

Chapter 4

Empirical investigation into the implementation of information and communication technology-based initiatives

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4.1. Introduction

In this chapter, three case studies concerned with the implementation of ICT-related initiatives in Mozambique are described. The first case study analyses an IS adoption in the Electricity Company in Mozambique (EDM). The information system described, which relates to the invoicing of electricity in Mozambique, is called *Galatee* meaning *the* 'God of Water'. *Galatee* is being implemented in five EDM operational areas, namely, Maputo City (south), Beira, Chimoio, (centre) Nampula and Nacala in the northern part of Mozambique. A French company called *SAUR* was contracted by EDM to design and implement this system.

The second case study concerns the introduction of a business process re-engineering (BPR) initiative in the banking sector of Mozambique, more specifically in the Central Bank of Mozambique (BM). This initiative consisted of two subprojects, including the organisational restructuring of the bank and the development of its IT Master Plan.

The third case study describes the initial experiences during the introduction of ICT in rural communities in Mozambique through 'Telecentres'. The case study examines the events and issues experienced by different actors in two rural districts, namely Manhiça and Namaacha, during the course of the initiation and implementation of the Telecentre project. This study helps to examine the role of ICT in rural development.

This chapter has four main sections. The first section describes the fieldwork. The second section describes the two organisation case studies including a historical perspective on the organisation and its structure, the role of the IT Department and details of ICT implementation. The third section describes the Telecentre case. The final section sums up the chapter.

4.2. Fieldwork

The case studies approach is based on the research methodology described in Chapter 3. In this section, the individual research sites and the data-gathering process are highlighted.

The fieldwork for the three case studies took place in Mozambique during the period from February 2000 to April 2001. For the EDM case study, the eight months of fieldwork from May 2000 was conducted in the five operational areas and at the Head Office. In the banking case study, BM, data gathering took place at the Head Office of the central bank, and also at the regional branches of Nampula and Beira in the northern and central regions of the country respectively. The BM research commenced in February 2000 and lasted for approximately four months. For the Telecentre project, data gathering took place in Manhiça and Namaacha from 14 August 2000 to 26 August 2000. In addition to this, data was also gathered at CIUEM (Eduardo Mondlane University Informatics Centre) in Maputo, and at other offices in various places within the districts (e.g., Palmeira and Maragra located some kilometres away from the Manhiça district village).

Data gathering involved individual and group interviews, group discussions, questionnaires, workshops, secondary sources, as well as formal and informal conversations. In all three case studies the interviews were pre-arranged and conducted at the premises of the key informants. The researcher adhered to specific interview guidelines for each case (details are given in Appendix 4.1).

In each organisation, at the departmental level, or in each regional branch or operational area, an initial group interview was conducted with the manager of the area and his/her management team to introduce the objective of the study and provide necessary clarifications. The interview sessions typically began with the introduction of the study objectives and the key expected results. This was followed by an invitation to give a detailed description of the major organisational functions, problems, opinions and suggestions regarding the process of adopting new ICT-based systems. This introductory session was followed by subsequent interviews with

employees directly responsible for different functions in each department, regional branch or operational area. In general, the interviews provided explanations about the functioning of each department, challenges being experienced in the IT initiation and how these are being addressed.

For purposes of cross-checking, the interview transcripts, when prepared, were sent to the interviewees for their confirmation, rectification and suggestions regarding changes or improvements.

In general, the individual interviews were aimed at obtaining a description of the demographic and educational background of the informant, the size and duties of the unit to which the interviewee belonged, and also the nature of the interaction between the individual and the ICT initiative.

The researcher gave a formal and written undertaking to preserve the anonymity of the interviewees and to refer only to the titles, not names. At the start of each session, permission to use a tape-recorder was requested. In general, they did not feel comfortable being recorded, and so no tape recorder was used.

