "misuse" of ICTs for education was a signal of an unresolved tension between prescriptions for, and actual uses of, ICTs. Witnessing the unfolding of these processes was an important stimulus to my subsequent decision to deepen my understanding of the complex relationship between ICTs, the state and other key actors in Ethiopia. It also influenced my choice of instruments to be employed for the task. The complexity of the relationship between the technical, the social and the political I observed in Ethiopia encouraged the development of a conceptual framework that could facilitate the study of how heterogeneous actors interact, struggle and negotiate, beyond the simplistic idea of technological transfer or the diffusion of innovations.

This framework was outlined in Chapter 2, where concepts emerging from the history of technology tradition and from constructivism in international relations were combined with other traditions, stressing notions of conflict, hegemony, and power. This has also led to reformulating the interest in the re-interpretation, re-definition and re-shaping of ICTs in Ethiopia as a more detailed exploration of the factors influencing the emergence of specific technopolitical regimes over alternative ones, of the resources mobilized to make this possible and of the actors involved in the process. It was with these questions in mind that the following phase of the research was planned, involving six months of fieldwork in Ethiopia.

Between February and July 2008 data were gathered and preliminarily analyzed from three main sources:

1) Seventy-seven in-depth interviews were collected with individuals who participated to the development of ICTs in Ethiopia in different capacities, from state ministers to system administrators in remote woredas, from private and government journalists to international civil servants. The sampling strategy I adopted is explained in section 3.3.1, while a full list of interviewees can be consulted in Appendix 1.

2) Woredanet and Schoolnet sites were visited in three regions, Oromiya, Tigray and Southern Nations Nationalities and Peoples, for a total of six sites visited. In each case I collected observations on the systems' architecture and of its functioning, and in most instances I had the opportunity to speak with teachers, students and deans when visiting a school, and with local administrators when in a government office. A detailed illustration of the procedures I employed is offered in section 3.3.2.

3) Additional textual material was collected to provide context to the interviews and observations and to supply additional evidence of the discourses characterizing the political debate in the country as well as the debate over ICTs. This material included: ICT policies, monitoring and evaluations reports on Woredanet and Schoolnet, newspapers articles and editorials from key Ethiopian newspapers, blog entries posted by Ethiopians in the country and in the diaspora. A full overview of this additional material and of the rationale behind its collection is provided in section 3.3.3.

In order to structure the data collection and analysis I employed a procedure that arguably has become the canon of good interpretive and qualitative research as identified by authors such as Yin (1994), Eisenhardt (1989), Glaser and Strauss (1967), Miles and Huberman (1994). At the same time, I developed more specific practices to tailor those research instruments to the case under scrutiny and to apply the conceptual framework developed in Chapter 2. All materials have been further organized with the support of NVIVO 7 software for qualitative analysis.

3.1.1 Case study research

My research is structured along the lines of an in-depth, single case study as it took place in a single country and analyzed how a specific set of technologies took shape within it (Eisenhardt, 1989; Flyvbjerg, 2006; Yin, 1994). As Yin points out, case study research entails the adoption of a particular strategy rather than the selection of specific methods (Yin, 1994). It allows one to make use of data in a structured way and to examine in detail the relations that connect phenomena together. It involves an "empirical investigation of a particular contemporary phenomenon" (Robson, 1993, p. 146), even if some of its instruments are similar to those used by historians. A case study approach is particularly applicable for the kind of research question I address. It is mostly used when a "how" and/or "why" question is being asked and there is little or no possibility to manipulate the events being investigated. In contrast, other strategies such as surveys or experiments, are preferred when the question is about prevalence or when there is a greater control over the events (Campbell, Daft, & Hullin, 1982; Yin, 1994). Both historians of technology and constructivists in international relations have employed single or small-N case study research to advance knowledge in their respective fields. Hughes studied electrification in different Western countries (Hughes, 1983), while Hecht focused on the development of the nuclear programme in France (Hecht, 1998). The majority of IR authors I refer to in my work developed their theories and observations through case studies, from Sikkink's research of how developmentalism was received differently in Argentina and Brazil (Sikkink, 1991), to Finnemore's analysis of UNESCO's role in the development of science bureaucracies (Finnemore, 1996); and from Risse-Kappen's edited book on transnational relations (1995b) to Checkel's analysis of the Soviet/Russian behaviour at the end of the cold war (Checkel, 1997).

Despite its popularity, however, the case study approach is not exempt from criticism. Flyvbjerg (2006) illustrated some of the most common critical remarks about case-study research in the social sciences, from the accusation that no theories can emerge from it, to its usefulness only in the initial generation of hypotheses but not in their testing, to the bias towards verification. While challenging these and

other prejudices, Flyvbjerg conceded, nonetheless, as others before him (Ragin & Becker, 1992; Stake, 1995), that the case study approach is not fit for all kinds of research, but it is most powerful when certain conditions are met. He argues, for example, that "the case study is ideal for generalizing using the type of test that Popper called "falsification" (Flyvbjerg, 2006, p. 228) and advocated experiences that let the researcher spend sufficient time on the ground to question preconceived ideas and have new ones emerge as a result of direct contact with data and events. He noted that:

> Researchers who have conducted intensive, in-depth case studies typically report that their preconceived views, assumptions, concepts, and hypotheses were wrong and that the case material has compelled them to revise their hypotheses on essential points. The case study forces on the researcher the type of falsifications described above. Ragin called this a "special feature of small-*N* research" and went on to explain that criticizing single-case studies for being inferior to multiple-case studies is misguided, because even single-case studies "are multiple in most research efforts because ideas and evidence may be linked in many different ways" (p. 225). Geertz (1995) said about the fieldwork involved in most in-depth case studies that "The Field" itself is a "powerful disciplinary force: assertive, demanding, even coercive" (p. 119). Like any such force, it can be underestimated, but it cannot be evaded. "It is too insistent for that," said Geertz (Flyvbjerg, 2006, p. 235).[30]

According to Flyvbjerg, a single case study approach should thus be pursued when there are the premises for letting data from the field exercise assertiveness in challenging preconceived ideas, a feature that has characterized a large part of my research. As explained above, the study of the re-shaping of ICTs in Ethiopia developed through a progressive involvement with both theoretical insights and empirical evidence. The phenomena observed in Ethiopia initially forced me to reconsider some of the assumptions I developed both through my professional activity in the ICTs for development field and through my engagement with the

[30] The works Flyvbjerg refers to in the quote reported above are (Ragin & Becker, 1992) and (Geertz, 1995).

literature. This led to the formulation of questions that later guided extensive fieldwork involving continuous comparisons among multiple sources of evidence.

Among the four categories of cases Flyvbjerg identifies – extreme, maximum variation, critical, and paradigmatic – the reshaping of ICTs in Ethiopia falls arguably under the critical type. Ethiopia is one of the poorest country in the world as its GDP per capita ranks it 171st out of 182 countries.[31] It receives the largest amount of aid in Africa.[32] And it enjoys a very preferential and positive relationship with Western governments. Prime Minister Meles Zenawi was celebrated by former American President Bill Clinton as belonging to a new generation of African leaders and was selected by former British Prime Minister Tony Blair to serve as the sole African prime minister in his Commission for Africa. Following the logic adopted by Flyvbjerg, Ethiopia could be considered the "least likely" case in which technology could be applied in ways that are conflicting with those advocated at the international level. Nonetheless, cases like Woredanet and Schoolnet indicated that even in a country whose resources largely depend on international assistance and whose relationship with Western countries are positive ICTs could be drastically re-shaped.

Within Ethiopia, the initial selection of which aspects of ICTs should be explored followed the criteria defined by Hughes and Hecht in their research. Neither of them offered clear-cut boundaries delimiting large technical systems (LTS) or technopolitical regimes. They preferred an image of the technical and the social connected in a seamless web, where one represents the continuation of the other. The definitions they provided pointed to heterogeneous sets of material and discursive elements, such as physical artefacts, firms and laboratories, but also laws, political programmes and institutional ideologies. At the same time, however, they recognized a unifying characteristic of LTS or technopolitical regimes in their problem-solving capacity and in their emergence as networks whose nodes cohere to fulfil a particular goal. Therefore, in order to identify a LTS or a technopolitical regime, Hughes and

[31] Between 2004 and 2008 Ethiopia's GDP per capita ranked it either at the 170th or 171st position out of 182 countries (UNDP, 2005, 2006, 2008, 2009).

[32] Between 2004 and 2008 Ethiopia's Overseas Development Assistance, has almost doubled, reaching more than three billion dollars in 2008 and raking Ethiopia as the major recipient of donors' funds in the continent (OECD, 2009)

Hecht's experiences indicate that we need to move beyond the simple artefact to look at the set of institutions that inform its functioning, at the actors using it to perform specific tasks and at the ways in which these elements connect in solving a particular problem. They also illustrate how it is only in practice that it becomes possible to understand what these institutions/actors are, how they are connected with each other and to specific technical objects. This exploration and the demarcation of clearer borders defining different technopolitical regimes has been carried out using the instruments of grounded theory described below. These define a set of steps to move between data collection and analysis and to progressively develop theory from empirical evidence.

3.1.2 Using grounded theory for the study of technical artefacts

Grounded theory emerged as a structured procedure to collect, organize, filter and analyze qualitative data and to explain social phenomena in terms of their causes, conditions and consequences (Glaser & Strauss, 1967). Since its initial formulation it has been used in a variety of fields, from social psychology (Charmaz, 1990), to organizational research (Martin & Turner, 1986), and international relations (Keck & Sikkink, 1998). Its application in a wider range of disciplines, however, has often followed only some of the procedures originally developed by its creators, Glaser and Strauss (1967). While, for example, many researchers have employed and advocated a systematic coding of the data, proceeding from open codes to concepts and categories, far fewer have followed the orthodoxy by engaging in research in the absence of any previous theoretical grounding (Eisenhardt, 1989). For example grounded theory has been proposed as a bridge between the theoretical assumptions made by discourse theory and empirical research (Keller, 2005). If grounded theory in fact is incommensurate with inductive a-priori theories, it has been used successfully in combination with more open frameworks.[33]

[33] An example of an inductive, a-priory, theory can be taken from Dahl's work on poliarchy, where he proposed propositions such as that indicating that "the likelihood that a government will tolerate an opposition increases as the expected costs of toleration decrease" (Dahl, 1971, p. 15).

The "theories" I have drawn upon in my research can be considered to belong to these types of frameworks. Within the IR tradition, a particular view of the international system is proposed, but no stringent theory is advanced about how it works, letting the researcher elicit new concepts from empirical data. As Finnemore and Sikkink note in their attempt to link a constructivist stance in IR with a specific empirical agenda, "constructivism is not a substantive theory of politics. It is a social theory that makes claims about the nature of social life and social change. Constructivism does not, however, make any particular claims about the content of social structures or the nature of agents at work in social life. [...] It offers a framework for thinking about the nature of social life and social interaction, but makes no claims about their specific content" (Finnemore & Sikkink, 2001, p. 393). It is within this open framework that I employed grounded theory, interpreting it as a systematic approach to qualitative data analysis rather than as a prescribed formula.[34] Similarly, in the case of the history of technology tradition as developed by Hughes and Hecht, a greater interdependence between the social, the political and the technical is proposed, in order to better understand the processes of technological innovation and implementation. No proposition is advanced on the specific causes leading to a particular configuration of artefacts, or on the consequences an artefact or a combination of artefacts are likely to produce in a given context.

A principle defined by Glaser and Strauss that I followed is the simultaneous collection of evidence and their early preliminary analysis. The examination of a first set of data informed the selection of new individuals, cases, and objects, leading to further analysis and a new selection, in a circular process. This is what Glaser and Strauss call "theoretical sampling" and which should allow new material to be included in the research plan and new, emerging, lines of inquiry to be followed when they demonstrate their capacity to answer the questions informing the research.

[34] Various works on social research methodology stress this aspect over others, presenting grounded theory mainly as a structured approach to qualitative data (Flick, 2006; Holstein & Gubrium, 2003; Kelle, 2000). Also of its most eminent representatives do recognize that, in some cases, "a previously identified theoretical framework can provide insight, direction and a useful list of initial concepts" (Corbin & Strauss, 2008, p. 40).

It is through this concurrent process that, for example, the connections structuring a technopolitical regime were explored, moving from its core to its periphery, delineating its characteristics as well as the features of other possible regimes against which it stood.

My practice of theoretical sampling was further guided by insights emerging from research in the history of technology tradition which suggest linking different sources of data to develop a deeper understanding of the discourses informing technopolitics. Historians such as Allen and Hecht (2001) indicate the importance of exploring the conceptualizations of technology held by politicians and technocrats. As they claim, "how public figures articulate the relationships between technology and society matters [...] to the development of technology itself. Technology may not drive history, but the fact that influential people believe that it does has real consequences"(Allen & Hecht, 2001, p. 5). To analyze the shape a particular technology has acquired it is thus important to investigate what key individuals thought of that technology and of its implications, and not to assume impacts based on an artefact's characteristics, as most mainstream ICT for development scholars have done. At the same time, however, these conceptualizations may become apparent only later in the research process. Especially when investigating sensitive issues, informants may conceal some of the motivations at the core of their decisions. For this reason it may be useful to combine the views articulated about a particular technology with close and direct observation of that technology in action. In Hecht's analysis of the French nuclear programme (2001) and Weinberger's of the Swedish military strategy during the Cold War (2001), for example, it is argued that it was through a close examination of technological systems that it became possible to unveil the politics a nation or a group within a nation were really following. In a comment on these studies Allen and Hecht affirm that "in both the French and the Swedish case we see a disjuncture between declared policy (policy as rhetoric) and enacted policy (policy as practice). In both cases, an understanding of actual technological practice is necessary in order to view the disjuncture clearly. One might say that technologies camouflaged actual political practices – except that the camouflage metaphor suggests a separation between technological and political

practice that did not exist. A more precise formulation would be that these technological systems *performed* national politics" (Allen & Hecht, 2001, p. 18).

Combining the principles of grounded theory with the practices developed in studies of history of technology of the type highlighted above led to a process of iterative comparison between conceptualizations emerging from interviews, as well as from other textual material, and observations of how technical artefacts actually took shape. This going "back and forth" between the technical and the discursive was also essential to capture the conflictual nature of technological appropriation articulated in the conceptual framework (see Chapter 2), and the ability of technology to embed specific political plans, despite the frequent claims of its neutrality.

If a linear approach to the application of ICTs in developing countries focuses on what technology does, on the effects it produces, or it may produce, in a specific context, the conceptual framework I use requires investigation about how technology is perceived, how different perceptions lead to specific assemblages, and how politics intervenes in the process. In order to detect conflict it is necessary to map both discursive and material elements intervening in the process of technological adoption, link them together and understand how a specific distribution of power, both as exercised through artefacts and as held by social actors, made certain applications possible, while it marginalized alternative uses.

The methods that have been employed to explore these complex processes, the collection of testimonies from people who contributed to the development of ICTs in the country and the observation of specific technopolitical regimes, are illustrated in the following sections, together with an indication of the additional data that were gathered and the triangulation employed to combine them together.

3.2 Methods for data collection

During the six-month field research period three main techniques were employed for the data collection. Interviews were carried out with key politicians, technocrats, opposition leaders, international civil servants, local administrators,

bureaucrats, members of civil society organizations and journalists. Close observations of technical artefacts and of their functioning were made during visits to Woredanet and Schoolnet sites in Tigray, Oromiya, and the Southern Nations Nationalities and People (SNNP), three regions in the north, centre and south of Ethiopia respectively. To complement this evidence additional uses of ICTs in the country were explored, archival material was gathered, from ICT policies to newspapers articles and blog entries. Because of the potential sensitivity of the issues under scrutiny, the techniques employed had to take into account additional challenges connected to the access to documents and informants (Lee, 1993; Lofland, 1971; Shaffir & Stebbins, 1991; Undheim, 2003) and to the credibility of the collected information (Batteson & Ball, 1995; Gewirtz & Ozga, 1994; R. Phillips, 1998). Some of the procedures followed to face these problems have been already illustrated, such as the verification of verbal evidence with the analysis of technical artefacts. Others are detailed further below.

3.2.1 Interviews: building trust and eliciting narratives

Seventy-seven people were interviewed. Forty of them were connected to the government in various capacities (ministers, party members, national and local civil servants, engineers working for key government agencies, etc.). The other thirty-seven belonged to institutions that participated in the development of ICTs in the country, but from an external and, in some cases, adversarial position (United Nations officials, ICT entrepreneurs, members of opposition parties, etc.) or held informed and influential opinions about ICTs, their evolution and role in the Ethiopian society. A list of the interviewees and of their affiliations can be consulted in Appendix 1.

The network of contacts I had built when I was working for the UNESCO-IICBA in 2005 and 2006 was fundamental to facilitate access to many interviewees. As part of my duties at UNESCO-IICBA I used to participate to donor meetings and to chair the "ICTs in education task force", a group created to facilitate the communication and cooperation between the donor group and the Ministry of

Education in Ethiopia on ICT related issues.[35] This role allowed me to meet and to communicate regularly with officers in the Ministry and in other institutions in charge of the implementation and management of relevant ICT projects, such as the Educational Media Agency (EMA) and the Ethiopian ICT Development Agency (EICTDA). In an effort to make the task force more inclusive and representative, I also organized meetings with members of civil society organizations such as the Ethiopian IT Professional Association (EITPA), and the Ethiopian Free and Open Source Software Network (EFOSSNET). This experience helped me develop an overview of the key individuals operating in the ICT sector which later served as a guide for the selection of the interviewees, especially in the early stages of the research on the ground.

The first round of interviews started in mid February 2008 and involved six individuals from each of the two groups highlighted above. They were selected because of the role they played in influencing the development of ICTs in the country and of their capacity to provide comprehensive answers to my research questions. Following the procedures characterizing the grounded theory approach discussed in the previous section, this first set of interviews was preliminary analyzed, and later correlated with data obtained through the initial observations emerging from visits to Schoolnet sites – it was possible to visit Woredanet sites only at a later stage – and through the collection of other material, such as ICT policies and media laws. The results of this analysis started to be employed as an additional guide for the selection of new potential interviewees.

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[35] As indicated in section 3.1 the decision of the Ethiopian government to implement Schoolnet despite the resistance of the donor agencies made them reluctant to embark on new ICT projects and to make ICTs a priority. The ICT in education task force was an attempt to restart the dialogue. It contributed to important events, such as panels on ICTs in education during two consecutive Annual Review Meetings –where donor and government representatives meet to assess achievements and discuss new priorities of their cooperation – and the "ICT in education" conference organized on 22-23 May 2006 in Addis Ababa by the EICTDA and the Graduate College of Telecommunication and Information Technology (GSTIT). Overall, however, the task force was not successful in restarting a productive cooperation between donor agencies and the Ministry of Education or the EICTDA, in ways that could substantially influence the development of ICTs in Ethiopia and the implementation and use of systems like Schoolnet.

The process of selection and preliminary analysis continued throughout the whole field research, leading to the construction of a corpus that was considered comprehensive enough to answer the main research questions and sub-questions (Bauer & Aarts, 2000). The rationale behind each step extending the corpus was to add variety to the representations held on the particular phenomena under scrutiny, until saturation was reached. According to Bauer and Aarts a corpus is saturated when "adding further strata [which they define as known categories such as age, sex, occupational activity, urban/rural] may make only a small difference with regard to additional representations" (Bauer & Aarts, 2000, p. 34). In the case of my research a sign that saturation was being reached was, for example, when an officer from an additional international organization involved in ICTs in Ethiopia was returning very similar answers to those already collected from members of the other international organizations.

The particular techniques employed to conduct each interview were the result of the combination of different traditions, and were aimed at developing a rich understanding of the mechanisms that influenced decisions and courses of action. This method was based on the experience of authors who have used interviews to reveal information about the discourses which shaped policies (R. Phillips, 1998) or technologies (Akrich, 1992; Hecht, 1998; Pinch et al., 1992), and aimed to produce historical accounts that could not be narrated easily from secondary resources or written materials (Portelli, 1991; Seldon & Pappworth, 1983). The capacity interviews have to produce "a fine-textured understanding of beliefs, attitudes, values and motivations" (Gaskell, 2000, p. 39), was crucial to detect the potentially contested nature of technology in a developing context and the alternative, adversarial narratives challenging the dominant ones.

The problematic nature of the events, spanning a process of substantial reshaping of ICTs including the censoring of blogs opposing the government, required the interview techniques to be particularly flexible. For example, with respect to the quoting of the sources, when requested, I agreed not to record and took

detailed notes.[36] During an interview some interviewees occasionally requested to go "off the record" when addressing some particularly problematic issues. This happened mainly in the case of civil servants working in government institutions who were being critical of the system they were part of, or international civil servants when speaking at a personal level and not as representatives of the organization they were part of. Some interviewees have been anonymized. For the purpose of the examination, they have been quoted with a code that can be matched in the list of interviewees in Appendix 1. While not disruptive of my research – most interviewees did not resist the idea of being quoted and the segments "off the record" were minimal in the context of complete interviews – this flexibility was key in gaining trust and access.

Even more important in allowing nuanced stories to develop were the structuring of the interviews, their wording and their progression. To be unobtrusive and engage the interviewees, without imposing my views on the informants and go beyond issues of my exclusive interest, I combined in-depth interviews techniques (Gaskell, 2000; McCracken, 1988), with the practices of narrative interviewing (Jovchelovitch & Bauer, 2000) and oral histories (Portelli, 1991). A consequence of this choice was the replacement of a semi-structured questionnaire with a more flexible topic guide (see Appendix 2) covering a number of themes, but allowing me to follow different paths as they emerged and to reframe questions using the same language and references used by the interviewer. The goal was to use the informants' knowledge and visions of the world and, as Jovchelovitch & Bauer (2000) suggest, transforming exmanent questions into immanent ones, therefore formulating questions that pertained to my specific research interest using the interviewee's own words and terms. Another outcome of the adoption of some oral history techniques

[36] In general I noticed that even in the case of the most relaxed interviewees, the recorder was perceived as an impediment to the flow of the interview. In many cases, I took notes making sure to transcribe them right after the interview or as soon as this was possible. There are a number of techniques that are used for speed-writing. Probably the most famous is the *Easy-script* elaborated by Levine (2001). This technique has been used in some cases for taking notes while a personal code for speed writing has been elaborated based on the jargon I started recognizing after the initial interviews. For example, the expression "ethic federalism" that was often mentioned during interviews with politicians and opposition leaders became "EF", Woreda "W", Woredanet "Wn", etc.

was the focus on facts and events, and on the meanings attached to them by their protagonists or witnesses. This helped to reconstruct the history of the development of ICTs in the country, inferring what the motivations were that had inspired certain courses of action. As Portelli, who explained the relevance of oral histories not only for historians, but also for the social scientists, has argued, "oral histories tell us not just what people did, but what they wanted to do, what they believed they were doing, and what they now think they did" (Portelli, 1991, p. 50).

Finally, in selecting pertinent events and timeframes for my topic guide I did not focus only on the most recent, but also on the recent past. For example, I extended my questions to cover the civil war in the 1980s and the coming of a new political elite in the 1990s, searching for long-term paths of adoption and uses of ICTs that might shed light on the more recent developments. This helped build rapport and demonstrated my interest not only in specific issues but also more widely, in the history of the country and in the interviewees. It also produced richer accounts, as compared to those referring to the more recent events, probably because, as some collections of oral histories show (Arthur, 2006; Portelli, 1991, 1997), moments of crisis and transition usually produce more vivid narrations.

The application of this variety of techniques, and the progressive refinement of the topic guide in order to incorporate new data and perspectives, made the interviewing process engaging and rewarding.[37] Interviews lasted between forty-five minutes and two hours, usually progressing from more cautious to more open and articulated answers. Interviews conducted at a later stage in the fieldwork tended to be more successful than earlier ones. The knowledge I accumulated, and carefully displayed when needed, on the evolution of ICTs in the country and on the political history of Ethiopia in general, helped building rapport with the interviewees and eliciting more focused answers.

[37] Only a few issues were considered problematic by some interviewees and created tension throughout the interviewing process. One of them were for example was the violence in the aftermath of the 2005 elections, considered an "hot topic" especially by government officials.

3.2.2 Observation of technical artefacts

During fieldwork and in parallel with the collection of interviews, the observation of a variety of technical artefacts was carried out. It started with field visits in selected Schoolnet and Woredanet sites in Tigray, Oromiya and SNNP regions, to understand how the two systems operated and how their users perceived them. Three schools were visited and three Woredanet sites, two at the regional level and one at the woreda level, were visited.[38] Also in this case, the network of colleagues I previously built in Ethiopia in 2005 and 2006 was instrumental in granting me access to most sites. Usually, in order to visit a secondary school or a woreda office, I had to display a reference letter or be introduced by an acquaintance I had interviewed or contacted to organize the visit.[39]

The observation of Schoolnet and Woredanet sites represented the opportunity to study how specific technological artefacts had been assembled and the reasons that motivated specific configurations. It allowed me to better understand and contextualize information previously collected through interviews as well as to note key aspects of the systems about which I could later ask for explanations from new informants. An example shows how this process worked in practice.

In one of the first interviews, a young Ethiopian technocrat, answering a question about how Woredanet was used in practice, responded by saying that:

> [Woredanet] is owned by the federal government. The technology does not allow the regions or the woredas to use the system independently. In theory the regions are independent but still the main political framework and the rules are

[38] As will be explained in detail in Chapter 6 the configuration of Woredanet at the woreda and at the regional level is practically identical.

[39] The reference letter was written by my previous UNESCO employer, briefly describing who I was and what the purpose of my visit was. This document was, in most cases, sufficient to access all Schoolnet sites. Accessing Woredanet sites either at the regional or at the woreda level was more complicated and in most cases I had to be introduced by either an official in Addis Ababa or by other colleagues who had been working with the person in charge of the management of a Woredanet site.

decided at the centre. There is no way for the regions to go on their own. So it is used by the centre, but it is also as a way to share resources, to stay together.[40]

A statement like this, if not compared with the specific technology it referred to, could offer a representation of how Woredanet was a centralized and tightly controlled system, but would be ambiguous about the specific instruments used to make this possible. By studying how Woredanet functions in a site, and by collecting reports and technical documents about its design, I could appreciate how the system was enhancing specific features and marginalizing others. I could collect observations and information on technical aspects to be further analyzed with the support of additional material at a later stage.

Each visit lasted between one and two hours and in the case of Schoolnet it frequently offered the opportunity to speak with students and teachers, while in the case of Woredanet I could engage in coversations with system administrators and local bureaucrats. In most of these instances I did not conduct interviews of the kind illustrated in the previous section. I took detailed notes during or immediately after my meetings to capture impressions and opinions about how the two systems worked and what they were contributing to. Assessing how the two systems operated on the ground was beyond the scope of my research, but the notes I collected with these informants were useful in providing further context to the observations of the technical artefacts themselves.

The research evolved beyond Schoolnet and Woredanet, to look at other local applications of ICTs that were complementing, patching or opposing those developed by the Ethiopian government. The examination of these other sites was guided by my conceptual framework and grounded in the empirical evidence I had started to collect. As noted in Chapter 2, and advanced by authors such as Hughes and Hecht, the construction of technological systems usually emerges in competition with alternatives. Therefore, to fully understand the features characterizing a

[40] Interview: Anonymous (70). Some interviewees have been anonymized. For the purpose of the examination, they have been quoted with a code that can be matched in the list of interviewees in Appendix 1.

technopolitical regime I had to investigate whether others emerged in opposition to it and what their characteristics were. At the more practical level, however, after a couple of months the visits and interviews started indicating more or less systematized alternative uses of ICTs. For example, in two of the schools where Schoolnet had been installed I was able to observe that other uses of ICTs were being promoted through projects financed and implemented by the international community that supported goals that appeared to be opposed to those the government-run system was designed to reach. Similarly, some interviewees, mostly working for local private companies or affiliated with civil society organizations, described previous attempts to use ICTs in ways similar to those experimented within other developing countries, from the installation of telecentres to the privatization of Internet Service Providers, that were opposed by the local government. These witnesses' observations, substantiated by archival evidence, helped to reconstruct the history of the technopolitical regimes that appeared to have been marginalized or failed to emerge as alternatives to the national one, but which, nonetheless, mobilized energy, resources and responded to competing discourses on how ICTs could, or should, be used in Ethiopia.

The exploration of actual and potential plans to use ICTs in the country and of the actors at the core of these real or attempted projects, also offered the opportunity to map and understand in practice how power is distributed in Ethiopia. Many projects, even if tailored to the needs of different groups within the country, as a functionalistic approach might have uncovered, or responding to the local specificity, as a cultural analysis might have yielded, lacked the necessary endorsement of powerful actors to be implemented. Within the government apparatus itself, comparing the views and opinions collected from politicians and technocrats with what was later implemented or not implemented on the ground offered the opportunity to reconstruct the distribution of power among policy makers and technocrats.

3.2.3 Other data and triangulation

In combination with the two main techniques discussed above, a set of strategies was used to elicit additional data that could provide context and crosscheck the data gathered through interviews and observations. This decision was motivated by two of the principles informing the research design and previously discussed in this chapter. First, as a result of the theoretical sampling procedure proposed by a grounded theory approach, the preliminary analysis of some of the interviews and of the notes highlighted some new themes that needed to be further investigated. Some of these required accessing data sources other than interviews or direct observations. For example, some government officials, when asked about the censoring of blogs, responded by pointing out that some of forums could be considered to be inciting ethnic hatred. Such statements needed to be crosschecked through directly accessing some of the online spaces that had been cited. Similarly, other informants pointed at the adversarial tone used in the government media towards most forms of opposition. As it was the case for the blogs, these assertions needed to be crosschecked through techniques such as examining the discourse articulated in state owned newspapers. Second, the controversial nature of the issue under scrutiny requested to access archival material and other sources of evidence in order to verify facts and figures.

As a result, three additional sources of evidence were collected: blog entries, newspapers articles and policy and project documents. As it will be illustrated in the next section, data from these sources was not systematically analyzed in the same way as the interview transcripts and notes from the observation of technical artefacts, but was used mostly to integrate the main corpus when needed and to provide context.

In order to select a number of relevant blog entries a screening of the three most popular blogs among Ethiopians was carried out in the 12 months preceding being blocked by the Ethiopian government in May 2006. According to Alexa, an online resource ranking websites worldwide, the three most visited sites targeting Ethiopian audiences were Nazret, Ethiomedia and the Ethiopian Review.[41] The

[41] Alexa.com ranks websites mostly through the feedback received from users who have the Alexa toolbar installed as a plug-in in their browsers. Despite criticism (see for example the article *Alexa's*

results offered by Alexa were further checked with informants in Ethiopia, in order to authenticate their relevance and importance for an Ethiopian readership.

Regarding newspapers articles, editorials were collected in two key moments of the recent history of the country, during the transition from the Derg regime to the new government headed by the EPRDF and during the highly contested parliamentary elections in 2005. In both cases a period of six months was covered, three months before and after the EPRDF took over Addis Ababa, on 28 May 1991, and three months before and after the election day, on 15 May 2005. In the first instance only articles from the state owned *The Ethiopian Herald* were consulted, since it represented the only resource in English available at the time.[42] In the second instance, editorials were accessed in translation in two weekly publications summarizing the most important articles published in the state owned and private press. The front covers of the two outlets, *7 Days Update* and *Press Digest*, are reported in Fig. 3.1 and 3.2.[43]

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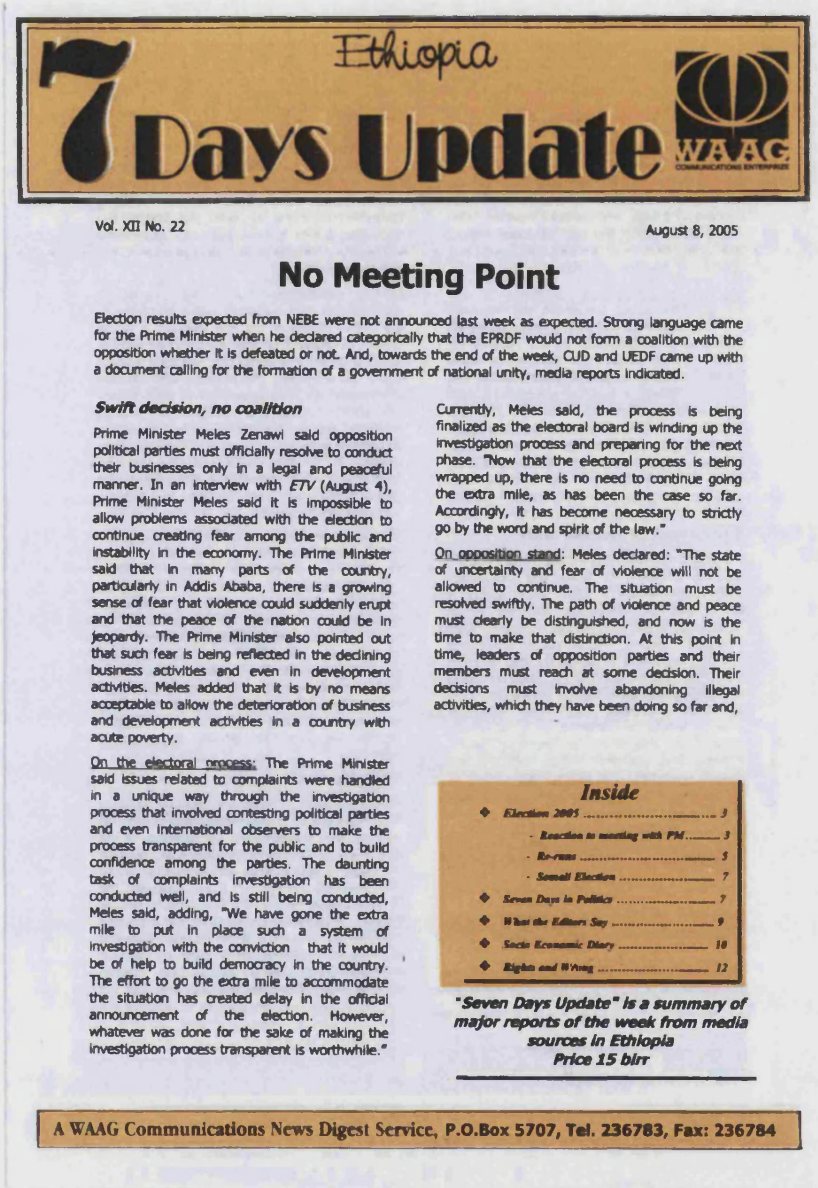
make believe Internet http://techcrunch.com/2007/11/25/alexas-make-believe-internet/ Last time accessed 12.01.2010), it remains the most widely used resource on the web to freely access ranking of websites and usage statistics.

[42] Copies of The Ethiopian Herald were consulted and photocopied in the library of the UNECA in Addis Ababa.

[43] Press Digest was consulted and photocopied in Press Digest's office, while copies of 7 Days Update were purchased.



Ethiopia
7 Days Update
WAAG COMMUNICATIONS ENTERPRISE

Vol. XII No. 22 August 8, 2005

No Meeting Point

Election results expected from NEBE were not announced last week as expected. Strong language came for the Prime Minister when he declared categorically that the EPRDF would not form a coalition with the opposition whether it is defeated or not. And, towards the end of the week, CUD and UEDF came up with a document calling for the formation of a government of national unity, media reports indicated.

Swift decision, no coalition

Prime Minister Meles Zenawi said opposition political parties must officially resolve to conduct their businesses only in a legal and peaceful manner. In an interview with *ETV* (August 4), Prime Minister Meles said it is impossible to allow problems associated with the election to continue creating fear among the public and instability in the economy. The Prime Minister said that in many parts of the country, particularly in Addis Ababa, there is a growing sense of fear that violence could suddenly erupt and that the peace of the nation could be in jeopardy. The Prime Minister also pointed out that such fear is being reflected in the declining business activities and even in development activities. Meles added that it is by no means acceptable to allow the deterioration of business and development activities in a country with acute poverty.

On the electoral process: The Prime Minister said issues related to complaints were handled in a unique way through the investigation process that involved contesting political parties and even international observers to make the process transparent for the public and to build confidence among the parties. The daunting task of complaints investigation has been conducted well, and is still being conducted, Meles said, adding, "We have gone the extra mile to put in place such a system of investigation with the conviction that it would be of help to build democracy in the country. The effort to go the extra mile to accommodate the situation has created delay in the official announcement of the election. However, whatever was done for the sake of making the investigation process transparent is worthwhile."

Currently, Meles said, the process is being finalized as the electoral board is winding up the investigation process and preparing for the next phase. "Now that the electoral process is being wrapped up, there is no need to continue going the extra mile, as has been the case so far. Accordingly, it has become necessary to strictly go by the word and spirit of the law."

On opposition stand: Meles declared: "The state of uncertainty and fear of violence will not be allowed to continue. The situation must be resolved swiftly. The path of violence and peace must clearly be distinguished, and now is the time to make that distinction. At this point in time, leaders of opposition parties and their members must reach at some decision. Their decisions must involve abandoning illegal activities, which they have been doing so far and,

Inside

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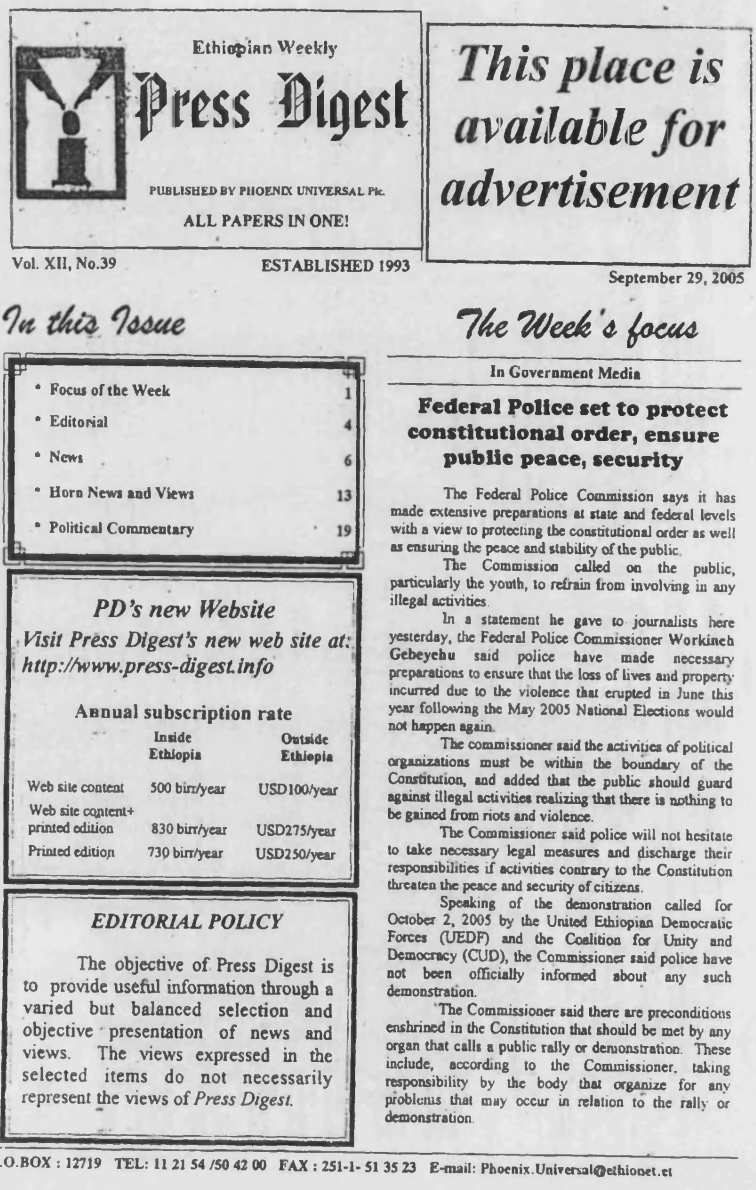
Fig. 3.1 "7 Days Update" cover

Finally, policy documents, reports on ICTs in Ethiopia, project documents and evaluations of Schoolnet and Woredanet were collected. The purpose of accessing policy documents was to determine the official position of the Ethiopian government on ICTs, as articulated in the documents that were shared with other players such as international organizations and foreign governments and often used to assess the status of ICTs and government commitment to their use. Project documents and evaluations offered important background material and were confronted with the observations conducted in Woredanet and Schoolnet sites.



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The Week's focus

In Government Media

Federal Police set to protect constitutional order, ensure public peace, security

The Federal Police Commission says it has made extensive preparations at state and federal levels with a view to protecting the constitutional order as well as ensuring the peace and stability of the public.

The Commission called on the public, particularly the youth, to refrain from involving in any illegal activities.

In a statement he gave to journalists here yesterday, the Federal Police Commissioner Workineh Gebeyehu said police have made necessary preparations to ensure that the loss of lives and property incurred due to the violence that erupted in June this year following the May 2005 National Elections would not happen again.

The commissioner said the activities of political organizations must be within the boundary of the Constitution, and added that the public should guard against illegal activities realizing that there is nothing to be gained from riots and violence.

The Commissioner said police will not hesitate to take necessary legal measures and discharge their responsibilities if activities contrary to the Constitution threaten the peace and security of citizens.

Speaking of the demonstration called for October 2, 2005 by the United Ethiopian Democratic Forces (UEDF) and the Coalition for Unity and Democracy (CUD), the Commissioner said police have not been officially informed about any such demonstration.

The Commissioner said there are preconditions enshrined in the Constitution that should be met by any organ that calls a public rally or demonstration. These include, according to the Commissioner, taking responsibility by the body that organize for any problems that may occur in relation to the rally or demonstration.

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Fig. 3.2 "Press Digest" cover

These three sources of data: interviews, observations of technical artefact and additional textual material, were progressively triangulated. Triangulation, when used in social science research, particularly in projects using qualitative methods, improves the quality and accuracy of findings, encouraging the researcher to reflect on inconsistencies and to explore multiple interpretations (Flick, 1992; Miles & Huberman, 1994). It presents the researcher with a variety of different objects and explanations, some of which have to be progressively ruled out to build a coherent

theory or narrative. In the case of this thesis where some of the issues were particularly sensitive and some informants may manipulate information so that a particular version seems to be prevailing over others, it was also fundamental for spotting contradictions and problematic nodes.

As explained by Denzin (1978) there are different types of triangulation. Data triangulation involves the collection of different sources of data to respond to the same research question. Investigator triangulation employs multiple researchers. Theory triangulation is about using different perspectives to read the same phenomenon. And similarly methodological triangulation requires the adoption of multiple tools, for example, discourse and content analysis, to analyze the same object. As it emerged from the previous discussion, among these different kinds of triangulation I relied mainly on a triangulation by data sources, and different types of materials were chosen to examine the same phenomena from different perspectives. As it is further explained in the next section on the procedure of data analysis, triangulating data from different sources did not mean mixing together observations, interviews and editorials. The materials in each corpus were kept as homogeneous as possible, data from each source was analyzed separately and later triangulated to test the compatibility of the categories that had emerged from each source and their capacity to respond to the research questions.

3.4 Data analysis and presentation

The data analysis was carried out following some of the principles developed by grounded theory. The systematic approach to the data allowed recurrent patterns to progressively emerge from empirical observations, later to be integrated to provide responses to the research questions and to serve as guide to study similar phenomena. As already illustrated in this chapter, during the fieldwork data collection and analysis proceeded together, and different sources of evidence were combined and analyzed in order to select new cases which could help to answer the main research questions.

The first step in the analysis involved a preliminary open coding of the first interviews, observations of technical artefacts, and documents such as the Ethiopian ICT policy (EICTDA, 2006) and the ICT Action Plan (UNDP, 2004). Through a line-by-line or micro-analysis, codes were generated directly from the data and, if applicable, later used to label new interview transcripts, documents, and observations. This procedure followed what Glaser and Strauss termed the "constant comparative method" (1967, p. 104), suggesting that "the analyst [should] start by coding each incident in his data into as many categories of analysis as possible, as categories emerge or as data emerge that fit in an existing category" (Glaser & Strauss, 1967, p. 105). The codes emerging in this phase were used, for example, to label the ways in which ICTs were interpreted according to the interviewees, "as a threat", "as a tool for education", etc. Similarly, open codes were also used to tag some themes that could be interpreted as explanations of observed reshaping, but subsequently had to be further substantiated by additional interviews and observations. They were, for example, "hostile diaspora" or "need for control and security". The identification of themes also helped to focus subsequent interviews, partially amending the topic guide in order to address specific gaps and to bring clarity to the key issues. It was similarly used as a guide for the collection of additional documents and archive materials, and for a more informed observation of technical artefact.

Finally, when almost all the data were collected and key issues and events were identified, I proceeded to a second, more focused (Charmaz, 2003) or selective coding (Corbin & Strauss, 2008), aimed at integrating the open codes into more abstract and higher level categories that could be classified as informing the reshaping of ICTs. The final result was the identification of core discourses that appeared to have influenced the adoption and transformation of ICTs in Ethiopia and their connection to specific features characterizing the technopolitical regimes that emerged in the country. This process allowed me to reconstruct discourses which were specific to the Ethiopian political culture as well as to compare discourses on ICTs articulated internationally with those developed at the local level, assessing their congruence or their antagonism, and linking them to specific hegemonic projects advanced by different actors.

All these phases were assisted by the use of NVIVO 7 to code, categorize and archive data. The use of NVIVO was important in supporting the emergent process of analysis advocated by grounded theory and was itself facilitating the progression from the initial line-by-line coding to a more focused analysis. For example, as shown in Fig. 3.3, which illustrates the coding of the first interview, the possibility of simultaneously tagging the same portion of text using a multiplicity of labels allowed considerable freedom in an initial phase and minimized the pressure of economizing on codes so as to later help to ensure a consistent analysis.

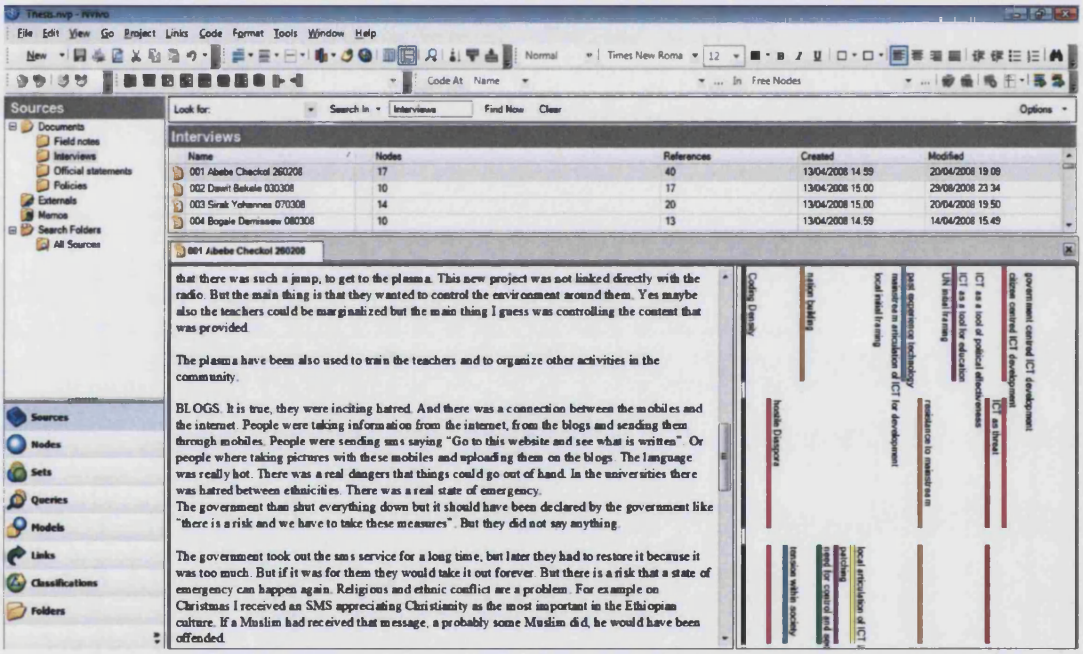

Fig. 3.3 The coding of the first interview

Fig 3.4 shows how the codes were integrated into higher level categories, to illustrate the discourses implicated in the reshaping of ICTs, according to the multiple dynamics that were identified in the interview data, documents, and notes.

A closer look at Fig 3.4 shows that some categories recur more often than others. However, the code frequencies alone do not mean that some categories are more important than others. They need to be weighed by other factors. There is the tendency in some qualitative research to imitate quantitative approaches and quantify some of the findings, using expressions such as "half of the interviewees" or "the most recurrent code". To follow this tendency would produce serious fallacies and

misinterpret the value added of qualitative research, and of a case study approach, which allows an in-depth investigation of a limited set of phenomena, understanding their characteristics, causes and consequences.[44] For example, the category of censorship occurs six times in six different interviews but the censoring of blogs and websites occupies a central position in this research, as I will discuss later. The case of the code "national project" also visible in Fig. 3.3 is different. It is important not just for its frequency, but also because it resonates with many other codes in the corpus.

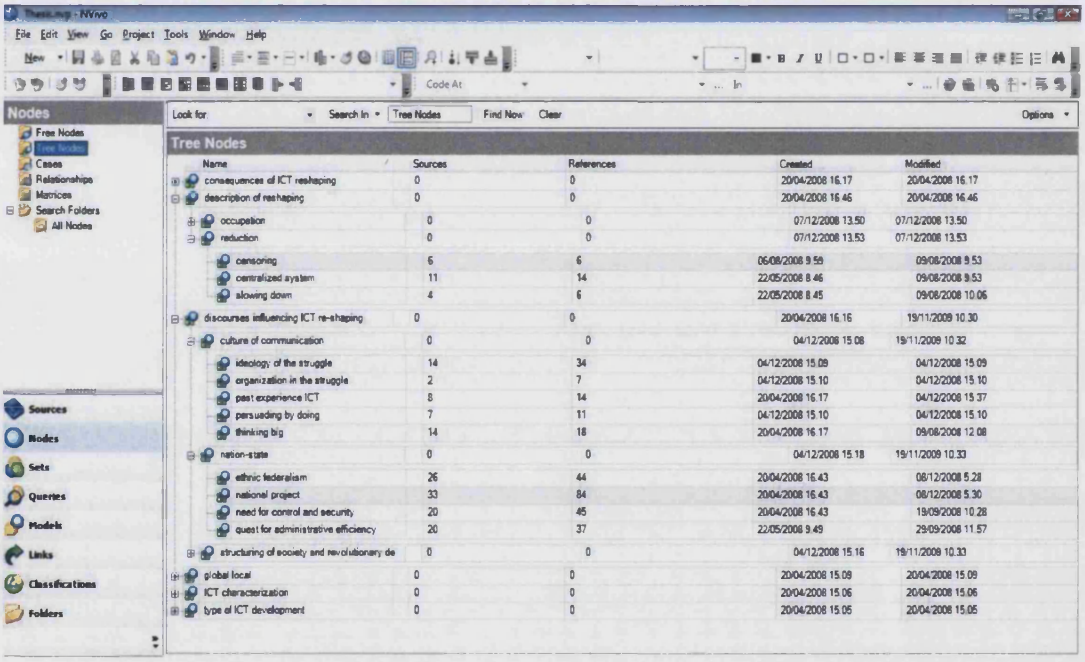

Fig. 3.4 The integration of codes into discourses

Finally, the strategy adopted for presenting the main findings integrates an historical and an analytical approach. In Chapter 5, for example, the text is organized according to the three main discourses which the analysis of the data sources suggest have influenced the re-interpretation, re-definition and re-shaping of ICTs in Ethiopia at the local level. Within each instance of discourse, it is illustrated how it appears to have originated, progressed and come to influence some aspects of the adoption of

[44] For a critique of this use of qualitative data see (Bauer, Gaskell, & Allum, 2000).

ICTs. A similar style, with some variations, is adopted in the other chapters, combining a focus on key events and their progression with the analysis of the data as interpreted in the light of the conceptual framework. To illustrate each discourse, aspects of it, or the influences it seemed to have on specific technical configurations, excerpts are presented in the text, mostly taken from interviews, but also from newspaper articles and policy documents. Their insertion serves two purposes. First, it aims to represent a variety of voices and to show how different competing discourses battled for the fixation of meanings and artefacts. Second, it offers the reader the possibility to access the primary data, and an opportunity to enter the world I explored through my research, thereby providing a basis for the reader to assess the validity and reliability of the interpretations that I advance.

3.5 Conclusion

The research design developed to study why and how ICTs have been re-interpreted, re-defined and re-shaped in Ethiopia responded to the need to study ICTs as sites of potential contestation, as articulated in the conceptual framework. It therefore relied on tools and techniques that could map the views held by different individuals about what technology is and how it should be used in the country, and to explore how these views appeared to have led to practical applications of new technologies on the ground. Since the issues I investigated were delicate and potentially problematic, from a substantial resistance to uses of ICTs advocated internationally to the censoring of websites, I had to rely on a variety of data sources and data collection techniques to ensure that each piece of information could be adequately cross-checked and substantiated by additional evidence. This chapter also illustrated how the data were integrated and analyzed using a grounded theory approach, enabling theories about how ICTs developed the way they did progressively emerge from the collected evidence. The following chapter offers a first illustration of how these approaches and methods were employed in practice, exploring how different actors, inside and outside Ethiopia, interpreted ICTs as potentially modernizing, democratizing and globalizing tools, and what

consequences different interpretations appeared to have had on the practical implementation of ICTs in the country.

Both the conceptual and methodological frameworks illustrated in this and in the previous chapter were tailored to study the case of Ethiopia, but they arguably can be employed to study the evolution of ICTs in other developing countries. Employing tools and methods stressing the conflictual nature of technology can allow researchers to uncover different narratives and explanations for the development of ICTs in countries where their application may appear to have been more linear.

CHAPTER 4 – COMPETING INTERPRETATIONS: INTERNATIONAL AND LOCAL DISCOURSES ON ICTS

This chapter examines how the discourses on the use of ICTs for development that emerged at the international level have related to pre-existing experiences of technological adoption in Ethiopia and were appropriated or rejected by different players within the country. These discourses were reconstructed from a variety of sources: from policy documents produced both by international organizations involved in defining the ICTs for development agenda and by the Ethiopian government; as well as from interviews with international civil servants and ICTs experts, Ethiopian politicians, technocrats, members of the civil society and of the local private sector. Secondary literature on ICTs for development, as discussed in Chapter 2, was also employed to contextualize the analysis of policy documents and interviews.

The chapter is structured into three sections. The first examines how the discourses on the modernizing, globalizing and democratizing potential of ICTs reached Ethiopia and what institutions played the most important role in this process. Secondly, the responses of government actors to the international framing of ICTs are investigated and some key factors that lead to selective readings of the salient aspects of the new technologies are identified. Finally, it is explained how the local civil society, the private sector and the diaspora have interacted with both international and local discourses on ICTs, but ultimately have been marginalized or hindered in their attempts to influence the applications of ICTs in Ethiopia or to use new technologies in confrontational ways.

4.1 Bringing ICTs to Ethiopia: the role of international actors

As described in Chapters 1 and 2, since the 1990s many countries in Africa, Asia and Latin America have been targeted by campaigns advocating the use of ICTs

for development. They were exposed to many interrelated discourses embodied by various institutions. In each specific country, however, it was likely to be only a few actors, or "active teachers", to use Finnemore's terminology (1993), that mediated this massive discursive production and played the role of socializing individual governments and other key actors to the new discourses. In Ethiopia, interviews and policy documents indicated that it was mainly through a few large initiatives and institutions that the new interest in ICTs reached the country and its elites. Of these, the United Nations Economic Commission for Africa (UNECA) emerged as the single most important institution.

4.1.1 The UNECA and the politics of the apolitical

The UNECA, headquartered in Addis Ababa, was created in 1954 to support socio-economic development in Africa. By the mid 1990s it had already accumulated substantial experience in the promotion of ICTs for development. In 1986, with the support of UNESCO, UNDP and the International Development Research Centre (IDRC), the UNECA inaugurated the Pan African Development Information System (PADIS), a centralized database that facilitated the sharing of information on African development related issues. It was within the context of PADIS that the first electronic connectivity was provided to twenty-four African countries through Fido-Net, to enable local and Africa-based international agencies to access the new database.[45]

Ten years later, with resolution 795, "Building Africa's Information Highway", the UNECA's role in promoting ICTs in Africa was taken to a new level.[46] The UN organization started framing ICTs not just as a tool to share information relevant to the continent, but as an opportunity for all countries to build an African information

[45] Fidonet is a computer network that was used predominantly in the late 1980s and early 1990s to host bulletin board systems (BBS) used to exchange messages and chat among users and to download software and files.

[46] The resolution was passed at the end of the African Symposium on Telematics for Development, organized by UNECA together with UNESCO, International Telecommunication Union (ITU), IDRC and Bellanet. It took place in April 1995 in Addis Ababa.

society, leapfrogging other stages of development and steering the economy towards the exploitation of knowledge and information. The African Information Society Initiative (AISI) was the document that embodied this vision and stipulated policies and standards for African governments to achieve it, such as the creation of National Information and Communication Infrastructure (NICI) policies, the establishment of specialized agencies in charge of ICTs and the development of partnerships with the private sector.

AISI became a dominant node that brought together existing institutions and inspired the creation of new ones. Financial support for the implementation of AISI was guaranteed through the Partnership for ICTs in Africa (PICTA), a forum of donors and executing agencies including The World Bank and the World Trade Organization.[47] This alignment with the policies advanced by similar institutions represented a profound shift for the UNECA. As Nulens and Van Audenhove illustrate, "the UNECA, with its rather harsh critique on the international economic system of the 1980s evolved towards a more mainstream view with regard to ICTs and development" (Nulens & Van Audenhove, 1999, p. 468). A training centre was set up in Addis Ababa, targeting especially politicians and technocrats, in order to make them aware of the potential of ICTs.[48] To ensure that key decision makers in

[47] PICTA comprised representatives from: Agence de la Francophonie (ACCT), Bellanet International Secretariat, Carnegie Corporation, COMNET-IT Foundation, United Nations Economic Commission for Africa (UNECA), Food and Agriculture Organisation (FAO), Global Information Infrastructure Commission (GIIC), International Development Research Centre of Canada (IDRC), ITU, Rockefeller Foundation, Swedish International Development Cooperation Agency (SIDA), US Department of State, the United States Agency for International Development (USAID), UNDP, UNESCO, WK Kellogg Foundation, The World Bank, and the World Trade Organisation (WTO).

[48] The presence of the UNECA headquarters in Addis Ababa placed Ethiopia in a privileged position to be included in most of the activities for the implementation of the AISI objectives Ethiopia was involved in most, if not all, the activities organized to facilitate the use of ICTs for development (UNECA, 2008). It was one of the first thirteen African countries to be initially assisted in the development of a National Information and Communication Infrastructure plan. Between 2000 and 2004 it was part of a group of six countries that were surveyed by the SCAN-ICT initiative to identify a set of indicators to assess the progress of the information society on the continent. Ethiopia has benefited the most from the trainings organized by the UNECA for various stakeholders to encourage their participation in the information society. Over the years Ethiopian representatives took part in

Africa were aware of the existence of AISI and of the discourses it was advancing, the first African Development Forum (ADF), a continent-wide gathering of African leaders organized by the UNECA, placed the document at its core. The ADF addressed the "challenge to Africa of globalisation and the information age", and it ended by proposing to embrace AISI as the response to the uncertainties and opportunities brought by ICTs. Some of the issues proposed during the forum, however, were contested by a number of African leaders.

Although the AISI framework was designed to serve as a reference point for many African governments, the discourse it promoted was problematically disconnected from the socio-political reality that characterized the continent in the 1990s. Its regional scope did not distinguish it significantly from other documents with a global focus and, apart from generic references to poverty, the shortage of basic services and poor governance, it lacked any reference to the politics of the continent. It reflected the tendency of most international organizations to avoid mixing the technical with the political so as to appear neutral. This choice, however, failed to reflect that the technical is often political and that, at some points in history, it cannot be other than political.

In the decade in which the AISI framework took shape, Africa was blighted by an average of 7.5 civil wars per year, a very small reduction from the previous one which was considered the most violent in history (Elbadawi & Sambanis, 2000; Nkurunziza, 2008). After the fall of the Berlin Wall in 1989 and the dissolution of the USSR, which had been supporting numerous governments in the continent, many African nations had to find new models of governance and experiment with new political arrangements. Some states became fragile democracies, while violent competition for power turned many into battlefields. A vocal diaspora often formed an oppositional force, trying to build alternatives to incumbent governments. In this context, failing to acknowledge that new technologies could also be interpreted through the lenses of politics, conflict and power, emerged as a severe shortcoming. This had profound consequences for how the AISI framework would be received in some African countries such as Ethiopia, where the government was dealing with an

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workshops and conferences targeting groups from parliamentarians to on-line journalists, and from medical doctors to small entrepreneurs.

ambitious internal agenda which partially conflicted with the principles advanced by international organizations.

4.1.2 Discourses in context

To further explain some of the aspects of the AISI document, three key passages are highlighted, including the foreword, vision and strategic objectives (UNECA, 1996). As will be analyzed below, the document has largely reproduced the discourses on the modernizing, globalizing and democratizing potential of ICTs which characterized most of the campaigns promoted at the international level.

Foreword

> The information revolution, along with its attendant explosive growth of knowledge, and the related phenomenon of the globalisation of the world economy have brought about the Information Age, which affects all aspects of economic, social and political activity. Insufficient appreciation of this phenomenon leaves African countries on the short end of an information and technology gap, the disparity between information rich and information poor. At the urging of the member States of the Economic Commission for Africa (ECA), ECA has taken the lead in helping prepare African countries to overcome this gap and utilise these new forces to promote social and economic growth in the region. [...]

Vision

> The African Information Society Initiative aims at supporting and accelerating socio-economic development across the region. Driven by critical development imperatives, it focuses on priority strategies, programmes and projects which can assist in the sustainable build up of an information society in African countries in accordance with the regional integration goals of the Treaty establishing the African Economic Community which foresaw the necessity of

information networks and of regional databases, information sources and skills capacities.

By the year 2010, the AISI is intended to realize a sustainable information society in Africa where:

- Information and decision support systems are used to support decision making in all the major sectors of the economy in line with each country's national development priorities;
- Every man and woman, school child, village, government office and business can access information and knowledge resources through computers and telecommunications;
- Access is available to international, regional and national "information highways", providing "off-ramps" in the villages and in the information area catering specifically to grass-roots society;
- A vibrant business sector exhibits strong leadership capable of forging the build up of the information society;
- African information resources are available which reflect the needs of government, business, culture, education, tourism, energy, health, transport and natural resource management;
- Information and knowledge are disseminated and used by business, the public at large and disenfranchised groups such as women and the poor, in particular, to make rational choices in the economy (free markets) and for all groups to exercise democratic and human rights (freedom of speech and freedom of cultural and religious expression).

Strategic objectives

To achieve the vision outlined above, African member States will need to:

- Ensure the continuous flow of information within the society by supporting initiatives to improve and create new information and communication services in different sectors of the society - education, health, employment, culture, environment, trade, finance, tourism, transport and commerce;
- Create a continent-wide information and telecommunication network that allows low-cost and reliable communication with other users in Africa and across the globe;

- Achieve maximum benefits from available information by encouraging the development of systems that allow wide dissemination to individuals, business communities, non-governmental organizations (NGOs) and the public sector;
- Foster a new generation of men and women in Africa that uses information and communication technologies to leverage the development of their nations;
- Link Africa with the rest of the world by improving the flow of new technologies in both directions and exporting intellectual products and services to the rest of the world.

In the AISI document the discourses on modernization, globalization, and democratization are tightly interwoven and complement each other to define the characteristics of ICTs. These aspects, however, can be analytically separated to illustrate how specific features of the text contributed to stress different aspects of the African information society that the UNECA and the other organizations contributing to AISI envisaged.

The discourse on modernization, for example, can be identified in the numerous references to the newness characterizing technologies that are capable of unleashing "new forces". The information society is supposed to belong to a new "age", inaugurated by a "revolution", thus interrupting continuity with the past and with previous failures in bringing development to poor nations. The men and women who will be "fostered" by the information society are described as belonging to a "new generation" who will know how to use ICT for development. At the same time, however, the potentially disruptive consequences each "revolution" may bring with it are removed from the text or tamed by references to how ICTs will "support" or "accelerate" socio-economic development across the region, and how the individuals empowered by the use of ICTs will use their capacities to "leverage" the development of their nations, and not for other projects, such as organizing platforms to criticize and oppose the government or support a partisan agenda. ICTs are thus framed both as modern, as the product of a greater technical prowess, and modernizing, allowing nations that have been lagging behind to reach those perceived as already developed.

Similarly, the references to the flow of information and free markets are used to characterize ICTs both as an expression of a globalized world as well as a

globalizing agent that collapses time and space. The rhetoric that permeated the NWICO debate, as illustrated in Chapter 2, is visibly resurrected. According to the document a "continuous flow of information" within the society must be ensured. Similarly, Africa will be linked "with the rest of the world by improving the flow of new technologies in both directions". However, the "information highways", and their "off-ramps" in the villages are evocative of small localities being flooded with huge amounts of information, rather than villagers selecting what is relevant for them and seizing their opportunity to produce valuable information and goods for the global economy. In addition, although it is said that ICTs will benefit every sector, it is "business" that is asked to "exhibit strong leadership capable of forging the build up of the information society". Similarly "free markets" are described as a core component of an African information society which, also in accordance with the free flow rhetoric, should be increasingly linked to the global economy, allowing goods to circulate both ways, without protectionism.

Finally, the kind of democratization ICTs are said to be facilitating is based largely on the principles of liberal democracy. Apart from general references to "democratic and human rights (freedom of speech and freedom of cultural and religious expression)", the document refers to individuals, to "every man and woman" as the key beneficiaries of the new opportunities and freedoms brought by ICTs. On the contrary, there is no reference to the collective and communal rights, that, as is illustrated below and is further explored in Chapter 5, have been placed by the Ethiopian government, as well as by other governments, at the core of the idea of the nation and of democracy.[49]

[49] It is also important to note that the AISI document uses highly technocratic language and mimics scientific jargon offering disputed claims as objective knowledge (McKenna & Graham, 2000). The document, for example, employs circular arguments, collapsing causes and effects of particular phenomena. It inextricably connects information society and ICTs as mutually dependent and reinforcing suggesting, for example, that there can be no information society without ICTs, but it is only a fully developed information society that can make proper use of ICTs. This technocratic language is also coupled with its normativity. The measures the AISI proposes are based on development "imperatives", on "priorities" that will have to be strictly followed to align the continent with the frantic rhythm that characterizes the "information age".

Actors within Ethiopia have reacted differently to the discourses on modernization, globalization and democratization, magnifying some of the elements highlighted above while resisting and marginalizing others. In the following sections these local responses are examined to investigate the interaction between the hegemonic plans that emerged internationally and those articulated locally and among the competing meanings attributed to ICTs by different agents as a result of this antagonism. Section 4.2 focuses primarily on the government response, while section 4.3 explores how other actors, including civil society organizations, the private sector and the Ethiopian diaspora, can be shown to have interpreted the potential of ICTs.

4.2 *Re-interpreting ICTs: the government response*

In Ethiopia the new wave of discourses on ICTs initially produced conflicting responses. A first division was between individuals connected to the government, both politicians and technocrats, on the one side, and members of the local civil society and from the diaspora, on the other. The latter group enthusiastically embraced the idea of an Ethiopian information society, appropriating most of the images and recipes proposed by international organizations, but, in some cases also using them for instrumental purposes. As will be illustrated in section 5.3, however, many of their attempts to influence the generation of a local approach to ICTs ended in frustration. As a result, the local civil society grew progressively disengaged, while many Ethiopians living abroad developed a mostly adversarial use of new technologies, aimed at challenging the government at home.

A second important split can be identified within the government camp which had great expectations, but even greater suspicions. Most technocrats and some progressive members of the government welcomed ICTs as potentially useful tools. Nega Alemayehu, Dean of the Graduate School of Telecommunication and Information Technology[50], recognized that as a result of the first wave of training

[50] The Graduate School of Telecommunication and Information Technology (GSTIT) is the most important institution in the country for the training of the Ethiopian IT workforce. It is owned and

and conferences organized at the UNECA, "the attitude towards ICTs was very positive. Not only positive. People were thinking that computers could do miracles, that they were the panacea to solve every problem".[51] Similarly, a technocrat at the Ethiopian ICT Development Agency (EICTDA), the institution created by the government in 2003 to centralize all ICT-related activities, who was a young graduate in information science in the late 1990s, recalled that "at the time my expectations were great. I thought that everything was going to come immediately, to change and reform our country in a few years. [...] But also in general, there were such big expectations about what technology could do".[52] However, in contrast to the case illustrated by Hecht in France, where technocrats constituted a powerful and influential class, that could advance its own political plans, technocrats in Ethiopia were largely an appendix of the central government. It was mostly the understanding of ICTs developed by the EPRDF's cadres that drove their application in a local context. And, at least in an initial phase, the most influential members of the party appeared to focus on the potentially harmful uses of ICTs rather than their development potential, highlighting their concerns about security and consolidating their legitimacy.

This reaction is illustrated by the words of a UNECA officer commenting on the Ethiopian resistance to implementing the strategies advocated by his organization. He focused, in particular, on the requests made to the Ethiopian government to liberalize the telecommunication market, a measure that had been opposed since the AISI was created. As he pointed out in his reply, the Ethiopian leaders saw their strategy as even more legitimate after having witnessed how a freer ICT regime could be used in other countries on the continent to challenge political power.

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controlled by the Ethiopian Telecommunication Corporation (ETC) and is mandated to train most of its employees, from those in charge of maintenance to middle and upper level managers.

[51] Interview: Nega Alemayehu (Dean of the Graduate School of Telecommunication and Information Technology, Addis Ababa)

[52] Interview: Anonymous (8)

> We discussed a lot with the Ethiopian government but they said "Not now". They are very intelligent, they understand very well the situation, all of the cases, all the best practices we present them, but their political strategy is different. Now they can use Kenya as a justification.[53] And say "You see? We told you that this technology can be used for violence in Africa. There are people ready to use technology to destabilize". So they are afraid, it is a strategy, they want to move slowly, to be given time for implementing technology in a way that is not dangerous for them. When I speak to them they tell me "We understand very well what you are telling us but we do not want to use that now". It is not a question of knowledge, it is a question of political strategy.[54]

These conflicting responses were the result of the different meanings various individuals and groups have attributed to ICTs. These meanings were connected to competing political plans, but they were also dependent on how key concepts used to describe ICTs, such as modernization, democratization and globalization, have been framed in the history of Ethiopia.

In the next two sections, the discourses on modernization, globalization and democratization as they emerged throughout Ethiopia's recent past are discussed, and the ways in which have been appropriated by some of the key actors involved in the implementation of ICTs in the country are analyzed. This discussion is located in the context of the introduction of previous ICTs, such as the telephone, the radio and the computer. The findings emerging from this analysis are then used to explain how the discourses advanced by the UNECA, as well as other international organizations, were interpreted selectively by the Ethiopian government.

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[53] The reference here is to the unrest in Kenya which stemmed from the elections held in 2007, and to the use of blogs, radios and mobile phones to incite violence across different ethnic groups within the country. For a detailed illustration see, for example, the BBC World Service Trust policy briefing *The Kenyan 2007 elections and their aftermath: the role of media and communication* (Abdi & Deane, 2008), or *The role of the media in the upcoming Somaliland elections: Lessons from Kenya* (Stremlau, Blanchard, & Abdi Gabobe, 2009)

[54] Interview: Anonymous (4)

4.2.1 Modernization, globalization and democratization in the Ethiopian context

Modernization in Ethiopia has been pursued for a long time as a strategy for the state to maintain its independence, compete with other nations and strengthen control over its territory (Clapham, 2006; Zewde, 1991). Since the late 19th century the modernization of infrastructure, the military, and other key areas of society became vitally necessary to resist the colonial ambitions of countries like Italy and Great Britain. Rulers of Ethiopia adopted various approaches to develop the country's resources, but in most cases they followed what Christopher Clapham has termed a "politics of emulation" (Clapham, 2006). The leaders looked to other countries, such as Japan or the then USSR, with which they believed Ethiopia shared a common past or a common spirit, in order to elaborate strategies that could guide Ethiopia into the modern world.[55] Through this process of identification and because of the significance the appropriation of the new tools held for the extension and consolidation of the borders of the state, modernization became an essential aspect of the country's politics.

Since their initial development ICTs have occupied a special place in this process. Ethiopia was the first state in Africa to have a public telecommunication operator (ITU, 2002). In 1897 emperor Menelik II inaugurated the first telephone line, connecting the capital Addis Ababa with the city of Harar, annexed to his expanding empire only a few years earlier. The new technology was adopted and employed as a key resource for maintaining control over the new territories, enabling

[55] According to Clapham (2006) and Zewde (2002), the Ethiopian rulers saw the imperial past of Japan to be very similar to Ethiopia. The government was fascinated by how a nation that managed to maintain its ties with tradition could modernize so quickly and they assumed that the same destiny awaited Ethiopia. Similarly, Russia was seen as comparable to Ethiopia due to the orthodox faith, and during Marxist inspired military dictatorship of the Derg, Marxist-Leninism became the inspiring ideology of the state. Other countries have have also inspired emulation. The EPRDF leadership, for example, looks to South Asia as a model of the developmental state which constitutes a possible trajectory for Ethiopian development.

the emperor to obtain information as well as to impart orders to the rulers of the annexed province.[56]

In interviews I conducted with both older and younger interviewees, this event was often mentioned as an example of Ethiopia's potential. It was an initial referent in a longer chain of episodes where modernization, in its different manifestations, was framed as an element that had been actively sought to help in exploiting the country's dormant capital. This discourse continued to apply to more recent technological advances. As Haile Michael Aberra, the Dean of the Civil Service College of Addis Ababa, the institution mandated to train Ethiopian civil servants, noted:

> I remember a book about Japan "How did Japan modernize?"[57] People were fascinated by it. The educated people learned that modernization was key in development and now with ICTs they are trying to reach as many people as possible to make this plan real.[58]

The idea of modernization that emerged in Ethiopia across different political regimes was a force that could be channelled to support development plans defined at the local level and could augment the outputs of ongoing processes. Similarly to the telephone in imperial times, the use of ICTs such as computers – from mainframes to PCs – was framed in this context, interpreting them as tools that could embrace and enhance projects already defined at the centre. In the beginning, computer use involved only academic institutions, a few ministries and state-owned companies, as these were the only entities with enough resources and experience to operate what

[56] The telecommunication infrastructure later expanded to reach other major towns and, apart from a line built in cooperation with the Italians to connect Addis Ababa and Asmara, the priority continued to be given to the territories that had been recently conquered, in the South and the West – Sidamo, Nekemte, Gambella.

[57] The book, which transliterated from Amharic is *Japan endet seletenech*, was published in the early 1950s by Kebede Michael, an intellectual who worked under Haile Selassie as Director General for the Ministry of Education and Deputy Director for the Ministry of Foreign Affairs. The book was written in Amharic and never translated into another language.

[58] Interview: Haile Michael Aberra (Dean, Ethiopian Civil Service College, Addis Ababa)

were still complicated machines.[59] Later on the use of PCs for basic office automation began and civil servants were trained to use word processors and spreadsheets. In both cases computers were used mostly to improve the efficiency of the state apparatus, extending and enhancing its control over the country.

Also in this case, foreign countries and international organizations intervened and encouraged specific uses of technology. Following the example of the USSR Academy of Sciences, in 1975 the Derg set up the Ethiopian Science and Technology Commission, and twelve years later, advised by UNESCO, it created a National Computer Centre as part of the Commission, "to promote the development of computer knowledge and services in Ethiopia; to provide consultancy and maintenance services; to provide training courses" (Kebede, 1994). Those who worked for the Centre describe it as the place where the first ideas about the relationship between IT – Information Technology – and development started circulating. According to Abebe Checkol, who worked at the National Computer Centre in its final years, "the centre was where a number of Ethiopians were first introduced to IT and to the role IT can have for growth and development. Since the beginning IT was strictly connected to the idea of development, in particular increasing the efficiency in certain sectors".

In contrast to modernization, *globalization* was received as a more problematic discourse, a challenge accepted by the Ethiopian government, but not interpreted as necessarily beneficial for the country's development. Globalization was framed as something to negotiate and balance; to slow down so as to allow the country to cope with new influences coming from the outside. This attitude is well summarized by Bereket Simon, the former Minister of Information and an influential EPRDF's leader.

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[59] Ethiopian Airlines was the first organization to introduce modern management information systems in 1961 with the purchase of an IBM class 421. They were closely followed by the Ethiopian Electric Light and Power Authority in 1962, and a few years later by the Central Statistical Office, in 1964, and by the Ministry of Finance, in 1968 (Kebede, 1994). The first appliances to be used in those offices were mainly cash registers and mechanical accounting machines and it was only a few years later that electronic data processing systems (such as IBM 360/20 or HP 3000) started being employed in government institutions.

> We studied globalization and we understood that it is a double edge sword. It creates opportunities and it also creates challenges. [...] At the end we concluded that we cannot be out of this globalized world. In the case of technology this means that on the one hand, if you have money you can buy the latest technology, and you can implement it here. But on the other hand when you implement it you also import the challenges that you have to avoid. And if you are not ready you will lose. One thing is sure: you cannot stand still.[60]

The use of broadcasting to weaken the control of the government over its citizens was probably the earliest case in which the EPRDF could experiment with the challenging potential of technology referred to by Bereket. Interestingly, the first actor to exploit this potential was the Tigreyan People's Liberation Front (TPLF), the movement from which the EPRDF later originated, and which fought for the rights of the people of Tigray, in northern Ethiopia, before extending its struggle to a national scale. To support the war efforts the TPLF set up its own clandestine radio station, known as *Voice of Woyene* or *Voice of the Rebellion*, and allocated substantial resources to winning the hearts and minds of the Ethiopian people.[61] As Debretsion GebreMichael, now General Manager of EICTDA, but at the time in charge of radio maintenance, explained, "our role was teaching about the struggle and trying to convince the people about our principles. [...] You had really to convert people, to make them think in a different way. And unless you communicate well and deeply you cannot get to the point of converting people".[62] The TPLF's radio was not the only voice advocating a competing idea of the nation over the Ethiopian airwaves. In 1982 Voice of America (VOA) inaugurated its Amharic service with the

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[60] Interview: Bereket Simon (Former Minister of Information and Political Advisor to the Prime Minister)

[61] The guerrillas' clandestine radio station started broadcasting in 1979 and successfully broadcast for the next 12 years on an almost daily basis. It was initially used by two insurgency groups, the TPLF and the EPLF. However, after a series of ideological battles between the two fronts, the TPLF started its own radio station in 1985.

[62] Interview: Debretsion GebreMichael (Director General, EICTDA and former guerrilla fighter in charge of the radio equipment and propaganda)

intent of fighting Soviet influence in Ethiopia (Alexandre, 1989; M. Nelson, 1997). The strategy was firmly grounded in Cold War politics, but the initial aim was soon hijacked by a more local agenda. In 1986 the VOA management appointed as Editor in Chief of the Amharic service a former supporter of the Ethiopian People's Revolutionary Party (EPRP) which, similar to the TPLF, was fighting the Derg's dictatorship, but was also firmly opposed to the ethnic based front.[63] Under his direction the VOA, in addition to its mandate of challenging state propaganda, also started attacking the TPLF, commencing a war over the airwaves that continued after Mengitsu's defeat (Sheckler, 1999).[64]

By the time they came to power the EPRDF's leaders had developed a noticeable experience of the multiple and conflicting uses that could be made of broadcasting. Through Voice of the Rebellion they had learnt how effective it is to counterbalance propaganda in an autocratic state, where the ownership of the media is only in the hands of the government. However, because of VOA, they also understood that the airways can be appropriated easily by opposing forces and that some ICTs can make borders too porous to block dissenting voices coming from a vocal diaspora and other actors.

A similar suspicion towards opening the country too much to external influences can be seen in the economic domain. A powerful expression of this

[63] The EPRP was established in Ethiopia in 1972 with the aim of removing the imperial regime and transforming the country into a popular democratic republic. It took an active part in the revolution that lead to the overthrow of Haile Selassie, but, when the transition process became dominated by the military, members of the party were first marginalized and later persecuted. EPRP refusal of ethnic politics and accusations to the EPLF and TPLF of dismembering the country, led to open confrontations also with the two ethnic based groups, and to the eventual defeat of the party, whose members either left Ethiopia and continued their political activities in exhile or joined other political organizations (Gudina, 2003; Young, 1997)

[64] As a sign of the tension between the government of Ethiopia and VOA, the government started jamming the signal of its Amharic service, as accused by VOA itself as well as by the Committee to protect Journalists. Information about the jamming of VOA as well as of Deutsche Welle (DW) can be found at http://www1.voanews.com/english/news/africa/a-13-2008-01-16-voa42.html Last time accessed 14.04.10 and http://www.cpj.org/2009/02/attacks-on-the-press-in-2008-ethiopia.php Last time accessed 14.04.10.

attitude was the speech Prime Minister Meles Zenawi delivered at the African Development Forum (ADF), the event organized by the UNECA to make the entire continent aware of the AISI. In contrast to other African leaders, the Ethiopian Prime Minister decided to use his privileged position not to endorse the idea that ICTs and globalization would help Africa, but to question it and propose alternative models. He is quoted at length below to illustrate how globalization was not simply refused by the leadership in Ethiopia, but was taken as an opportunity to articulate a complex alternative vision of the role development should play in a globalized world.

> Talking about globalization, Mr. Chairman, the choice Africa has is not whether it should be part of the global economy or not. It is already part of it. It will willy nilly be even more enmeshed in that process. This applies not only to Africa but no matter how remote or isolated they might be, to all parts of the world. We would be naïve if we were to underestimate the reach of this process and its capacity to penetrate and embrace all aspects of the lives of societies, including the cultural sphere.
>
> But being part of the global economy does not necessarily mean - as indeed our conditions at present demonstrate in so vivid and palpable a manner - that one has become a productive part of the process and in position to become a productive part of the process and in a position to draw benefits from it.
>
> If present conditions remain unaltered and the trend we see were to continue, then being more enmeshed within the globalized economy would only mean that by force of circumstances, Africa would be made to stay on the margins of the global economy, not as an integral part of the process, but as a part which, having been excluded from benefiting from the process in a bona fide manner, would have to fall back on other options likely to be opened up by those engaged in extra-legal business activities, ranging from crime syndicates to drug traffickers. [...]
>
> There is also another element without which all our efforts at ensuring healthy and sustained growth are bound to fail. This relates to the role of the state. For a variety of reasons the role of the state in economic development has come to be cast in recent years in negative terms, not however always without justification. But damage can and have been made by going overboard on this issue.

> In short, it appears to me that it is not weak states, let alone failing states, which can be considered growth-friendly but rather robust states which can carry out their functions in all areas of societal needs with effectiveness. This does not take away anything from the need for states to be legitimate and democratic. They can be both.
>
> In light of all this, it appears to me and to many others that the path to development that has so far been encouraged by international financial institutions and more or less accepted willingly by governments in Africa, has been far from being effective.
>
> Their economic prescriptions have proved to be narrowly focused on liberalization and on macro-economic stability. The orthodoxy has thus been devoid of comprehensive vision, which is so essential for ensuring durable and sustained economic growth and development goals which can be achieved only through structural transformation. This economic model chosen as a panacea for Africa's economic predicament has failed to handle issues of liberalization and macro economic stability within the context of structural transformation. These issues are normally taken as an end in themselves. The end result has in fact proved to be that we have neither meaningful growth and transformation nor sustained liberalization and macro-economic stability.
>
> One of the basic features of this model is in effect the sidelining of the transformative role of the state. African countries are not assisted in finding ways of enhancing the capacity of the state and in addressing its weakness for carrying out its transformative function with some degree of effectiveness. Instead the policy prescriptions encouraged by international financial institutions has had the effect of weakening the state and of ensuring its emasculation. A radical change in policy prescriptions with respect to the state is thus a condition for any meaningful growth and development in our continent (Zenawi, 1999)

The Ethiopians interviewed over the course of this research who attended the event recalled Meles' speech as both inspiring and foundational in the light of the recent history of ICTs in the country. The Prime Minister, while demonstrating his understanding of globalization and recognizing the impossibility of resisting it as "naïve", openly challenged the claim that the integration it implied would benefit African countries as "being part of the global economy does not necessarily mean

that one [is] in a position to draw benefits from it". To make his point clear he used strong imagery, evoking the active role of other countries in "excluding" Africa and leaving it at the "margins", and threatening that if the situation persisted the continent could turn to "extra-legal business activities, ranging from crime syndicates to drug traffickers". This framing of the effects of globalization openly challenged that advanced by AISI: that it is a lack of understanding on the part of African countries that results in their being excluded from its benefits ("Insufficient appreciation of this phenomenon leaves African countries on the short end of an information and technology gap").

Meles accused the "orthodoxy" promoted by financial organizations, based "on liberalization and on macro-economic stability", of having failed and having merely "weakened" the state. He therefore requested a "radical change in policy prescriptions", a change which could recognize the "transformative role" the state can have in Africa. This credo, also expressed by the Prime Minister on a variety of other occasions, would later prove to be a cornerstone of the Ethiopian approach to ICTs.[65] The Ethiopian government refused to allow the private sector to take the leading role the AISI framework and other documents claimed it should play, preferring strong state interventionism. Similarly, it recognized the transformative power of ICTs, but as something that must be adapted to serve a particular political project and not simply permitted to alter society.