All ‘formal’ interviews were transcribed in *Word* and these constituted the field materials documentation. In the group interviews, the interviewees appeared in the same reference box and when their comments are used in this thesis, the following reference abbreviation format is used: Initials of the organisational unit (department) to which they belong, company branch abbreviation, interview number and the page in the field materials on which the extract from the interview is located, e.g. [DE_BM_HO_ Interview 1, p. 2] or [DT_BM_BE_Interview 5, p. 3] or [IT_EDM_CH_ Interview 4, p. 10]. In the case of individual interviewees, the professional or management position is indicated, company and branch abbreviations are used in the beginning of the interview identification, followed by the interview number and page from where the quotation is extracted e.g., [System Analyst_BM_HO_ Interview 1, p. 3]. Quotes from Portuguese interviewees and from other sources are translated throughout the thesis by the researcher. However, some

text is also left in Portuguese, for instance job titles and names of departments. The materials of the fieldwork are also in Portuguese.

In addition, secondary sources were also used as research material. Therefore, documents such as public reports (government publications), annual reports, and consultancy reports, project proposals and other documents were included in the case studies.

The secondary material was used to develop background information on the social, political and economic context of the sites, which helped to reconstruct the history of each ICT initiative (*Galatee*, BPR and Telecentre). During the one-year stay at the field sites it was possible to have informal discussions with many of the staff, as well as to make general observations. Through being present at the sites, frequent conversations and casual remarks (especially during the trip to the regional branches and operational areas) provided insights into the organisational climate. A summary of the informal conversations and observations was maintained in a diary as part of the field notes.

At EDM, the fieldwork began in May 2000, six months after the *Galatee* implementation, and lasted for eight months. The historical reconstruction of the story of *Galatee*, its implementation and use was possible through interviews with key people involved in the project, system users and the analysis of secondary documents and observations.

Additionally, a meeting with the IT Department at the head office in Maputo took place after the completion of the fieldwork to present and discuss issues concerning the *Galatee* implementation.

Interviewees appeared to welcome an opportunity to re-examine events six months after the *Galatee* implementation with a person from outside EDM. In general, the interviewees found this to be a unique opportunity to revisit and analyse the events. This was evident at the end of several interview sessions when an interviewee said:

I hope that you can help us this time to get our reported problems to the right people who can solve them on time, because when we inform the people from SAUR it takes a long time to get a solution. [Cashier_EDM_CH_ Interview 35, p.32]

Problems such as the one above that were highlighted by interviewees were reported by the researcher to the IT Department in a memorandum. For example, after an interview with a cashier in Maputo, a memorandum was sent to the IT Department, explaining the problem of a difference between the electricity receipt and client account, which the cashier had to resolve by paying from his own pocket. This was creating an unpleasant situation between the user (cashier) and the *Galatee* system.

Thus, the empirical component consisted of approximately 38 individual and group interviews, and one group meeting. Interviews typically lasted about 2 hours. The *Galatee* system demonstration took about 3 hours and much time was spent on informal discussions with many staff members as well as making general observations.

Many of the *Galatee's* project members were interviewed. Unfortunately, it was impossible to interview foreign experts from SAUR involved in this project. Interviews took place at the EDM head office and various other locations in the country (Nampula, Maputo, Nacala, Chimoio and Beira) with:

- EDM senior managers
- ICT/IS specialists
- Invoice managers
- Cashiers
- The New Image Project members (*Nova imagem*).

Secondary source materials for this thesis included:

- Commercial reports
- Internal EDM memos and documents (e.g. *Problemas do Galatee* 2000, IT report)
- Technical documentation (e.g. *Galatee* training procedures)
- EDM contract programme with the Government

- Annual EDM reports.

A detailed list of interviewees (only IT staff), their department's positions and roles are described in Appendix 4.2. In terms of time coverage, the interviews and internal documents concentrated mainly on the duration of the *Galatee* project, from its initiation in 1998 to its implementation in 2001.