The speech delivered by Meles at the ADF pointed to broad disagreements on some of the principles that should inform the economics and politics of African countries. This divergence between discourses articulated nationally and internationally, however, was not always clearly spelled out. Some key concepts, such as democracy, could appear to be consensually embraced at both levels, while concealing fundamental conflicts beneath the surface. Vaughan and Tronvoll, two leading scholars of Ethiopian politics, warned the international community on this

[65] Meles articulated extensively his appreciation of development models which placed the state as a driver of economic transformation in the concept paper *African development: dead ends and new beginnings* (Zenawi, 2005). As I will later explain, this publication was also important to further clarify other central elements in Meles' political agenda, such as "revolutionary democracy".

point in an publication commissioned by the Swedish International Development Agency (SIDA) to introduce key aspects of the local politics to development practitioners:

> A point of primary importance is that donors and the EPRDF have not meant the same thing by 'democracy'. The ruling party has its own understanding of democracy, which differs significantly from the type favoured, and ascendant, in the West; the institutions it has created accordingly function differently. Its conception of democracy is not the liberal bourgeois variety based on individual participation, a diversity of interests and views, and plural representation. [...] What the Front calls 'popular democracy' [or revolutionary democracy] is based on communal collective participation, and representation based on consensus" (Vaughan & Tronvoll, 2003, pp. 116-117)

Therefore, even if donor agencies and local institutions may profess an apparently similar commitment to democratization, the processes they support are rooted in different traditions. In one case they aim at fostering individual rights such as private property and initiative and at having a variety of views competing in the public arena. In the other, the final goal is an increased sense of belonging to particular ethnic groups whose cultures, traditions and rights of representation are publicly recognized as building blocks of the nation.

Similar to other concepts, revolutionary democracy emerged at the time of the struggle in the bush. It embraced and resounded with the discourses on the nation, society and communication that are explored in the next chapter, contributing to characterize a specific idea of the Ethiopian nation. However, its definition continued to evolve after the EPRDF came to power. The Prime Minister himself contributed to its progressive specification through books or concept papers such as *African development: dead ends and new beginnings* (Zenawi, 2005).[66] In this publication Meles further aligned revolutionary democracy to the ideas of developmental state practiced in countries such as Taiwan, and illustrated his admiration towards

[66] Sections of the book can be found on the website of Columbia University, and specifically at www0.gsb.columbia.edu/ipd/pub/Meles-Extracts2-AfTF2.pdf. Last accessed 12 November 2009.

countries such as Japan where the same coalition ruled for decades offering stability while democratic rights were exercised within a one-party state.

This discussion of the local meanings attributed to modernization, globalization and democratization deepens an understanding about why and how the discourses advanced by AISI and other international organizations were selectively adopted by the Ethiopian government, leading to a partial re-shaping of newer ICTs in the country. As will be illustrated in the next section, in some cases, the discourses articulated locally and internationally emerged as congruent and compatible, in others those coming from outside were resisted and partially rejected.

4.2.2 The Ethiopian government's response to the AISI's discourses

Of all the discourses articulated in the AISI's document and advanced in general at the international level, the potential for ICTs to modernize Ethiopia and support its government's plans emerged as the most appealing to the country's ruling elite. Substantial resources were invested, first to understand how these new technologies could be put to work for the country's benefit and later to implement the plan which emerged from this deliberation. ICTs were often referred to as "shortcuts" to or "accelerators" of development. In the words of Debretsion, the General Manager of the EICTDA:

> This is why we are focusing on strengthening the government. ICTs are just an instrument to get the government working well. This is the purpose of the struggle. If we want to transform the country we have to transform the government first. In this process ICTs have the role to speed up and to facilitate. ICTs can accelerate our development.[67]

[67] Interview: Debretsion GebreMichael (Director General, EICTDA and former guerrilla fighter in charge of the radio equipment and propaganda)

The potential of ICTs was channelled to serve specific priorities, while sectors that could have benefited from them, but were not considered instrumental for the transformation of the country professed by the EPRDF, were marginalized. As the first computers were used simply to enhance the capacity of pre-existing intuitions or to increase the efficiency of particular sectors, now more advanced technologies were being reshaped to fit into a similar model, to expand, but not threaten, the capacity of the state to operate. These findings indicate how a modernization paradigm which has often been criticized for its Western bias, continued nonetheless to exercise a strong appeal.

On the contrary, the global nature of ICTs and their globalizing power encountered active resistance in Ethiopia. They did not lead to a purely ideological refusal, but motivated careful analyses by political and intellectual elites. As illustrated by Meles Zenawi and Bereket Simon cited earlier, at the turn of the millennium, there was urgency among EPRDF cadres to understand the possible consequences of a process Ethiopia had to accept, but which could also threaten its stability. This resistance to globalization was articulated in various ways. The idea of a free flow of information was opposed because of the challenges it could present to the leadership in controlling the adversarial voices coming from abroad. The power of ICTs to threaten governments had already been experienced during the struggle and it could similarly materialize, as it did, in new platforms from which to attack the idea of the nation advanced by the EPRDF. More generally there was widespread scepticism that an unrestrained circulation of information would benefit the population as a whole. As Nega Alemaheiu, the Dean of the Graduate College of Information and Communication Technology noted,

> If you have little local content and you build information superhighways the result is that only the external content will come. And people will be exposed to it. People who speak the local languages should be put in the position to access their own content. To be capable of reading and using the Internet with the mediation of their culture. It can be really dangerous to have these people

exposed to too much external information. They would not know how to process it.[68]

Similarly, the idea of liberalizing the ICT market and letting the private sector lead the creation of an information society was strongly opposed, to the extent that Ethiopia is at the time of writing one of the few countries in the world where telecommunications are still a state monopoly. In stark contrast to the benign image attributed to market forces by the AISI's document, in Ethiopia they were framed as mostly hostile, despite the adherence to capitalist principles shown by the government to its international partners. Amare Amslau, CEO of ETC, for example responded to questions about the refusal to liberalize by arguing that "We have to grow first. Only when we will be strong enough, and we will have the capacity, we will liberalize. Things have to be done gradually. And when we will be ready we could go to the fight". [69]

Finally, the democratization potential of ICTs was apparently embraced with enthusiasm. The draft ICT policy, for example, placed democracy and good governance at its very core. According to the document the ICT vision for Ethiopia was:

> To improve the social and economic well being of the peoples of Ethiopia through the exploitation of the opportunities created by ICT for achieving rapid and sustainable socio-economic development, and for sustaining a robust democratic system and good governance (EICTDA, 2006, p. 9).

Similarly, the politicians and technocrats I interviewed often referred to democratization as one of the pillars of projects such as Woredanet and Schoolnet. For example, Bereket Simon, commenting on the benefits brought by Schoolnet, claimed that because of the new system, "now we will have a new generation that has been trained in the principles of democracy in secondary education and they will

[68] Interview: Nega Alemaheiu, (Dean of the Graduate college of Information and Communication Technology, Addis Ababa)

[69] Interview: Amare Amslau, (CEO, Ethiopian Telecommunications Corporation)

know how to contribute to the development of the country".[70] However, as illustrated in the previous section, the meanings attached to the term democracy by the EPRDF's leaders were, and remain, significantly different from those implied in the mainstream discourses on ICTs for development. As will be illustrated in greater detail in Chapter 6, the training Bereket refers to is civic education where, among other things, some of the discourses the EPRDF placed at the centre of its idea of nation were taught to students. In general "sustaining a good democratic system and good governance" through the use of ICTs meant for the Ethiopian government creating a functioning state and increasing its capacity to provide services to the population, but also filling the political space against competing ideas of the nation. Employing ICTs for democratization did not signify empowering individuals so they could contribute with various ideas to the public debate on how the country should be run at best, but reinforced the nation-state so that it could best realize the principles of revolutionary democracy embraced by the EPRDF. This conceptualization of democracy and its successful implementation on the ground implied a centralized application of the new resources and the marginalization of possible competing uses.

4.3 The marginalization of non-state actors in the development of an approach to ICTs

Civil society, the private sector and the diasporic communities in the US and in Europe responded more positively to the discourse on ICTs articulated at the international level. This reaction was the result, in part, of the strategy adopted by the UNECA which attempted to involve non-state actors in many of its activities, and of the perception by these actors of ICTs as a window of opportunity to increase their influence and initiate a gradual change in Ethiopia. However, the country's highly centralized power structure made most of the ideas and projects developed in these areas of little relevance for the actual re-shaping of technology at the local level.

[70] Interview: Bereket Simon (Former Minister of Information and Political Advisor to the Prime Minister)

Many pioneering activities, especially those resounding with the international discourse but taking lesser account of the local context, were blocked or marginalized by the government, forcing some of their promoters into adversarial positions and progressively alienating them from active participation in the development of ICT policies and plans.

4.3.1 International alignments: importing new solutions to old problems

Divergin from the EPRDF's cadres, most members of Ethiopian civil society and the private sector did not only perceive the modernizing role of ICTs to be positive, but also accepted some aspects of their global nature as potentially beneficial for Ethiopia. The local ICT firms for example, even if small and poorly resourced, strongly advocated liberalization of the market. As Bogaled Demissew, former head of the Ethiopian Information Technology Professional Association (EITPA) remembered: "EITPA has been always advocating for liberalization. It was the main actor in promoting this agenda [...] But also the World Bank put a lot of pressure. We organized many events together. We showed to the government that if there is competition the state is also going to get more revenues. But it did not work. They just had a different agenda".[71] Given the direct interest IT professionals have in expanding the ICT sector, their reactions are hardly surprising, but other initiatives promoted by non-state actors were not purely connected to the advantages its members could have derived from their implementation. They depended more on curiosity about the kind of transformation ICTs could bring and on a general acceptance of the discourses promoted at the international level.

The first debate over the significance of the Internet for Ethiopia, for example, benefited from the active participation of representatives of NGOs and professional bodies, who were trying to strike a balance between the hype coming from the West and the initial scepticism and conservatism shown by the EPRDF. Initiated in 1995

[71] Interview: Bogaled Demissew (Former Head of the Ethiopian Information Technology Professional Association)

by Dawit Yohannes, the speaker of the House of People's Representatives, and known as Bringing Internet to Ethiopia (BITE), this debate was aimed at producing concrete recommendations for policy makers to handle the new technology effectively. Dawit Bekele, a PhD graduate in computer science from the University of Lyon, France, and one of the most active advocates for an open and inclusive use of ICTs, described his own involvement in BITE:

> At the time nobody knew about the Internet. From Ethiopia we did not have access to the Internet, so we could not have access to relevant information for the BITE commission. But we made a series of recommendations anyways. [...] We had realized that the government would have not accepted a privately owned Internet provider, so we proposed to have a flexible system under ETC.[72]

The system Dawit refers to was a public network service provider, a "not-for-profit service organisation with the main objective of serving the public and developing services" (Furzey, 1995), independent from any actor in particular, but accessible to all. The idea was strongly rejected by the Ethiopian government which instead decided to place service provision under its direct control.[73] This was only the first of a series of frustrations civil society faced in its attempt to import tools and discourses emerging at the international level.

A few years later, in 1997, Abebe Checkol, the Head of Information Services for the British Council in Addis Ababa, initiated a process that would have lead to the creation of the first telecentre in Ethiopia. In the late 1990s telecentres were one of the most popular solutions proposed by international organizations to bring connectivity to remote areas, a first step towards the highway's off ramps mentioned

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[72] Interview: Dawit Bekele (Professor at Addis Ababa University and Africa Focal Point for the Internet Society ISOC)

[73] Dawit stressed the risks connected with being too proactive by noting that "the guy who made the recommendations, the chair of the technical committee was marginalized since then. It was bad judgment. The government did not really know what the Internet was and it did not want to listen. They did not like the Internet."

in the AISI document.[74] As Abebe himself remembered "the ITU and IDRC were organizing a lot of conferences at the UNECA, in particular on telecentres. It is there that I picked up the idea to start one of them in Ethiopia, using a public library in Wolisso, in Oromia".[75] With the support of the British Council, and after having obtained approval from the regional and local information bureau and trainig a number of local IT experts for the daily running of the centre, Abebe inaugurated it on the 26 February 2000. Unfortunately, as he recalled, "the government closed it after a few days. We opened on a Saturday and on Monday it was closed. They said it was against the Ethiopian Telecom Law, but the main reason why they closed the centre is because they were scared". It took a lot of lobbying through international organizations such as the Commonwealth Telecommunication Organization, the UNECA and the UNDP to have the telecentre reopened a year later.[76]

These experiences illustrate how the efforts made by actors other than the government to develop a more dynamic information environment have been strongly opposed at the central level. As previously argued, this reaction was motivated by the need to slow down the pace of transformation to be able to exert more control over it and by the desire to occupy the new political space that was created by ICTs in ways that would primarily benefit the government and its national project. As I illustrate in the next section, the incidents which occurred in this period, far from increasing the chances for civil society to be involved in the change ICTs were supposed to bring, was associated with further polarization between state and non-state actors, making ICTs yet another contentious issue in Ethiopian society.

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[74] My first experience in a developing country consisted of the installation of two Linux-based telecentres in the south of Tunisia.

[75] Interview: Abebe Checkol (Former Head of Information Services for the British Council, Addis Ababa)

[76] The next telecentre was established in 2005 in Harar, sponsored by UNESCO. In 2007 the World Bank initiated an ambitious programme that would lead to the creation of numerous telecentres across Ethiopia. This programme will be illustrated in greater detail in Chapter 7.

4.3.2 Disillusionment and disengagement

After initial attempts to shape local ICT policies and plans, NGOs, academics and pressure groups continued to take part in initiatives aimed at contributing to the local development of new technologies. New projects were initiated to localize software in Amharic, a group for the promotion of Free and Open Source Software was established and many civil society organizations participated in a forum created to draft a comprehensive ICT policy for Ethiopia. However, none of these activities offered individuals and groups outside the government the opportunity to have a real say in shaping the future of ICTs in Ethiopia, leaving many critical individuals at the margins or forcing others to be co-opted and enter government ranks. These failures, especially when combined with the expectations that the discourses about the transformative power of ICTs had created, left many with a strong sense of disillusionment. This feeling is captured by Dawit Bekele, who, after his initial experience with BITE, initiated many other ICT projects in the country.

> We understood that the government works alone. Everybody tried to work with the government, NGOs, academia, etc. But they have not been effective. The UNECA was instrumental in activating the civil society but was not enough. I am not interested anymore in ICTs in Ethiopia. I did everything I could but with little result.[77]

Similarly Abebe Checkol, after his enormous efforts to start the first Ethiopian telecentre, later started to doubt the real value of the model he embraced and promoted in his country.

> The problem with telecentres is sustainability. These centres were not really demanded by the community. They were more the result of international advocacy.[78]

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[77] Interview: Dawit Bekele (Professor at Addis Ababa University and Africa Focal Point for the Internet Society ISOC)

[78] Interview: Abebe Checkol (Former Head of Information Services for the British Council, Addis Ababa)

The hype created by the discourse on ICTs articulated in the 1990s did not frustrate only the hopes of members of civil society because of their exclusion from an active role in influencing the ICT sector. The unprecedented scenarios envisaged for developing countries also created a certain optimism among government officers who were later to be faced with a different reality. At the beginning of section 4.2 the words of two technocrats were reported to illustrate the initial faith in ICTs shared in some government circles. Reflecting on the stages that followed those early days they recognized that "after a while they realized that technology cannot do miracles"[79] and that "everything happened at a much slower pace [...] During our meetings the politicians were saying 'We invested so much money in it, and see what we have. There is nothing compared to what could have been done'".[80]

These observations help to analyze the drawbacks of technocratic discourses on ICTs of the kind proposed by the UNECA through AISI, as well as by other international organizations in the 1990s and 2000s. Presenting mere possibilities as facts resulted in the creation of high expectations that could not be fulfilled in practice. In addition, strong reliance on the support local civil society could have provided for a specific agenda that did not take account of the power structure in Ethiopia and of the actual potential for individuals and groups to succeed in their efforts, appeared to have fostered disillusionment. Many individuals working for international organizations or foreign NGOs certainly advanced an agenda of the kind promoted by AISI with the hope that it could benefit populations in the developing world. At the same time, ignorance of the context in which this agenda was supposed to be implemented, compounded by faith in the transformative power of technology, meant that many of the initial ambitions regarding the use of ICTs for development were frustrated and produced outcomes that were very different from those expected.

[79] Interview: Nega Alemaheiu, (Dean of the Graduate College of Information and Communication Technology, Addis Ababa)

[80] Interview: Anonymous (8)

4.3.3 The response of the diaspora: failing to engage and waving conflict

Ethiopians residing outside the country reacted differently to the government's refusal to engage other forces in the development of a more consensual path to ICTs. In contrast to their compatriots in Ethiopia, they did not have to engage the local authorities to develop their own projects and they were seemingly free from the control exercised by the government over what it considered to be improper or adversarial uses of the new technologies. As a result, some Ethiopians living abroad could make bolder attempts to influence the path of ICTs in the country, relying on the success or reputation they gained abroad. In other cases, members of the diaspora started to employ technologies such as the Internet precisely in the ways that were opposed at home, to challenge the government and its political ambitions.

The most notable example of an Ethiopian citizen abroad trying to influence the development of ICTs in the country was Noah Samara, the founder the first satellite radio network, World Space Radio. Noah had started the company with the ambition of providing clear and consistent information across Africa, to fight HIV/AIDS, provide education in remote areas and support a variety of programmes in health and agriculture. He successfully exploited the hype that was surrounding digital technologies at the end of the millennium and welcomed the opportunity to operate in his home country to bring what he called "information affluence" during a speech he delivered at the African Development Forum inaugurated by Meles Zenawi. As will be explained in greater detail in Chapter 6, his role was important in explaining to Ethiopian leaders how different uses could be made of ICTs, combining satellite communication, Internet Protocols and various systems for the reception of information. This could have represented the initial step in a longer-term collaboration between World Space Radio and the government of Ethiopia, offering the private sector a leading role as advocated by the UNECA. However, the EPRDF, in line with the strategy followed with the local civil society and private sector, preferred to continue alone in defining how ICTs should be used in the country, refusing to keep working with Noah and preferring more ideologically neutral international corporations to assist it in the development of its plans.

If Noah Samara saw in ICTs a chance to extend his social and business agenda, fulfilling the ambition to bring information affluence to Africa, many Ethiopians abroad interpreted ICTs to be less of a business opportunity but as new channels to wage political battles from a safe platform, attacking the government at home. The reasons why a medium such as the Internet was employed in this manner can be found in the recent history of the Ethiopian diaspora in the United States and Europe. As will be illustrated in the next chapter, since the 1970s the country had been entangled in multiple conflicts which caused significant waves of migration (Terrazas, 2007). A large majority of migrants was made up of professionals and intellectuals who escaped political persecution (Abye, 2004). Many of these refugees belonged to political groups hostile to the EPRDF. Throughout the 1970s and 80s they were members of parties such as the Ethiopian People Revolutionary Party (EPRP) and the All-Ethiopia Socialist Movement (better known with its Amharic acronym MEISON which stands for *Mela Ethiopia Sosialist Niqinaqē*). These groups were also opposed to the Derg regime but supported a nationalist agenda which was equally hostile to ethnic politics. More recently, others that fled abroad were former Derg supporters that were defeated in 1991 along with and other ethnic based movements critical of the monopolizing strategy of EPRDF (Lyons, 2007). This composition turned many new opportunities to reconnect the diaspora with the homeland into a significant obstacle for the EPRDF's nation building and development plan, and for the capacity to assert it without facing substantial political confrontations.

4.4 Conclusion

This chapter examined how the discourses about the modernizing, globalizing and democratizing potential of new technologies were appropriated, resisted, or transformed in Ethiopia. By investigating how the same artefacts were interpreted by a variety of actors operating in the country, it provided an illustration of how ICTs, rather than being objects producing effects, are nodes influenced by wider networks of discourses and power.

More specifically, the chapter began by explaining how the UNECA emerged as the most important "active teacher" in the country, to assessing how its framing of ICTs, which resounded with the larger policy agenda developed internationally, produced conflicting responses in Ethiopia, supporting great expectations among the most progressive elements of society, but even greater concerns within the government ranks. It was indicated how this process of appropriation of the new technologies, and of definition the their most relevant uses for Ethiopia, was dominated by the EPRDF, frustrating the attempts of other actors to influence the adaptation of ICTs in the country. Finally, the process of appropriation of earlier ICTs, such as the telephone, the radio and computers was briefly surveyed, illustrating how the longer term paths of technological adoption may influence the interpretation of newer technologies, despite the claims of their unique attributes.

While this chapter illustrated how the same technology and the same discourses can be charged with different meanings, how the term democracy, for example, was describing different realities for international organizations and for the Ethiopian government, the next chapter focuses more closely on the specific discourses articulated by the EPRDF and explores how these discourses came to influence the re-interpretation, re-definition and re-shaping of ICTs in the country.

CHAPTER 5 – A QUEST FOR HEGEMONY: THE USE OF ICTS IN SUPPORT OF THE ETHIOPIAN NATIONAL PROJECT

This chapter examines the key discourses that have influenced the re-interpretation, re-definition and re-shaping of ICTs in Ethiopia at the local level. These discourses have been reconstructed from the analysis of textual and non-textual data, as outlined in Chapter 3. They have emerged from interviews with high-ranking government and opposition politicians as well as with technocrats and civil servants; from press clippings, especially from the state controlled press; and from a study of the key aspects of Woredanet and Schoolnet.

The relevance of these discourses became apparent through the investigation of the main research questions that are concerned with the re-shaping of ICTs. The same discourses, however, were also significant beyond the specific case of new technologies. They were characteristic of the political agenda pursued by the Ethiopian government, which, as the previous chapter illustrated, emerged as the most important actor in appropriating ICTs and marginalizing other possible uses that could be advanced by other components of the Ethiopian society.

Three discourses, in particular, appeared as the most influential. First is the discourse on the nation-state elaborated by the EPRDF. According to this discourse the Ethiopian nation must be understood as a patchwork of different ethnic groups, each with an inalienable right to self-determination. A second discourse, similarly grounded in the ideological background of the EPRDF and its Marxist-Leninist past, concerns the Ethiopian society as it exists and as it should be. This is a pillar of the party's hegemonic project, advanced to gain legitimacy and consolidate control over the state. Finally, a discourse about communication in Ethiopia has structured the relationship of the political leadership to its constituencies and adversaries. The EPRDF, as fighters and subsequently as rulers, have shaped communication according to the "psychological make-up" (an expression used in the Ethiopian constitution) of the main targets of their mobilization efforts, the peasants.

The long-term development of these discourses is analyzed, from their origins to their more recent influence on the re-interpretation and re-shaping of ICTs. The

relevance of considering an extensive period of time emerged from field research and from the realization that many key decisions and projects were grounded in a relatively distant past. Even if the technologies were new and were described by international actors as radically innovative, only analyzing events surrounding their recent introduction was found to have little explanatory power. A much more revealing story emerged from considering how the political thinking of the current leadership had evolved and continued to influence more recent courses of action. Thus, the chapter proceeds by analyzing the three discourses over an extended period of time and by considering the influence they exercised on ICTs and on the development of different technopolitical regimes in Ethiopia.

5.1 Ethnic federalism as the core discourse of the nation-state

> I have to balance otherwise I cannot create good citizens. Technology is used to build the nation, for the people at the centre and at the peripheries. But this is true in general. For example when we build a university in Addis Ababa we make sure that another one is being built in the regions at the same time. (Amare Anslau, CEO, Ethiopian Telecommunication Corporation)[81]

Since coming to power in 1991, the EPRDF has struggled to unite Ethiopian citizens around its idea of the nation. As Amare Anslau suggests, technology has emerged as just one of the instruments that has been developed over time to achieve this goal, incorporating the discourses at the core of the government's national plan. Among the most important was ethnic federalism.

Ethnicity emerged as both a means and an end. It served as an operational principle for the redistribution of resources to those recognized as separate ethnic groups. But the provision of material benefits along ethnic lines was also aimed at convincing people on the ground that it was in their interests to be recognized as ethnically diverse. Building a university in each of the regional states, as reported by

[81] Interview: Amare Anslau (CEO, Ethiopian Telecommunication Corporation)

Amare, can thus be interpreted not just as a response to a generic redistributive principle, but as a way to show to citizens that their rights were being realized primarily as members of a distinctive ethnic group. Projects like Schoolnet and Woredanet were designed to further enforce these principles on the ground. As a technocrat who had been working on Woredanet illustrated, "Woredanet is to complete the decentralization process. The success of the government will have to be measured against this goal. [...] This issue is both managerial and political".[82]

The discourse on ethnic federalism emerged during the civil war against the Derg, the military dictatorship that had ruled Ethiopia since 1974. For almost two decades the precursor to the EPRDF, the TPLF, fought for the rights of ethnic groups within the larger Ethiopian state. Its agenda was grounded in the historic marginalization of the region of Tigray, in northern Ethiopia, whose people first revolted against the central government in 1942-43. The insurrection, known as Woyene, was crushed with the support of the British army, but survived in the mind of Tigreyans as a key referent in the struggle of oppressed ethnicities. Following its formation in 1975, the TPLF joined forces with another ethnically based liberation movement, the Eritrean People's Liberation Front (EPLF). Together, the two groups came to represent the strongest, and eventually decisive, threat to the Derg.[83]

The struggles of the EPLF and the TPLF were the response of the northern peripheries of Ethiopia to a dominating and assimilating centre. However, even if strongly related, the insurgencies were fought to attain different objectives. The EPLF had a secessionist agenda, with the independence of Eritrea as its final goal. The TPLF had a more ambitious and complex programme. The movement started in the name of the Tigreyan peasantry, but soon began to locate its activities in the

[82] Interview: Anonymous (8)

[83] The TPLF and the EPLF were not the only ethnic based movements fighting against the Derg regime. The other most important ones were the Oromo Liberation Front (OLF) and the Ogaden National Liberation Front (ONLF). However, the TPLF and the EPLF emerged as the most successful movements, whose activity was decisive in overthrowing Mengistu's regime. In an initial phase the OLF and the ONLF were invited to take part to the transitional federal government created after the Derg defeat, but they left soon after and the Ethiopian government now labels them as terrorist organizations.

wider context of the rights of all *nations, nationalities and peoples*, as it termed the ethnic groups composing Ethiopia. Its ultimate aim was not just Tigreyan self-rule, but control of the country.[84] In accordance with this objective, before entering Addis Ababa, the TPLF leadership decided to create a new party, including fighters from ethnic groups other than Tigreyan. In 1990 the Ethiopian People's Revolutionary Democratic Front (EPRDF) was born, as a coalition of ethnic based movements: the TPLF, the Ethiopian Peoples' Democratic Movement (EPDM), composed mainly by ethnic Amhara, and the Oromo People's Democratic Organization (OPDO), founded to represent the Oromo, the largest ethnic group in the country. However, neither EPDM nor OPDO were the expression of a large popular movement, but were rather ad hoc parties created by the TPLF to demonstrate its commitment towards a larger constituency (Young, 1997).[85]

The EPRDF captured Addis Ababa on 28 May 1991, marking the end of the civil war but also the beginning of the quest to transform a military success into a broader consensus on the future of the nation. A new discourse was articulated in support of this agenda and to legitimate what would otherwise have been seen as the rule of a minority, representing only 5.8% of all Ethiopian citizens[86]: Ethiopia was not a unitary nation but a federation of ethnicities, which at least on paper were all entitled to the same rights to self-determination which mobilized the people of Tigray. By connecting the Tigreyan minority to other oppressed groups and offering them, at least in principle, the opportunity to participate in the re-founding of the nation, the EPRDF was reframing its de facto capture of the state as a victory for all marginalized groups. As is shown in the next sections, achievement of this objective was more complicated than expected.

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[84] At the beginning of the struggle the TPLF leaders were also advocating the secession of Tigray from Ethiopia, but soon abandoned this agenda (Young, 1997).

[85] EPDM was created by a group of disbanded members of the Ethiopian People's Revolutionary Party (EPRP), whose fight against the Derg was based on a class, rather than ethnic, basis. After having been defeated by the TPLF, some of the members of EPRP created the new party with the support of TPLF. OPDO's members in contrast were mainly Oromo soldiers which had been fighting for the Derg and were later captured by the TPLF's forces (Young, 1997).

[86] Central Statistical Agency of Ethiopia, 1994.

5.1.1 Ethnic federalism, and its discontents

Ethnic federalism entitles all major ethnic groups to promote their language, culture and history, to elect their local government and to representation in the federal government. It was this ideology which underpinned the drafting of the Transitional Period Charter in 1991, where the right of Ethiopian nations, nationalities and peoples to self-determination was affirmed for the first time, as well as of the Ethiopian constitution, which came into force on 21 August 1995, extending the right to state self government to a right to secede.[87]

Because of its uniqueness as well as its contradictory character, ethnic federalism has been one of the most researched areas in the history of modern Ethiopia. Major recent works in comparative politics and international relations have addressed it as a whole (Aalen, 2002; Assefa & Tegegne, 2007; Gudina, 2003; Pausewang, Tronvoll, & Aalen, 2002; Tegegne, 1998; Turton, 2006) or dealt with specific components of it (Ottaway, 2003; Stremlau, 2008; Young, 1997). For the purpose of this research I will examine, in particular, how it influenced the applications of ICTs in the country.

As with all attempts to generalize a particularistic view across a national polity, the EPRDF's vision emerged antagonistically with competing versions and entailed a struggle over history and the role played by adversaries of the party and its potential supporters within it. Of the many challenges faced by the EPRDF in attaining its goal, two were probably the most complex to overcome.

First, ethnic federalism stood in sharp contrast to the nation building project promoted by previous Ethiopian regimes, which was characterized by the imposition of the culture of one specific ethnic group, the Shewan-Amhara, over all others. This process was initiated in the second half of the 19th century by emperors Tewodros II and Menelik II who respectively ended a long period of competition between feudal princes and annexed the regions in the South to the Abyssinian empire, creating

[87] According to Article 39, 1st paragraph, of the Ethiopian constitution, "Every Nation, Nationality and People in Ethiopia has an unconditional right to self-determination, including the right to secession".

Ethiopia as we know it today.[88] During his 50 year long reign, Emperor Haile Selassie further consolidated the "Amharization" of Ethiopia, also extending it to Eritrea, which was annexed after the defeat of the Italians in World War II.[89] This process did not stop with the deposition of Haile Selassie and the end of the empire and the feudal system which had supported it. The Derg regime in theory refused to distinguish between different ethnicities, but in practice continued to impose the culture of Amhara over the rest of the nation. Amharic was chosen as the national language, the use of vernacular idioms was prohibited and Amhara urban elites were favoured as representatives of the government across Ethiopia.

For more than a century the mission of the central authority had thus been the creation of a unified nation around a set of values which should bring together all Ethiopians. In 1991, this project was reversed, and the foundation of the nation was recalibrated to be based on the multiple ethnic groups which compose it and their distinctive cultures. The language used to advance and justify this competing discourse demonstrated a marked contrast with that which had been employed previously, as is well illustrated in the newspapers of the time. The two excerpts below are from editorials published by *The Ethiopian Herald*, the state controlled English daily. The first piece is taken from the newspaper before the end of the civil war, when in the hands of the Derg, and the second is from after the war, when controlled by the EPRDF. They represent occurrences of diametrically opposed, but repetitive discourses. It can be argued that for months before and after the transition two basic editorials were being written, one praising unity, the other diversity, with only slight variations.

The Derg attempted to rally the population around its long-term motto, *unity*, in particular, against TPLF and EPLF, defined as anti-unity and anti-peace movements.

> Ethiopians throughout the length and breadth of the country have continued to voice their concern over the danger posed against the nation's *unity* and

[88] Between Tewdros and Menelik another emperor, Yohannes IV, reigned over Ethiopia, but he spent most of his reign protecting the empire from foreign incursions.

[89] Haile Selassie ruled over Ethiopia between 1916 and 1974, first with the title of regent and later as emperor. His reign was interrupted between 1936 and 1941 by the Italian occupation, during which he found refuge in Bath in the UK.

sovereign integrity. The outrage of the people is mounting. Ethiopians everywhere are expressing their readiness to be deployed to the war front and thereby pay any and every sacrifice to safeguard the long-standing freedom and *unity* of the country. The Ethiopian people are very well aware that in *unity* lies our strength. They are equally aware that *unity* is the reliable guarantee for the attainment of socio-economic progress. Accordingly, all stand for *unity*. They bitterly oppose all forces that are bent on undermining the *unity* of the nation. To this end, the people are prepared to pay any sacrifice the struggle calls for. Ensuring national *unity* and security is the driving force behind the people's mounting concern and firm commitment.

The Ethiopian Herald, Editorial, Friday 5 April 1991(emphasis added)

The second editorial tries to reverse this discourse, illustrating that the foundation of a new Ethiopia resides, instead, in its plural *nations and nationalities.*

Ethiopia is a country of many *nations and nationalities*. Not only have the various *nationalities* and oppressed people of this country been neglected for too long but deliberate efforts have been exerted to cause them to live completely forgotten and neglected and to remain in a dismal state of backwardness. [...] By convening a national conference for the peaceful and democratic transition aimed at resolving the complex national tasks, the EPRDF has given particular emphasis for the resolution of these problems. The problems of *nations and nationalities* have thus come out for serious discussions on a priority basis. This is the first major accomplishment of its kind in the history of Ethiopia. Through this forum, convened by the EPRDF at which representatives of different minority *nationalities* were represented, it was possible to hear the various political outlooks particularly in connection with the burning issue of *nations and nationalities*. On the basis of the draft proposals submitted by the EPRDF regarding this major *national* problem, participants have held frank and open exchange of views and adopted unanimously a resolution on ways ensuring the democratic rights of oppressed *nationalities and nations*.

The Ethiopian Herald, Editorial, Friday 5 July 1991(emphasis added)

The two pieces almost mirror each other, obsessively reiterating the terms at the core of two competing discourses of the nation, and attaching opposite meanings to similar concepts. In the first editorial for example, unity is linked to socio-economic progress: "They are equally aware that unity is the reliable guarantee for the attainment of socio-economic progress". While in the second editorial it is framed as oppression and becomes a cause of backwardness: "deliberate efforts have been exerted to cause them to live completely forgotten and neglected and to remain in a dismal state of backwardness". Similarly, the two pieces indicate different sets of values associated with what animates Ethiopian citizens. In the first editorial, unity is presented as being a cause people would die for: "Ethiopians everywhere are expressing their readiness to be deployed to the war front and thereby pay any and every sacrifice to safeguard the long-standing freedom and unity of the country". While in the second article the issue of nations and nationalities is said to be the one addressed when people were given the chance to speak out for the first time: "The problems of nations and nationalities have thus came out for serious discussions on a priority basis".

This debate did not end with the victory of the EPRDF, but continued, first in newspapers such as *Tobiya*, which was founded by journalists who had worked for the state owned press under the Derg regime, and subsequently through blogs and websites dominated by opposition parties and the diaspora.[90] An excerpt from an editorial in Tobiya can be illustrative of this point:

> The attempt by the fascist Italians to divide the people and the country was not successful, but now it is getting rooted thanks to the current regime. The people of the country are being divided along ethnic lines... The 1991 Charter follows and adheres to the secessionist ideology of a few Eritreans. It seems that the Charter was prepared to facilitate the secession of Eritrea from Ethiopia....The attempt to view unity as a marriage is very simplistic and incorrect. The people of Ethiopia are connected by history, nature, culture and psychological make-up.... We also

[90] A second threat to the ethnic federalist discourse did not come from the forces that used to control the state under the Derg or Haile Selassie, but from other movements which, like the TPFL, had been opposed to those regimes. Although the TPLF emerged as the most successful among the groups opposing the state it was far from being the only one.

> think that no group should be allowed to disintegrate the country. In the new Ethiopia, the unique and terrifying term is "unity". The charter is not in favor of unity. It also seems that the constitution fears the same term. It rather pronounces and emphasises the phrase "self-determination up to secession".... The regime supports the division and disintegration of the country and we think this is the first national government to do such a thing in the world.
> *Tobiya, Editorial, 24 February 1994* [91]

Over the years the two poles of the debate remained almost the same: unity, which the EPRDF was accused of having destroyed by allowing the secession of Eritrea and imposing a new divisive nation building agenda, and ethnic federalism, equated to positive change by the government, which the opposition parties have been accused of opposing as forces of conservatism and enemies of development. As will be shown in Chapter 7, this polarization also came to influence newer media, with some of the most popular blogs attacking the EPRDF's ethnic federalist agenda, and the government trying to shield readership at home from receiving these critical articles and posts while at the same time trying to occupy new online spaces with its own narrative.

A second problematic aspect of the ethnic federalist discourse, and a reason for the resistance it initially provoked, is connected to how it attempted to construct ethnicities from above, extending the experience developed by the TPLF among the peasantry in Tigray to other ethnic groups in Ethiopia. As authors such as Anderson (1983) and Hecht (1998) have explained, concepts like ethnicity and nation are always constructed, and their meaning is contested by competing political projects. However, in different locations and at different points in time the extent to which a particular discourse is challenged varies. At the time of the civil war against the Derg, for example, a variety of factors made the Tigreyan identity more stable and less contested than others in Ethiopia (Young, 1997). Tigreyans had powerful common referents: the glorious Aksumite empire[92], the Woyene revolution in the

[91] As quoted in Stremlau (2008, p. 90)

[92] The Aksumite empire represents the foundation of the modern state of Ethiopia. Between the third and seventh century Aksumite emperors controlled most of northern Ethiopia, Eritrea, part of

1940s, and the struggle itself, which was uniting the population further against central authority. The vernacular language, Tigrinya, had been used for centuries and, like Amharic, had a written script. For sixteen centuries orthodox Christianity had been professed by almost the entire Tigreyan population. However, these factors were far from being present across other groups within Ethiopia, and, more importantly, were not necessarily understood by other ethnic groups as a reason to revolt against the centre and request official recognition of their ethnic diversity.

The EPRDF's programme was based on a map of the social composition of Ethiopia imposed from above, and like other 'top-down' nation building projects, encountered a great deal of hostility on the ground.[93] As Amhed Hassen, a member of parliament responsible for information and communication, recalled, "at the beginning of the new government the idea of a federal Ethiopia was opposed from everywhere. We felt highly misunderstood".[94] A concrete illustration of this reaction is offered by Vaughan's research in the southern region of Simien Omo, where the government was trying to amalgamate different ethnic groups into more manageable units (Vaughan, 2006). As part of this operation a new language was created from a variety of dialects spoken in the area intended for use in administration, for educating children in primary schools and providing a new glue to unite different groups living in the region. However, far from being perceived as a manifestation of ethnic rights, this act led to strong resistance and sparked violence among the population. The first textbooks written in the newly created idiom were publicly burned during protests that resulted in several deaths and imprisonments (Vaughan, 2006)

Southern Sudan and Yemen. It entertained trading relations with most of the Arab world, but also with India and Rome. King Ezana II was the first to convert to Christianity in 324 AD, making Aksum the first centre of Christianity in the continent. It is also claimed that the rests of the Arch of covenant are preserved in a church in Aksum. For more information about the history of the Ethiopian empire see Collins and Burns (2007)

[93] An interesting and quite literal example of this tendency is the fact that as of 2008 there were not yet official maps of the regions available. A clear delimitation of regional boundaries could lead to violent conflict since these boundaries, especially in the South, are strongly disputed.

[94] Interview: Ahmed Hassen (Member of Parliament and Deputy Chairman of the Information & Culture Affairs Commission)

It is difficult to reconstruct the degree to which such reactions surprised the new leaders or were anticipated, but since ethnicity alone could not mobilize all people of Ethiopia as much as it did in Tigray and in Eritrea, a variety of different strategies had to be adopted to implement the ethnic federalist agenda in the country.

5.1.2 Ethnic federalism in practice: building the state to build the nation

To translate the ethnic federalist discourse into more concrete forms and, at the same time, to increase its control over the territory the government started developing institutions which embodied the principles of ethnic federation. As key components of the new order, these institutions had to fulfil two main requirements: first, they had to be based on ethnicity, incorporating quotas to equally represent different groups in society; second, they had to be efficient, or at least more efficient than those Ethiopian citizens had known in the past. The two principles were presented as being strictly interconnected and mutually reinforcing. Ethnicity provided the ideational framework for the creation of the new administrative infrastructure on the ground. Efficiency and an equal redistribution of resources among the identified groups were supposed to substantiate this and reinforce among the population the belief that an ethnic federation was the most appropriate form of government.

These processes can be interpreted as further examples of Anderson's formulation of nations as imagined communities (Anderson, 1983). It was through the invention of new symbolic referents that a different idea of the nation was proposed and negotiated, in the attempt to reach some for of consensus among the Ethiopian population. But, as Anderson also points out, and as Hecht's research further substantiates, ideational referents needs to be grounded in a material reality in order to function among communities at large. Some of these material referents may already exist and be invested with new meaning which is functional to a nation building process. This can be the case of a location becoming a destination for pilgrimage. Others need to be constructed, such as a series of reactors, as explained

by Hecht in her research on the French ambitious nuclear programme. In the case of Ethiopia, it was systems like Woredanet and Schoolnet, together with numerous other physical substantiations of EPRDF's national project, that came to play this role. They were designed to simultaneously embody the principles of the ethnic federalist state, to signal it on the ground and to improve its image. Debretsion Gebre Michael, the General Manager of EICTDA, illustrated this point.

> Ethnic federalism is a key component. In Woredanet you can see the federal system reproduced at the technical level. You have the federal, the regional and the woreda. The system is organized in a way that you can make sure the message is delivered to the lowest levels of the government.[95]

To establish the ethnic federalist discourse at the political and social levels, the country was divided into nine regional states[96], each intended to represent "a group of people who have or share a large measure of a common culture or similar customs, mutual intelligibility of language, belief in a common or related identities, a common psychological make-up, and who inhabit an identifiable, predominantly contiguous territory".[97] The states were split into *woreda*, units of approximately 100,000 people, governed by administrations modelled on *baito*, the councils created by the TPLF in Tigray during the war. The woredas were in turn divided in *kebele*, village councils representing grassroots units of government.[98] In 1992, elections were held to provide the new institutions with a popular mandate and to signal to the population that a new order was being created. The EPRDF had founded a number of ethnically based parties which could compete in each of the regions, but the only two genuine opposition parties, the Oromo Liberation Front (OLF) and the All Amhara People's Organization (AAPO) withdrew due to harassment and intimidation.[99]

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[95] Interview: Debretsion Gebre Michael (Director General, EICTDA and former guerrilla fighter in charge of the radio equipment and propaganda)

[96] The cities of Addis Ababa and Dire Dawa were also granted administrative status.

[97] The Constitution of the Federal Democratic Republic of Ethiopia, art.39, paragraph 5.

[98] The kebele maintained the form of the village councils created by the Derg.

[99] The four member parties of the EPRDF were the Oromo People's Democratic Organisation (OPDO), the Amhara National Democratic Movement (ANDM), the Southern Ethiopian People's

Subsequent elections, for the constitutional assembly in 1994 and for the regional and federal governments in 1995, were similarly uncontested. This was not novel for the Ethiopian population, who had never been called to vote in free and fair elections. The electoral contests were rather a means of providing the new leaders with a symbolic mandate which, even if it did not emerge from genuine competition, could be used in support of their national discourse and to justify continued reforms in the country, especially among the rural population.[100]

The political remapping of the country along ethnic lines was accompanied by a similarly ambitious reform of the civil service.[101] Many administrators I

Democratic Front (SEPDF) and the Tigray People's Liberation Front (TPLF). The affiliates were the Afar People's Democratic Organization (APDO) in Afar region, the Somali People's Democratic Front (SPDF) in Somali, the Gambella People's Democratic Front (GPDF) in Gambella, the Benishangul-Gumuz Peoples Democratic Unity Front (BGPDUF) in Benishangul-Gumuz, and the Harari National League (HNL) in Harari. They are officially independent but have been created by the EPRDF and have strong links with it.