At the BM, the fieldwork was initiated in February 2000 and lasted for approximately four months. The second subproject (the IT Master Plan development) of the BPR project at the central Bank of Mozambique had just started. The aim of the research study was to understand the developmental process of the IT Master Plan and to reconstruct the organisational re-structuring subproject.

In 1999, the executive board of BM decided to embark on the development of an IT Master Plan for the organisation. For this purpose BM decided to hire a firm of consultants called *Perago*, a South African IT company consisting mainly of former IT staff of the South African Reserve Bank. In addition, this company had experience of working with central banks in the Southern African Region (SADC – Southern African Development Community) such as in Malawi and in Namibia (<http://www.perago.com>).

Perago initiated the project in early 2000. For the development of the IT Master Plan, *Perago* decided to conduct group interviews with each of the BM departments. The purpose was to elicit opinions and perceptions about the main functions they were performing, the level of technical support they received from the IT Department and what they expected in the future.

The interviews of managers, staff and the IT group took place at the BM head office and in the regional branches of Nampula and Beira. In total, 53 group interviews were conducted with more than 100 people. Each group interview lasted between one and two hours.

In the initial phase, data gathering by *Perago* basically took place through the medium of group interviews. *Perago* staff, BM IT staff, the researcher of this work and a translator formed the data collection team. A translator was necessary because the *Perago* staff could not speak Portuguese. These interviews were directly translated into both Portuguese and English and it was possible to display all interview notes taken by using a data video projector to display all information being collected in the interview process. '*Inspirator*' software was used to draw data flow diagrams (DFD) for levels one and two, and to depict the organisational structure of each department.

All BM departments were involved in the group interviews, including the regional branches of Beira and Nampula. The direct display of the interview notes during the interview process served as an initial confirmation of the data gathered during the interview.

On completion of the group interviews, a one-day workshop was organised by *Perago* for the BM IT Master Plan project team, in order to consolidate data collection and the BM rich picture in order to produce the IT Master Plan. This workshop took place outside the BM head office so that the participants could give the workshop their undivided attention. *Perago* staff, the IT Department and the researcher participated in this workshop. A translator was not necessary as all the IT staff were fluent in English. The document produced by *Perago* after this workshop was then also presented at another workshop in which all BM's heads of departments participated. Based on the insights and contributions made by the participants, further refinements to the IT Master Plan document were made. The IT Master Plan was then presented by the consultant company to the executive board of directors of the BM, which approved it in December 2000.

The subproject of restructuring the organisation had been conducted in 1999, before the fieldwork started. The reconstruction of this subproject was possible through interviews with key people involved in it. For the purpose of gaining a thorough understanding of the role of the IT Department at the BM, it was necessary to conduct

some interviews with the IT staff. Five interviews were conducted, each lasting about one to one and a half hours.

IT staff interviewees appeared to welcome an opportunity to re-examine events related to their department, particularly the BPR project, the BM restructuring and IT Master Plan formulation. In general, the interviewees found this a good opportunity to re-analyse the events with someone outside BM. In general, BM employees expressed high expectations concerning the future of BM in terms of ICT-based systems, as compared to their earlier rather unsatisfactory experience with proposed new systems. Also contributing to the high expectations was the fact that the proposed computer-based information systems at that time were aimed at addressing commercial bank and not central bank issues. Some BM employees had a feeling that if the BPR project was going to fail, then the credibility of the IT Department within the bank would be decreased considerably. One interviewee commented:

This project gives us a big opportunity to show what we are capable of doing for the benefit of the BM. We know that many people here are waiting to see what benefits this project will bring to the BM [Acting IT Manager_BM_HO_ Interview 1, pp. 3-4]

The Telecentre case study fieldwork was conducted intensively from 14 to 26 August 2000 in the Manhiça and Namaacha districts, the sites of two Telecentre projects. During the data collection process the researcher stayed at the field sites. Twenty-four semi-structured interviews were undertaken in all the large and medium-size companies in each district, as well as in governmental and public bodies. These public and private organisations were identified as potential users of the Telecentre. A typical interview lasted between an hour and an hour and a half. In addition two individual interviews were undertaken with the manager of the CIUEM and the Telecentre project manager.