[100] As indicated by von Bogdandy, Häußler, Hanschmann, & Utz (2005), processes of state and nation building are closely related and successful reforms of the state can be undertaken only if the ruling elite has a certain degree of legitimacy. This relation can be found in their definition of state and nation building, focusing in particular on post-conflict situations of the kind experienced in Ethiopia after 1991. "State-building means the establishment, re-establishment, and strengthening of a public structure in a given territory capable of delivering public goods. Essential to state-building is the creation of sovereign capacities of which the fundamental one is the successful and generally undisputed claim to a 'monopoly of the legitimate use of physical force'" (pp. 583-584). "Nation-building is the most common form of a process of collective identity formation with a view to legitimizing public power within a given territory. This is an essentially indigenous process which often not only projects a meaningful future but also draws on existing traditions, institutions, and customs, redefining them as national characteristics in order to support the nation's claim to sovereignty and uniqueness. A successful nation-building process produces a cultural projection of the nation containing a certain set of assumptions, values and beliefs which can function as the legitimizing foundation of a state structure." (p. 586).

[101] The World Bank, for example, described the operation in a background paper: "Following the fall of the Derg regime in the early 1990s, the EPRDF-coalition Government embarked on a long term strategy of "state transformation" characterized by bold attempts to implement multiple reforms in parallel; the massive scale-up of institutional development efforts across tiers of government; and the deliberate expansion of the scope of public sector capacity building initiatives" (World Bank, 2004b, p. 5).

interviewed at different levels of the government apparatus by 2008 had become obsessed with keywords such as efficiency, good governance, empowerment and service delivery, the meaning of which seemed, however, to be increasingly distorted at lower levels of the administration. At the time of my research, a number of ministries were being restructured using the principles of Business Process Re-engineering (BPR), and BPR manuals could often be found on the desks of their General Managers. However, BPR was only the latest of a long series of techniques employed to reform the civil service.[102]

The most important of these reforms, known as the *National Capacity Building Programme* (NCBP), started in 2001. It was a multi-sector and intergovernmental programme, involving a variety of activities, of which the most relevant was the creation of the Super-Ministry of Capacity Building and the reinforcement of the woreda as the fundamental building block of the Ethiopian state machinery. Prior to 2001 the decentralization process had not produced the expected results and the NCBP was intended to improve performance by devolving authority to lower levels of the administration, the woredas, while at the same time linking them tightly to a newly created institution. The programme was initially piloted in four regions (Oromia, Amhara, Tigray and Southern Nations Nationalities and People Regions) and later expanded under the name of the Public Sector Capacity Building Program (PSCAP).

Woredanet and Schoolnet were set to play an important role in this later wave of state transformation, supporting some key aspects of the reforms. The link between investment in technology and the decentralization process was evident to the engineers and technocrats that were asked to formulate solutions to the challenges presented by the NCBP and PSCAP reforms. The testimony below is from one of the technocrats that had been involved in the design and implementation of Woredanet from the very beginning:

[102] For details of BPR and for a comprehensive illustration of the decentralization process and civil service reform see the Special SIDA Study written by Vaughan and Tronvoll (2003), or the book edited by Tegegne (1998).

> The Minister of Capacity Building was asking and demanding and we had to come up with solutions to what he was asking. There was frustration after frustration. All the decisions were political decisions, to decentralize, to follow the project of decentralization, to create a sense of collectiveness among different communities and the centre.[103]

This explanation suggests how the decentralization project influenced the design of Woredanet, and how the newly created Ministry of Capacity Building exercised a prominent role in the initial phases in which Woredanet took shape. They also illustrate, similarly to what Hecht discusses in her work on nuclear power in France, how the political nature of technology is often appreciated and portrayed as an explanation for technical decisions by technical personnel. The interview from which the quote above is taken was one of my first and as much as Hecht reports she was surprised by the explicit reference to politics in technocrats' answers to her questions, I was not expecting to receive such straightforward accounts of issues that I considered very problematic in terms of how technology was used to enact specific political needs. As the interviewee continued,

> Another request was to diffuse information up to date to the periphery and to know what was going on in there. A minister cannot wait for too long. Now the Prime Minister can speak to the rural areas, all at the same time. All the costs for his transportation, his security, are not there anymore. [...] The Prime Minister can use the system every time he wants, while for the other nodes, they should fill a form.[104]

The tendency to underline the political nature of systems like Woredanet and Schoolnet was confirmed in many interviews with technocrats and other non-political personnel. The following comments by a computer scientist working at Addis Ababa university is indicative of this.

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[103] Interview: Anonymous (32)

[104] Interview: ibid.

> China is now the model. To be effective and deliver is a way for them to stay in control. The government thinks that if they do a good job with the economy and provide good services the people should keep quiet and let politics take its course.[105]

The above examples are initial illustrations of how Woredanet and Schoolnet emerged as technopolitical regimes, as the embodiment of a political plan that could be enforced with the support of technology. Their scope, however, was not simply to support a decentralized state. The combination of the foundational discourse of the nation advanced by the EPRDF and the kind of state building project this "dictated" in practice, created a more intricate distribution of forces that the new systems had to "fix". This, in part, explains the unique nature of the two systems, their scale and complexity.

5.1.3 A contradictory project: controlled decentralization

> This is the paradox the current government created: it is a minority government and it needs to justify with an ideology like ethnic federalism its staying in power. They need to decentralize to support their ideology but also to exert a central control to make sure they can stay in power.[106]
> (Bahru Zewde, Historian)

Bahru Zewde is one of Ethiopia's renowned historians, and his words indicate the contradictions in which the EPRDF became embroiled as a result of its complex nation and state building projects. Ethnic federalism was probably the only possible compromise which could legitimate the EPRDF's control over the country, but in order to bring this about it had to strengthen centrifugal forces which had the potential to threaten the capacity of the new leaders to maintain the control they were seeking.

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[105] Interview: Anonymous (35)

[106] Interview: Bahru Zewde (Historian)

Different measures have been devised to resolve this paradox, some of which have been illustrated in previous studies. Pausewang, Tronvoll and Aalen (2002) have explored how the EPRDF created a de facto single party system by founding dependent ethnically based parties and assuring that these were able to win majorities in both local and parliamentary elections. Control of what appeared to be a highly decentralized administrative system could thus be guaranteed by a centralized party. Assefa and Tegegne (2007) have shown how the close control exercised by central government over financial resources has, in practice, denied local administrations the capacity to define their own priority spending. Sara Vaughan and Kjetil Tronvoll (2003) have identified additional measures such as the use of the federal security forces to control unstable peripheral zones and the provision of a wide range of training and courses to universalize the philosophy of the EPRDF.

Woredanet and Schoolnet represent the latest incarnation of the desire for controlled decentralization. Since power was further devolved to woreda level, a new mechanism was required to ensure that, whilst granted greater responsibilities and increased capacity to operate, the units did not fall outside of the control of the state. The system, although bidirectional in principle, has been used mostly to consolidate the EPRDF's influence in the periphery, to ensure that the powers to which local administrators were entitled were exercised within a framework decided at the central level. This was elaborated by an EICTDA technocrat.

> Woredanet is used mainly to connect people with the centre for administration purposes, to govern the entire community and provide services. By using technology, information is not lost when it is transferred. This is at the base of everything. Let me give you an example. If you are in a school where the professor teaches by saying something to a student and asking him to pass the message to the next student, and so forth, the last student will have information that is completely different from the one communicated at the beginning. Woredanet prevents this from happening [107]

[107] Interview: Anonymous (16)

Making sure that all receive the same message and can act accordingly contrasts with the principles which should inspire a decentralized state, whereby those working in the localities are able to make decisions autonomously on the basis of their knowledge of the local context. However, this had been one of the major requirements in designing Woredanet which aimed at intensifying the presence of the centre in the periphery, empowering local administrations without the risk that they could fall outside of the orbit of the leadership at the centre.

Beyond government circles, this characteristic of the system was heavily criticized for having magnified the need to control the local administrative structures rather than enhancing their capacity. Yemane Kidane, a former guerrilla fighter and government official who left the government in 2001 as a result of a critical stance towards some of its policies, argued that this excessive attempt to control could jeopardize the whole state building project.[108]

> Through Woredanet there can be a commitment to building their [the local cadres] capacity and probably they are doing it. But the problem is that the people at the centre do not allow people at the woreda level to make their own mistakes. There is this obsession with control and command. So the people in the woredas even if more trained and skilled [...] they are not allowed to learn from trial and error. They will always wait for instructions and will be afraid of taking responsibility.[109]

An even more critical stance was expressed by Merera Gudina, Assistant Professor of political science at Addis Ababa University and Deputy Chairman of the United Ethiopian Democratic Forces (UEDF), a moderate opposition party.

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[108] After the war with Eritrea (1998-2000) some of the most influential members of TPLF started criticizing Meles' rule, especially over the ways in which the Prime Minister handled the war with the neighbouring country and former ally. This led to a profound split within the front which, according to Tadesse and Young (2003), was based on ideology, but was also an expression of a contest over power. Meles Zenawi, supported by key members of Amhara National Democratic Movement (ANDM), emerged victorious from the dispute, while most of his opponents were purged, arrested or marginalized.

[109] Interview: Yemane Kidane (Former Member of EPRDF and Officer in the Ministry of Foreign Affairs. Director, Centre for Policy Research and Dialogue in Addis Ababa)

> The rhetoric is about decentralization, the empowerment of the people. But when you look at it in practice very little is happening in this direction. The government strategy is to control, not to empower. So Woredanet is to transfer their message from the centre to the periphery. It is used to control and indoctrinate. Maybe they say it is for public service delivery but I saw very little results so far. Good governance is just a way to cover all this with nice words.[110]

Projects such as Woredanet emerged as the latest incarnation of complex, and partially contradictory, nation building and state building projects. These projects embodied the ideologies that sustained the guerrilla struggle in the bush, but at the same time they were aimed at enforcing some key components of those ideologies on the ground. As such they could not but emerge in competition with alternative political plans advanced by other key actors in Ethiopia, operating domestically and from abroad. To succeed, the EPRDF had to marginalize not only the oppositional discourses, but also the actors articulating them. The next section illustrates how this was achieved in practice and how it has resulted in the polarization of the Ethiopian society where citizens are framed as either beneficiaries or as enemies of the EPRDF's national plan.

5.2 *A populist discourse of social integration*

Between the start of the civil war and 1991, when the EPRDF came to power, global political conditions changed dramatically. The Berlin Wall had fallen and the USSR was slowly dissolving. The Marxist-Leninist thinking, which had inspired the struggle had become a problematic legacy for the new government as it sought to position itself in the post Cold War order. At the same time, to install itself firmly at the centre of the local political scene against many competing forces, the EPRDF needed strong backing from the international community. In this context the party leadership decided to distance itself from its communist past and to publicly embrace

[110] Interview: Merera Gudina (Professor at Addis Ababa University and Chair of the United Ethiopian Democratic Forces)

the principles of liberal democracy. This move was, however, more strategic than ideological.

The TPLF had always shown a remarkable dedication to the rights and needs of peasants, who they considered to be their most important constituents. This commitment was grounded in Marxist-Leninist thinking and was common to many other movements which had been fighting oppression in Ethiopia and elsewhere in Africa. In contrast to other groups, however, the TPLF fighters were not simply abiding by a programmatic point. They took this principle as an inspiration for their everyday conduct and tried to maintain a lifestyle as close as possible to that of the farmers. Alfred Taban, a Southern Sudanese journalist who was invited by the TPLF to report on their struggle, illustrated this point in a memory from his time in Tigray.

> Because of the bombings we were travelling at night.... We found a small town at 2 am where they said we should sleep. It was very cold, they threw us some blankets. [I said] are you going to sleep here in this cold? [They said] yes it is very late so we cannot wake up these people at this time of the night. I was shocked because my only knowledge of guerrillas was not like that. There were people that would throw away any people at any minute [at] will. Take the SPLA[111]; they wanted the best things for themselves at the expense of the citizens.[112]

Other reflections of the TPLF's ideological background were the absence of any private property among the fighters and the regular meetings held by the leaders to study and discuss Marxist-Leninist thinking.[113] It is difficult to accept that this approach, practised for such a long period of time, could be so swiftly and easily

[111] The SPLA is the Sudanese People Liberation Front, led by Joseph Garang, which has fought for the recognition of the right to self determination of Southern Sudan.

[112] Interview: Alfred Taban (Editor in Chief of The Khartoum Monitor and BBC Correspondent in Sudan). This interview was conducted with Nicole Stremlau, who has also used it in her monograph on *The press and consolidation of power in Ethiopia and Uganda* (Stremlau, 2008).

[113] One of the most influential organs within the TPLF was the Marxist-Leninist League of Tigray (MLLT). The members of MLLT, among which was also future prime minister Meles Zenawi, portrayed themselves as defenders of orthodox Marxist-Leninist ideas, and often used disputes over doctrinal interpretation as ways to fight for power within the front (Young, 1997).

overturned and replaced with new principles. Behind the rhetoric of liberal democracy, important vestiges of the TPLF's past remained. As of 2008, all land in Ethiopia was owned by the state, which is supposed to guarantee access to farmers on an equal basis. The telecommunication sector was a monopoly, the only system that, according to Ethiopian leaders, can make sure peasants are not forgotten in the name of profit. The state or the party continued to control large proportion of shares in some of the biggest industries in the country.[114] Whilst EPRDF cadres saw, and many still do, rural Ethiopia as the principal target of their endeavours, they concurrently framed the elites who were not aligned with the EPRDF as enemies of the government to be fought and prevented from gaining any form of power. This attitude could be partially interpreted as retaliation against the oppression suffered by many ethnic groups under the rule of the Amhara class, which had largely settled in the major towns. It resulted in government policies which often marginalized the urban population, even when this was against the national economic interest.

As ethnic federalism was the founding discourse for the Ethiopian nation-state, the primacy of the rural population was the discourse embraced by the EPRDF to frame its idea of Ethiopian society. Both discourses resounded with another discourse that was central to the EPRDF: revolutionary democracy. As discussed in Chapter 4, revolutionary democracy refused the focus on the individual that characterizes liberal democracy, preferring to stress group rights and consensus. It similarly favoured a populist discourse claiming a direct connection of the leadership with the masses, bypassing the need to negotiate with other elites who advanced competing ideas of the nation-state and of the role different groups can have within it. This conceptualization of the Ethiopian society had also concrete repercussions on how priorities were set and resources allocated. While very little was invested to increase and improve the communication channels with dissenting voices, substantial

[114] The tendency of having loyal political figures heading the most important industries in the country is particularly evident in Tigray, where the biggest industries, from tanneries to pharmaceutical factories, are clustered in a consortium known as Endowment Fund For The Rehabilitation of Tigray (EFFORT), responding directly to TPLF cadres. Among board chairmen of EFFORT companies is worth remembering Sebhat Nega, former Chairman of the TPLF and Head of the Economic Affairs Department of the EPRDF.

efforts were made to consolidate and reinforce the relationship with the base of political power.

5.2.1 Including the poor

> We always said that whatever policy we decide to develop, it will always be the farmers and the peasants to implement it. So the decisions may be taken at the centre but the targets for these decisions are the farmers. So even now through technology the final targets are the farmers. It is the concept of mass mobilization. The whole idea of revolutionary democracy is to have the hegemony of ideas and views, to be the only one occupying the political space. But this has to be implemented on the ground. So technology is used to disseminate ideas but also to achieve results, otherwise people will know that what you say is just words.[115] (Yimane Kidane, Former Leader in the TPLF)

During the civil war Yemane Kidane's assignment was to mobilize support for the TPLF inside and outside Ethiopia. From its base in Sudan he contacted journalists and officials in ministries of foreign affairs, but also covertly conveyed leaflets to influential politicians through their Ethiopian maids. As a TPLF leader, he continued to shape state policy, especially communication and foreign policy, until 2001, when an internal split in the party forced him to leave government. Although he was not directly involved in ICT related projects, his experience in defining the TPLF and EPRDF communication strategy during and after the war, as well as his criticism of his former allies and his witty personality, made Yemane's perspective particularly illuminating regarding important aspects of discourses used by the EPRDF and their influence on the re-shaping of ICTs.

As cited above, Yemane notes that there were several key points used by the EPRDF to define and structure Ethiopian society and the party's role within it. This section focuses on the links between mass mobilization, the peasantry and

[115] Interview: Yemane Kidane (Former Member of EPRDF and Officer in the Ministry of Foreign Affairs. Director, Centre for Policy Research and Dialogue in Addis Ababa)

revolutionary democracy, leaving the analysis of others, such as the importance of achieving results instead of using "just words", for the following section (5.3).

Mass mobilization has been at the core of numerous revolutions throughout history. It refers to the need to activate large numbers to guarantee the success of a specific political project, and its nature varies according to the relationship between the mobilizing and the mobilized.[116] In the case of the Ethiopian civil war, the peasants were placed at the core of revolutionary efforts, not just as ideal-type referents, but as individuals to whom the party leadership had to show its commitment. Yemane Kidane explained how "when we were in the bush we were sleeping with the people to show with facts what our struggle was about".[117]

The TPLF/EPRDF's idea of mass mobilization was heavily reliant on a direct connection with the peasantry. The quest for "hegemony of ideas and views" mentioned by Yemane should thus be interpreted as having the farmers as its main focus. Less attention was accorded to other social groups, whose ideas and critiques have been actively excluded from political debate since the EPRDF came to power. This aspect is well illustrated by the words of Haddush Kassu, former General Manager of the Ethiopian News Agency and one of the senior officials in the Ministry of Information. His words were a reply to a question about censorship of oppositional blogs.

> During the elections it is true that websites played a big role and people were printing articles from the Internet and using them and disseminating them. But I do not know about the relevance of these ideas, because they are just individual opinions. Some issues are controversial only for the politicians but not for the people. So we think that if people think differently they have to have the chance to express it and strengthen their way of looking at things. But if it is just about

[116] For a comprehensive review of the role of the concept of mass mobilization in revolutions see, for example, Jack Goldstone (2001).

[117] A female former fighter I interviewed in Tigray further illustrated this point with her testimony by explaining that "during the struggle we were going house to house to talk with the women and also to help them. So at the end we were like friends. And they became interested in what we were saying" (Interview: Roman Almaz, Regional Head of Women Affairs, Tigray and Former TPLF Fighter).

the elite agenda, the individual agenda and not the agenda of the people why we should allow them to express.[118]

The populist attitude exemplified by Haddush is a key component of the EPRDF's political project. By framing rural Ethiopia as the most important, and almost the only important, constituent of Ethiopian society, and by claiming to have developed a special relationship with it, the EPRDF has created a way to assert its legitimacy outside of the representation model which characterizes liberal democracies. But, as Yemane pointed out in his final remark, this has to be proven in practice, and technology, ICTs in particular, have come to play a key role in keeping contact with the masses, and demonstrating commitment to them through the implementation of government plans. How this was achieved in practice will be illustrated in Chapter 6 as the design of Woredanet and Schoolnet was profoundly influenced by the necessity to replicate some of the mechanisms that had been at the centre of mass mobilization at the time of the struggle with a larger constituency than the peasants of Tigray.

5.2.2 Excluding the elites

The process of framing the peasants as the building blocks of Ethiopian society was accompanied by a complementary framing of other groups as irrelevant or as enemies of the oppressed. Below is an excerpt from an editorial published a month after the capture of Addis Ababa, which describes the members of the Workers Party of Ethiopia (WPE), the party created by the Derg, as exploiters of the innocent.

The so-called WPE is a dictatorial fascist party which had been spilling the blood of the innocents from its very foundation till its doom. On the basis of the unjustifiable expression 'priority for the comrades; the best for the comrades', WPE members used to lead an affluent life. On the other hand, the unfortunate

[118] Interview: Haddush Kassu (Head of External Relations at the Ministry of Information and Former General Manager of the Ethiopian News Agency)

> poor were not properly paid for their labour and were even robbed of the fruits of their labour. *The Ethiopian Herald, Friday 28 June 1991*

It was not only the long term enemy which was framed as a danger to society. Other liberation movements which fought the Derg with agendas which differed from that of EPRDF, received similar treatment.

> At the present moment chauvinists living in foreign countries are doing everything to ignite the flames of war only days after the former regime, which was in the forefront of the war drama, was defeated. Only a few days ago, these anti-peace elements held a meeting in Washington and made various anti-peace decisions. We must not fail to recognize that anti-peace forces like the EPRP and MEISON undertake acts of war. These groups, being the very forces who used to murder the children of the oppressed people, have no compassion whatsoever for the oppressed.
> *The Ethiopian Herald, Thursday 6 June 1991*

Use of such language has continued and could be easily found in the government sponsored media at the time of research. This is a signal of the problematic nature of a nation building project which attempts to marginalize political dissent. As will be illustrated in Chapter 7, it has also triggered responses from those portrayed as enemies using similarly polarized rhetoric, which has been highly detrimental to political debate in Ethiopia.

5.3 An empiricist discourse of communication

In the previous sections, two components of the EPRDF's ideology have been examined, illustrating how the party devised its nation building agenda through the extension of discourses regarding the nation and society, ethnicity and the peasantry. Some aspects of the influence these two discourses have had on the reshaping of ICTs at the local level have also been illustrated and will be analyzed in detail in Chapters 6 and 7. However, the nature of the Ethiopian approach to ICTs cannot be

fully understood without referring to a third discourse: communication as an *empirical* process. On the one hand its characteristics derive from the two previous discourses: the definition of the farmers as the main targets of state activities and of the nation as a federation of ethnicities to be held together by increasing the presence of the state on the ground. Conversely, the discourse about communication has also structured the other two, defining the ways in which they are put into practice.

All three discourses are rooted in the experience the EPRDF leadership developed during the civil war. After the struggle ended the EPRDF demonstrated great reluctance to abandon or transform them, given the key role they played in coalescing various individuals around a common cause. When the TPLF started its struggle it was composed of a few hundred people, but only a few years later it had already gained control of most of rural Tigray.[119] Many other movements, such as the All Ethiopian Socialist Movement (MEISON), the Ethiopian Peoples' Revolutionary Party (EPRP) and the Oromo Liberation Front (OLF) had been active before the TPLF's foundation and were initially better resourced and more experienced, but it was the TPLF/EPRDF that eventually put an end to the Derg regime. Drawing confidence from this background, the new rulers proceeded to apply the lessons learned in Tigray to the whole of Ethiopia. Their communication strategy during the transition in the 1990s and the consolidation of power later on continued to heavily rely on practices and principles developed in their recent past.

5.3.1 Showing by doing

The TPLF always recognized the importance of communication in supporting its struggle. From the very beginning a variety of means were used to mobilize the local population and to make people aware of the causes for which the movement stood. Many fighters were given the task of visiting villages and explaining what the TPLF was and what its goals were. Churches and markets were used as focal points to address crowds. Leaflets in both Amharic and Tigrinya were printed in caves and

[119] According to Markakis (1987), at the time of the first TPLF congress in 1976 its entire membership was 170 people.

secretly brought into schools and government offices. In 1979 a radio station was established to extend dissemination of the message into enemy held territory. Debretsion GebreMichael, General Manager of EICTDA and formerly responsible for the maintenance of the radio in the bush, explained how communication was perceived during the war:

> Communication was central to the struggle, it was the essence of the struggle for us. [...] You had really to convert people, to make them think in a different way. And unless you communicate well and deeply you cannot get to the point of converting people. It is what you communicate but it is also the design of the communication itself. This component was critical to our success.[120]

He further elaborated on the meaning of "design of communication".

> Communication has to be not just abstract communication, just about principles. It has to be linked to the real life of people. We had to convince them through practice, showing what was practically changing in their lives and giving information that they could practically use in their life. [...] If you are talking to the peasants you have to show. The strategies that we were using in the struggle are still important and are still used now. Only the form has changed.[121]

The importance of showing and not using "just words" was similarly captured in Yemane Kidane's quotation in section 4.2.1 and in many other interviews with former fighters and members of the Ethiopian government. Fetlework GebreEsgabier, a female fighter who was active in mobilization during the struggle, named this strategy *empiricism*.[122]

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[120] Interview: Debretsion DebreMichael (Director General, EICTDA and former guerrilla fighter in charge of the radio equipment and propaganda)

[121] Ibid.

[122] Empiricism should not be confused with pragmatism, another of the principles guiding the operations of the fighters during the struggle. Pragmatism was embraced only by a minority of the TPLF vanguard and caused a split within the font. The idea at its core was that some key aspects of

> We were supporting empiricism. The idea to practice first rather than just disseminating ideology. We were not using theories to explain to people. We had to act first to show them. But at the same time we were thinking that practice should be led by theory. Theory was important to analyze issues. And practice should be theory driven. But you have to implement to make people understand, to explain to them.[123]

Empiricism does not operate on the principle that actions should follow words, as is generally the case where political organizations are competing for power. Rather, it demonstrates that for the TPLF facts *were* words. Facts were the message. It was mostly through direct exposure to what was being done on the ground that people could be "converted", as pointed out by Debretsion, and thus choose different courses of action. This belief continued to guide EPRDF cadres, and has strongly influenced key aspects of the re-shaping of ICTs, as will be shown in Chapter 6. Debretsion illustrated this relevance of empiricism in recent times.

> So this is also key now, because all the strata of society have to be reached. ICTs represent an extension of that very idea. If the Prime Minister wants now to communicate with the people he can do it. So, this need to reach out to the people is still there. But now since you have a country to rule it is more difficult, you cannot gather all the people. You need the infrastructure, but communicating effectively is still an art.[124]

Similarly, Bereket Simon, former Minister of Information and Advisor to the Prime Minister, explained that Woredanet was designed with the farmers as one of the main targets.

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the struggle should be concealed to those who were not part of the core leadership. (Tadesse & Young, 2003)

[123] Interview: Fetlework GebreEsgabier (Former Guerrilla Fighter and Officer in the Aksum province)

[124] Interview: Debretsion DebreMichael (Director General, EICTDA and former guerrilla fighter in charge of the radio equipment and propaganda)

> Woredanet is for different purposes. It is to strengthen the capacity of the public administration,
> but it is also to reach rural Ethiopia, to make sure that the farmers get the right information. Woredanet is part of the wider communication strategy we have developed. Instead of communicating with everybody, we prefer to communicate with the most advanced part of the society and let it be our messenger.[125]

Some features of Woredanet were thus optimized to emulate some of the communication mechanisms employed in the bush, but on a larger scale. Videoconferencing from the centre towards the peripheries was prioritized over Internet browsing, for example. As is further explained in the next section, having the vanguard talking to the local political cadres was considered more important than letting them use new tools to find tailored solutions on their own.

5.3.2 Internal communication

The focus on showing results instead of just promising them was effective with the peasants during the struggle but presented a fundamental challenge: to ensure that at different levels the fighters, and subsequently the administrators, knew what these results had to be. As indicated by Fetlework in the previous section, theory did not have to be communicated directly to the ground, but was nonetheless informing the majority of decision-making ("We were not using theories to explain to people. We had to act first to show them. But at the same time we were thinking that practice should be led by theory. Theory was important to analyze issues"). Yemane Kidane extended her argument:

> When communicating in the bush we had a lot of problems in making sure that the same information could make it to the village councils without being corrupted. Because of course everybody was interpreting [it in] his own way. And these people who were leading the struggle at the grassroots level could not

[125] Interview: Bereket Simon (Former Minister of Information and Advisor to the Prime Minister)

> show that they did not know what they were fighting for and what they were doing. So even if they had not understood a message well, they had to communicate to the people what was their interpretation. And maybe this was different from the original message. [...] The people on the ground were the ones who had to know how to implement. But the ideology was at the centre. It was the prism through which all information was elaborated and decisions were taken.[126]

The need to ensure that a vision and the activities derived from it are known at different levels is common to many organizations. What is important in the present context is how this has been perceived as a priority by the government for a long time and has influenced the interpretation of ICTs as the tool that could meet this need. In section 4.1.3, I illustrated the importance of Woredanet in ensuring that all cadres received the same message. Amare Anslau, CEO of ETC, reaffirmed this point.

> When information is provided through mediators it may loose the value that the first person gave to it. But now a message that emanates from the Prime Minister can produce the same level of understanding both among officials as well as at the lowest level.[127]

Amare used the example of the Prime Minister to illustrate his point which is similar to the example cited by Debretsion in the previous section when he noted "If the Prime Minister wants now to communicate with the people he can do it". These two cases are far from being isolated examples. Most politicians and civil servants, when asked to provide an example of how Woredanet was used, mentioned the need for the Prime Minister to communicate.[128] This aspect has had a profound influence on the design of Woredanet, and will be analyzed later in Chapter 6.

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[126] Interview: Yemane Kidane (Former Member of EPRDF and Officer in the Ministry of Foreign Affairs. Director, Centre for Policy Research and Dialogue in Addis Ababa)

[127] Interview: Amare Anslau (CEO, Ethiopian Telecommunication Corporation)

[128] The interviewees were not primed but responded to generic questions. For example, they were not asked how the Prime Minister was using the system, but they were asked only to provide examples of

5.3.3 Refusal to engage

A final aspect of the discourse on communication is related to the relationship the TPLF/EPRDF has with its political opponents. As illustrated in section 4.2 the vision of society advanced as part of the EPRDF's nation building project posits a population divided between a large constituency for which the state is responsible and a minority that opposes the endeavour. Since it came to power the EPRDF has chosen not to negotiate with adversarial voices, preferring to expand its influence and presence as exemplified by ambitious projects like Woredanet and Shoolnet. The party has sought to minimize and marginalize opposition, rather than enlarging its base by incorporating new forces and perspectives. This attitude is clearly evident in the words of two senior members of the EPRDF, Bereket Simon and Ahmed Hassen, Deputy Chairman of the Information & Culture Affairs Commission, as they describe the initial period of EPRDF government and how the policy towards opposition entailed ignoring competing ideas.

> There were problems with the practical perception of what we were doing. With the new constitution there were people who were not happy with the idea of ethnic federalism. They were thinking that ethnic federalism would have endangered the unity of this country. And we had to reply to them with the practice. [...] The elites in the urban areas did not like us for the handling of the national question. So we decided that we were going to deal with this with time. Not immediately. We wanted to address this issue by showing it. And we were also busy addressing all other issues: agriculture, education, everything that was needed to rule a country. And our being busy addressing all these issues also gave the opportunity to the opposition to hammer us constantly. But we were ready to accept these hiccups. We did not have to explain. We were doing.[129]

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how Woredanet was used. In some cases, such as those cited here, this question was not even asked, but the reference to the Prime Minister came spontaneously as part of the response to a different question.

[129] Interview: Bereket Simon (Former Minister of Information and Political Advisor to the Prime Minister)

Bereket's statement summarizes a range of issues that have been analyzed so far: ethnic federalism as the core of a new discourse of the nation, the dismissal of urban elites as inimical forces, and the importance accorded to practice rather than rhetoric. But most importantly for the present argument is observing how little relevance he accorded to the engagement with other voices and the need to respond to criticism. As is typical of populist discourses, the culture of "doing" pursued by the EPRDF was opposed to a culture of just "talking", which oppositional forces are accused of. This point was further substantiated during an interview with Ahmed Hassan, Member of Parliament and Deputy Chairman of the Information & Culture Affairs Commission:

> We saw this initial phase as a transition period. We did not have very much hope. We hoped that a democratic process would have come through the civil society and we were hoping also through the media. But the media did not participate. They were just adversarial. And so our approach was to just ignore them. At the time of the transitional government they were attacking Meles personally but he decided just to ignore them. [...] Unfortunately there is no middle ground in Ethiopia. The culture of dialogue is not there.[130]

This confrontational environment and the lack of any desire for engagement, on both sides of the political spectrum, is one of the main factors which later led to the closure of many critical newspapers, and the censoring of blogs. The government contributed to the creation of this climate but it has also been a victim of it. Its refusal to engage has polarized political debate, further radicalizing adversarial components of society which, after having been framed as enemies, have become enemies in actuality.

[130] Interview: Ahmed Hassen (MP, Deputy Chairman of the Information & Culture Affairs Commission)

5.4 Conclusion

Chapters 4 and 5 contribute substantially to answering the first component of the question driving this thesis: *why* ICTs in Ethiopia have taken the shape they have. This chapter, in particular, identifies the nation and state building processes Ethiopia was engaged in at the time when a new wave of ICTs for development campaigns reached the country, as the most influential factors in shaping ICTs to manifest themselves in their present form. While connecting the Ethiopian case with wider scholarship on nations as imagined communities (Anderson, 1983), this chapter has investigated the specific discourses that were aimed at building Ethiopia as a federation of ethnicities, creating a popular base against political opponents and effectively communicating with it. The evolution of the discourses was also illustrated, focusing, in particular, on how they originated at the time the EPRDF was a guerrilla movement fighting the Derg regime and how they later came to influence the re-interpretation, re-definition and re-shaping of ICTs in the country.

The specificity of the discourses articulated in Ethiopia suggests that there should be greater reflection in the scholarship on the explanatory power held by theories addressing, for example, the democratizing potential of new technologies or their capacity to support good governance. If most of the research on ICTs and their appropriation in developing countries continues to focus on categories that are grounded in Western thought, it will continue to ignore the important processes that influence the shaping and use of new technologies. Transforming a country into an ethnic federation may or may not be positively associated with greater democratic processes and a more accountable state, but the realization of this project certainly has consequences for the lives of Ethiopian citizens, consequences that are worth studying per se. The findings illustrated in this chapter should also stand as an invitation for future research to move beyond questions asking, for example, whether ICTs have a democratizing effect or not, and instead focus on the more complex nexus of governance and politics and how ICTs emerge and operate in developing contexts. The next chapter further substantiates this argument, illustrating how the combination of global tools and local discourses generated technopolitical regimes that present challenging puzzles to mainstream ICTs for development theories.

CHAPTER 6 – THE NATIONAL TECHNOPOLITICAL REGIME

> Not long ago, many of us felt that we were too poor to afford to invest seriously in ICT. We assumed that ICT was a luxury that only the rich could afford. We were convinced, and rightly so, that we should invest every penny we have on securing the next meal for our people, on putting some sort of shelter over their heads, on reducing or, as the experts in the development business would have it, alleviating absolute poverty, absolute poverty which has aptly been defined as poverty that kills. We did not believe that serious investment in ICT had anything to do with facing the challenges of poverty that kills. Now I think we know better. Now we believe we are too poor not to save everything we can and invest as much of it as possible on ICT. We recognize that while ICT may be a luxury for the rich, for us - the poor countries - it is a vital and essential tool for fighting poverty, for beating poverty that kills and ensuring our survival. That is why we are fully committed to investing as much of our time, energy, and money as possible on ICT and to its effective use in our war on poverty. (Meles Zenawi, Prime Minister of Ethiopia)[131]

Meles Zenawi's statement illustrates how dramatically the perception of ICTs has evolved over time in Ethiopia. ICTs were initially interpreted as instruments that could do little to help a country where food security was still one of the main concerns, only to later become, in the words of the Prime Minister, "a vital and essential tool". This chapter analyzes the various steps which characterized this progress, but it also addresses some key aspects concealed by the Prime Minister's words: how the investment of "time, energy, and money" in ICTs was not simply motivated by the "war on poverty", but, more importantly, by the desire to use technology to enact the EPRDF's political plans.

The previous two chapters analyzed the discourses at the core of this plan as well as those emerging around ICTs, starting with politics to get at technology. This

[131] The quote is taken from the inaugural speech made the Minister of Capacity Building Tefera Walua (2006) at e-Learning Africa, the international conference on ICT for development, education and training in Africa that took place in Addis Ababa on 25-27 May 2006.

chapter and the following one will move in the opposite direction, looking closely at technological artefacts to reconstruct how they have embedded specific political plans. They will focus on the technopolitics that emerged at the intersection between hegemonic projects and technical possibilities and on the actual technopolitical regimes that were generated from this intersection.

After having dealt with the passages that led to a progressive engagement of the Ethiopian government with ICTs and finally to the development of a national technopolitical regime centred on Woredanet and Schoolnet, this chapter will illustrate how the discourses on the nation, society and communication were embodied in different components of these two systems. It will also be shown how the process of adaptation of tools designed outside Ethiopia to meet local needs did not result in a perfect "machine" which could lead to the most effective implementation of the plans defined at the centre, but instead in a less coherent assemblage which fell short of realizing all the aspirations expressed by the Ethiopian government.

The findings presented in this chapter are the result of the use of different sources and methods of data collection, as outlines in Chapter 3. During my fieldwork, I visited Woredanet and Schoolnet sites in Tigray, Oromya, and SNNP, where the systems were analyzed and interviews were held with technical personnel, local administrators, civil servants, teachers, and students. Reports were collected from a variety of national and international institutions, private consultancy firms and independent research centres. Numerous interviews were also carried out with politicians, civil servants, and engineers in Addis Ababa, as well as with international civil servants and international consultants. All these sources helped to reconstruct the complexities of the Woredanet and Schoolnet systems and the story of their evolution from their inception to their deployment and use.

6.1 Fluctuations and turning points: moving towards a new technopolitical regime

The process leading to the creation of a national technopolitical regime, which had Woredanet and Schoolnet at its core, was not linear or smooth. On the contrary, it was characterized by a chaotic evolution, marked by an initial slow progression and a subsequent rapid acceleration. This phenomenon could be explained by one of the principles developed in IR constructivist theory: the necessity for new discourses to be effectively embraced to resonate with those already articulated in specific social and political environments. In many cases this fit is not initially apparent, but must be constructed by either local or international actors, or both (Checkel, 2001; Keck & Sikkink, 1998). Following this principle the movement towards the design of Woredanet and Schoolnet could be divided into three different phases. During a first phase, the discourse on ICT for development as articulated internationally emerged as mostly alien to state agents, the only ones with enough power and resources to open the path towards new applications of ICTs. In a second phase different actors progressively built the bases for a fit to be created between international and local discourses. Given the nature of the ICT agenda, this fit had to be found both at the discursive and at the material level, and required the Ethiopian government to develop an understanding of the means that could be mobilized to support its agenda. Finally, a path was opened for the creation of a new technopolitical regime, taking shape at the crossroad between the opportunities opened by the new tools and the political ambitions articulated at the local level.

The first phase can be dated between 1991, when the EPRDF seized power, and the early 2000s. In this period the government showed little inclination to embrace ICTs as advocated by international organizations and corporations. Its priority was guiding the country through a critical political transition after a long civil war and new technologies, as framed in international circles, did not appear instrumental in achieving this plan. The promotion of the private sector and of the free flow of information held very little appeal for the EPRDF. Economic growth and efficiency were certainly more interesting, but were not as crucial as political

hegemony or the control of the state, which, quite predictably, did not feature in the international discourse. As a sign of this minimal interest, the centres in charge of ICTs instituted by the Derg regime were left almost untouched, in contrast to urgent efforts to re-orient other institutions, which lead for example to the dismissal of most officers in the Ministry of Information and the Ministry of Education. As a former official of the National Computer Centre, recalled: "at the beginning they did not really care about us, we could continue to do what we were doing. Later they started asking us to do more bureaucratic work such as checking if efforts were duplicated, but we were not really affected by the change in power".[132]

During this period the new discourse on ICTs simply fluctuated throughout different sectors of the Ethiopian society, without finding a concrete application. In the absence of a clear understanding of how technology could be used to serve the state's interests or, on the contrary, could be turned against them, the government simply acted to guarantee that no other actors would be able to seize the opportunities potentially opened by ICTs. Telecommunications continued to be a state monopoly, no private Internet Service Provider (ISP) was licensed and even the purchase of hardware and software was complicated by a limited offer and by high import taxes.[133]

The beginning of the new millennium, however, witnessed the development of a different attitude towards ICTs, opening a second phase which would later lead to the massive investments undertaken to realize projects such as Schoolnet and Woredanet. It is difficult to assess exactly what event led to this turning point, and most probably it was not one, but a series of events which conspired to produce change, generating momentum for a new strategic approach to ICTs.

Between 1999 and 2001, the international community organized an unprecedented number of events on ICTs for development in Addis Ababa that

[132] Interview: Anonymous (25)

[133] Until 2008 all items such as personal computers, laptops, printers, etc. were subject to a 5% duty and 10% surtax on top of the 15% VAT. The lifting of the duty and surtax was welcomed by the business sector in the country, which, however, indicated that also the VAT should be lifted in order to promote the private sector and computer literacy (Mekuria, 2008).

forced some key figures, including Meles Zenawi, to engage more seriously with the new tools and rhetoric.[134] As previously argued, this did not mean that the discourses articulated on these occasions were unchallenged, in fact the opposite was the case, but they offered Ethiopia's leaders the chance to reflect on which aspects of this discourse were more compatible with their plans and to appreciate that despite often being framed as a holistic package, ICTs were not a monolithic entity.

The "unpacking" of ICTs was further facilitated by international companies which, if generally interested in supporting a discourse centred around the reduction of the digital divide, also had strong commercial interests and were eager to to win large contracts with African governments, even if this meant serving agendas that differed from those advocated in international fora. The first person to work closely with the Ethiopian government and to illustrate how ICTs could be tailored to the country's specific needs was Noah Samara, an Ethiopian national living in the US who founded the first satellite radio network, World Space Radio, as referred to in Chapter 5. The civil servants I interviewed at the Educational Media Agency and the Ministry of Education remembered Samara as the person who introduced ministers and technocrats to the uses of satellite communication to provide educational content and reach the peripheries of a large state like Ethiopia.[135] After Samara, other international corporations such as Cisco, Hughes Network and Panasonic started proposing similar or complementary ideas to respond to the requests articulated by the Ethiopian government, opening the path to a more enthusiastic appropriation of ICTs.

The availability of the skills necessary to re-shape new technologies according to a local agenda could be found in the international market and made it possible for the Ethiopian government to envisage new ways to implement their plans on the ground, which ultimately led to the design of Woredanet and Schoolnet. Relying on

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[134] See section 4.1.1 for a list of events and training activities in which representatives of Ethiopian institutions were involved.

[135] As Noah explained during a speech he delivered at the African Development Forum in 1999: "we have embarked on a study with the Ethiopian Media Agency to put receivers in every school and attach these receivers to computers and printers. In addition to delivering the curriculum for each school, the units would address the needs of the other constituencies attached to the schools: like women, health professionals, farmers" (Samara, 1999).

foreign companies rather than on local ones also represented a greater guarantee that the expected result could be reached in a shorter period of time, without having to wait for the necessary local workforce to be adequately trained, and that local politics would not jeopardize the realization of the plans defined at the centre. In contrast to other governments in the developing world, which might have seen the realization of similar large projects as an opportunity to strengthen the local private sector and develop a skilled work-force, the Ethiopian government prioritized the implementation of a national agenda and the connection of the centre with the periphery over the possibility of making of ICTs a dynamic sector. Even Noah Samara, who could have claimed a better knowledge of the Ethiopian society and culture, eventually fell out of the picture and all contracts for the implementation of both Schoolnet and Woredanet were signed either with American or Japanese companies: Cisco Systems for the provision of the networking technologies, Hughes Networks for the satellite connection, VCON for most of the videoconferencing equipments and Panasonic for the Plasma TV screens.

Since the decision was taken, the implementation of Schoolnet and Woredanet proceeded with remarkable speed, especially in comparison with the long time often required for projects of such a magnitude to be implemented in Africa. In 2004, only a couple of years after a Request for Proposals was issued to put the systems in place, the first broadcast classes could be attended in many secondary schools and videoconferences took place between the central government and some woreda offices. In order to enable the operation of the systems in even the most remote areas of Ethiopia which were without electricity and not served by the main roads, petrol generators were installed and the military was employed to airlift some of the equipment.

The explanation for the faster pace that characterized this third phase can be found in the greater clarity about how ICTs could be bent to serve specific national needs. According to some commentators, their deployment was accelerated in time for the 2005 elections, which posed an important challenge for the EPRDF and one that had to be addressed in advance. Prior to 2000, elections in Ethiopia had been staged for the ruling party to reaffirm its control over the territory and for external

consumption rather than to provide a real opportunity for political competition. Opposition parties historically had been harassed and, in most cases, boycotted elections in protest. However, in an effort to consolidate its domestic and international legitimacy, the EPRDF decided to make the parliamentary elections of 2005 the first openly contested polls in the history of Ethiopia. As was later recognized by international observers, the EPRDF allowed the voting process to be free and fair (Carter Center, 2005). Opposition parties were given unprecedented access to the state media and numerous oppositional newspapers were able to circulate in Addis Ababa and other major cities. The comparative openness, however, required the government to develop new tools to make sure that it retained a competitive advantage and occupied the political spaces necessary to win the election through consensus and not coercion alone. Bobak Rezian, the ICT focal point for the World Bank, argued that the election strategy had a profound influence on how new technologies were to be interpreted:

> Before the elections in 2005 it was key for them [the government of Ethiopia] to reach the population in the rural areas. To speak with the peripheries. And they saw technology as an opportunity to do that, a great opportunity. And this strategy was the driving force behind their plans, even if they did not realize how expansive the project was going to be.
> But because of this the political dimension created problems. Technical decisions were made by political figures creating a convoluted combination. And they rushed all their plans so much that they were not aware of all the problems that would have obviously arisen on the way. In fact at the end it did not really serve the purpose they had in mind. And the technology did not make such a big difference in the elections of 2005. But at the same time by investing and implementing so much they realized that this tool was powerful for politics and for other reasons too. This is the law of unintended consequences.[136]

As Bobak's words suggest, the deeper knowledge of the potential of ICTs, if motivated by a greater enthusiasm among the political elite, did not necessarily lead to the creation of a perfect assemblage. The Ethiopian leaders still had to confront the

[136] Interview: Bobak Rezian (ICT Focal Point for Ethiopia, World Bank)

reality of adapting a technology that was designed to serve different purposes. In the minds of top level politicians, technology had to be a direct expression of their strategic thinking. But in the absence of a local capacity to reconfigure and re-shape technology, a variety of actors needed to be mobilized to establish Schoolnet and Woredanet. International corporations were responding to the requests expressed by the government, but always within the limits set by the contracts they had signed. Middle level bureaucrats were left to mediate between the two worlds but at the same time they often lacked enough power to take important decisions. As a long serving Ethiopian technocrat who worked on Woredanet since its initial conception explained: "The minister of capacity building was asking and demanding and we had to come up with solutions to what he was asking. There was frustration after frustration. All the decisions were political decisions".[137]

The need for a thorough coordination motivated the building of institutions where political will and technical expertise could be reconciled. A national ICT committee was created with input from all the main ministries to assess the needs of different sectors, from agriculture to federal affairs. But it was the foundation of the Ethiopian ICT Development Agency (EICTDA) in 2003 that provided the coordination and oversight necessary to develop and manage complex projects such as Woredanet and Schoolnet, as well as other ICT projects in the country. EICTDA became the transmission chain between the highest levels of the government and all other gears of the national technopolitical regime. It was a novel kind of institution in the Ethiopian landscape. Hosted in one of the newest buildings erected by the Ethiopian government, it was set to represent a new outpost of modernity. As compared to the traditional ministerial bureau, usually dated and reflecting the country's communist past, the luminous EICTDA's offices, separated by glass rather than walls, were set to incorporate the new principles of transparency and accountability. Most the staff were young graduates that were among the best in the country. At the same time, as most Ethiopian institutions, it still maintained the burden of the centralized administration of power, marginalizing creative but unaligned positions in favour of politically motivated ones. This was evident in the numerous interviews carried out with EICTDA's officers and in the variety of

[137] Interview: Anonymous (32)

opinions collected among them, of which, however, very few found an application in official policies and state sponsored technologies.

6.2 Technopolitics in action: embedding the key discourses into artefacts

A growing understanding of how ICTs could be employed to serve its nation-building agenda and the international availability of the skills required to translate this vision into practice provided the Ethiopian government the opportunity to turn politics into technopolitics. This enhanced dimension of political power opened the opportunity to enact policies through the support of technological artefacts, but it also engaged politicians and engineers in complex negotiations to reconcile political aspirations and technical possibilities. This section analyzes the key aspects of these negotiations, focusing, in particular, on the influences exercised by the three discourses illustrated in Chapter 5 on the actual development of Woredanet and Schoolnet. Through a close look at the two systems it is shown on the one hand how they were designed to structure both objects and users in ways that were instrumental to the EPRDF's national plan, and on the other hand how the material nature of ICTs often forced technocrats and politicians to revise parts of their strategies.

In order to equip the reader with all the necessary means to indentify the various steps of this process of mutual influence, before moving to the analysis of how discourses on the nation, society and communication were embedded into Woredanet and Schoolnet, some of the technical aspects of the two systems are briefly outlined.

Figure 6.1 illustrates the architecture that Woredanet and, in part, Schoolnet are based upon. The system is divided into three fundamental components: the satellite, represented at the top of the picture; the national data centre, on the left; and the remote sites, on the far right. Each component is described in detail below, also illustrating some key features of Schoolnet by comparing it to the very similar architecture of Woredanet.

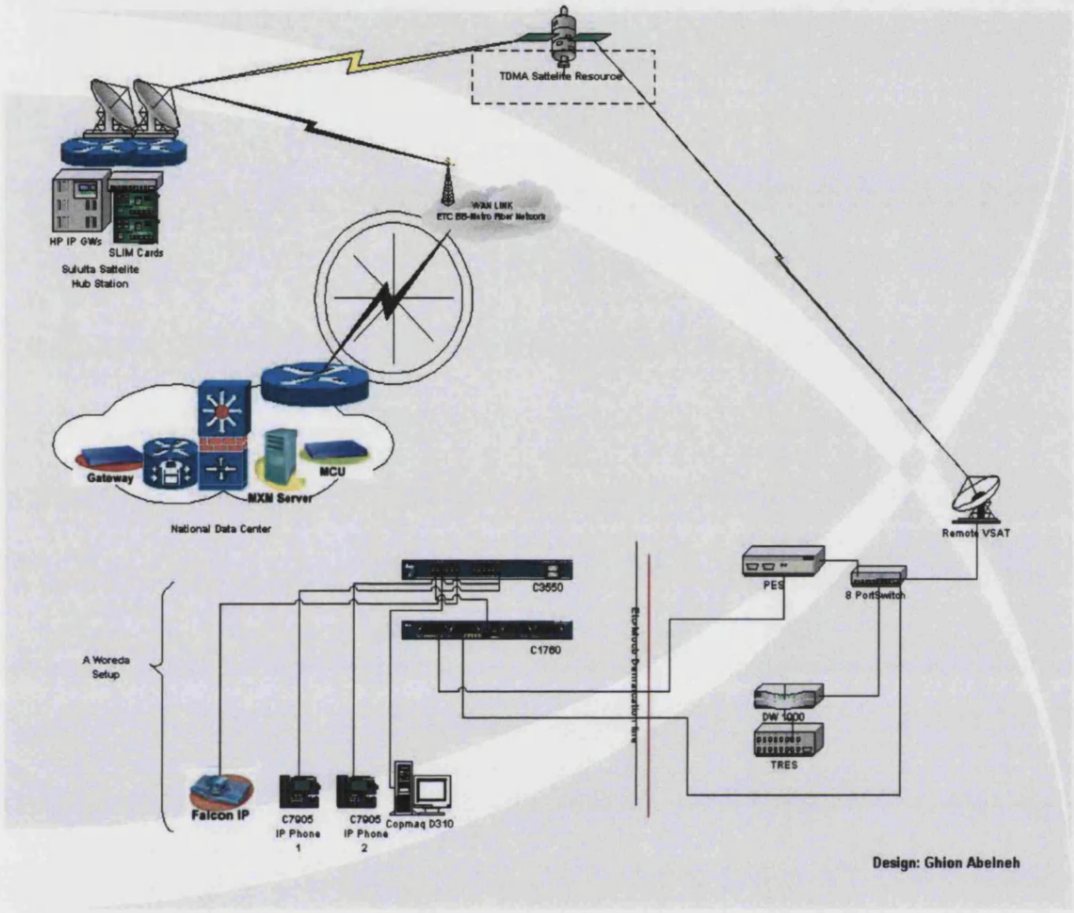

Fig. 6.1 The Woredanet Architecture (Source: EICTDA)

The satellite

For a country like Ethiopia, vast, landlocked and with very little infrastructure, the use of a satellite was the most practical option to implement Woredanet and Schoolnet within a short timeframe. The connectivity was provided by Hughes Network Systems, through a C-band transponder on the Intelsat Satellite 901 in service over the Atlantic Ocean. The transponder, with a capacity of approximately 60 MBps, had to be shared between all the services offered by the two systems. Schoolnet was allocated approximately 16 MBps which were used to broadcast pre-recorded classes on eight channels.[138] The remaining bandwidth was used by

[138] The number of classes was later increased to 12, but this did not require augmenting the bandwidth allocated to Schoolnet on the satellite. The channels were administered through a statistical

Woredanet to provide various services: videoconferencing, emailing, voice-over- IP (VoIP) and access to the Internet. The system offered Broadband on Demand (BoD): each service was allocated a certain amount of Mbps, but each channel could be switched off to free bandwidth for the others, as was often the case.

The national data centre

Woredanet's main servers were installed in the national data centre, located in the office of the Prime Minister. This site hosted the equipment necessary to initiate and manage videoconferencing sessions as well as to remotely control the other services provided through the satellite. The selection of the site is indicative of the strategic relevance of the system and its importance in serving a centrally defined agenda. Two sets of servers, the Media Xchange Manager (MXM) and the Multipoint Control Unit (MCU), were configured to support different videoconferencing typologies, enabling centralized communication. The three most important are detailed below.

Broadcast is a type of transmission whereby messages are sent from one point to all other points. It requires a stream of information to be sent only once but it does not permit any other node to interact with the source or other nodes. While it is the most centralized, it does not allow the centre to see what happens in the remote sites.

Multipoint transmission allows simultaneous videoconferencing between three or more remote points. It is mediated through an MCU where each party must be authenticated. The MCU receives streams of information from each node and, similarly, sends individual streams to each of them. In a situation where bandwidth is scarce, as in the case of Woredanet, only a few nodes can simultaneously participate in the same session. It is a relatively centralized system. The centre has the power to connect or disconnect parties to a specific session. It also sees what is

---

multiplexing, a system which could optimally allocate bandwidth among channels. According to the system administrator in charge of the management of the bandwidth at Sululta Earth Station, "a statistical multiplex allocates bandwidth to each channel according to the needs in a particular moment. For example if one channel for some time has just a black screen and does not require a lot of bandwidth, extra bandwidth is freed for other channels that may have picturesor videos which require more".

happening in the remote sites and it is the only node that can decide whether or not to forward messages coming from one remote site to the others.

Multicast is a type of transmission where messages originating from each node are sent directly to all others, without the need for a central server. Multicast allows the remote sites to communicate with each other, bypassing the centre which is required as a bridge during a multipoint session. However, similar to multipoint, multicast presents some challenges when bandwidth is scarce and multiple nodes participate in the same session. It is the most decentralized and transparent system, in theory allowing each party to join a multicast session at any time and see all other streams.

Woredanet was configured to manage each type of transmission, while Schoolnet was capable only of broadcasting messages. Also, while Woredanet content was managed at the national data centre, the Schoolnet's broadcasts regularly originated from the Educational Media Agency.[139]

The remote sites

In the Woredanet's architecture the remote sites are composed of regional and woreda nodes. They function using similar equipment, with two exceptions. Regional nodes, in theory, are able to initiate a multicast session, while woreda nodes can only join an existing one. Most regional nodes are also equipped with a terrestrial connection that allows them to be connected to the Internet and use other applications on a regular basis, while woreda nodes only have access to the Internet through satellite which provides intermittent service.[140] Apart from these differences, all remote sites are equipped with a Very Small Aperture Terminal (VSAT), a 2.4 m satellite dish connected to a router and switch, which addresses traffic to three different types of equipment: a set of PCs, two VoIP phones and a videoconferencing system. As shown in Figure 6.2 the front end of the videoconferencing system is

[139] Also the national data centre could reach Schoolnet remote sites when needed, as will be explained in section 6.2.2

[140] At the time of my research the Regional Data Centres in Gambella and Benishangul did not have a terrestrial connection.

constituted by a large Plasma TV screen, a video-camera, and other equipment managing video and audio streams. The videoconferencing system is usually installed in the Bureau of Capacity Building in the regional and woreda offices, so it is necessary for administrators and civil servants to gather there in order to attend the videoconferencing sessions.

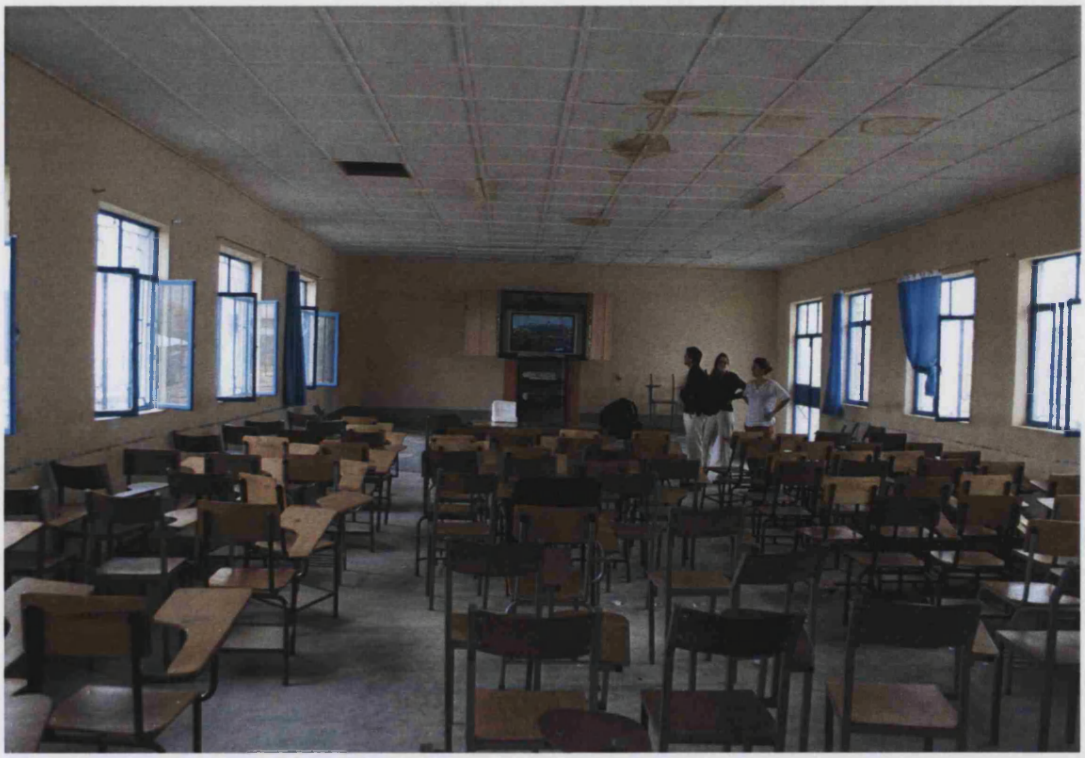

Fig. 6.2 A room dedicated to Woredanet videoconferencing (© Author)

Schoolnet's remote sites are simpler than Woredanet's. As schools only receive broadcasted lessons they do not need videoconferencing equipment. In addition, they do not have VoIP phones and only a few enjoy an Internet connection. However, similar to Woredanet, they receive streams through a VSAT and have a 42 inch plasma television screen as a delivery mode.

As described so far, the system may simply appear to be characterized by a eclectic and complicated architecture. On the contrary, as will be discussed in the next section by associating some of the components of Woredanet and Schoolnet

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with the specific discourses illustrated in Chapter 5, there were underlying motivations behind this convoluted patchwork of technology and politics.

6.2.1 An ethno-technical federation tied to the centre

The influence of the EPRDF's ethnic federalist project on the development of both Woredanet and Schoolnet can be seen in the architecture of the two systems. As illustrated in Chapter 5, the promotion of a discourse reframing the domination of a single minority in the larger context of the right to self-determination of every minority, proved a challenging enterprise, often forcing politicians and bureaucrats to come up with original solutions to a variety of problems, from the everyday administration of the periphery to the consolidation of power at the centre. In the case of Schoolnet and Woredanet this aspect was expressed both in the scale of the two systems and in their convoluted design. Some services, such as videoconferencing from the centre to the periphery, were privileged over others, such as the access to the Internet or the capacity to communicate horizontally among different nodes of the state apparatus.

The scale of Woredanet and Schoolnet was one of the most contentious issues dividing the Ethiopian government and the international community. Donor agencies were concerned that there were no examples of systems of this kind in Africa or elsewhere in the world and were demanding to pilot them first, before full-scale implementation. It would have been more logical, for example, to start with the major towns that were easier to access and had a greater availability of skilled personnel. The government, however, was responding to a different rationale. As Zelalem Bekele, the Chief Technical Officer at ETC explained:

> There is one principle here. When we started Woredanet and Schoolnet we went full scale and we knew it was going to be expensive but it was not unaffordable. But we had to respond to one principle in the government that is the principle of equity. You cannot derogate to that. This is something you cannot compromise. So we had to do it for the whole country. You cannot pick up one town here and

one village there and say this deserves connectivity and this not. It would be against equity.[141]

Enforcing the principles of ethnic federalism on the ground required the allocation of the same rights and resources to every ethnic group. The symbolic value of equally distributing resources among different regions was seen to be as important as their material value. It was essential that each node of the federal state had equal access to use the system, even if this might constrain its effective functioning.

Respecting this principle imposed serious technical hurdles, especially on Woredanet. One of the most serious was represented by the constraint imposed by the limited bandwidth available though the satellite managed by Hughes. Having every woreda connected at the outset meant catering for almost 600 nodes. With only 45 Mbps allocated to Woredanet on the Intelsat transponder, for every node to be constantly connected, the bandwidth available for each would have to be reduced to an untenable speed.[142] Another major problem was related to the lack of a skilled workforce in the remote sites. Even if most of the equipment was deployed on time, there were too few technicians who could install and maintain it.

Paradoxically, these two problems could have cancelled each other out, at least temporarily. For the first few years, the operational nodes were reduced to only 100 of the 600 sites that were equipped or waiting to be equipped with the required technology. Consequently, the bandwidth available for each Woreda was increased to a speed close to that provided by a normal dial up connection.[143] However, even at this point, the bandwidth continued to be insufficient to provide the service that was deemed the most important by the EPRDF leaders. 44 Kbps would have been enough to allow individuals in the remote sites to browse the Internet and use email but it was videoconferencing and not Internet access that was considered a priority by the central government. To allow videoconferencing sessions of a quality that was good

[141] Interview: Zelalem Bekele (Chief Technical Officer, Ethiopian Telecommunication Corporation)

[142] If each node had to be connected to the Internet, the speed of the connection would have be around 7.5 Kbps, half the speed allowed by the first commercial dial-up modems sold on the market in the early 1990s, whose speed was 14.4 Kbps.

[143] If one hour of navigation was allowed per region, the bandwidth available to each woreda could have been of a much higher speed, those usually available to commercial broadband used in Europe.

enough for the large screens located in each remote site, the bandwidth allocated by Hughes was 1 Mbps for download and 512 Kbps for upload. This dramatically reduced the number of nodes that could participate in a videoconferencing session and led to a competition of resources between different services such Internet browsing, videoconferencing, VoIP and emailing. As individuals who managed and used Woredanet described during interviews, this problem was solved simply by switching off the channels allocated to all other services so as to free bandwidth for central and remote sites to be "on screen".[144]

Additional evidence of the minimal interest in providing the periphery with a reliable Internet connection was also provided by the analysis of another aspect of the Woredanet architecture: the convoluted route that packages had to follow up and down the satellites in order to connect to a remote computer and a server hosting a website. The following explanation by an international consultant details the problem.

> Content from the Internet would have to travel first over satellite/fiber optic gateway from Europe, America, Asia to the ETC gateway [the teleport at Sululta] and then travel back up to a satellite (perhaps different from the first) to then be retransmitted down to the destination at a distant woreda and the user would get their desired Internet content with an extreme amount of delay. Typical roundtrip times for a single satellite hop are over 550 ms with no traffic, so a double-hop path would make interactive applications very difficult to use and websites very hard to navigate. (Haque, 2004, p. 13)

If the Internet was a priority, this complex system could have been simplified with a few changes in the architecture to reduce the two-hops to one and make the

[144] This aspect produced significant frustration among people using Woredanet in the remote sites. In fact, apart from when they were communicated to participate in a videoconferencing session, they did not know when they could have access to the Internet and when it would be unavailable. There was no service agreement of any kind. As an informant argued "no one in the remote sites knows when the system is going to work and for how long. From the centre, people can shut down the system without saying anything in advance, [even] just to test applications or for other reasons" (Interview: anonymous (59)

transport of Internet data faster and cheaper.[145] Videoconferencing packages, on the other hand, were not affected by this issue as they only had to travel "locally" with no need to access data coming from outside Ethiopia. Therefore, the alternative architecture that could have facilitated the browsing of websites without affecting the other services was never implemented.

The decisions to favour services such as videoconferencing over the Internet were rooted in the complex plan of controlled decentralization articulated by the Ethiopian government. As Yemane Kidane summarized in a quote cited in Chapter 5, "the people at the centre do not allow people at the woreda level to make their own mistakes. There is this obsession with control and command. So the people in the woredas, even if more trained and skilled [...] they are not allowed to learn from trial and error. They will always wait for instructions and will be afraid of taking responsibility".[146] Woredanet was installed in the remote areas not to empower individuals to find solutions to their problems independently, for example through accessing the Internet, but to offer to the central power the opportunity to impart clear directions when needed, even to the most remote nodes of the state apparatus.

Similarly, the strategies that had been employed in the bush to communicate internally played an important part in favouring a service such as videoconferencing over others. This influence was noted by Haddush Kassu, the former Manager of the Ethiopian News Agency:

> Face to face communication is vital to reach consensus. This is part of our way of framing communication. Woredanet comes from this attitude. The leaders of our country are here in Addis and they cannot communicate with the people all the time or travel to have face to face meetings. So Woredanet came to allow

[145] Rather than being channelled through the teleport at Sululta, the Internet data could have been provided directly from a teleport on the Hughes or another satellite. This would have entailed equipping the remote sites with receiving infrastructure and a routing system which could allow concurrent reception and forwarding of signals from both sources (one signal from the international teleport, and the other from the 'local' teleport at Sululta).

[146] Interview: Yemane Kidane (Former Member of EPRDF and Officer in the Ministry of Foreign Affairs. Director, Centre for Policy Research and Dialogue in Addis Ababa)

the Prime Minister and others to communicate as if they were in a face to face interaction, speaking to the people but also listening to what they have to say.[147]

The type of videoconferencing method that was chosen from those that were available represented a further illustration of how, in the minds of those who envisaged it, Woredanet had to serve the plan of progressive and controlled decentralization. Decentralization was a necessary step in the implementation of an ethnic federation, but the particular form envisaged by the EPRDF had to be controlled by the centre so as to prevent the nodes of the federal government from gaining too much independence.

According to this principle, multipoint communication was privileged over other videoconferencing formats that could be used through the Woredanet architecture. By using multi-point, all transmissions, whether between two woredas, between regions and woredas or between the centre and regions, had to be mediated by the centre. The other nodes were not given the freedom to choose when to use the system. To participate in a videoconference, remote sites were supposed to file a request at the national data centre, but more often the national data centre would notify the administrators in regions and woredas to convene in front of the plasma at a specific date and time to receive a transmission.[148] As explained by a technocrat working on the PSCAP reform, "Woredanet is there to provide support for things to be done properly, and to supervise them. But still nothing can be implemented without approval from the centre. Federalism does not mean independence [...] Technology helps to keep the pieces together. Maybe in the future the regions will be

[147] Interview: Haddush Kassu (Head of Research for the Ministry of Information and Former General Manager of the Ethiopian News Agency)

[148] An assessment commissioned by the EICTDA to an independent consultancy firm clearly illustrates this point "BCX and VCON had designed and spec'ed the system on the basis that videoconferencing sessions would only be initiated and controlled by either the Prime Minister's office (or the National Data Centre) or by the Federal and Regional sites – remote WoredaNet sites (the vast majority) would not be able to initiate or control videoconferencing sessions, and (because of this limitation), it would thus not be possible for any remote WoredaNet sites to videoconference with each other directly" (Daedan, 2004, p. 54)

strong to decide for themselves. But not now. Now it is not possible".[149] The technical and the political were thus aligned to make sure that the progress towards a better functioning of the peripheries of the state was gradual. The remote nodes were offered new and unprecedented opportunities, but they could be easily retracted and the nodes were always controlled at the centre.

Choosing multicast instead of multipoint would have posed some technical hurdles, but it would have equipped the system with far greater transparency and flexibility.[150] Regions would have been able to start their own sessions and communicate with each other without central mediation. Remote woredas still would not have been allowed to initiate a videoconferencing session, but they would have been able to join a session without requiring permission. At the same time, a multicast type of transmission would not have enabled the centre to authenticate and control the remote sites. The problem of bandwidth would have remained and the system would have been a little more chaotic. However, the limited resources could have been allocated optimally creating time-slots for different nodes to communicate with each other: region to region, a region with its woredas, a region mediating among different woredas, and so forth. However, this path was never tried. On the contrary, at the Woredanet sites I visited a service level agreement or document that could explain how, when and for how long they would have been allowed to use the system, was never provided. It was not only artefacts themselves but also the rules developed for their operation that made the remote nodes entirely dependent on the centre to perform any kind of action.

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[149] Interview: Anonymous (70)

[150] It would have created saturation problems because the bandwidth available would have been managed by the systems through statistical multiplexing and not by individuals deciding who to connect and disconnect. However, this problem could have been bypassed by providing windows for different regions or areas to communicate which could be managed independently from the centre.

6.2.2 Shaping society thorough the use of technology

Some aspects of the national technopolitical regime developed by the Ethiopian government, such as its penetration in the rural areas, might appear to be a consequence of successful advocacy by international organizations to use technology for the benefit of the poor. The AISI, along with authors such as Hudson (1984; 1990) and Parker (1981), placed significant emphasis on the opportunities offered by the new technologies to connect remote villages to resources previously available only in urban centres. A photo such as the one in Fig 6.3, taken outside a secondary institute equipped with Schoolnet could have been taken from a report published by a UN agency or a NGO about success stories of ICT applications in remote communities. Similarly, Fig. 6.4, which reproduces a popular ETC advertisement, is an illustration of how catering for farmers was a central component of the discourse on ICTs advanced by the Ethiopian government. However, the fact that Woredanet and Schoolnet were planned to reach even the most remote areas was less dependent on voluntary alignment with a discourse articulated internationally than on the ideological background of the EPRDF. The kind of equipment brought into schools and government offices could, and did, offer students and local administrators greater access to new training opportunities. However, this bore little resemblance to the off-ramps from information highways connecting villages to a globalized world that was envisaged by the AISI framework.

Fig. 6.3 - A teacher and students in front of a VSAT terminal

Commitment to the peasantry played a central role in the EPRDF's discourse on society, but it was also a means of reaffirming its legitimacy and control over the territory. If Woredanet and Schoolnet were designed to improve the quality of life of rural communities, this simultaneously entailed increasing the presence of the state on the ground. The two systems sought to address this in complementary ways: by improving service delivery and by opening new communication channels directly with the grassroots. The strategy had both practical and symbolic components.

The principles inspiring Woredanet were succinctly summarized, and cited in Chapter 5, by Bereket Simon:

> Woredanet is for different purposes. It is to strengthen the capacity of the public administration,
> but it is also to reach rural Ethiopia, to make sure that the farmers get the right information. Woredanet is part of the wider communication strategy we have developed. Instead of communicating with everybody, we prefer to

communicate with the most advanced part of the society and let it be our messenger.[151]

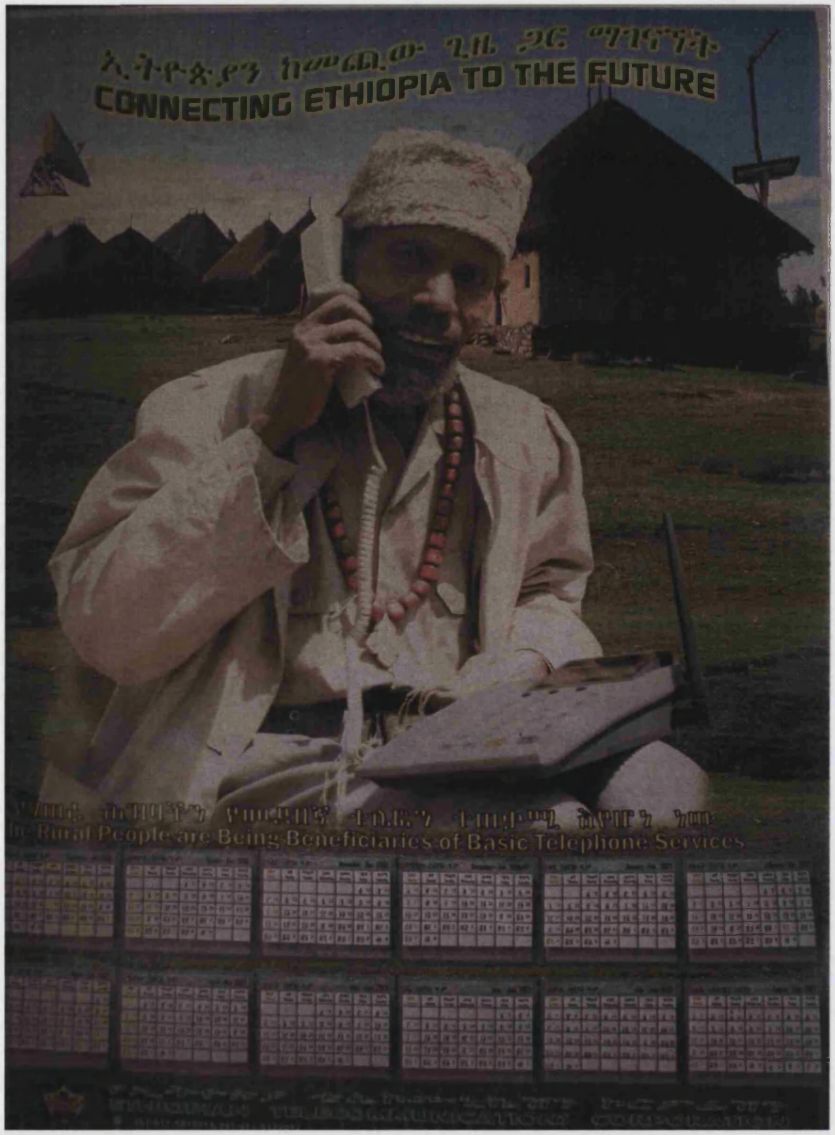

Fig. 6.4 ETC advertisement

At the practical level Woredanet had to build the capacity of the peripheral nodes of the state by training and instructing individuals, some of whom had little formal education, to enable them to provide better services. This had to benefit the whole community, but at the same time it also had to symbolize the commitment of

[151] Interview: Bereket Simon (Former Minister of Information and Political Advisor to the Prime Minister)

the government to the rural population. The most advanced part of the society was required to demonstrate the principles inspiring the Ethiopian state through their actions and become signifiers of a wider strategy. It was therefore extremely important that everybody knew what this strategy was. Analyzing the arguments used by two officials in charge of ICT in two local administrative nodes to describe the main functions of Woredanet in their localities suggests that the government was successful in this respect.

> This time it is possible that even the people at the grassroots level can receive the same information, they can receive the very voice of the Prime Minister. We have been using the system mostly for videoconferencing. It helps a lot to understand what the line of the government is, but also to learn new practices.[152]

> The government wants to provide us with information directly on our desk, the same information about the budget, politics, development to all desks in the country. In the remote areas people are not aware of what they should do. People do not know how to use new techniques for development. And this is a way to reach them.[153]

At the lower levels of the state apparatus there was awareness and acceptance that administrators and bureaucrats had to primarily serve as performers of policies that had been decided at the centre. The unity of the message was understood in its importance so as to coalesce the whole country around similar principles, despite its diversity. On the contrary, there was little perception that this strategy was openly contradicting the rationale of a federalist system, the delegation of key decisions to the officials who are elected locally and who can act according to a better knowledge of the situation on the ground (Kymlicka, 2006).

As compared to Woredanet, Schoolnet served the rural communities as well as the needs of the state in a different way. It enabled students living in the countryside to access the same kind of education as those in the major towns and cities. They no

[152] Interview: Anonymous (64)

[153] Interview: Anonymous (47)

longer had to rely on the weakest teachers for their education, as it used to be the case.[154] This was a powerful symbol of the EPRDF's commitment to guarantee every citizen equal rights and opportunities. Probably nowhere else in Africa can children who are born in remote areas attend classes of the same quality as those residing in the urban areas. However, abiding by this principle also meant that for some time Schoolnet was more effective at a symbolic level rather than at a practical level.

The fact that all the classes were taught in English caused serious comprehension problems for most students. In the schools I visited in 2005 and 2006, both in towns and in remote villages, I could barely have a basic conversation in English with students who were supposed to have been trained for at least one year with English as the medium of instruction. Also, when attending class during a broadcast, I noticed that most students were trying to sketch notes on their notebooks, but had to give up after a few seconds because the teachers on the screen were too fast to follow. As confirmed in an evaluation carried out in 2006 by UNDP among teachers and students, "the speed of plasma instructions and exercises coupled with the English language difficulty of learners have impacted negatively on students' understanding of the lessons delivered" (Asefa, 2006, p. 59). A number of amendments were later introduced by EMA to respond to some of these problems, and the "real teachers", those in the classroom, were allocated more time for explaining what had not been clear during the broadcast. As a result new evidence indicated that, especially in the higher grades, the level of understanding of what was said on TV had increased, also affecting the overall perception of the project.[155] A

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[154] According to the *Education statistics annual abstract for 2006-2007* (Ministry of Education, 2008), during the school year covered by the study, there were extreme differences among regions in the number of qualified teachers, and thus the teachers possessing the necessary titles to be teaching at the secondary level. In the regions surrounding urban areas such as Addis Ababa, Dire Dawa, and Harar more than 80% of the teachers were qualified. In the peripheries the picture was dramatically different. In Gambella only 7.5% of the teachers had the right titles to be teaching at the secondary level, 32.3% in the Somali region and 39.7% in the Southern Nations Nationalities and Peoples (SNNP) region (Ministry of Education, 2008).

[155] According to a presentation made by Demissew Bekele, EMA's General Manager in Addis Ababa in May 2008, as of 2008 the ratio of students who could understand the broadcast classes had increased to 66.3%. And, according to EMA's assessment, 70.8% of the students reported to have

United Nations Volunteer, carrying out an assessment of Schoolnet in 2008 recognized that "at the beginning the students did not like it. They wanted to break the plasma. Now they see it as their own property. So, things have changed over time".[156]

Another advantage of having each student exposed to the same programming was that each of the students could be equally trained in the founding principles of the state. Civic education was among the first subjects to be included in the Schoolnet programming and, according to some of the individuals I interviewed, the way it was taught was highly problematic.[157] Below are excerpts from the two manuals on which the lessons were based.[158] Their purpose is not to judge the discourses articulated through the civic education programme, but simply to highlight how they were constructing subjects and objects in ways that could not be other than partial. While some of the modules for the higher grades were addressing ways to curb corruption, to respect human rights and participate in elections, other issues addressed by the civic education classes were more problematic. For example for some Western audiences the following reference to capitalism is likely to seem contentious:

> In societies where we find categories of master and slave, landlord and serf, capitalist and proletariat, there shall be unequal distribution of rights and burdens among citizens. These inequalities lead to the existence of discrimination among citizens (Engida, 2007, p. 86).

Similarly, sympathizers of the former Derg regime as well as opponents of the idea of ethnic federalism would strongly challenge a statement like the one below:

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been motivated to actively participate by Schoolnet. It must be noted, however, that these figures emerged from an internal and not an independent evaluation.

[156] Interview: Anonymous (63)

[157] In April 2005, during one of my first visits to attend a Schoolnet broadcast in a secondary school in Addis Ababa, the teacher of civic education followed me out after the lesson and vehemently argued how what we both saw on the screen was propaganda and not educational content.

[158] I also personally attended some of the civic education classes and downloaded some of them from the servers at EMA.

> The right to equality of Nations, Nationalities and Peoples includes the equal rights to full measure of self-governance [...] It guarantees the nationalities, nations and peoples' equal right to administer their own region by themselves in a democratic manner. It also creates better conditions for national unity (Engida, 2007, p. 91).

Evaluating the efficacy of civic education taught through Schoolnet was outside the scope of my research. Nonetheless I could infer from interviews with local elites that many EPRDF cadres held a strong faith in the power of the new teaching to influence young Ethiopians. As Bereket Simon noted, in reference to Schoolnet:

> In our education our cornerstones are math, science and civic and ethical education. So we can have a home-grown democracy. A country in order. Now we will have a new generation that has been trained in the principles of democracy in secondary education and they will know how to contribute to the development of the country.[159]

Similarly, Haddush Kassu argued:

> We can use Woredanet and Schoolnet to educate people about civics, ethics, our national flag and hymn. All the information about the nation should be strengthened through the media and new technologies.[160]

Bereket and Haddush's words acquire even more significance when located in the broader context of the role young educated Ethiopians played in the country's political transformations. As illustrated by Young (1997), many of the TPLF's early recruits during the struggle against the Derg were secondary schools students. This

[159] Interview: Bereket Simon (Former Minister of Information and Political Advisor to the Prime Minister)

[160] Interview: Haddush Kassu (Head of Research in the Ministry of Information and Former General Manager of the Ethiopian News Agency)

point was further, and dramatically, illustrated by Fetlework GebreEsgabier, the female fighter I interviewed in Tigray:

> An important school was Queen of Sheba in Adwa. But there were important schools also in Mekelle. A lot of high school students joined the struggle. They were key especially at the beginning. And in Tigray the TPLF started having a lot of influence in the schools. Most of the people who joined the struggle at the time were students and many of them died as martyrs. I joined the struggle with my brothers and sisters and all of them died in it.[161]

The appreciation of the role youth can have in political mobilization persisted after the civil war, as did the strategies employed to reach out to young Ethiopians. Some of these strategies were implemented through newer means, such as the civic education programme offered by Schoolnet, while others represented a simpler extension of models that had proved successful in the past.[162]

Schoolnet, however, was not meant only to educate the youth. From the analysis of the architecture that was employed to transmit messages from EMA's headquarters in Addis Ababa towards secondary schools, it became apparent that the system was designed to enable other uses, beyond the transmission of pre-recorded classes.

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[161] Interview: Fetlework GebreEsgabier (Former Guerrilla Fighter and Officer in the Aksum province)

[162] An illustration of this latter tendency was offered by Solomon Inquai, an important ideologist of the TPLF and a long serving director of the Relief Society of Tigray (REST), the NGO created by the TPLF during the war to provide humanitarian assistance to the population in Tigray and that continued to play a pivotal role in the provision of basic services in the region after 1991. His response was to a question about how the ruling party lost some key constituencies in 2005 election. "In 2005 we lost Addis and many other towns. Since than we decided to organize youth leagues, and women leagues. Some of the members are university students, some are younger. We are also getting old and we need new members to replace us. Also during the struggle we had similar associations. But the reason of the election result is that we became too confident, we lost perspective. So we are trying to revive this tradition of associations, but on a wider scale. Not just for Tigray but for other regions as well". Interview: Solomon Inquai (Former Director of the Relief Society of Tigray).

In contrast to the videoconferencing used by Woredanet which was designed to be bidirectional, Schoolnet was based on static content and did not require interactivity between central and remote sites. If this had been the only use the system was designed for, employing a satellite to broadcast classes was not the most efficient mode of delivery. The provision of high quality education to both urban and rural areas, as well as the training in the principles of the state, could have been provided more easily and less expensively in different ways, for example, by saving all lessons on hard disks mounted on a local server. [163] As a young foreign consultant who visited some Schoolnet sites noted,

> The first time we saw Schoolnet we were shocked. They rented a satellite to broadcast pre-recorded content. Whoever designed it was crazy. The content is static. It would have been so much cheaper to buy hard drives and install the lessons on them. A big video server would have been much cheaper.[164]

Even if Schoolnet, like Woredanet, had many weaknesses, the reason for its particular configuration was not the folly of its designers, but simply was attributable to the fact that it was designed not only to reproduce the same educational content, but also to broadcast new messages when this was needed. When the students were not in school, the system was used as a platform for other training, including what has been described by some informants as "political" training. In this sense Schoolnet complemented Woredanet. While the latter was used to reach officers in the state apparatus, the former was an instrument to communicate with larger audiences. Amare Anslau, the CEO of ETC, explained this synergy:

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[163] A basic Schoolnet outlet needed at least a VSAT, a decoder, a router and a switch. Using a video-server and hard disk would have required a capacity of around 150 GB, a reasonable capacity for a hard disk even in 2004. According to EMA there were 2978 classes when the system started, and once digitized in an Audio Video Interleave (AVI) format a single class occupyed around 50 MB. This system would also have allowed teachers and students to replay some lessons so as to revise key issues in the curriculum or to provide students who could not attend a class with the opportunity of catching up with the program.

[164] Interview: Anonymous (41)

> Before Woredanet if the Prime Minister wanted to speak to the officials he had to call them, but now in a moment he can communicate with every woreda.[165] So this is disclosing unprecedented opportunities. The Prime Minister can address people through Schoolnet too and reach the whole country. He can also do it through Woredanet to contact every official. Now we can make sure that different people in different areas can be reached by the same message, directly.[166]

Woredanet and Schoolnet thus need to be understood not as separate programmes, designed to respond to different needs, but as complementary expressions of a similar need to reach the periphery of the state. If they were the incarnation of a serious commitment towards development, providing greater education opportunities and better services, they were also aimed at translating this commitment into a greater political acceptance of those in power and a reduction of the political space available for critique and alternative.

6.2.3 Internet or intranet?

The previous two sections (6.2.1 and 6.2.2) have analyzed how the discourses about the nation-state and society, ethnicity and the peasantry appeared to have influenced the shaping of ICTs in Ethiopia and, in particular, of systems like Schoolnet and Woredanet. They have illustrated how the discourses at the core of the ethnic federation motivated the decision to install the new equipment simultaneously in the key nodes of the state apparatus and how the need for controlled decentralization structured communication between them. I have explained how the use of ICTs to respond to the needs of rural communities was accompanied with the reinforcement of the presence of the state on the ground. By illustrating these points the two sections have also demonstrated some aspects of what I referred to in Chapter 5 as the discourse on communication. First, the communication strategy of

[165] Here Amare refers to the fact that even Woredanet could use a broadcast type of transmission when needed. However, as compared to multi-point this type of transmission was less common.