Interviews were facilitated by the use of questionnaires developed during the course of another study on the evaluation of the Telecentres (Macome and Cumbana, 2001). For more details about the questionnaires, see Appendix 4.3. The researcher also had informal and formal conversations with potential users in order to gain an

understanding of their expectations regarding quality of services and usage patterns of e-mail.

In addition, two group discussions took place (one in each Telecentre) to help identify the key issues as seen by the Local Advisory Committee (CAL) for their respective Telecentre. These group discussions promoted insights into shared understanding and beliefs, while still allowing individual differences of opinion to be voiced.

The Local Advisory Committee (CAL), the managers, the researcher and other colleagues participated in all group discussion meetings (normally 12-14 people). To give the discussion a sharper focus, the key aspects were defined as: necessary information for the Telecentre, priority services, new services, the prices charged, available human resources, benefits of the Telecentre, and a reflection on the future of the Telecentres at the end of the project. Guidelines for the meetings were prepared, and each CAL member and the Telecentre managers received the guide *prior* to the meetings (details are given in Appendix 4.4). The minutes of these group discussion meetings were also transcribed and analysed after the sessions with the project team.

A further data source was an afternoon workshop held in Maputo in April 2001, jointly organised by the researcher and the project team. In the workshop, the results of the Telecentre study were presented and discussed among different stakeholders. This also served as a vehicle to validate collected data.

Table 4.1 below summarises the data-gathering process used in each case study.

Table 4.1: Summary of data-gathering process in each case study

	EDM	BM	Telecentre
Location of the study	Maputo, Beira, Chimoio, Nampula and Nacala	Maputo, Beira and Nampula	Manhiça and Namaacha
Period of the study	May 2000- April 2001	February 2000 May 2000	August 2000
Data source (quantity)	Primary sources: Individual interview (38) Meeting (1) System demo (1) Secondary Sources: Decree laws Annual reports Contract programme Internal memos Technical documentation of <i>Galatee</i> Web page	Primary sources: Group interview (53) Individual interview (4) Workshops (2) Secondary sources: Annual reports Decree laws, laws Organisational structure manual BPR project proposal Web Page	Primary sources: Individual interview (26) Group discussion meeting (2) Workshop (1) Questionnaire (2) Secondary sources: Project proposal CAL procedures Monthly reports Minutes of meetings Web page

4.3. Organisational case study

4.3.1. *The EDM case study*

4.3.1.1. *Organisational background*

Historical Context

The historical context of EDM is divided into two main periods, from its creation/inception in 1977 to 1995 as a parastatal company and subsequent to 1995, a public enterprise.

EDM as a parastatal company

EDM is a Mozambican public company and deals essentially with the production and distribution of electrical power to the whole country. The company was created in 1977, two years after national independence, as a result of the nationalisation programme implemented by the new government (Conselho de Ministros, 1977 - decreto lei 38/77). It was formed as a parastatal company that was known as EDM_E.E., for the purpose of integrating all the electrical power generation centres that existed in the country. This was expected to make a major contribution towards satisfying the basic needs of the country in terms of electricity, particularly in relation to the development of agriculture, industry, services and the public sector. The exodus of skilled persons after independence in the country also affected EDM.

Widespread socio-political instability and a breakdown of infrastructure occurred in the country as a result of the civil war, and EDM was one of the companies directly affected. Moreover, many of the employees had lost their lives in the process of trying to protect electricity infrastructure. Despite the war, EDM concentrated their rehabilitation efforts on the destroyed infrastructure and tried to guarantee electric power in the country. It received a recognition award in 1989 from the central government for these efforts.

During the period when a centralised economic policy held sway, EDM was responsible for providing low cost electric power to all. As a result, the company suffered financially because power tariffs did not reflect the production, transportation and distribution costs. In general, the government relied on external donors and financial investors to support the electric power production costs.