[166] Interview: Amare Anslau (CEO, Ethiopian Telecommunication Corporation)

the EPRDF, based on showing empirical results, led the government to increase the capacity of the state to deliver basic services with the support of technology. Second, both systems, but especially Woredanet, were a response to the need to deliver the same messages from the highest to the lowest ranks of the government without intermediaries, and to have the recipients of these messages act as messengers themselves to their larger communities.

To conclude this analysis, I want to examine one final component of the government's discourse on communication that has influenced the design of both Woredanet and Schoolnet: the refusal to engage in dialogue with oppositional forces. Although both Woredanet and Schoolnet were based on the IP and intended to deliver a variety of services, the very limited access granted to data from outside Ethiopia transformed the systems into a state intranet. In the case of Woredanet, as illustrated at length above, videoconferencing was the only system to be employed. Emailing was also occasionally used, but only within Woredanet sites.[167] Similarly, although some Schoolnet sites were supposed to receive an Internet connection, most of them did not, or did so only for a short period of time. This meant that most, if not all, information being received through the systems emanated exclusively from the centre of the state.

Woredanet and Schoolnet were essentially functioning as communication channels which were partially invisible to a large component of the Ethiopian society. Woredanet allowed exclusive and routine communication between nodes of the state. Schoolnet ensured that the new generations were exposed to messages decided at the centre, without the mediation of possibly critical teachers, and it also allowed the EPRDF to reach wider constituencies discretely.[168] Use of these new

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[167] A typical address of an officer in a woreda was "name@woreda.region.gov.et".

[168] I am not implying that marginalizing teachers was one of the main reasons the system was put in place, but it is important to be aware that in the history of Ethiopia teachers have played a key role as an oppositional force. As pointed out by Markakis, in the turmoil that led to the deposition of Haile Salassie, "The 17,500 teachers constituted more than half the country's professional stratum. [...] Their association was the only effective professional organization in existence, and it was to play a leading role in the popular movement" (Markakis & Ayele, 1986, p. 55). Similarly, many former TPLF fighters recognized that it was mostly in secondary schools that new recruits were convinced to join the struggle. After Schoolnet was introduced many teachers reacted negatively to their

channels provided the government with a strong competitive advantage over oppositional forces and prevented it from having to engage with them. As illustrated by Kumlachew Dagne, a member of the association InterAfrica, that mediated the televised debates between government and opposition leaders during the campaign for the 2005 election, "During the campaign the government was having a tough time in the debates. Many opposition candidates were having more success than the government leaders. As a result they cut the voices that could oppose them. And they had to rely on alternative ways to reach their goals".[169]

In this context, Woredanet and Schoolnet assisted the government in expanding its sphere of influence through the use of technology. The EPRDF almost always refused to engage in dialogue with other groups in society. When it attempted to do so, as indicated by Kumlachew, its culture of communication that centred more on showing tangible results than on winning rhetorical battles disadvantaged it in relation to the opposition. This experience reinforced the idea that the alternative strategies pursued through systems like Woredanet and Schoolnet should be strengthened in order to support the government nation building project and to increase its legitimacy in the eyes of Ethiopia's citizens.

6.3 Conclusion

This chapter has explored how a national technopolitical regime based on ICTs emerged in Ethiopia, incorporating salient discourses advanced by its ruling party and being designed to further enact them on the ground. The analysis responds to the second component of my main research question, i.e. *how* ICTs were re-interpreted,

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marginalization, especially the most experienced and active among them. A UN volunteer who assessed the use of Schoolnet among teachers and students noted that "In grade 9 when they start attending the plasma lessons for the first time they do not understand but slowly they start liking it. But a lot of school deans complain that as a result of the plasma a lot of teachers are becoming passive". Interview: Anonymous (63)

[169] Interview: Kumlachew Dagne (InterAfrica). Between September 2004 and April 2005 the main parties participated in nine televised debates each covering a different issue, with some key issues such as governance or federalism and decentralization being addressed in more than one debate.

re-defined and re-shaped. It has shown that it was by relying on competencies and resources available on the international market that the Ethiopian government could develop and implement its technopolitics. It similarly illustrated that it was thorough a constant process of negotiation between the political and the technical, and among different actors, that assemblages like Woredanet and Schoolnet developed, though progressive adjustments and solving the problems that arose as part of their design and implementation.

The focus on the mutual influence between politics and technology, however, was not intended to rule out other factors influencing the shaping of ICTs in Ethiopia, but depended on the specific conceptual framework structuring my research. Not all aspects of Woredanet and Schoolnet were motivated by a political will. Ethiopia is a vast and landlocked country, with an irregular geography, and employing a satellite as the transmission channel emerged as the only available option to realize Woredanet and Schoolnet within the chosen timeframe. The hierarchical nature of the system was also influenced by the similarly hierarchical structure characterizing the Ethiopian society that has developed through the centuries as a defining trait of the Ethiopian polity, distinguishing it from other countries in Eastern Africa. At the same time, it has to be acknowledged that while the development of Woredanet and Schoolnet, was influenced by factors at the technical and cultural level, the idea of the systems emerged first to perform specific political goals.

My argument is that politics is always likely to play an important role in the development of technological artefacts, especially of those of national relevance, but its primacy over other factors is not absolute and has to be assessed at the empirical level. This chapter has illustrated how politics prevailed in the case of Ethiopia. The next will continue to provide evidence reinforcing this claim, illustrating how alternative technopolitical regimes which could have challenged the EPRDF's national plan, were actively resisted and marginalized.

CHAPTER 7 – RESISTING ALTERNATIVE TECHNOPOLITICAL REGIMES

> One of the primary characteristics of a system builder is the ability to construct or to force unity from diversity, centralization in the face of pluralism, and coherence from chaos. This construction often involves the destruction of alternative systems (Hughes, 1987, p. 52)

Using ICTs to support nation building meant that the Ethiopian government not only had to assemble a technopolitical regime which amplified the discourses at the core of its political agenda, but also that it had to resist the emergence of alternative ones which could oppose it. Since the appearance of a new discourse on ICTs and development in the 1990s actors other than the government, both at the international and at the national levels, have favoured aspects of it which competed with the priorities articulated by the EPRDF and sustained different sets of interests. In some cases these alternative projects remained potentialities, elements of the discourse on ICTs and development included in official documents and advocated by important agents such as the UNECA, but with little or no application in the Ethiopian context. In other cases they were actualized in concrete artefacts and practices, leading to the emergence of technopolitical regimes that tried to oppose, complement or "patch" the technopolitical regime developed by the Ethiopian government.

This chapter considers these regimes, further illustrating how the struggle for the definition of ICTs in Ethiopia was fought both at the discursive and at the material level. It analyzes how the government's active resistance to some of the uses of ICTs had to face attempts by international organizations, private companies and opponent political groups to enforce them in the pursuit of competing goals. Three technopolitical regimes are analyzed, representing more or less structured alternatives to the national regime developed by the Ethiopian government: an international, a privatised, and an oppositional technopolitical regime.

Similar to the previous chapters, the findings presented here are drawn from several sources and methods of data collection. In addition to interviews with

Ethiopian politicians, civil servants, and technocrats as well as with international civil servants, the direct observation of technical artefacts was accompanied by reference to reports on those artefacts collected from national and international institutions. A screening of the most popular blogs and websites targeting Ethiopian readership was carried out to understand the nature of the oppositional technopolitical regime that was developed by members of the diaspora and of oppositional political groups. In particular, the three websites that were ranked as the most popular, Nazret, Ethiomedia and the Ethiopian Review, were monitored for 12 months before they were blocked by the Ethiopian government in May 2006.[170]

7.1 The international technopolitical regime: fighting international politics through technology

The implementation of Schoolnet and Woredanet alarmed the members of the international community in Ethiopia. Both donor and UN agencies were critical of systems that had no precedents in the field of ICTs for development and whose scale was considered disproportionate for a poorly resourced country like Ethiopia. In addition, the unwillingness of the government to pilot the two projects first, and to provide information that could facilitate a better understanding of their scope and nature, further alienated international actors and triggered increasingly aggressive, but not necessarily effective, responses.

Starting from 2004, when both Schoolnet and Woredanet became operational, the majority of bilateral organizations started to become reluctant to operate in the field of ICTs and to engage in new initiatives promoted directly by the government. In contrast to what was happening on the rest of the continent, where the influence of events such as the World Summit on Information Society (WSIS) was placing ICTs on the agenda, fewer meetings organized by donor agencies in Ethiopia on education or health proposed ICTs as a solution. This scepticism continued to influence the

[170]The popularity of the blogs was assessed through Alexa.com that registers how frequently websites are visited. The results were crosschecked with some of the informants. For more information on the methods employed to select and analyze online data see section 3.2.3

donor approach in the following years: it was evident, for example, in the refusal by most embassies to support Negroponte's One Laptop per Child (OLPC) programme in Ethiopia and in similar rejections to fund ICT components in country programmes.[171]

Multilateral organizations reacted in a slightly different way, elaborating a more articulated and ambitious agenda. In the years following the implementation of Schoolnet and Woredanet, agencies such as the UNDP and The World Bank started planning ICT projects which incorporated some aspects of the ICTs for development discourse that were resisted or excluded by the Ethiopian government. They used their leverage to progressively build a parallel technopolitical regime which could reduce the eccentricity of the national one assembled by the Ethiopian government. By implementing more mainstream initiatives which had been applied in other developing countries, and enjoyed a greater degree of support from the international community, multilateral organizations were attempting to patch in practice what they had not been able to redress employing the usual means of diplomacy.

The UNDP's project was the one where the "patching effort" was most evident. It consisted of the installation of computer laboratories connected to the Internet in every preparatory school (those catering for students in grades 11 and 12) already receiving broadcast content. Each lab was designed to be used by students to

[171] OLPC is an initiative launched by Nicholas Negroponte, the founder of the Media Lab at the Massachusetts Institute of Technology, to equip children in developing countries with rugged, low-cost laptops, to facilitate their learning process. In Ethiopia, the only donor agencies that supported the initiative were the German and Italian embassies. This followed decisions taken by the Italian government after a high level meeting between former Prime Minister Romano Prodi and Ethiopian Prime Minister Meles Zenawi. While the Italian government provided the funds to purchase 5000 laptops, the German Development Cooperation took care of their deployment and piloting in selected secondary schools. This intervention was supposed to represent the first phase of a larger scale intervention funded by other agencies, but no donors stepped up to continue this plan. More information can be found on the OLPC Ethiopia website http://wiki.laptop.org/go/OLPC_Ethiopia. Last accessed 19.04.2010. Similarly, in 2008, when all major donors embarked on the "General Education Quality Improvement Program Project" (GEQIP), a USD 400 million initiative aimed at improving the curriculum in schools, training teachers, improving coordination among education offices, they refused to include the investment in ICTs, as requested by the Ethiopian government.

learn key computer skills (word processing, spreadsheets, etc.), but more importantly, to conduct independent research using the Internet to complement the school curriculum. A total of 2,700 PCs were donated to 161 schools and each school was provided with an Internet connection initially paid for by UNDP with the intention that it would subsequently be funded by ETC.[172] In this case, the Internet connection was framed not as a marginal service, but as the system's defining characteristic: all computers were networked in a Local Area Network (LAN) and set to be connected to the Internet either through VSAT, dial-up or ADSL. If the project managed by EMA in Addis Ababa was meant to reach the periphery with content defined at the centre, officially to improve the quality of education throughout the country, the one promoted by UNDP was opening each school-node to the world, letting students and teachers decide which content they wanted to access.

UNDP operated not only at the technical level, but also at the symbolic level, strategically positioning its own project in relation to the one promoted by the Ethiopian government. Similar to the Ethiopian government's project the UN's project also was called Schoolnet. This was not done to frame the laboratories as an integral part of the Schoolnet system managed by EMA but rather to present an alternative to it. By referring to other international experiences such as Schoolnet Canada and Schoolnet South Africa, which are also based on computer laboratories that are connected to the Internet, the UNDP was trying to flag the use of the term promoted by the Ethiopian government as inappropriate, and to reclaim the name Schoolnet for its own initiative.[173] The excerpt below, taken from an assessment by an Ethiopian consultant, Gorfu Asefa, was commissioned by UNDP to analyze the effectiveness of both Schoolnet programmes. It clearly illustrates how this strategy worked in practice.

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[172] Twenty schools were later added to the plan.

[173] The first Schoolnet project started in Canada in the early 1990s with the aim of wiring all secondary schools in the country to the Internet and linking students and teachers to high quality educational material tailored to the needs of students in different grades (Shade & Dechief, 2004). A similar model was later extended first to South Africa and later to other countries in the continent such as Namibia, Lesotho, Senegal, and Uganda. The Ottawa based International Development Research Centre (IDRC) played a substantial role in encouraging and funding Schoolnet systems around the African continent (Cossa & Cronjé, 2004).

> The term SchoolNet has become part of the vocabulary of those technical personnel working in the education and telecommunications sectors two years now. The term is now extensively used by the MoE [Ministry of Education], EMA, schools and ETC in relation to pre and post-implementation activities related to the inauguration of the satellite-based educational TV program. Nonetheless, the concept of SchoolNet is understood differently by the institutions. For instance, for ETC SchoolNet means the totality of the ICT infrastructure, the VSAT terminal network, communication devices being used for the transmission of plasma lessons. From what has been gathered from students, teachers and staff of MoE/EMA working on the project, the concept of SchoolNet is associated to plasma education. On the other hand, the concept and understanding prevalent among ICT practitioners in the ICT for development circle is a bit different from the above two groups in that SchoolNet is referred as a web interface used to link learners and educators each other over the Internet and provide a framework where educational contents and resources are collectively created and used towards improving the quality of education and making the teaching-learning process interesting and responsive to problems faced in real life situations. [...]
>
> For the author of this report, the SchoolNet Ethiopia Initiative is a digital connectivity initiative whose aim is to establish local area networks in schools and use the Internet to facilitate communication and interaction among students, teachers and school administrators locally and abroad for collectively embarking on content creation and exchange of learning resources and experiences. Thus, this initiative should not be considered as a new initiative but as a call for using digital opportunities for interactive and active learning and for supplementing classroom learning resources with learning materials on the web (Asefa, 2006, pp. 27-28).

Similar language to that which was used by Asefa was used in press releases and official documents produced by UNDP and other UN agencies, referring only to the project based on computer laboratories as Schoolnet and to the one managed by the Ethiopian government simply as "plasma", indicating its most visible and

anomalous feature, the 42 inches plasma TV screen.[174] This war of words is indicative of the larger political battle that was being fought over ICTs, including the efforts to distinguish appropriate uses from unorthodox ones, and of the ways in which both linguistic and technical aspects were mobilized to support competing hegemonic projects. The government of Ethiopia was trying to promote a use of ICTs which could mostly serve its nation building plan, enhancing the possibilities of the centre to reach the periphery without making peripheral nodes more capable of seeking and receiving information independently. On the contrary, the UNDP initiative was re-affirming the globalizing and individualistic nature of ICTs, enacting discourses articulated internationally. It was stressing the role the new tools should have in facilitating the free flow of information among nations and individuals.

At the end of the "Schoolnet conflict", however, the strategy elaborated by the UNDP proved only partially successful. The UNDP's patching effort was set to produce results in the short term and it assumed that the Ethiopian government eventually would have accepted the new project and developed ownership of it. Very little was planned to sustain this strategy for a more extended period of time and to respond to the eventuality of a protracted resistance of the government to the attempts to redress its course of action. As a result, after the UNDP ceased to provide Internet connectivity, ETC did not step in as initially planned. Most of the laboratories lost their role of Internet points and became little more than spaces occasionally visited by students to learn some basic skills in word processing. The Ethiopian government continued to provide resources for the maintenance of the "plasma" and to extend it to newly created secondary schools. However, it decided not to allocate any resources to increase or even to maintain the exposure of Ethiopian students to content produced outside Ethiopia.[175]

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[174] I found this ambiguity puzzling in the early months of my experience working for UNESCO in Addis Ababa. Whether speaking with government officers or UN personnel, the same name was being used to refer to two different projects. When I visited Ethiopia again in 2008 for the field research many people working in international organizations in Addis Ababa continued confuse the two projects.

[175] In some cases it was the local communities that tried to mobilize resources to guarantee that the school laboratories could continue to be used as Internet points. As reported by one of the UN

An analogous destiny awaited the other large initiative supported by another international organization and aimed at reinforcing an international technopolitical regime. With a budget of more than USD 30 million, of which 25 million was granted by The World Bank, the ICT Assisted Development (ICTAD) Project was a multi-sector framework structured to enforce aspects of the discourse on ICTs that had been marginalized by the Ethiopian government. ICTAD advocated the increase of Internet connectivity, the support of the private sector and the provision of better access to market information.[176] The projects developed to transform this vision into practice were part of a carnet of initiatives inspired by various international experiences: telecentres offering Internet access, business incubators, refurbishment centres, community radios and private Internet Service Providers (ISPs).

Despite the substantial resources available, the competition between ICTAD and the government of Ethiopia's priorities made the implementation of the strategy developed by The World Bank slower and more problematic than initially expected. In 2008, three years after ICTAD started, only a few of its objectives had been achieved. The licensing of ISPs, agreed in the first covenant between The World Bank and the government of Ethiopia, was achieved with great delay, and none of the licensed companies ever started operations.[177] A similar tactic was employed for

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volunteers overseeing Schoolnet in the regions "In Nekempt for example, one of the towns I visited, they wanted to know about connectivity. They asked me how they could have it and they said that if the government was not going to provide it they would have found the resources for paying a connection themselves". Interview: Anonymous (63).

[176] As stated in the project document, its key areas of assistance were:

- Creating an enabling policy and a legal and regulatory framework for the growth of the Ethiopian ICT sector;
- Increasing connectivity and providing access to communication services throughout the country;
- Strengthening the institutional capacity of regulatory, advocacy and key policy making institutions;
- Establishing locally adapted ICT industry standards and data security policies;
- Fostering opportunities for women and youth as well as small and medium enterprises in the ICT sector;
- Facilitating access to markets and market information for rural and urban communities. (World Bank, 2004a, p. 1)

[177] According to the contract, the ISPs had to be licensed by September 2005, but the licences were issued only in March 2007. However, as of March 2008, the four companies that obtained a licence,

the drafting of a comprehensive ICT policy. ICTAD invested considerable resources to make this process as participative and effective as possible. Numerous events were organized in Addis Ababa to include in the debate both the civil society and the private sector. Renowned international consultants were hired to assist in the preparation of the policy. As a result, the consultative process was well received even by the individuals who were usually critical of the operations of the Ethiopian government. This is illustrated, for example, in the words of Hamed Hassen, the founder of the most important private ICT college in the country and one of the most active civil society representatives during the drafting of the ICT policy.

> Schoolnet and Woredanet were not debated. Someone decided it and imposed it. There was no debate around what to do with that. My guess is that they may have a hidden agenda for it. But look at the debate on ICT policy instead. That was open. They were looking around for suggestions. We debated freely, there were no restrictions.[178]

Unfortunately this participative experience ended in frustration. The Ethiopian government did not keep the promise of transforming the debated policy into law but maintained it as a draft with no binding power. In addition, as further argued in the following sections, if some of the principles incorporated in the draft policy were apparently consistent with international discourses, such as recognizing a leading role to the private sector, they were had little impact in informing concrete actions in the ICT sector.

Even the few successes that were achieved by ICTAD, such as the implementation of telecentres in the South-Western part of the country, the licensing of four community radios and the localization of software in local languages, never managed to seriously affect the development of ICTs in the country (EICTDA, 2008). ICTAD created new opportunities for individual communities and operated in

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Millennium systems, All-In-One, Symbol Technology and Net Computer, had not started operations (EICTDA, 2008)

[178] Interview: Ahmed Hussien (Professor of Computer Science. Founder of the private college Hilcoe, Higher Learning Center of Excellence, Addis Ababa)

a variety of sectors, but did not succeed in challenging the centralized use of ICTs advanced by the Ethiopian government.

In comparison with the national technopolitical regime based on projects such as Schoolnet and Woredanet, and managed by EICTDA and ETC, the international technopolitical regime was less centralized and did not depend upon a unitary authority. The UNDP and The World Bank initiatives were initiated concurrently and were both aimed using technology to enact discourses that had been selectively refused by the EPRDF. They were not, however, implemented as part of a coordinated effort by the two institutions. This trait and the lack of substantial support from other actors in the international community prevented the emerging international regime to represent a serious threat to the ambitious plan articulated by the Ethiopian government. As further illustrated in the following section through the case of private companies trying to enter the ICT market, the Ethiopian government could act from a position of greater power than its adversaries and accept features that were not challenging its control over ICTs while restraining and delaying others.

7.2 The privatised technopolitical regime: marginal nodes in a state-dominated information economy

While the international technopolitical regime was centred on two uncoordinated but prominent institutions acting to support alternative discourses, the agents comprising the privatised regime were more passive and simply occupied a space that was carefully circumscribed by the state. Even if they had similar interests, and some of them did coalesce to form consultative bodies such as the Ethiopian IT Professional Association (EITPA), the government did not allow local private companies to grow strong enough to influence or shape an Ethiopian path towards ICT.

Despite the proclamations of the Ethiopian politicians that affirmed the relevance of the private sector in developing a modern information society, they did not generate real opportunities for engagement. As illustrated by historians of

technology in similar cases, when technology emerges in critical moments in the history of a country, there is often a "disjuncture between declared policy (policy as rhetoric) and enacted policy (policy as practice)" (Allen & Hecht, 2001, p. 18). The complex strategies pursued by politicians can be understood only by concurrently analyzing what they said and how this was embodied in the technopolitical regimes they promoted. Meles Zenawi, for example, during the speech cited in Chapter 4 where he criticized the globalization logic and reaffirmed the centrality of the state, used encouraging words towards the local private initiatives.

> On the part of Africa there is little doubt that for it to be able to take whatever opportunities there are in the global economy, it has no option but to do whatever it takes to ensure having a vibrant private sector. By this I mean, first of all, a vibrant domestic private sector. The reason for emphasizing the role of domestic private sector is neither philosophical nor political. It is merely practical (Zenawi, 1999).

A similar rhetoric was employed in the draft ICT policy, which addressed the private sector as one of the driving forces in the creation of an Ethiopian information society. For example the section on Private Sector Development was opened affirming that "since the private sector plays a crucial role in accelerating the process of transforming Ethiopia into a knowledge - and information - economy and society the Government is committed to removing obstacles constraining its development" (EICTDA, 2006, p. 18). However, as previously mentioned, the policy was never enforced and the provisions about the private sector either did not find a concrete application or were interpreted in a very selective fashion. Powerful ideological forces were preventing the market from structuring the development of ICTs.

ICT businesses were only allowed to operate freely in areas that could produce an incremental and predictable increase in productivity and in sectors that were considered safe by the government. Continuing to follow an approach of the kind developed when the first computers appeared in Ethiopia, and with the modernization plans pursued by different political elites in the history of the country, newer ICTs were adopted and supported largely when they emerged as simple

enhancers of tasks already defined at the centre. While the number of private companies operating in sectors such as sales and maintenance or in software development sharply increased over the years, no private firms were allowed to operate in the telecommunication sector. Between 2006 and 2008, for example, the sales and maintenance sector grew by 227%, and software development by 140%. Among the best selling applications were Word and Excel, which reached 48.34% of the overall sales in 2008, closely followed by accounting (27,1%) and engineering software (19,2%). The software developed in Ethiopia was for accounting and finance, human resource management, payroll and inventory control (EICTDA, 2009). As this list indicates, none of the industries that experienced considerable growth, or the products they sold or produced, appeared to represent a direct threat to the state apparatus.

On the contrary, the opportunities to communicate within and beyond the national borders were interpreted as a riskier component of ICTs which should be tightly controlled to prohibit oppositional forces from taking advantage of the new channels. Also, the commitment to rural areas, coupled with a greater suspicion towards urban elites, motivated the Ethiopian leadership to prioritize features of the telecommunication network that were in open contrast to successful models emerging in other developing countries. For example, in many English-speaking countries such as South Africa, Kenya, or Nigeria, ICTs have often been framed as a way for local firms to provide services on the global market at competitive prices, relying on increasingly fast and widespread connections, at least in the main urban centres (Esselaar, Gillwald, & Stork, 2007). In Ethiopia, on the contrary, while massive efforts were made to equip even the most remote schools and government offices with the appliances needed to run Schoolnet and Woredanet, the major towns, including the capital, were left with connections of very poor quality and, where broadband was available, its cost was exorbitant. As of 2008 the monthly fee for a 64 kbps ADSL connection was USD 200, and for a 2 Mbps line, which is normally offered in Europe for around USD 20, reached almost USD 5,000 (EICTDA, 2009). The prices remained the same between 2006 and 2008, indicating no significant change in the policy, despite the fall in the prices for broadband connections worldwide. Similarly, in 2008 calling abroad was still beyond the reach of many

Ethiopians: a one minute-call cost 10.72 Birr (around one USD in 2008), twice as much as the average daily income.[179] This obstacle could not be overcome by resorting to cheaper Voice over Internet Protocol (VoIP) applications, which were blocked by the ETC for all domestic and business connections.[180]

As these examples indicate, most of the applications that could increase the interlinking of Ethiopia with the rest of the world were either blocked or seriously constrained, reflecting resistance on the part of the government towards globalizing forces. The justifications offered by three influential individuals working on ICTs in Ethiopia further highlight the ideological nature of these decisions and how they were dependent on the discourses on the Ethiopian nation-state that were articulated by the EPRDF. They strongly supported this peculiar configuration of the sector including the retention of telecommunications as a state monopoly and the prioritization of development in rural areas. As Debretsion Gebre-Michael, the General Manager of EICTDA, argues:

> Monopoly is a crucial factor in this. It is exactly because ICTs are so important and they have the capacity to penetrate every aspect of our lives that we have to make sure that it is the state that is in charge of using and implementing them. In this phase we cannot leave it to the market. ICTs are too key for our development. They are a priority. Behind the decision of leaving the monopoly in the ICTs and telecommunication market there is big philosophical thinking. It is not just because we want to make money from the use of telecoms.[181]

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[179] According to the United Nations Statistics Division in 2007 the GDP per capita in Ethiopia was USD 201. See http://unstats.un.org/unsd/environment/envpdf/Country_Snapshots_Sep%202009/Ethiopia.pdf Last time accessed 12.01.2010

[180] As illustrated in Chapter 6, this feature was, on the contrary, included in the Woredanet architecture to allow free communication among different nodes of the state. However, the prioritization of videoconferencing and the lack of bandwidth dramatically reduced the use of VoIP among Woredanet nodes.

[181] Interview: Debretsion GebreMichael (Director General, EICTDA and former guerrilla fighter in charge of the radio equipment and propaganda)

This approach was further illustrated by Bereket Simon, a former Minister of Information and one of the most influential politicians in the country.

> The majority of Ethiopians still live in the rural areas. If you go there you do not make profit. So the private won't cover the rural areas. But if Ethiopia has to develop first it has to have the rural on board. When we will be done with this and other projects the private sector will be accepted. Look at Schoolnet. Now all the students in Ethiopia can have access to the same education. No private sector company would have done anything like that.[182]

ETC's chief executive officer, Amare Amslau, further explained how ICT policies must be understood in the context of a divide between the people/peasants and the individuals/elites as articulated by the populist discourse on society developed by the EPRDF and how this affected important decisions in the telecommunication sector.

> Holding telecommunications is not just about security. We need this instrument for development, so we need it for the people. Ethiopia is not like any other African country. Those countries just think that they can become rich, the individual can become rich. But what we want is instead building in the mind of people the attachment for their land and for their country. Once you have technology you become addicted to it. So, if you allow the private they can certainly make money but what about the society? The society will not benefit from it. So the government is the one that has to make sure that things are done in the interest of the people.[183]

The hegemonic nature of this commitment, its ambition to structure the nation-state according to a plan developed by the political elite, but not necessarily shared by all individuals in the state apparatus, emerged even more clearly in interviews with bureaucrats and technocrats in lower positions in the government. In contrast to their politically appointed superiors, most of them relied on a less ideologically

[182] Interview: Bereket Simon (Former Minister of Information and Political Advisor to the Prime Minister)

[183] Interview: Amare Anslau (CEO, Ethiopian Telecommunication Corporation)

charged discourse, grounded in evidence from other markets in Africa and elsewhere. They were critical of government policy and less convinced that monopoly was the way forward. They argued that competition in the telecommunication market had produced better results, even for rural populations. This divergence is also illustrative of the distribution of power in the Ethiopian state and of how those in the higher ranks of the power hierarchy had greater capacity to decide the outcome of discursive struggles. The opinions expressed by the mid-level bureaucrats and computer scientists cited below reflect frustration with policy emanating from above over which they have had little influence.

> I am personally not very happy with the government policy because it won't be able to provide quality service in the absence of competition. Even if you prioritize the rural, to reach 80 million people with all services in absence of competition is just impossible. The government people know it too but they are rigid. They have decided to stick to their plan.[184]

> Technology is not used properly. The big problem is monopoly. There is a great potential for business but there is not a good environment for investment because of the government. [...] Many people have left. The CISCO people left. Others left because of the Chinese. At a certain level I see a lot of commitment. The government is installing fibre optic here and there. They are doing a good job. But the monopoly of the telecommunication is not the right decision.[185]

> Here for example we have a monopoly of telecoms. For the Ethiopian government it is good, but even for me – I am a government official – they cannot last for long. They will have to change their policy. What they say is that Ethiopia is different from other countries like Kenya where the population is concentrated in urban areas. Ethiopia has never been colonized and so the villages are scattered. If a private company comes, it will cater only for the urban, leaving a lot of the population behind. And only a state monopoly can take care of the rural people. This may be true. But we have to find a solution. Maybe private companies will come, but it is the government that will continue

[184] Interview: Anonymous (61)

[185] Interview: Anonymous (25)

to take care of rural connectivity or set rules for private companies to connect also the rural if they want to operate.[186]

The full development of a privatised technopolitical regime that could influence or at least complement the national strategy promoted by the Ethiopian government was constrained for a variety of reasons. The perspectives of the three bureaucrats, as well as the explanations offered by their superiors earlier in this section, point to two key features of the EPRDF's discourse on the nation-state. They illustrate the need to equally distribute resources among different ethnically-based states to reinforce the ethnic federalist set-up, and the tendency to privilege the rural population, even when this constrained the empowerment of private entrepreneurs in ways that could eventually benefit the economy of the whole country.

Another key reason for the resistance to the emergence of a regime that would be more independent from the state and rely on other local actors was to prevent agents hostile to the EPRDF from taking advantage of the opportunities offered by new technologies to challenge the central power. This aspect is further analyzed in the following section that illustrates how some actors inside and outside Ethiopia, used ICTs to criticize the Ethiopian government. It is also shown that, given its monopoly of force as well as of communication channels, the government could easily silence these actors and their attempt to influence public opinion in Ethiopia.

7.3 The oppositional technopolitical regime: attacking the state from beyond its borders

Globalisation has generated new means for transnational populations to influence and for homeland governments, political parties, and social movements to seek to co-opt pressures from populations abroad. Political campaigns and strategies are in part the product of complex interactions between political and social leaders and organisations in multiple locations, with diaspora and other transnational networks serving key linking roles. These forms of cross border participation in the politics of countries of origin are

[186] Interview: Anonymous (16)

> increasingly important as 'political entrepreneurs' create new networks and transnational practices that are distinct from inter-state political processes. (Lyons, 2007, p. 531)

The globalization Lyons describes, with its real and potential effects on internal politics, is what the Ethiopian government has sought most actively to resist. This opposition visibly materialized in May 2006, with the blanket censorship of most of the websites and blogs hosted outside Ethiopia that were critical of the operation of the government. As illustrated below through examining three of the most popular websites blocked in Ethiopia – Nazret, Ethiomedia and the Ethiopian review – the response of the government was motivated not only by its approach towards critical voices, preferring dismissal over engagement, but also by the kinds of attacks that were launched from those online spaces that targeted the heart of the EPRDF's national discourse.

7.3.1 The free flow of contestation: connecting different media to disseminate oppositional voices

Despite the delay in establishing the first Internet connection, the tight control over telecommunication and the limited Internet penetration, the types of use of the medium developed by the diaspora as well as by the oppositional voices still residing in Ethiopia, made it an effective channel for disseminating alternative discourses. The websites targeting Ethiopian audiences that started appearing in the 1990s and dramatically increased in the early 2000s, demonstrated a significant capacity to connect with other, older and newer, media.[187] Opinion pieces and news published online were often picked up and translated by newspapers being printed and circulated in Addis Ababa and other major towns. In critical moments, such as the period surrounding the parliamentary elections in 2005, news, commentaries, and political manifestos published online were printed and turned into leaflets. Mobile

[187] Nazret was the first Ethiopian website to go online, already in 1994. Ethiomedia was launched in 2002. The Ethiopian review first started as a printed leaflet distributed to Ethiopians in the US in 1991and it developed an online edition in 2000.

phones, especially the SMS, were used to mobilize people in real time and also responded to calls for action posted in web forums.[188]

Eskinder Nega, Editor and columnist of the newspapers *Menelik*, *Asqual*, and *Satenaw*, among the most popular in Ethiopia before the government shut them down in November 2005, pointed out the ways in which his papers were promoting awareness within Ethiopia about debates generated by the Ethiopian diaspora: "We were publishing articles by prominent people in the diaspora. Fundamental debates were going on in websites such as Ethiomedia and the Ethiopian Review and we were translating them because we wanted to make sure they were known to the public in Ethiopia".[189] As Eskinder continued to explain, this strategy responded to an idea of journalism as an oppositional force. Its role was raising key political issues rather than simply reporting news: "The unique situation of Ethiopia forced us to be not just journalists, but activists. We were not seeking this role, but the conditions in the country forced us to do so".[190]

These interactions, between websites and newspapers, but also mobile communication and international broadcasters such as Voice of America (VOA), were making online spaces part of a wider system where oppositional voices were interconnected to each other, maximizing the capacity to reach different audiences using a variety of platforms and languages. Defining this network as an oppositional technopolitical regime may seem like an attempt to force the theory onto the

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[188] The use of SMS to disseminate slogans and organize political mobilization can appear to be a new phenomenon, but as reported for example in Markakis' account of the revolution that lead to Haile Selassie's demise, it connects with important referents in the history of Ethiopia (Markakis, 1987). Markakis stresses the importance of clandestine publications and leaflets in the main urban centres in promoting political mobilization, especially among students. Translations from two of these leaflets are also indicative of how the tension among different political forces in Ethiopia is not a new phenomenon, but is grounded in a more remote past.

"Ministers and generals enrich themselves at the expense of the soldier... Ethiopia rise. Crush the government that benefits only the few" *Voice of the oppressed to the armed forces 17 February 1974.*

"High officials and foreign capitalists are eating our flesh and sucking our blood. Next day will chew our bones. We must not keep silent. We must do something. We must rise up" *Let us strengthen our unity 18 February 1974*

[189] Interview: Eskinder Nega (Former Editor of Menelik, Asqual, and Satenaw)

[190] Interview: ibid.

empirical data, but it was treated as a system by the Ethiopian government itself, that considered the oppositional voices articulated through different media as part of a somehow coordinated attempt to delegitimize it. Desta Tesfaw, the General Manager of the Ethiopian Broadcasting Authority (EBA), the institution in charge of licensing TV and radio stations as well monitoring their uses, explained this position:

> That was a period that showed how technology can also affect society negatively. [...] Short messages were used to defamate people and you could not really know the source. If I send an SMS to you, then you can act as a multiplier. Also the websites were publishing a lot of factious articles. All this was making people confused. There was an uncontrolled circulation of unfiltered and unbalanced information. I think that it was a strategy of certain groups who know how to use the media. The strategy was to turn down this government and many different media were used to reach this single goal.[191]

As Desta continued to explain, it was mostly in the aftermath of the 2005 elections that the threat of the oppositional technopolitical regime became fully apparent and motivated the government to take extreme measures. Following the voting on 15 May 2005, the lack of clarity in counting the ballots and the rumours that the opposition might have won the majority in parliament caused widespread protests, exploding in two different waves, in June and in November 2005. The Ethiopian government responded harshly, leading to numerous killings of protesters and to the arrest of thousands of individuals, captured in schools, universities, and in their own homes. Various communication channels were progressively closed so as to reduce their capacity to be employed, singularly or in combination, to serve the protest and disseminate alternative information and narratives. On 10 June the SMS, which had been used to mobilize people in real time in Addis Ababa and other major towns, was shut down.[192] It would be restored only two years later, on the occasion

[191] Interview: Desta Tesfaw (General Manager, Ethiopian Broadcasting Authority)

[192] In June 2005 I was living in Addis Ababa and I remember friends and colleagues receiving messages on their phones calling them to participate to demonstrations, to strike if they were taxi drivers or shop owners, or to forward messages to their friends and acquaintances.

of the celebration of the Ethiopian millennium.[193] In early November 2005, some of the most vocal Ethiopian journalists, including Eskinder quoted above, who challenged the results of the election and called for more democracy, were arrested and their papers closed down (Crawford, 2006).[194] Even when released in 2007 most of them continued to be refused new licences to restart their publications. In May 2006, one year after the contested election, the oppositional blogs were censored including the three most popular, Nazret, Ethiomedia and the Ethiopian Review (Opennet Initiative, 2007). As this thesis goes to press, the websites remain inaccessible from inside the country, as Figures 7.1, 7.2 and 7.3 show.[195] Finally, and in this case only intermittently, the radios broadcasting from outside Ethiopia using short waves, such as Voice of America and Deutsche Welle, were jammed.[196]

[193] The first message the Ethiopian citizens received on their mobiles after a long silence was a greeting by ETC's CEO Amare Anslau wishing them a an happy new Ethiopian millennium.

[194] A full chronology of the crackdown on the media in the aftermath of the elections is offered by Ethio-Zagol, a famous Ethiopian blogger who used to post from within Ethiopia. His article can be found at http://seminawork.blogspot.com/2006_05_01_archive.html Last time accessed 14.04.2010.

[195] The reason for the delay in the blocking of websites is attributable to the lack of a clear understanding of how this could be done rather than to a strategic sequencing. During interviews and informal conversations with oppositional figures, but also with a number of individuals connected to the government, it was pointed out that it was Chinese engineers who intervened to block websites, as requested by the Ethiopian government. However, if the blocking itself, always officially denied by ETC, could be easily proved, and was reported by organizations such as the Opennet Initiative and Reporters without Borders, I could not find any hard evidence that Chinese individuals or organizations were behind it.

[196] The government actively targeted foreign-based media outlets. Beginning in January, the Committee to Protect Journalists (CPJ) received reports that the broadcast signals of the U.S. government's Voice of America (VOA) and the German Deutsche Welle were being jammed. Reacting to the reports, an Ethiopian Information Ministry spokesman, Zemedkun Tekle, told VOA that the allegations were "utterly baseless." The report can be consulted here http://www.cpj.org/2009/02/attacks-on-the-press-in-2008-ethiopia.php Last time accessed 14.04.2010

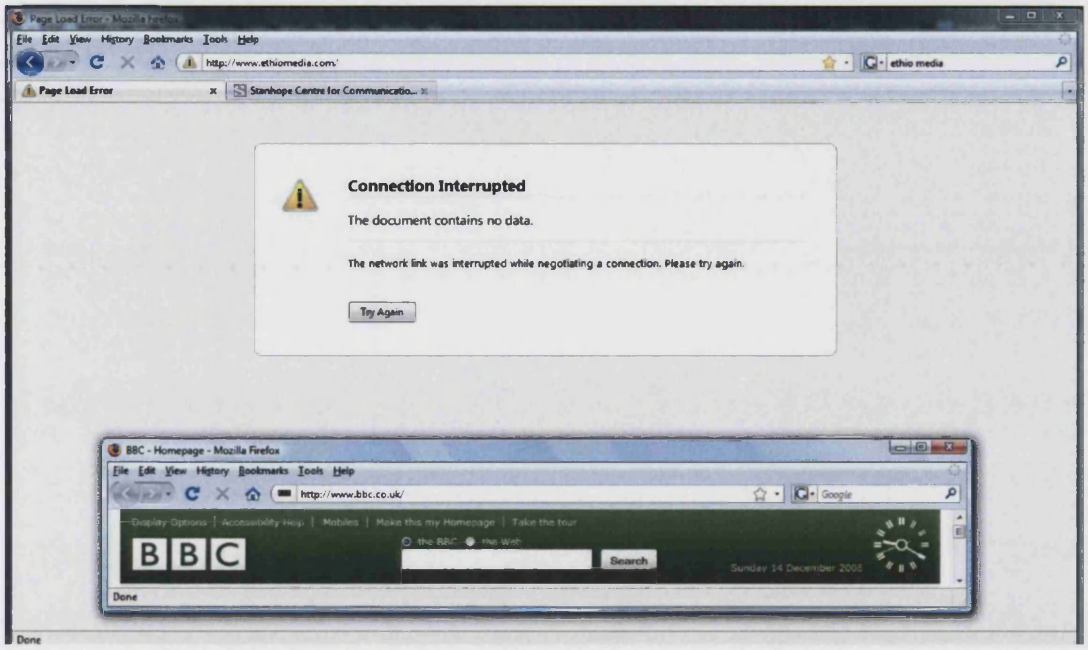

Fig. 7.1

The Ethiomedia website blocked (The additional bar and the windows with the BBC heading are to illustrate that the internet connection was on while the timeout message was received for the blocked website)

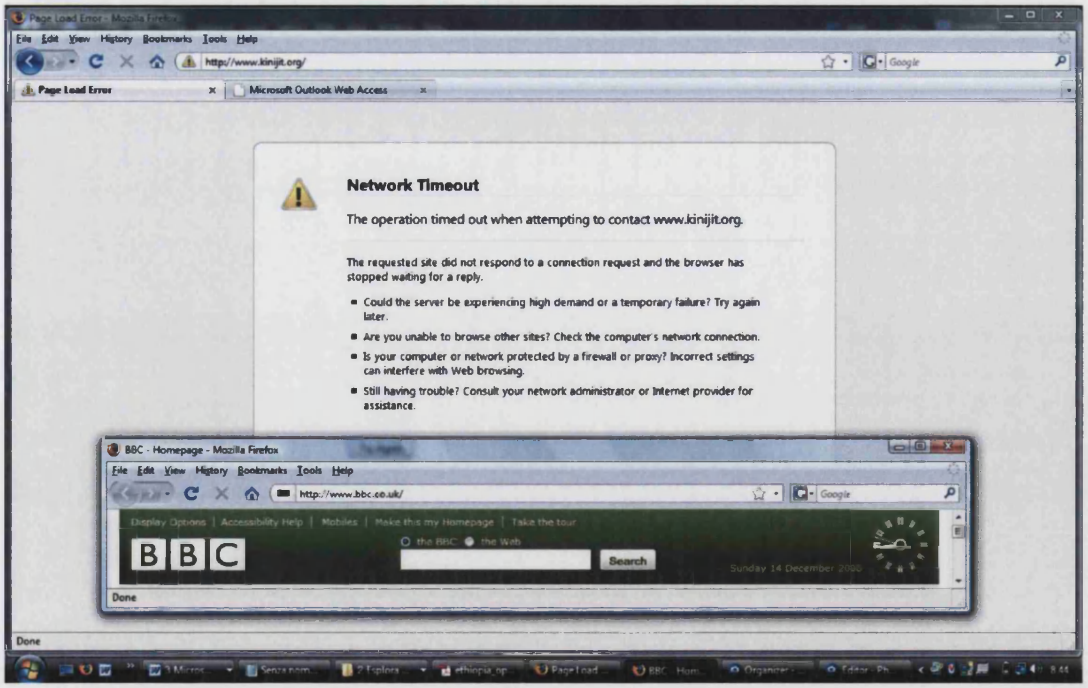

Fig. 7.2

The Kinjit website blocked – The website of the main opposition group

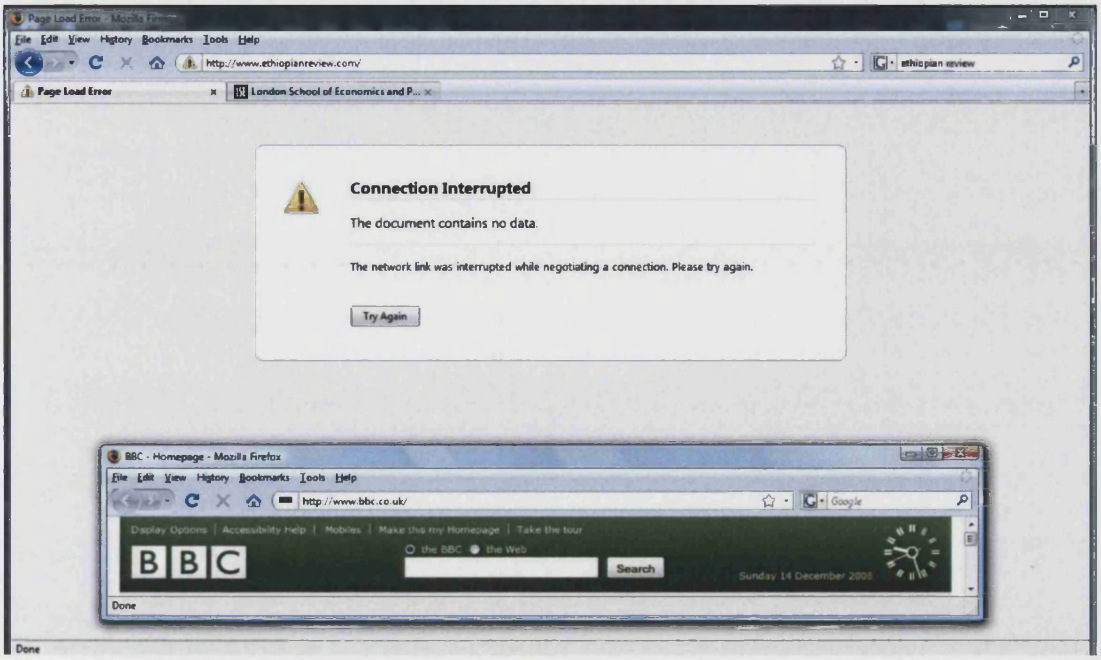

Fig. 7.3

The Ethiopian Review website blocked

The oppositional technopolitical regime was characterized by a marked heterogeneity. It was going from long-established radio stations such as VOA, whose adversarial role has been illustrated in Chapter 4, to blogs such as Urael, which started to be hosted on Nazret.com only in 2005 but quickly gained popularity in the Ethiopian blogosphere and beyond. It was not based on stable institutions, but represented the result of the efforts perpetrated by actors challenging the control of the EPRDF over the nation and taking advantage of the capacity of ICTs to coalesce around a common narrative people residing in different locations. The systemic nature of this technopolitical regime is also what turned the apparently insignificant number of Internet users, around twenty thousands in 2005, of mobile users, around four hundred thousands, and of newspapers readers into a powerful wave, challenging the control of the government over its citizens, and forcing it to take more radical measures.[197]

[197] The data for Internet and mobile users are from EICTDA, which in 2005 reported the capacity of the system in Ethiopia to cater for 21,914 Internet users and for 408,134 mobile users (EICTDA, 2005)

In general, similar to the international and the privatized technopolitical regimes, the oppositional regime was enhancing aspects of the discourse on ICTs which were opposed and resisted by the Ethiopian government. The actors at the core of the oppositional regime were challenging the use of new technologies as instruments to be used by the state to reinforce its control and legitimacy, and re-framing them as channels to connect Ethiopians outside and inside the country in the effort to find political alternatives. As a popular blogger wrote, "The Diaspora is a political factor in the democratic struggle which is not to be underestimated. [...] In cyberspace Nazret.com and all the other publications make it impossible that we are silenced".[198] The next section, however, shows that while some online spaces were characterized by a genuine desire for peace and democracy, others used the web for violently attacking the Ethiopian government, its representatives and the key aspects of its discourses on the nation-state.

7.3.2 Attacking and defending the national narrative

Blogs and websites opposing the government in Addis Ababa were not blocked all together, but were obscured progressively during the month of May 2006. The first to condemn the filtering were Ethiopian bloggers themselves. Those operating from inside the country were able to register the online spaces that had become inaccessible on a daily basis. For example Ethio-Zagol, a blogger posting from Addis Ababa, wrote on May 18:

> Over the last two days, all blogspots blogs [...] have been blocked in Ethiopia. Those who seek political quips from weichegud or intelligent analysis form other bloggers can't access the sites via the telecom servers. In addition, the government has blocked Ethiopian Review, cyber ethiopia, quatero and Free Our Leaders

[198] *Sickness and the nephew*, Urael on Nazret, 13 April 2006, http://nazret.com/blog/index.php?blog=13&title=sickness_and_the_nephew&more=1&c=1&tb=1&pb=1 Last time accessed 12.02.2010

websites. My sources told me this is done by tel. [the Ethiopian Telecommunication Corporation] with the advise and help of the Chinese.[199]

This information was later confirmed by other sources inside and outside Ethiopia.[200] Defying the blocking, most bloggers residing in the country continued to update their spaces through proxies and sent information to friends and colleagues living abroad, while websites such as the Ethiopian review and Ethiomedia, managed primarily by Ethiopians in the diaspora, continued to be adjourned as usual. Many bloggers started providing advice to their readers on how to circumvent the censorship, hoping this information could reach the intended targets through the websites that were still accessible or through emails or other means.[201] Cyber-

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[199] *Government blocks bloggers*, Ethio-Zagol, 18 May 2006 http://seminawork.blogspot.com/2006/05/government-blocks-bloggers-over-last.html, Last time accessed 12.02.2010

[200] From inside Ethiopia, see for example Addis Ferengi, a French woman managing a blog from Addis Ababa hosted on the online platform nazert.com. She wrote various articles on the issue, among which are *Censorship Please forward* , Addis Ferengi on Nazret.com, 22 May 2006 (http://nazret.com/blog/index.php?blog=9&title=censorship_please_forward&more=1&c=1&tb=1&pb=1) and *All "no-propaganda" websites are blocked now*, Addis Ferengi on Nazret.com, 28 May 2006 (http://nazret.com/blog/index.php?blog=9&title=all_no_propaganda_websites_are_blocked_n&more=1&c=1&tb=1&pb=1) Last time accessed 12.02.2010.

[201] Addis Ferenji on nazret.com, for example, wrote: "The Ethiopian government is obviously decided to silence all independant Medias [sic]. Please note that the censorship may be circumvent by using http://securebar.secure-tunnel.com and forward the information to insiders" (*Censorship Please forward* , Addis Ferengi on Nazret.com, 22 May 2006 http://nazret.com/blog/index.php?blog=9&title=censorship_please_forward&more=1&c=1&tb=1&pb=1 Last time accessed 12.02.2010). Ethio-Zagol offered a more detailed explanation on how to use these instruments: "This blog can't be accessed in Ethiopia so the following advise may not reach its intended readers. Other websites like Ethiomedia who hasn't yet been blocked should carry the message to Ethiopian readers. Readers can use an open proxy like this which allow to circumvent the blocks. Readers should click on http://securebar.secure-tunnel.com/cgi-bin/nph-freebar.cgi/110110A and enter the address that is blocked in the displayed box. Using the proxy we can access our beloved blogs and websites even though the government has censored them" (*Government Blocks Bloggers,* Ethio-Zagol, 18 May 2006, http://seminawork.blogspot.com/2006/05/government-blocks-bloggers-over-last.html Last time accessed 12.02.2010)

activists operating at the international level, and advocacy organizations such as Reporters Sans Frontières (RSF) and the Committee to Protect Journalists (CPJ) followed denouncing the new attempt of the Ethiopian government to further curtail an already narrow space for public debate.[202]

As often happens when censorship measures are denounced by international actors and institutions, it was the simple act of blocking websites and blogs that was acknowledged while little or no mention was made of the discourses that were animating the targeted online spaces and of the underlying causes that led to the censorship. Knowledge of Ethiopia's political history, and a closer examination of the articles and posts hosted on the most popular online spaces addressed to Ethiopian readers, would have shown that the filtering was just the latest incarnation of a long-term struggle between the EPRDF and other forces opposing its nation building plan. As the excerpts below from Ethiomedia and the Ethiopian review indicate, the attacks waged against the Ethiopian government were not simply critical of its governance, but were directed at some of the pillars on which the national agenda was founded, such as ethnic federalism which was presented as an attempt to divide rather than unite Ethiopian citizens, and revolutionary democracy, portrayed as just another form of authoritarianism.

> The Meles propaganda machinery and his state apparatus are tirelessly promoting all sorts of machinations aimed at turning one Ethiopian ethnic group against another. In a police state where mismanagement, nepotism and corruption are rampant, and where the people are completely disenchanted and disgusted with the authoritarian rule of a tyrant, the illusion of stability and security would remain whimsical.[203]

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[202] See for example Ethan Zuckerman's *Ethiopia "pioneers" cybercensorship in sub-Saharan Africa* (http://www.ethanzuckerman.com/blog/2006/05/22/ethiopia-pioneers-cybercensorship-in-sub-saharan-africa/), or RSF's article: *Three more sites unaccessible, government denies being involved* (http://en.rsf.org/spip.php?page=article&id_article=17783) and report *Dictatorships get to grips with Web 2.0* (http://en.rsf.org/spip.php?page=article&id_article=20844). CPJ similarly denounced the censorship in a note: *Critical Web sites inaccessible in Ethiopia* (http://cpj.org/2006/05/critical-web-sites-inaccessible-in-ethiopia.php). Last time accessed 12.02.2010.

[203] *Deconstructing Meles Zenawi's Response to US Congress,* by Concerned Ethiopians in the United States, Ethiopian Review, 1 July 2005.

> Ethnic-based parcelling of the map of Ethiopia with evil design to make it convenient for cessation. This is a reckless and dangerous experiment, which should be utterly condemned not only by Ethiopians but also by all Africans suffering from tribal strife as a cancer to peace, stability and prosperity. Creation of a feudal land tenure system in which TPLF is the landlord and the peasants live in slavery in serfdom.[204]

The discourses articulated in these two posts, hosted on The Ethiopian Review and Ethiomedia, respectively, closely resemble those promoted in the 1990s by newspapers such as Tobiya. Ethnic federalism was not only attacked as a problematic strategy which could fail to hold the country together, but an "evil design" intentionally pursued by the Tigreyan minority to subjugate other ethnic groups. Similarly, in the second excerpt, the popular discourse of social integration was challenged. As previously argued, the TPLF/EPRDF had long addressed the peasants as the main beneficiaries of its policies. Reframing them as slaves serving a feudal lord, and employing imagery that was evocative of the times of imperial Ethiopia, meant accusing the government of having simply taken the throne from previous rulers, rather than being the revolutionary force it had tried to appear.

It must be noted, however, that the heated and polemical language employed in these and similar posts was not characteristic of oppositional voices alone, but was a trait common to most of the players participating in the polarized political debate in Ethiopia. A few days before the elections, for example, the Prime Minister himself declared in a televised interview:

> I call on the people of Ethiopia to punish opposition parties who are promoting an ideology of hatred and divisiveness by denying them their votes at election on May 15. Their policies are geared toward creating hatred and rifts between ethnic groups similar to the policies of the Interahamwe when Hutu militia

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http://www.ethiopianreview.com/2005/jul/001OpinionJuly1_2005_Re_Meles_Letter.html Last time accessed 14.02.2010

[204] *Two successive Ethiopian despots in comparison*, by Robele Ababya, Ethiomedia, 16 August 2005 http://www.ethiomedia.com/fastpress/two_ethiopian_despots.html Last time accessed 14.02.2010

massacred Tutsis in Rwanda. It is a dangerous policy that leads the nation to violence and bloodshed.[205]

In the months following the elections and the unrest their uncertain result triggered, Meles' argument was often turned on its head by bloggers who used similar or greater vehemence to accuse him, and not the oppositional forces, to be the main cause of ethnic divisions.

> It is now clear that Meles' campaign was centered on further deepening ethnic suspicion and mistrust in to the fiber of Ethiopian politics. Lacking results to show for the 14 years of his time at the helm, the PM chose to campaign on ethnic politics platform that shamelessly dared to bring the Rwandan experience in to the Ethiopian political discourse. Meles chose this platform, not only because he lacked a record to campaign on but he also believed that ethnic politics has taken root capable of delivering votes bounty. The lesson Meles will take from this election will be the need to accelerate his divisive ethnic project. If allowed, he will come back with vengeance. Venomous ethnic division and instigation of tension among the people will be the trademark of his rule for years to come. Instability will ensue, providing Meles with the rational for his future extrajudicial measures. He will use this to impress and cajole the international community. Beware, given the chance, he will do it![206]

> These criminals [the EPRDF leaders] are more than capable of inflicting some atrocities, in the confusion of the time, on one or another group of Ethiopians and then blame other group(s) of Ethiopians so as to implement their 'Intrahamwe' dream on Ethiopia and Ethiopians. Ethiopians have to be careful

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[205] Part of the speech is reported in the article *A critical look into the Ethiopian elections*, 3 June 2005, Sudan Tribune. http://www.sudantribune.com/spip.php?page=imprimable&id_article=9931 Last accessed 16.02.2010. It is also referred to in (EU-EOM, 2005; Teshome, 2009)

[206] *Why the result of Election 2005 matters*, by Ajibew A., Ethiopian Review, July 27 2005 http://www.ethiopianreview.com/2005/jul/001OpinionJuly27_2005_Ajibew_A.htm Last time accessed 16.02.2010

not to be drawn into such traps of the criminal mafia and its head that would do anything to continue their open blunder.[207]

The mission of the militia is to go into the Oromo and Amhara regions of Ethiopia and eliminate anyone suspected of supporting the opposition against TPLF rule. Meles and his militia commanders are carrying out this mission of search and destroy in the name of protecting Tigreyans. The true intentions of Meles are to start ethnic warfare between Tigreyans and non-Tigreyans and use this as a pretext to divide the country and the people.[208]

These excerpts further exemplify how some of the most popular online spaces targeting Ethiopians in Ethiopia and abroad were challenging the very core of the national discourse advanced by the EPRDF. They also suggested, in potentially provocative and harmful language, ethnic federalism could turn into ethnic discrimination and ethnically motivated violence.[209] These uses per se should not justify the censoring of blogs and websites, but, together with the responses they triggered in the Ethiopian government and with the condemnation this response received internationally from organizations such as RSF and CPJ, they illustrate how local and international discourses may coalesce as well as compete in complex and problematic ways. On the one hand, defending the discourse of ICTs as a globalizing force and of information as free to flow independent of frontiers sometimes required

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[207] *Call For All Ethiopians*, by Girum Getinet, Ethiomedia, November 3 2005 http://www.ethiomedia.com/fastpress/call_for_all.html Last time accessed 16.02.2010

[208] *The violent birth and life of Meles Zenawi may bring his downfall* by Girma Bekele, Ethiomedia, September 28 2005 http://www.ethiomedia.com/fastpress/zenawi_fuels_violence.html Last time accessed 16.02.2010

[209] Fortunately, the unfolding of the events in the aftermath of the elections proved that neither the warnings issued by the Prime Minister nor those of bloggers were justified. Violent confrontations between government opponents and police forces did erupt in Addis Ababa and other major towns, leading to killings and arbitrary imprisonments that were condemned by the international community, but they were largely motivated by politics rather than ethnicity (Aalen & Tronvoll, 2009). The government reacted disproportionally to a scenario it had not foreseen and was moved by the fear of losing control over the urban areas, while the protests were directed mostly towards institutions accused to have stolen a vote, rather than towards specific groups such as the Tigreyans. For more information see (Aalen & Tronvoll, 2009; Carter Center, 2005; EU-EOM, 2005)

tolerating messages that appeared to lean towards hate speech and showed little sensitivity of the complexity of the political situation in Ethiopia. On the other hand, the Ethiopian government did not seek any form of consensus on the means that could be employed to bring the debate back to more constructive dialogue and prioritized its desire to hegemonize the political scene. As discussed in section 5.3.3, its tendency was to dismiss rather than reach out to critical voices, and also in this instance dissent was simply removed. Ethiopia's sovereignty was affirmed at the technical, rather than at the discursive level, blocking the undesired spaces, while simultaneously denying it was actually occurring. This offered another example of how technology can expand the sphere of political decisions, without the necessity of a political debate to take place among relevant stakeholders.

The resistance to the oppositional technopolitical regime, however, did not simply result in a reduction of the freedom to receive and impart information in Ethiopia. As illustrated in the case of Woredanet and Schoolnet, the EPRDF's priority was not narrowing down the space for political debate. Rather, it was occupying the political space to the greatest extent possible. The events of 2005 and 2006 reminded its leaders that a significant portion of this space had grown outside of Ethiopia and, most importantly, that what was occurring in that space had important repercussions at home. As Bereket Simon explained:

> We learned that we were taking many things for granted and this was a mistake. We were thinking that for nation building you have to engage first with the people in the country. But later we changed our minds. And we decided that we had to engage with the diaspora as well. Now we have ETV [Ethiopian Television] on the satellite and the radio as well that can be reached by the diaspora everywhere.[210]

The blocking of online spaces was paired with a more aggressive strategy to engage Ethiopians abroad. It was structured along similar lines to that which was being employed in Ethiopia where the government refused to engage with elites

[210] Interview: Bereket Simon (Former Minister of Information and Political Advisor to the Prime Minister)

while trying to communicate more effectively with the grassroots, which in this case were not represented by the peasants but a "silent majority" of Ethiopians in the diaspora that were less politically engaged. As Bereket continued, "you have to take into account that in the diaspora you have 20% of vocal people and than you have 80% of silent people. We are interested mostly in talking to this majority". In order to reach this portion of Ethiopians abroad, the government tried to improve both the quantity and the quality of information, broadcasting the nation television and radio via satellites but also reaching out thorough the Internet. As Meles Gebre-Medhin, General Manager of the Ethiopian News Agency, one of the public institutions that had been selected as part of this new communication strategy, indicated:

> We now have a new web-strategy whose aims are twofold. First, from a technical point of view we want to improve our skills to be on the Internet. By doing that we want to compete with other websites. We try to do that making our website more appealing. The second point is about reaching consensus on the idea of our country. It involves the national interest in particular. Most of our resources are channelled to this goal. Also as part of this is the building of a different image of Ethiopia, not anymore a country of famine and suffering but a country of opportunities.[211]

The Walta Information Centre, a formally independent news agency, which was strongly aligned to the EPRDF, was another pillar of this new strategy. As Haset Fishea, Head of ICT at Walta, explained:

> The target of our website is the diaspora. And we are informing but also trying to counterbalance the extreme voices. And to tell people what is really going on. Usually the websites opened by the diaspora present biased information. As opposed to this our strategy is to show what is really happening here. We need our people to know that. But there are still gaps and there are capacity problems. In the elections of 2005 this gap became clear. But now media are trying to do a better job in that, to promote information inside and outside the

[211] Interview: Meles Gebre-Medhin (General Manager, Ethiopian News Agency)

country. To balance the extremist voices we just try to be responsible and to be balanced.[212]

As of 2008, however, this strategy had proved only partially successful. The websites remained basic and according to Alexa.com, they were ranked significantly lower than the most popular Ethiopian websites.[213]

7.4 Conclusion

This chapter concludes the empirical section and has examined how ICTs evolved in Ethiopia from the 1990s, when a new political elite took control of the government as well as a new wave of ICTs for development campaigns reached the country, to the second half of the 2000s, when the same elite was capable of employing the new technologies to support its political agenda while marginalizing alternative uses of ICTs that would oppose it. This chapter focused, in particular, on those real or potential alternatives which emerged to patch, complement or oppose the national technopolitical regime developed by the Ethiopian government. Section 7.1 illustrated how both the UNDP and the World Bank tried to redress in practice what could not be rectified through dialogue or diplomacy. These organizations implemented projects that incorporated discourses on ICTs for development that had been resisted by the Ethiopian government. In section 7.2 the initiatives of the Ethiopian private sector were taken into account, indicating how they failed to actively influence the development of ICTs in the country, but simply occupied the spaces left available by the government. Finally, section 7.3 addressed how, despite the limited penetration of ICTs in the country, the messages of oppositional forces travelled across different media, challenging the narrative advanced by the EPRDF and forcing the government to engage in subsequent acts of censorship, targeting

[212] Interview: Haset Fishea (ICT Head, Walta Information Centre)

[213] For a record of the rankings of websites addressed to the Ethiopian readership, see *Ethiopia – Nazret is ranked #1Ethiopian website.* 12 December 2008, Nazret.com http://nazret.com/blog/index.php?c=1&more=1&pb=1&tb=1&title=ethiopia_nazret_com_is_ranked_1_ethiopia Last accessed on 15.02.2010.

various channels of information, from messages sent through a variety of communication outlets, from cell-phones to newspapers and from the Internet to radio stations that broadcasting from outside Ethiopia.

The next chapter will continue to explore these alternative technopolitical regimes by connecting their evolution with that of the national technopolitical regime developed by the EPRDF and by returning to analyze the arguments developed in the previous chapters. The conceptual framework illustrated in Chapter 2 will be employed to structure the analysis of the evidence presented and to further address the puzzle of why and how ICTs have been re-interpreted, re-defined and reshaped in Ethiopia.

CHAPTER 8 – ANALYSIS: THE RE-INTERPRETATION, RE-DEFINITION AND RE-SHAPING OF ICTS IN ETHIOPIA

This chapter offers a structured analysis of why and how ICTs have been re-interpreted, re-defined and re-shaped in Ethiopia. The conceptual framework developed in Chapter 2 is employed to analyze the data that have been presented and to offer answers to the questions that have informed this research. The chapter is divided into four sections along the four core components of the conceptual framework. Each section contributes a unique piece of the puzzle of the adoption and adaptation of ICTs in Ethiopia. In addition, the chapter is structured to have sections 8.1 and 8.2 provide answers to the first sub-question addressing the reasons that have motivated the generation of particular technopolitical regimes and the resistance to the emergence of others. Sections 8.3 and 8.4 focus more on the second sub-question and on the means that have made the realization of a national technopolitical regime possible. It also considers the processes that various actors, discourses and artefacts were part of throughout its generation.

8.1 Conflict is the starting point

Chapters 1 and 2 examined the salient aspects of international policy discourse framing ICTs. ICTs were shown to have been presented by important international organizations as tools capable of supporting goals such as helping developing countries emerge from poverty, preventing natural and manmade disasters, and promoting economic growth. If that discourse was accepted by the Ethiopian government, as one of the poorest countries in Africa and one of the most affected by famine, ICTs would probably have been employed to: boost the productivity of the agricultural sector; set up early warning systems to respond quickly to drought and other natural disasters; support private initiatives; or offer the population new spaces for debating how to better solve the many problems affecting the country.

As illustrated in Chapters 6 and 7, very little of this happened in Ethiopia. Projects intended to apply new technologies to agriculture remained on paper. IT companies were almost non-existent and in no position to seize the opportunities offered by a global market or even sufficiently to cater to the local demand. Access to the most popular online spaces was blocked in the country and Internet connections were either too slow or too expensive.

Instead, millions of dollars were invested to develop systems like Woredanet and Schoolnet that could reinforce the presence of the government in the periphery and improve its capacity of providing services, but also allow the EPRDF to occupy key political spaces. The two systems emerged as a unique patchwork of global tools and local needs.

The reasons why this patchwork emerged were found in the complex process of transformation the country was engaged in at the time the new wave of ICTs for development campaigns reached it. Various actors were battling to assert or resist particular ideas of the Ethiopian nation-state and ICTs became a component of this struggle. The government of Ethiopia, the only entity with enough power and resources to take control of the development of the new technologies nationally, appropriated them to support its ambitious nation-building project, while real or imagined enemies were prevented from developing uses that could challenge it.

The fact they were employed to support nation building does not mean that ICTs are always used as tools for nation building. But rather it highlights their potential to be used in this way. As argued throughout this thesis, ICTs had to be substantially re-adapted to serve that particular goal, a process that was achieved by incorporating specific discourses articulated by the EPRDF. At the same time a variety of measures had to be taken to prevent other applications, many which were presented at the international level as the most "natural" and appropriate, from diffusing and possibly challenging those controlled by the state.

Using ICTs to enact a national project does not mean that they can do it successfully. Assessing the effectiveness of Woredanet and Schoolnet was beyond the scope of my research. However, from the analysis of the systems, it has become evident that many of their features were problematically flawed. Responding to numerous, and not always compatible, politically motivated tasks in the absence of

sufficient resources and expertise often meant developing convoluted architectures, overlooking technical details which would have later caused the malfunctioning of the systems, or prevented them from operating as expected. Similarly, blocking oppositional blogs did not stop the most skilled Internet users from relying on proxy servers to access them. And enlarging the offer of pro-government websites targeting Ethiopians in the country and abroad did not mean that they would become successful spaces for aggregation and debate.

What the analysis of the re-shaping of ICTs in Ethiopia strongly suggests is that politics is central to understanding technology and how it is deployed. Technologies, especially those that can come to constitute large technical systems, are subjected to intense conflicts and negotiations. They are likely to be captured in the networks of powers and discourses that characterize a country and are influenced accordingly. Nation building, and the specific discourses on the nation, society and communication articulated by the EPRDF have emerged as the most important factors in explaining why ICTs took the shape they did in Ethiopia. In another country different factors could have motivated the emergence of a different technopolitical regime. However, in all case studies, to understand why ICTs take the shape they do, it is important to "control" for politics first and then proceed to other explanations, rather than the other way around. Politics may or may not be the main force influencing the development of a particular technical system, but, as the case of Ethiopia demonstrates, along the lines of what was previously suggested in the works of Hughes (1983; 1986; 1987) and Hecht (1998; 2001), it is very probable that it can play a considerable role.

If politics matters, it does so in varying degrees and it is unlikely to be the only factor explaining why ICTs adopt a particular shape. Placing greater significance on this particular aspect does not negate other accounts. For example, some of the features adopted by Woredanet and Schoolnet could be justified by the functions they had to perform in relation to specific material and social conditions encountered in Ethiopia rather than by politics. Using a satellite to transmit data, for example, was probably the most logical decision for a country with a heterogeneous geography and little infrastructure like Ethiopia. Similarly, some of the key features of the two systems were adaptations to specific characteristics of the audiences they were

designed to target. In reference to Schoolnet, Demissaw Bekele, EMA's General Manager, explained this point:

> We wanted to start with less complex technology. Teachers, especially in the rural areas, were not ICT literate. But to operate a plasma TV you just need to push a button. Our teachers are computer illiterate, meaning that they do not know how to use a computer and they are information illiterate, meaning that even if they know how to operate a computer they would not know what to do with it.

It is important to recall, however, that if these functions were developed to adapt technology to given geographical and educational circumstances, they emerged to increase the effectiveness of systems that were created to respond to specific political demands in the first place. A functional account alone is unable to explain the emergence and functioning of Woredanet and Schoolnet.

This example illustrates that to fully understand the process of adoption and adaptation of ICTs in developing countries, different approaches must be combined to explore various dimensions. However, for too long deterministic approaches have prevailed.

The Ethiopian case also suggests an important lesson for development practitioners and the individuals and institutions that advocate the use of technology for development. The fact that many international organizations in Ethiopia did not openly acknowledge that technology may be a site of conflict and negotiations, but only focused on its transformative potential, had significant consequences for a variety of actors who became involved, or tried to be involved, in the development of an Ethiopian path towards ICTs.

As illustrated in Chapter 4 many members of civil society and the private sector developed false expectations about how the new tools could change their country and open new opportunities. They subscribed to an agenda defined internationally only later to realize that there was little applicability in a country like Ethiopia where power was tightly controlled at the central level and where the priorities defined by the government were competing with those advocated by the international community.

The AISI vision reported in Chapter 4 set "development imperatives" and "priority strategies" to build "information highways", support "free markets", and help "exerciz[ing] democratic and human rights". Similar to other documents aimed at defining a common agenda, its assertiveness and the recurrence of a technocratic language were instrumental in convincing and rallying a variety of actors around supposedly common goals and shared principles. Most of the resources mobilized by the UNECA and by the donor community in general, were employed to market new discourses and artefacts rather than to understand how they could contextually apply to countries marred by conflict. Unfortunately, the expectations that were created among members of Ethiopia's civil society and private sector later turned into disillusionments. After realizing that the Ethiopian government was taking the implementation of ICTs in directions that were conflicting with those advocated internationally, many donor agencies simply decided to disengage.

The lesson from this experience, however, is not that international organizations should adopt a conservative approach and be cautious in producing alterations within a given country. If new tools can help improving the living conditions in developing countries, they should be employed and diffused, even if this may entail a risk. The analysis of the Ethiopian case does suggest a more responsible approach and it reconfirms Melvin Kranzberg's argument that "technology is neither good nor bad; nor is it neutral" (1986, p. 547). ICTs, as presented in the mainstream discourses, come with a bias. As was illustrated throughout this thesis and is further addressed in the next section, the modernizing, globalizing and democratizing potentials of the new technologies were not simple descriptions of reality. They were both prescriptions indicating how the new tools should be used and features embedded in the artefacts by actors belonging to specific socio-cultural contexts. As such, they could be resisted and the technology incorporating them redefined to integrate new discourses.

This experience should suggest to development practitioners that while describing new artefacts and discourses as neutral and universal may be necessary to define a global agenda, the incapacity to make this agenda flexible enough to match local conditions can hamper its success and produce avoidable side effects, such as wasted resources, unreasonable expectations and an increase in tensions among

competing actors. If ICTs were perceived for what they are, as potential sites of conflict, greater attention could be paid to analyzing both the material and intellectual resources a country can mobilize to use technology in predefined ways, as well as how different priorities and political goals can lead to a redefinition of tools and their multiple uses.

8.2 Technology is both material and discursive

The concept of ICTs I adopted to understand why and how ICTs took the shape they did in Ethiopia, appreciated technology to be both material and discursive. The latter component, its discursive nature, was articulated along two interrelated and complementary dimensions. On the one hand, discourses were framed as the socio-political components which are inserted into artefacts to perform specific functions, and thus also incorporate specific worldviews, along the lines illustrated by Hughes (1983), Hecht (1998), but also by Mansell and Silverstone (1996) and Winner (1980). On the other hand, they were conceived as texts describing the uses that should be made of a particular artefact, aimed at magnifying certain aspects while marginalizing others (Pinch et al., 1992). These should not be conceived as isolated dimensions but as continuations of each other. Descriptions may be inscribed into artefacts in an effort to lock particular functions into an object rather than simply indicating how a user should perform them. And descriptions, similarly to those appearing in technical manuals, can be employed to reinforce the effectiveness of a specific feature designed into an artefact.

Conceiving technology as both material and discursive was useful to reconstruct the process through which ICTs were interpreted and negotiated in Ethiopia and to explore how the same technology could be perceived by some actors as liberating and by others as a threat. It helped to understand why artefacts that were presented as modernizing, globalizing and democratizing, and could have been so, did not produce the outcomes indicated in their "descriptions" in Ethiopia.

The case of the globalizing potential of ICTs is one where the complex connections between the material and discursive aspects of technology emerged in all

their clarity. The Internet is one example. Because of its capacity to deliver information fast and cheaply, it has been framed in the policy discourse as a globalizing force. This is an accurate characterization. Some of its main components, email and the World Wide Web, were designed precisely to perform the goals of transmitting and linking information almost independently of where it is stored and from where the senders and receivers are located. These components were also those that received the greatest attention and figured prominently in the documents indicating how ICTs could and should be used.

At the same time, the globalizing practices allowed by the technology at the core of the Internet were far from being the only possible ones. Woredanet and Schoolnet were employing the same transmission protocol the Internet is based upon (the Internet Protocol). Information packages were transported by a satellite, which is both a vehicle and a symbol of global communications. However, as illustrated in Chapter 6, these technologies were not applied to connect Ethiopian citizens to the rest of the world, but to create a kind of state intranet, maximizing the capacity of the central government to communicate with the periphery of the Ethiopian state, while minimizing the possibilities for the remote sites to access resources originating from abroad. This technical set-up was in line with other measures adopted in the country at large. As illustrated in Chapter 7, the quality of private and business Internet connections remained very poor, while their costs were exorbitant and did not adapt to the fall in prices experienced internationally. Political blogs opposing the government, in most cases edited by Ethiopians residing abroad, were blocked in the country. Even international calls were made difficult by their high costs and by the blocking of VoIP.

This picture illustrates how the globalizing traits of the new technologies, even if real and framed as advantageous, were actively resisted and contained in favour of others considered more instrumental to realize the projects defined by those in power in Ethiopia. A globalizing discourse, as incorporated into specific artefacts and further articulated in their descriptions, could be considered beneficial by actors operating from countries producing large amounts of digital content and embracing a vision of an open world. The same could be true for local agents, such as members of the civil society who could benefit, for example, from greater integration into

activist networks and an enhanced capacity to reach and sensitize foreign audiences. On the contrary, the same discourse, and the same technologies, were perceived as threatening by a government struggling to control its country and to defend itself from attacks, both real and perceived, launched by its enemies at home and abroad.

If resistance to the forces of globalization has been documented in numerous studies on the relationship between the global and the local, the analysis of the Ethiopian case uniquely shows how it can be enacted not only through policies and behaviours, but also through technical artefacts. In addition, this study does not focus exclusively on reactive measures, such as the actions often registered by comparative research ranking countries according to number of censored websites or the measures taken against dissenting journalists or bloggers. In contrast, this research has focused substantially on the proactive actions, indicating how a conflict between competing discourses was resolved through a re-shaping of artefacts so as to have them incorporate new meanings and functions.

The negotiation that occurred around the democratizing potential of ICTs and the results that it produced can be explained by employing a similar analytic logic that has been applied to question the globalizing potential of new technologies. Had ICTs been democratizing tools, and had democratization of the kind described in documents such as the AISI framework been consensual, their application would be expected to have empowered individuals with greater rights and political freedoms. As argued throughout this thesis, however, some of the applications that could have helped to realize these goals were resisted, or at least they were not favoured, while those that were implemented responded to a concept of democracy that did not comply with the canon of Western, liberal democracy.

The case of the two Schoolnets, one implemented by the Ethiopian government and the other by the UNDP, is a clear illustration of this point. The system developed by the international organization was based on computer laboratories installed in preparatory schools and was aimed at using "the Internet to facilitate communication and interaction among students, teachers and school administrators locally and abroad for collectively embarking on content creation and exchange of learning resources and experiences" (Asefa, 2006, p. 28). It was inspired by the idea that

individual interaction could lead to new and more effective learning experiences and that cooperation irrespective of physical or national boundaries was one of the key opportunities offered by the new medium. The kind of democratization it was meant to facilitate was based on the principle that individuals should be given the chance to access a wider variety of content and be left free to choose which ones suited them best. This system, however, emerged without the active support of the Ethiopian government, whose resistance became apparent when it refused to continue providing the internet connectivity the laboratories were depending on to fully perform their functions. The Schoolnet managed by EMA, on the contrary, took shape because of the support of the government and against the opposition of a variety of donor and multilateral agencies. The state-run Schoolnet gave little or no opportunity to choose content. It provided identical educational materials to every secondary school student in the country, by broadcasting pre-recorded classes on plasma TV screens installed in each classroom. The EPRDF leaders and the technocrats involved in Schoolnet's design and management responded to a different ideal of democracy that was not based on individual choices. For them, the system had democratizing effects because it was offering equal opportunities to Ethiopian students, teaching them how to be better citizens and "how to contribute to the development of the country".[214]

By comparing the two Schoolnets it is clear how different discourses on democratization led to the creation of different systems, often supporting rival goals. In addition, the fact that the two systems were developed in competition with each other, as explained in Chapter 7, further exemplifies the continuity between discursive and technical aspects of ICTs: a struggle over policies and ideologies was shifted to the technical level and fought in more subtle, less visible, ways. This phenomenon bears an interesting resemblance to the case of the French nuclear policy analyzed by Gabrielle Hecht. As she explained:

[214] Interview: Bereket Simon (Former Minister of Information and Political Advisor to the Prime Minister)

> French military nuclear policy in the 1950s did not take the form of a ministerial decree; it took the shape of G2 (and other related technologies). This meant, for example, that in 1954 the assurances of the CEA's leaders that Marcoule reactors were both electricity-generating prototypes and plutonium producers enabled one prime minister to abstain from deciding about a bomb. Official French state policy declared a purely peaceful interest in atomic energy, while the CEA's actual technopolitics performed a military nuclear policy (Hecht, 2001, p. 270)

Similarly, the Ethiopian leaders could publicly assert their commitment to democracy, apparently aligning themselves to the requests of the international community, while in practice systems like Schoolnet and Woredanet performed policies that were not inspired by the principles of liberal democracy.

Finally, the analysis of how the modernizing potential of ICTs was translated into the Ethiopian context illustrates that even when there was a greater proximity to discourses articulated internationally, this did not lead to complete adherence. One reason is that discourses that can be separated analytically are highly intertwined in reality and influence each other in complex ways. For a long time and in many countries, modernization and globalization processes proceeded together and one was often considered the by-product of the other. They frequently inspired the production of a wide variety of technologies, including ICTs. Resisting globalization and globalizing features of specific artefacts could not leave the modernizing potential of those artefacts untouched. Or, conversely, the outcomes of one process could not be entirely achieved without concurrently triggering those linked to the other.

Another reason is the inevitable ambiguity that every discourse bears. What was illustrated earlier in the case of democracy, the possibility that substantially different meanings could be attached to the same term by different actors, still applied, even if to a lesser degree, to the case of the modernizing potential of new technologies. As described in Chapter 4 modernization was first introduced in Ethiopia as a means to defend its independence and was later embraced to extend the control of the state over its territory as well as to increase its capacity to function.

However, this commitment towards modernization left ample room for differing interpretations of how modern and modernizing tools such as ICTs could better serve Ethiopia's needs. It resulted in significant investments in the new technologies of a magnitude that surprised many international observers. It brought some of the latest symbols of progress, such as satellite dishes and flat screens, to some of the most remote areas in the world, as illustrated in Fig. 6.1. But it did not always follow the path prescribed by international actors. The Ethiopian authorities did not employ ICTs to support every sector that could have benefited from their application, but selected those that they perceived to be the most critical to improve the presence of the state on the ground. They similarly struggled to make sure that ICTs would not trigger an information revolution and produce transformations that could not be controlled. The government sought to use technology to produce incremental and predictable changes.

If modernization was accepted and favoured by the Ethiopian leaders, and ICTs were embraced as modernizing tools, their potential was attentively channelled to reach and empower only specific nodes of the Ethiopian society, while leaving others almost untouched. Any person travelling between a main Ethiopian town and a rural village would appreciate the results of this process. In the town, only a few offices, cybercafés, and a very limited number of private residences were likely to have access to the Internet, through slow and unreliable dial-up connections. In rural woredas, satellite dishes, power generators and plasma TV sets allowed students and administrators living in villages otherwise not reached by electricity to learn about mathematics and the founding principles of the state as well as to videoconference with their Prime Minister from his office in the capital.[215]

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[215] As an assessment by Cisco Systems notes, "Possibly the most challenging aspect of the project was the creation of the Woredanet infrastructure. Given the nature of Ethiopia's terrain, a large percentage of the VSAT and videoconferencing equipment is deployed in extremely remote towns and villages, some of which are three days' walk from the nearest road or three days' drive from the nearest town". http://www.cisco.com/en/US/prod/collateral/optical/ps5724/ps2006/prod_case_study0900aecd8010d326.html .
Last accessed 03.01.10

8.3 Discourses do not spread by themselves and require agency to diffuse and be implemented

The re-interpretation, re-definition and re-shaping of ICTs in Ethiopia could not be fully understood by simply analyzing the characteristics of discourses and artefacts. To explain these processes it was essential to examine how specific international and local actors embraced and employed them. Along the journey that ICTs have undertaken in the country, from abstract ideas to concrete assemblages, different institutions, companies and individuals performed different functions and, over time, some prevailed over others. In Chapter 6 three phases were identified: the first was characterized by the intense activity of international organizations that were working to set a global, continental and national ICTs agenda and to convince a variety of local actors of the relevance of ICTs. In a second phase a variety of translational and mostly private agents competed to take advantage of the interest created in Ethiopia by earlier campaigns. The third phase started when a select number of actors, including Cisco Systems and Hughes Networks, were mandated by the Ethiopian government to implement a national regime, which could incorporate its political ambitions. The phenomena analyzed in Chapter 7 can be seen to belong to a fourth phase that is characterized by the attempts by actors other than the state to enact discourses opposed or marginalized by the state or to take advantage of the possibilities the state did not seize.

These phases have been described earlier in the thesis and it is not necessary to address them here at the same level of detail. However, returning to them briefly helps to illustrate some key aspects of how local regimes progressively take shape. In particular, the focus on the role played by different actors in different phases helps to understand the ways in which the interaction between international and local discourses was not a static interfacing of the elements comprising each of them, but was a dynamic process along which new possibilities were opened while other ones were ruled out by the active engagement of various agents embracing or resisting those elements.

For example, the resources mobilized by international, transnational and continental actors to set an ICT agenda are illustrative of the role "active teachers"

play in promoting new discourses (Finnemore, 1993, 1996). In the 1990s the EPRDF, busy as it was in gaining legitimacy over the country after a long civil war, showed little interest in the transformations ICTs were triggering in the rest of the world. The EPRDF did not seek them out as tools that could support it in implementing its political plans. It was mostly through documents such as the AISI framework, ICT for development advocates and events such as the African Development Forum in 1999 that ICTs were "brought" to Ethiopia. However, they were initially presented mostly as an end in itself which could contribute "to realize a sustainable information society in Africa" (United Nations Economic Commission for Africa, 1996, p. 6), or, conversely, whose absence would "leave African countries on the short end of an information and technology gap" (ibid, p. 1).

Analagous to the case of the diffusion of science bureaucracies investigated by Martha Finnemore "both the 'problem' and the solution were supplied to states by outside actors" (Finnemore, 1996, p. 11). But, in contrast to what happened with the science bureaucracies that were created to respond to UNESCO's perceived necessity of coordinating scientists, in Ethiopia the relationship between problems and solutions progressively shifted. With time ICTs did start to be regarded as possible solutions, but not to the problems initially indicated by international organizations. As has been variously illustrated throughout this thesis, the EPRDF had little interest in facilitating the creation of an Ethiopian information society based on individual freedoms and the private initiative. However, the party was desperate to find new means to enforce its political agenda on the ground.

Despite being delayed, the EPRDF's interest in ICTs was eventually decisive. It emerged as a precondition for a second phase characterized by a greater engagement of the Ethiopian government with new technologies, and it continued to be reinforced by some of the events that took place during this period. Among other factors, the greater involvement of international corporations and their role in explaining how ICTs could be adapted to serve a variety of goals was critical in allowing Ethiopian leaders to envisage new possibilities to employ them. In contrast to other areas where a compromise between international and local discourses is found mostly at the level of policies, the adoption of ICTs in the country required a fit to be created both at the discursive and at the material levels. Had ICTs only been

capable of producing the results illustrated in the mainstream discourse, they probably would have remained an issue of little interest in the minds of the EPRDF leaders. The government would have most likely continued to resist them to avoid importing new challenges, but might not have actively embraced them to serve its plans. Conversely, as illustrated in Chapter 6, the possibility of practically redesigning technological artefacts to make them incorporate new discourses and facilitate processes that did not figure in the mainstream documents convinced key EPRDF figures to embark on the ambitious project that eventually encouraged them to proceed with both Woredanet and Schoolnet.

The involvement of international corporations in this and in the next phase, when the projects envisaged by the Ethiopian leaders started taking the shape of a specific technopolitical regime, illustrates an aspect of the adoption of ICTs in developing countries that is often overlooked: the role played by international private companies, often the same ones that contributed to defining a mainstream ICTs agenda, in making other technopolitical regimes possible, even those contradicting the principles advocated in global fora. Without the possibility of relying on firms based in technologically advanced countries such as the United States and Japan the Ethiopian government probably would have never been able to implement Woredanet and Schoolnet. CISCO systems provided most of the equipment and tailored its networking solutions to meet the requirements defined by the Ethiopian government. Hughes Networks leased space on one of its satellites to allow data transmission across the vast Ethiopian territory. And Panasonic won the bid to supply the plasma TV screens.

The vital contribution of these corporations in developing a national technopolitical regime in Ethiopia also highlights the often-paradoxical nature of the campaigns to diffuse ICTs in the developing world. On the one hand, ICTs were presented as tools that could favour democratization, globalization and modernization. And, as illustrated in Chapter 1, many corporations contributed to promoting these discourses and to positioning them on the global agenda. On the other hand, when the opportunity to win large projects arose, private companies were ready to compromise on some of the principles they otherwise publicly supported. The Ethiopian case is not unique, but it represents an example of a trend that has

been seen in a number of other countries where governments with the assistance of corporations used applications developed in the West to filter unwanted content (Deibert, Palfrey, Rohozinski, & Zittrain, 2008).

This reliance on the skills made internationally available by private companies also generated another interesting paradox. It was because of the possibilities offered by the global market of competencies that the Ethiopian government could effectively resist the globalizing forces ICTs were bringing with them. This point can be made clearer by returning to an argument made by the former Minister of Information Bereket Simon:

> Globalization is a double edge sword. It creates opportunities and it also creates challenges. [...]If you have money you can buy the latest technology. And you can implement it here. On the other hand when you implement you also import the challenges and you have to avoid them. If you are not ready you will lose. One thing is sure. You cannot stand still.[216]

Bereket's words introduce a final aspect that has been shown to characterize the struggle among different actors for the implementation of ICTs in Ethiopia: despite the massive investments for the implementation of a national regime and the resistance to some of the challenges that ICTs could have "imported", the battle for their appropriation did not have a clear end. The EPRDF leaders "could not stand still". As argued in Chapter 7, some of the agents that were marginalized by the Ethiopian government persisted in seeking alternative ways to make use of ICTs and the discourses that were resisted continued to inspire their actions. Similar to what was indicated earlier about the necessity for a fit to be found both on a discursive and a material plane, the struggle was fought not simply at the level of politics: criticizing the uses of ICTs made by the government, withdrawing funds, proposing alternative ways to employ technology; but also practically, through the implementation of alternative technopolitical regimes.

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[216] Interview: Bereket Simon (Former Minister of Information and Political Advisor to the Prime Minister)

8.4 Technopolitical regimes are where the negotiations occur

This thesis has comprehensively covered many aspects of ICTs including their conflictual nature and their material and discursive dimensions. The influence exercised by different actors in asserting or resisting particular discourses has been shown to have concrete expressions in the development of specific technopolitical regimes. The national regime assembled by the Ethiopian government, as well as the alternative regimes that emerged to complement, patch or oppose it, took shape as a result of progressive negotiations, both within and among different regimes. Throughout the design and implementation phases, heterogeneous entities came into contact with each other, initiating processes of transformation that were influenced by given networks of power, technologies and discourses, but were also influential in the redesign of those very networks. The realization of a regime was not simply the enactment of a given plan, but the progressive elaboration of responses to new opportunities and challenges, many of which were not even visible at the time the regime was imagined but became apparent only when it started taking shape. The next paragraphs offer some examples of how this happened in practice.

As illustrated in Chapter 6, the development of Schoolnet and Woredanet was neither linear nor smooth. Throughout the process that led to their design and implementation, multiple negotiations concurrently took place at different levels. Policy makers required their visions to be turned into technical features, but their aspirations were often frustrated by the inability of technocrats to fully understand whether and how this could be achieved. As the EICTDA officer recalled "the Minister of Capacity Building was asking and demanding and we had to come up with solutions to what he was asking. There was frustration after frustration".[217] The contractors that won the bid to implement the two systems worked to fulfil the requirements published by the government in its Request For Proposal (RFP), but in ways that often took advantage of the ambiguities left unresolved by the lack of expertise within the state apparatus. This was illustrated in a report commissioned by

[217] Interview: Anonymous (32)

the government to an independent evaluator in 2004 to assess how CISCO and Hughes were complying with their obligations and how some of the problems that had begun to arise could be solved:

> In spite of the technology focus of the RFP, there were a number of material omissions and unclear definitions and expectations. These undoubtedly gave vendors significant leeway when interpreting the intention and meaning of the RFP, and it is thus likely that vendor submissions (although compliant to the occasionally unclear technology requirements) would not have been regarded as suitable if the technology specifications and requirements were much more clearly stated. (Daedan, 2004, p. 15)

These conflicts did not emerge exclusively as part of negotiations within and between organizations, but were affecting the interactions among technical artefacts. In order to incorporate the specific discourses on the nation, society and communication discussed in Chapter 5, and which uniquely characterized the nation-building project pursued by the EPRDF, important technical features had to be modified, often radically. Artefacts designed to perform given sets of tasks, in specific environments, had to be combined and compliment new ones in ways that had never been tried before. As the evaluation cited above continued, these adaptations could be highly problematic:

> There is not only a real risk of the Woredanet service network becoming operationally unsustainable, but also that the project may become financially and economically unsustainable. Some of the issues that have contributed to this reality are: [...] The complexity of the HNS [Hughes Network Systems] DirecWay VSAT solution [the specific technology used to transmit data through the satellite], both in terms of the BoD [Broadband on Demand] requirement, as well as in terms of the complexity of the network design and the number of devices in the field. All this is necessitated by a requirement for a videoconferencing service which cannot ordinarily be accommodated by the HNS DirecWay VSAT platform. (Daedan, 2004, pp. 10-11)

The scenario presented in this assessment, and illustrated at length in Chapter 6, only emerged once the system started taking shape, when different actors and different artefacts started interacting among each other. Woredanet, as well as Schoolnet, did not evolve as the product of a well thought out plan, but acted as a tool "forcing" those who had imagined it to progressively understand which features and functions they really needed. The Ethiopian leaders had to make difficult decisions, ruling some possibilities out while accepting others, and thus gradually demonstrating what mattered most to them.

In this sense the evolution of a technopolitical regime can be considered the core site to study and understand how heterogeneous entities interact, the discourses that emerge as the most influential, the constraints that are the most difficult to overcome, and how power is distributed. On the one hand, the results of combining the discourses, artefacts, and actors could not have been imagined by analyzing each element in isolation or before they came into contact with each other. On the other hand, the nature of the single elements themselves became clearer as they started interacting.

The trajectory of the Internet as a service offered by Woredanet exemplifies these phenomena. Despite the resistance towards the globalizing forces exhibited by the EPRDF, access to the Internet was initially requested as one of Woredanet's features. By the time a RFP was formulated by the Ethiopian government in 2002, browsing the web and sending emails had become standard features to be expected in any project employing ICTs to improve the efficiency of a state apparatus and its capacity to communicate with its nodes. When Woredanet started taking shape, however, the centrality of videoconferencing over other services drove the policy to limit the bandwidth available for accessing the Internet. In addition, the architecture that was implemented made data communication within Ethiopia easier, while it strongly limited the possibilities of visiting websites hosted outside the country.[218] At a later stage, when the negative repercussions of the lack of bandwidth on the use videoconferencing emerged, even the thin share allocated for the Internet started to be employed for videoconferencing sessions, effectively switching off the possibility of browsing the web. As a result, the application that, probably more than any other,

[218] For more detail see section 6.2.1

contributed to triggering a new wave of ICTs for development campaigns was progressively marginalized in order to respond to other, local, discourses. There were no explicit requests to make browsing a webpage through Woredanet difficult. It was only when the Internet started interacting with other services that its relative importance for Ethiopian leaders became apparent. The redundancy embedded in the system as a result of conflicting global and local influences started decreasing, letting some features prevail over others. Against the assumptions of those who celebrated the transformative power of the new technology, the Internet showed little capacity of holding the ground against local demands. Only some of its features survived, such as the transmission protocol it was based upon, generating new assemblages that hardly could have been predicted by analyzing their constitutive discourses and artefacts in isolation.

However, when the national technopolitical regime was stabilized it did not represent the end of the negotiations that led to its realization. The balance between different discourses, artefacts and actors was only temporary. Benefiting from the eventual implementation of the systems on the ground, the government of Ethiopia initiated new negotiations with some of the key players from a position of greater power. For example, it agreed to allow international organizations, such as The World Bank, use Woredanet to implement some of their projects.[219] It incorporated some of the critiques of Schoolnet in projects aimed at patching some of its problematic features. In 2008 two secondary schools in the towns of Awassa and Bahir Dar were connected to the ETC network through fibre optic cables, and

[219] As reported in a World Bank project document, Woredanet was perceived as an opportunity to extend the reach of The World Bank's Global Development Learning Network (GDLN), a system connecting institutions working on development issues all around the world. "The Bank and Government teams took advantage of the Government's creation of a government network (WoredaNet) as a great opportunity to establish an interface between the Ethiopian Civil Service College' GDLN center and the Government's WoredaNet (a network of more than 600 local government sites, each equipped with video-conference equipment and local area networks). This would allow the College to reach out to about 600 local government facilities through video-conference programs, making it possible for ECSC to move toward reaching the development objectives related to the testing of electronic distance education approaches in the near future" (World Bank, 2007, p. 5)

equipped with video servers, which allowed teachers and students to engage interactively with the educational content. They were able to replay classes and interrupt the viewing in order to provide more time for the teacher to integrate the recorded material. This project was framed as a pilot that could later be scaled up to other towns, when the fibre optic infrastructure would be completed to make it possible. Similarly, in 2008 the government lifted the taxes on hardware imports, allowing a greater amount of PCs and laptops to be sold in Ethiopia.[220] Finally, in cooperation with the Chinese company ZTE, the ETC embarked on an ambitious programme to overhaul the Ethiopian telecommunication infrastructure. This project increased the capacity of the mobile network, it reached many remote villages for the first time with fixed telephone lines, and, on paper, was also meant to make faster Internet connections more easily available, it

This further illustrates how the complexity of the interactions among competing hegemonic discourses, artefacts and actors needs to be addressed in context. A discourse that is refused at an early stage can be accepted, at least partially, in a subsequent one after a reconfiguration of the balance with other discourses, artefacts and actors. From a more practical point of view, it raises the important issue of timing and sequencing, and of the necessity for international actors not to push a given agenda on local stakeholders, but rather to understand which part of this agenda are the most compatible with local contexts at any given time. Accepting the evolutionary nature of technopolitical regimes can make a significant difference in planning effective interventions that are aimed at introducing new discourses and artefacts in scenarios that are different from those where they originated.

8.5 Conclusion

After having addressed the multiple transformations ICTs underwent in Ethiopia in the previous empirical chapters, this chapter has provided a synthesis of the most relevant findings and integrated them to answer the questions that inspired

[220] See section 6.1 for the details on the taxation regimes for the hardware.

the research. Sections 8.1 and 8.2, in particular, examined how, by framing conflict as the starting point in the analysis of the application of ICTs and by appreciating technology both in its material and discursive components, it was possible to understand why the same artefacts produced very different interpretations among various segments of the Ethiopian society and what consequences this had for the concrete development of ICTs in the country. Sections 8.3 and 8.4 focused more specifically on the actors that intervened in the re-definition, re-interpretation and re-shaping of ICTs, and on the processes they activated and became part of throughout the development of specific technopolitical regimes. These sections stressed the dynamic nature of the application of ICTs in Ethiopia, illustrating the constant negotiation that allowed new possibilities to be revealed, while others were ruled out. The next chapter extends this analysis to consider the broader relevancy of what the Ethiopian experience means for other contexts and how the tools employed in this thesis could be applied to other cases.

CHAPTER 9 – CONCLUSION

Since the international community placed 'bridging the digital divide' on the global agenda, numerous attempts and strategies have been made to support the diffusion of ICTs in the developing world. International organizations and donor governments have been motivated by the conviction that new technologies can drive economic growth and support democratization processes. Most of the studies that have emerged in the ICT for development field have been focused on identifying how these goals could be reached, detecting both the successes and failures, as well as understanding how the new tools could operate in different social, economic and cultural contexts.

My research has also been driven by a desire to understand how ICTs can benefit developing countries. However, I have chosen to take a step back and question the assumed consensus between international and local players about what ICTs are and how they should be used. Woredanet and Schoolnet provided a challenging test to the prevalent belief that developing countries are willing to pursue the path indicated by international organizations, but simply lack the resources and the capacity to do it properly. Rather, they suggested that profound discrepancies exist between interpretations of the same artefacts emerging internationally and locally, and that these differences can lead to processes of substantial re-shaping, even in a developing country such as Ethiopia that heavily relies on international assistance, primarily from donor countries in the West.[221]

This thesis has examined the reasons and the consequences of these discrepancies. It has employed a conceptual framework combining insights from different forms of constructivism, especially from the international relations and the history of technology traditions, to analyze what led to magnifying certain aspects of ICTs, while marginalizing others (see Chapters 2 and 8). It has developed methods that facilitate the integration of discourses emerging from interviews with individuals

[221] According to the OECD, in 2008 Ethiopia was the first recipient of donor assistance in Africa. The amount of aid has almost doubled in recent years, shifting from USD 1,809 million in 2004 to USD 3,327 million in 2008 (OECD, 2009).

who defined the path of ICTs in Ethiopia with observations of how the technical artefacts were actually implemented (see Chapter 3). These conceptual and methodological tools have helped reconstruct how the centralization of power in the hand of the state and the determination of the ruling party to enforce an ambitious national plan on the ground motivated the re-interpretation, re-definition and re-shaping of the new technologies (see Chapters 4 and 5). Other agents, such as the private sector and the civil society, that were identified both in the policy and in academic discourses as potentially instrumental in the promotion of the use of ICTs for development, were actively constrained in their faculty of defining an Ethiopian way of applying ICTs (see Chapter 4).

This evidence suggests that governments in developing countries may have a greater motivation and capacity to adapt technology to their own needs and political projects than usually assumed by international actors defining a global ICT agenda (see Chapter 1 and 2). This was exemplified by the national technopolitical regime incorporating the discourses on the nation, society and communication articulated by the Ethiopian government (see Chapter 6). At the same time, the research also indicated how, despite the government efforts to monopolize both uses and meanings of the new artefacts, other applications continued to be implemented and advocated, crystallizing in more or less coherent alternative technopolitical regimes (see Chapter 7). The analysis of how this competition evolved further substantiated the claim that new technologies are implemented as a result of complex negotiations occurring both at the discursive and at the material level, within and among technopolitical regimes, rather than as a simple transfer, making new tools available to perform functions that are defined internationally as the most appropriate (see Chapter 8).

The emphasis on the political aspects of the design and application of ICTs can arguably be considered one of this thesis' major contributions. It helped to understand how power, at the local and at the international levels, as embedded in artefacts and exercised in social relations, influences the adoption and adaptation of new technologies and how ICTs are integrated in locations that are different from those of their invention, beyond particular normative perspectives. At the same time, and for the same reasons, this "political reading" could be criticized for downplaying

other factors that are usually taken into greater account in explaining how new technologies are and should be used to support development.

Some critics might question the concept of selective adoption, suggesting instead a greater alignment between international and local readings of new technologies. They might argue, for example, that projects like Schoolnet and Woredanet represent just a variant of more traditional e-learning and e-government projects which took the shape they did to adapt to a complex geography, to the lack of terrestrial infrastructure and to the low literacy rate outside of the capital. After all, as advocated by policy documents such as the AISI framework or the WSIS Geneva Declaration of Principles, these projects were designed to target mostly the rural population. Other critics might point out, for example, that the lack of affordable and reliable Internet access was not motivated by an active resistance to uses advocated internationally, but could be simply explained by incompetence and lack of resources.

While some of these explanations have not been completely ruled out and have been discussed, for example, in sections 6.3 and 8.1, it must be acknowledged that the political significance of these systems and of the resistance to alternative ones emerged from the interpretations advanced both by their advocates and designers and by their critics. Similar to what Hecht illustrated in her study of nuclear technology in France, many technocrats participating in the development and implementation of a technical system, referred to politics as a mayor variable in its shaping, without being primed by asking if "technology had politics", but simply responding to questions investigating why and how a particular technology took the shape it did (Hecht, 1998). As was the case in other studies in history of technology (Allen & Hecht, 2001; Hughes, 1983; Weinberger, 2001), searching for insider perspectives, for the voices and witnesses of those who designed policies and technologies of national significance, led to the discovery of explanations that are usually downplayed by research focusing on the effects of the application of technology or on users' behaviour.

The scope of this research was not ruling explanations other than politics out, and systems like Woredanet and Schoolnet can be described as unusual e-government and e-leaning projects without undermining the core argument emerging

from the analysis of the data. This research sought to accord adequate attention to a dimension that is usually overlooked and which, if incorporated in wider frameworks used to study ICT for development, can greatly enrich the understanding of how new technologies concretely operate in different developing contexts. Some of the tools that can be adopted to incorporate this perspective are discussed in the next sections of this concluding chapter. Their illustration is complemented by an overview of other contributions that the study of the adoption of ICTs in Ethiopia offer to larger international debates in the areas that have been explored by my research. More specifically, I address why this research has deeper resonance beyond the single case study and offer insight into some of the complex changes that ICTs are facilitating in the developing world, but often remain overlooked. Section 9.1 stresses the importance of bringing the analysis of unique systems such as Woredanet and Schoolnet to the attention of the academic community and highlights potential new paths for research. Section 9.2 focuses on the theoretical and methodological contributions of this research. It illustrates how it fits into the scholarship on the politics of modern Ethiopia. It also suggests how international relations and the history of technology traditions can benefit from some of the tools developed to study the selective adoption of ICTs in Ethiopia. Section 9.3 discusses the ways in which the concepts and tools developed to study the evolution of ICTs in Ethiopia can be extended and applied beyond the single case study.

9.1 Broader implications

Despite the uniqueness of Woredanet and Schoolnet and the productive challenges they offer to understanding ICT applications in developing countries, at the time of writing no major studies have addressed these cases, exploring their causes and implications.[222] This thesis represents the first attempt to analyze the two

[222] There have been MA theses on Schoolnet (Takeuchi, 2008) and on e-government in Africa making references to Woredanet (Kitaw, 2006). There have also been reports commissioned from consultancy firms by the Ethiopian government (Daedan, 2004) or by other players involved in the implementation of Woredanet and Schoolnet (Asefa, 2006). The two systems have been mentioned in conference

systems comprehensively, together with the alternatives that emerged in relation to them. In addition, the detailed descriptions offered in the previous chapters can provide scholars from different disciplines the opportunity to approach the data from complementary viewpoints and to identify phenomena that have the potential to inspire new research projects. Political scientists, for example, could further explore the political repercussions of Woredanet and Schoolnet, focusing on the influence the two systems have exercised on the local and national elections in 2008 and 2010 when the ruling party obtained two landslide victories. This could be contrasted with the contested election in 2005 that took place less than a year after the two systems started operating.[223] Education researchers could assess the consequences Schoolnet has had for the learning process as well as the evolution of the responses students developed towards the system which, as briefly reported in section 6.2.2, shifted from an initial resistance to a subsequent appreciation.

Researching Woredanet and Schoolnet, and the technopolitical regimes that tried to patch, complement and oppose them, responded to the need to engage more deeply with emerging assemblages of ICTs and local politics and cultures, even when they contradict widespread assumptions of what technology could and should do. This research has resisted the prevalent tendency to label uses of the kind promoted by the Ethiopian government simply as problematic or as the ordinary expression of an authoritarian regime, ignoring deeper meanings and implications.

Understanding the complexities of the selective adoption of ICTs in Ethiopia is rather urgent. With almost 80 million citizens, Ethiopia is the second most populous country in Africa after Nigeria and its population is growing rapidly. The Ethiopian government argues that Woredanet and Schoolnet are central to improving

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papers, policy documents and reports, but without addressing the specificity of their set-up and of the functions they were set to perform (Asefa, 2006; Haque, 2004) . However, at the time of writing, there are no major published works on Woredanet and Schoolnet.

[223] This is a potentially exciting comparative study. Some of the data collected during my field research suggest that these systems have complemented the governments party mobilization of advanced elements as well as the encouragement for teachers and students to join party groups similar to the Soviet Unions' "Young Pioneers". Clearly identifying the role of Woredanet and Schoolnet in this mass mobilization campaign and the elections would be a dramatic study in technology for political capture.

development and stability. This argument must not be taken lightly. In addition to being ill-equipped to handle the current massive population growth, the Ethiopian government continues to face several armed insurgencies threatening the central state. The Ogaden Liberation Front and the Oromo Liberation Front, both of which were active during the civil war, continue to this day. And there have been additional insurgencies even in Tigray, the EPRDF's stronghold. In addition, Ethiopia is conspicuously bordered by fragile states and states that are heavily engaged in armed conflict, including Sudan, Somalia and Eritrea. Disregarding the uses of ICTs promoted and restrained by the Ethiopian government and their possible implications for development, service provision, or political stability because they are too eccentric to be captured by the frameworks commonly employed to measure the diffusion of the new technologies would be a mistake.

As argued throughout this thesis, in order to address this challenge and to understand why and how ICTs took the shape they did – the central research question in this study – I relied on an open framework that did not start from assumptions about how ICTs should be used and which effects they should produce. This approach allowed local discourses to emerge and become guides for analysis. It also entailed some costs and trade offs.

On some occasions, the discussion of the analysis of the data risked appearing to defend a political elite that has been governing for almost twenty years and has offered little opportunity for a fair political competition while simultaneously constraining civic and political rights. Rather than justifying their rule, the analysis of the data was contextually dependent on the fact that some of the transformations brought by the enforcement of discourses such as ethnic federalism and revolutionary democracy could not be assessed outside the framework created by those very discourses. As a consequence, the focus was often on the services Ethiopians in rural areas were provided with or the attempts by the government to promote a greater sense of communal belonging among different ethnic groups. Similarly, the need to understand rather than to normatively assess or compare the uses of ICTs that emerged in Ethiopia highlighted the importance of analyzing political ideology. In the case of Ethiopia, the investigation of what informed the design of a national technopolitical regime, and the resistance to alternative ones, led to the recognition

of discourses on the nation, society and communication. These are significant in Ethiopia but the same discourses might not be as useful for understanding the appropriation of ICTs in other countries. However, while applying discourses such as ethnic federalism or empiricism may not be a relevant strategy for researchers investigating the adoption of ICTs in other countries, the research design and analytical process this thesis employed offer an example of how complex patchworks of technology and politics can be addressed and analyzed "in their own terms". The research design that led to the identification of more specific factors, including the focus on political ideology, could be productively employed beyond the Ethiopian case, to detect emerging processes of resistance and appropriation.

9.2 Theoretical and methodological contributions

Among the different academic traditions the study of systems such as Woredanet and Schoolnet, as well as of the alternatives that emerged in relation to them, could be approached, could draw from, the particular standpoint I adopted allowed me to contribute to the debate among ICT for development scholars and practitioners. The pillars of this contribution were discussed throughout the thesis, and most systematically, in Chapter 8. The conflictual nature of ICTs, as both material and discursive, as well as concepts such as technopolitics and technopolitical regimes represented important complements to the study of ICTs for development, by allowing researchers to critically address the negotiations that surround the implementation of ICTs in developing countries.

At the same time, the academic literature I referred to and the conceptual framework I developed that combined scholarship from international relations and the history of technology, enabled me to produce new insights and to propose new research tools for other disciplines. These empirical and theoretical contributions have been illustrated in different parts of this thesis and are addressed systematically in this section by focusing on how this research fits into the scholarship on the politics of modern Ethiopia. I then turn to some of the most significant contributions to the international relations and history of technology traditions.

In Chapter 5 I referred to various studies addressing the transition of Ethiopia from the military rule of the Derg to a new political phase dominated by the EPRDF, (Aalen, 2002; Assefa & Tegegne, 2007; Gudina, 2003; Ottaway, 2003; Pausewang et al., 2002; Stremlau, 2008; Tegegne, 1998; Turton, 2006; Young, 1997). This body of literature shed light on how discourses such as ethnic federalism or revolutionary democracy informed the policies and practices of the new rulers, on the contradictions they created and on the strategies that were elaborated to face emerging challenges. These complex phenomena have been concisely captured by Bahru Zewde, the Ethiopian historian, when he noted:

> This is the paradox the current government created: it is a minority government and it needs to justify with an ideology like ethnic federalism its staying in power. They need to decentralize to support their ideology but also to exert a central control to make sure they can stay in power.[224]

Re-framing Ethiopia as a federation of ethnicities rather than as a unitary and homogeneous state required the government to embark on a complex process of decentralization and the building of new institutions. Greater power and responsibilities had to be devolved to the local level, guaranteeing, or at least offering the impression of guaranteeing, the major ethnic groups representation and self-rule. At the same time, the government had to make sure that the greater rights the local institutions were entitled to would be exercised without challenging the authority and primacy of the centre over the periphery. Over the years, different strategies were adopted to address this challenge. Pausewang, Tronvoll and Aalen (2002) explored how the EPRDF created a de facto single party system by founding dependent ethnically based parties and ensuring that these would be able to win majorities in both local and parliamentary elections. Assefa and Tegegne (2007) showed how the close control exercised by central government over financial resources in practice denied local administrations the capacity to define their own priority spending. Vaughan and Tronvoll (2003) identified additional measures such as the use of the federal security forces to control unstable peripheral zones and the

[224] Interview: Bahru Zewde (Historian)

provision of a wide range of training and courses to universalize the philosophy of the EPRDF.

My study has extended some of these arguments, unveiling aspects of the EPRDF's political strategy as concretely embedded in technical artefacts. For example, the analysis of the videoconferencing typology that was privileged over others for Woredanet demonstrated how the peripherical nodes, despite being provided better resources, were kept dependent on the central authority to make use of the new system. Similarly, the marginalization of the Internet exemplified the resistance towards a genuine empowerment of peripherical institutions which practically were denied the possibility of autonomously seeking resources to respond to demands emerging locally. Through Schoolnet, and in particular through broadcasting lessons in civic and ethical education, a sense of common belonging was promoted among students, while simultaneously affirming the principles of ethnic federalism. By analyzing these and similar features as embedded in the national technopolitical regime promoted by the Ethiopian government, the paradox illustrated above by Bahru can be appreciated even more clearly. Regions and woredas were provided with better resources and new possibilities to access training and to learn about best practices. However, this always occurred within a framework that allowed the centre to assert its presence and primacy.

The characteristics of the national technopolitical regime mentioned above, together with others that have been elaborated in the previous chapters, such as the emphasis placed on implementing Woredanet and Schoolnet simultaneously in all regions and woredas, are illustrative of another important, and related, aspect of the selective adoption of ICTs in Ethiopia: how new technologies have been, and can be, embraced as tools for nation building. The research design I adopted was not intended to study the interactions between technology and nation building per se, but, as was explained throughout the thesis, and more specifically in Chapters 5, 6 and 8, these interactions emerged as significant from the engagement with the data collected in the field. Their analysis helped to answer the main research question of why and how ICTs were re-interpreted, re-defined and re-shaped in Ethiopia. It also offered

original insights to scholarship investigating processes of nation and state building per se, in different respects.

It indicated how the national technopolitical regime implemented by the Ethiopian government was meant not simply to be a vehicle for messages about the new form of the nation, but also to serve as a symbol of some of the core aspects of the new national discourse. Schoolnet was to be used to teach the principles of ethnic federalism to secondary students, and Woredanet to make sure that local politicians and administrators could hear how the national project should be implemented from the very mouth of the Prime Minister. At the same time, the systems themselves, their presence among local communities in Ethiopia, were serving as signifiers of the discourses they were mediating. As explained in Chapter 5 and 6, the equal provision of resources along ethnic lines was also aimed at reinforcing, among Ethiopians, the perception that it was in their interest to articulate their demands as part of distinctive ethnic groups. It was through ICTs, as communication channels, that the government made sure its messages could reach different typologies of citizens. And it was with ICTs, as symbols of the presence of a modern state in the peripheries, that it signalled a particular vision of society, based on ethnic diversity and rooted in rural communities.

The negotiation of a new national identity did not happen through ICTs exclusively. It was part of a wider strategy, as explained in section 5.1. Local languages were accorded greater visibility and importance (see section 5.1.1). New institutions were created to facilitate local representation, and to signal the new role ethnicity had to play in Ethiopian politics (see section 5.1.2). The issue of nations and nationalities was placed at the core of the discourses promoted by state owned media (see section 5.1.1). The use of ICTs, however, was particularly indicative of the selective nature of the EPRDF's national project, of the ambition its leadership had to reach national hegemony without seeking the consensus of important components of the Ethiopian society, such as the urban elites, the supporters of the previous regime and other political organizations that refused ethnic politics as the organizing principle of the state (see sections 5.3 and 5.4). Woredanet and Schoolnet could reach wide audiences and be used by government figures in a more secretive way than other media, such as television or radio. Because Woredanet allowed

routine communication only between nodes of the state, it was primarily used by public figures at the centre to reach peripheral nodes, while minimizing the capacity of the latter to access information independently. Schoolnet ensured that the new generations were exposed to messages defined at the centre and it allowed EPRDF cadres to reach wider constituencies when needed. In a context where the boundaries between party and state had almost disappeared, the use of these new channels provided the central power with a strong competitive advantage over oppositional forces and prevented it from engaging with them.

As the government was enlarging its political control, reinforcing its apparatus on the ground as well as multiplying its communication channels through Woredanet and Schoolnet, the restrictions imposed on other media, as illustrated in section 7.3, were meant to prevent alternative discourses on the nation and on society to reach Ethiopian citizens. Therefore, ICTs, rather than opening new spaces for debate and confrontation, as had been the case for many developing countries, were largely applied to boost the capacity of a central authority to reach the most remote corners of the state. While critical information coming from outside Ethiopia had to fight hard to reach its intended destination, through Internet filters and slow and expensive connections, the Prime Minister had the chance to address his citizens and subordinates using a fast and private lane, wherever and whenever he wanted.

In essence, to enforce and defend a specific national project, the Ethiopian government had created two systems operating at different speeds: the first was a unique type of fast, state-owned, Intranet diffused throughout the whole territory; the second was a slow and partially censored network, that could allow users to access the Internet and other services almost exclusively in the urban centres and for a cost that could not be afforded by the large majority of the population.

In turning now to the contribution of this thesis to international relations scholarship, I suggest that the value of this research lies in investigating how discourses and norms articulated at the international level propagate and influence domestic practices. As illustrated in section 2.4, different scholars have focused on various actors intervening in this process including international organizations (Finnemore, 1996), NGOs (Keck & Sikkink, 1998), epistemic communities (Haas,

1992), and local institutions (Checkel, 1997; Sikkink, 1991). There has also been a focus on different phases in the life of discourses, from their origin (Adler, 1992), to the mechanisms that preside over their dissemination (Finnemore, 1996; Strang & Meyer, 1993), to how they fit into specific cultural and political environments (Checkel, 1997; Keck & Sikkink, 1998; Klotz, 2006; Magnusson, 2002; Risse-Kappen, 1995b; Sikkink, 1991).

Within this range, the analysis of how ICTs have been selectively adopted in Ethiopia offers new insights into processes of local appropriation, and the resistance and recombination of discourses articulated internationally. To date most of the research in the international relations field addressing this final moment has theorized the mechanisms leading to constructing a match between international norms and local contexts as significant (Checkel, 1999; Finnemore, 1996), but it has provided few concrete examples. Those scholars who have engaged with case studies have largely focused on the reasons that motivated a successful or unsuccessful socialization of local actors to new discourses, asking fewer questions about how these discourses could be reworked in practice, rather than being either accepted or rejected (Keck & Sikkink, 1998; Risse-Kappen, 1995b).

In contrast, by focusing on how technologies with an international relevance such as ICTs were appropriated in Ethiopia, the research presented in this thesis has addressed some of the complexities that characterize the concrete interactions between international and local discourses and the processes that can lead to their possible hybridization. It showed, in general, that analyzing discourses as embedded in technical artefacts may allow the researcher to better understand which aspects of those discourses are magnified, which ones are marginalized, and how they integrate in more or less coherent ways.

An artefact may enable users to perform specific actions, but it may also preclude other types of actions at the same time. When the analysis of both the material and discursive aspects of that artefact highlights assocations between some of its functions, as well as their descriptions, and specific discourses, it becomes possible to "read" the complex patchwork of discourses, as locally and internationally grounded, it refers to. This analysis arguably becomes even more meaningful when it is applied not at the level of single artefacts, but of large

technical systems, linking technical objects to other social, economical and political factors, analyzing them as part of the seamless web described by Hughes and connecting the technical and the social (see section 2.3).

Various examples of how this analytical process can work in practice have been provided throughout this thesis. Chapters 6 and 7 illustrated the particular ways in which the capacity of accessing the Internet was constrained, as well as highlighted the costs, both at the technical and at the financial level, incurred to enable the central government to communicate with the nodes of the ethnic federation was enhanced.

More generally, and beyond ICTs, this research further confirmed how the study of technical artefacts as part of large technical systems can be appreciated as a way to understand the politics of a nation, or a group within a nation, as suggested Allen and Hecht (Allen & Hecht, 2001). In some cases analysing the features of a large technical system offers a picture that is more accurate than the one emerging from the examination of laws and policies. This can be especially true in developing countries, when it is often the case that laws and policies are created for donors' consumption and are seldom enforced. In research investigating how supposedly global discourses are received and implemented locally, large technical systems analysis represents one of the entry points to appreciate some important features characterizing a specific location. These systems can be interpreted as texts which are representative of the discourses embraced by the individuals and groups who assembled them and can return valuable insights on the politics and culture of the society they are a part of.

In turning to the history of technology tradition, the contribution offered to this area of study mirrors the contribution to the international relations field. Above I illustrated how the investigation of the interactions between international and local was enriched by grounding it in the study of large technical systems. I now discuss how the understanding of the ways in which some of these systems originated and evolved was enhanced by locating them in an international context. I also demonstrate how this might be extended to other cases.

There is a large body of literature in history of technology tradition that has adopted an international and comparative perspective. Some of this work has investigated how large technical systems centred on the "same" technology have evolved differently in distinct national contexts. For example, Hughes' research on electrification spanned cases from the United States to England and Germany (Hughes, 1983), while Hecht's reconstruction of the French nuclear program drew comparisons with the American and the British programs. These works, however, mostly located the drive for the appropriation and shaping of a particular technology in local governments and companies. They would, for example, indicate how a technology was demanded in a particular state and how it could then be adapted to take on specific traits of the political, social and economic environment that characterized it.

On the contrary, as the case of the re-shaping of ICTs in Ethiopia illustrated, together with other research, such as Finnemore's study of UNESCO's promotion of science bureaucracies (Finnemore, 1993) or Keck and Sikkink's analysis of activists networks (Keck & Sikkink, 1998), in some cases innovations may be supplied to states rather then being sought out by them. In these cases technologies are likely to come as part of a package, together with prescriptions about how they should be used and what political or development goals they should help to achieve. As the analysis of the Ethiopian national technopolitical regime and of the resistance to its alternatives indicate, this does not necessarily mean that the package is accepted. However, it does suggest that to understand the evolution of a specific technical system it may be important to take into account how it emerged as part of a negotiation with relevant international players, and how a state resisted certain influences while adapting, and possibly adopting, some prescriptions.

Finally, the methodology that has been developed and employed in this thesis (as outlined in Chapter 3) employs a set of tools that can be applied to detect and understand the conflict that may emerge around ICTs in developing countries. It can also help to examine the implications this may have for the appropriation and use of the new technologies. These tools converge around two core practices. First, the identification of technopolitical regimes as privileged units of analysis. Second, the

engagement in a process of iterative comparison between conceptualizations held by individuals who shaped the path of ICTs in the country, and observations of how the technical artefacts actually took shape.

When investigating how ICTs are employed in a specific context, the concept of technopolitical regimes, as well as the closely related concept of large technical systems, encourage the researcher to move beyond the isolated artefacts or assemblages and explore them in connection with non-technical elements, such as institutions, ideologies, and cultural habits. They help to counter the determinism that characterizes a large share of the ICT for development discourse, while promoting the investigation of processes of mutual influence among the technical, the social and the political.

Grounded in the history of technology tradition, the notion of technopolitical regimes encourages researchers to locate new technologies in the longer-term path of adoption and adaptations that has been traced by older technologies. It also stresses the importance of being attentive to how the discourses identified as significant have emerged and evolved in the history of the country. As the analysis of various ICT-based technopolitical regimes in Ethiopia made clear, some of the puzzles these systems presented could be solved by referring to discourses that emerged at the time of the civil war in the 1970s and 1980s or to competing hegemonic projects that had been battling for decades, as indicated in Chapter 5 and 7. These examples suggest that the ICT for development literature discussed in Chapter 2 could benefit from integrating some of the tools used by historians. This would help to overcome the prejudice and assumptions that the 'newness' of new technologies somehow excuse researchers from investigating how these technologies can be captured in the networks of discourses and power characterizing specific national contexts.

The toolkit available for ICT for development scholars could also be enriched by another method that was used in this thesis and has resonance beyond the Ethiopian case. Combining insights from grounded theory and from the history of technology tradition encouraged novel ways of engaging with discursive and material aspects of ICTs. This approach adopts a cyclical process that progressively reconstructs both the motifs and the resources that have led to the emergence of specific technopolitical regimes, and to the marginalization of other ones, as it was

discussed most extensively in Chapters 6 and 7. It is based on understanding, through the collection of interviews, oral histories, and other textual material, how ICTs were conceived by stakeholders who became involved, at various stages, in the shaping of different technopolitical regimes. It also focuses on how these conceptions found concrete applications in technical artefacts. This moving "back and forth" between the technical and the discursive is essential if the conflictual nature of technological appropriation as well as the specific distribution of power characterizing the context under scrutiny are to be captured and explained.

9.3 Beyond Ethiopia

One of the most important lessons that can be drawn from the analysis of the Ethiopian case suggests that if researchers are overly concerned with detecting and evaluating normative processes of technological diffusion and appropriation, the reality of the complex role ICTs are playing in developing countries may be obscured. The research presented in this thesis has stressed the need for new lenses and new frameworks to understand the transformations that are taking place in an increasingly complex and multi-polar world. These changes are not limited to ICTs, nor to Ethiopia alone. Wang Shaoguang, for example, a Chinese scholar who has been working both in American and in Chinese universities, advanced a similar argument when reflecting on how the scholarship in the West characterizes Chinese politics. He argues that,

> The analytical framework of authoritarianism from the West is completely unable to capture these deep changes in Chinese politics. In the past several decades, this label has been casually put on China from the late Qing era to the early years of the Republic, the era of warlords, Jiang Jieshi, Mao Zedong, Deng Xiaoping and Jiang Zemin. Chinese politics has made world-shaking changes during this period, but the label put on it made no change at all. (Wang Shaoguang in (Leonard, 2008, p. 76)

Such categories can easily obscure more complex and nuanced processes. The risk is that, if efforts are not made to explore and understand emerging phenomena in their particular contexts, misunderstandings may turn into greater divides. Alternative models will continue to emerge and thrive without researchers or policy makers giving them their deserved attention. The national technopolitical regime developed by the Ethiopian government cannot be simply considered a temporary outcome of a transition that will eventually lead to more "appropriate" uses of ICTs, or to variations that the current democracy or freedom indexes will be able to measure. Systems like Woredanet and Schoolnet are enormous investments on the part of a poor country with significant implications for the lives of their citizens.

This evidence provided in this research may help international development practitioners and scholars to re-evaluate the capacity for developing countries to adapt technology to their own needs and political projects. This research has also proposed a set of tools that can be employed to study and understand the alternative models that are emerging in developing countries, with the ambition that they will be integrated in wider frameworks to capture new aspects of the contribution of ICTs to development.

Appendix: Example of topic guide

This represents only an example of some of themes that were covered in a "typical" interview. Because of the variety of interviewees and the particular interview techniques used (see section 3.2.1), apart from some common threads, each interview was different and focused on particular events each informant participated or witnessed to.

Background

- Place of birth
- Education
- Profession (How what you do now relates to what you did before?)

ICTs in Ethiopia

- What have been the most important driving forces in making ICTs what they are in Ethiopia?
- Has the situation changed over time?

Woredanet

- When did you first hear about Woredanet?
- What was your first reaction?
- Which purpose do you think Woredanet serves the most?

ICTs for development discourse

- When did you first associate ICTs and development?
- Who/what was the most influential in shaping your vision of ICTs?

Most significant uses and projects

- What do you think are the most significant uses of ICTs in the country?
- Is there a particular Ethiopian way to ICTs?

Schoolnet

- Why do you think ICT for education in Ethiopia took this particular shape?
- Do you think it has been influenced by earlier uses of technologies for education?

Resistance to ICTs

- Do you think there are uses of ICTs that have been resisted in the country? Why?
- What do you think Ethiopian citizens think about this?

The civil war / transition

- Did you participate to the struggle against the Derg regime?
- Has what you learned then influenced your ideas and actions today?

Other projects

- Are there other significant uses of ICTs in Ethiopia?
- Do they have any relationship with projects such as Schoolnet and Woredanet?

The larger context

- How do you think ICTs fits in the larger context of Ethiopian politics?
- Is there any relationship with ideas emerged at the time of the civil war?

Summary

How would you define the road taken by Ethiopia in relation to ICTs? Which factors do you think played the most important role in making ICTs what they are today?

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