EDM as a public enterprise

With the liberalisation of the economy, in 1995 EDM was transformed into a public company, its mission being to improve the quality of customer service, maximise revenues, introduce new management practices, and promote the autonomy and decentralisation of regional and operational offices (Conselho de Ministros – decreto lei 28/95). To help achieve these goals, EDM identified the following tasks: (a)

improvement of the aesthetics of the physical infrastructure; (b) rehabilitation and expansion of the electricity infrastructure; (c) institutional development with particular emphasis on human resources; (d) participation in the exploration of hydro energy; (e) institutional reorganisation and promotion of good competencies and better management practices; (f) establishment of commercial areas and expansion of the implementation of a computerised invoicing system in all operational areas; and (h) outsourcing of some EDM services.

In order to achieve these goals, EDM entered into a contractual agreement with the government to influence the following:

- **Tariff policy:** to ensure the economic and financial sustainability of the company, while also providing a social tariff for those with low-income capacity and to promote agriculture and industry. In addition, EDM needed to be able to adjust the electricity tariff to bring it into line with monetary inflation.
- **Commercial policy:** EDM needed to orient its activities towards improving all its customer's related services.
- **Financial policy:** to ensure the company's financial revenue and establish an adequate financial system.

Human resource policy: to increase productivity by having highly motivated and skilled employees. Optimise the number of employees.

Investment policy: the investment must be mostly oriented towards rehabilitation and expansion of electricity to rural areas, better conditions for the customers, improvement of the physical infrastructure, computerisation of the vital systems of the company and improvement of the communication infrastructure within the company.

EDM structure

Currently, EDM has approximately 2 860 employees distributed in different locations of the company. Of these, 123 have university degrees while 496 have had no formal schooling (EDM, 2000a). EDM has about 186 208 customers in the whole country. Table 4.2 gives the spread of customers in the five different operational areas where *Galatee* was being implemented.

Table 4.2: Number of customers in operational areas (source: EDM, 2000a)

Operational area	Number of customers
Maputo	93 613
Beira	14 588
Chimoio	4 084
Nampula	15 030
Nacala	10 802

EDM's organisational structure reflects its mission and its linkage with the government. The structure of EDM can be summarised as follows: (a) Board of Directors, chaired by a President of the company nominated by the government, and 6 Administrators, one each for Infrastructure and Engineering, Finance, Human Resources, Commercial, representing EDM employees, and representing the Government through the Ministry of Planning and Finance (b) Four directorates: Commercial, Economic and Financial, Engineering and Networking, and Human Resources Management (c) Five divisions, consisting of Support Services (including the IT Department), Planning, Auditing, Engineering of Electrical Centres, and Stocks and Materials. The whole organisational structure can be found in Appendix 4.5. In addition to this central structure, EDM also has Regional Branches (North, Centre and South), Operational Areas and Zones of Distribution.

With the transformation of EDM into a public enterprise and a new strategic vision of customer-orientation, a new concept of *Agência* was introduced within EDM's management style as compared to the earlier *Dependencia*, where only electricity bills could be paid. In the *Agência* framework, EDM attempted to provide the customers with better services and a more comfortable environment by opening new contracts

and systems to deal with complaints. The new physical place with good aesthetics helped to encourage contacts between EDM and its customers. A Maputo *Agência* interviewee commented:

The behaviour of our customers and also of the employees changed completely when we opened this *Agencia*. Previously, when people came here to pay or complain about something they were already bored and spoke too loudly. Now it is quiet, people speak in an orderly manner. It seems that they find it a most pleasant place and they are more confident about finding solutions to their queries. [*Agência* Manager_EDM_MAPjardim_Interview 17, p.20].

The New tariff policy

A new electricity tariff policy was introduced by EDM in November 1999. This new policy consists of: (a) a fixed amount for electricity supply; (b) definition of social tariff from 0 to 50 KWh, where the consumer pays 468.00 MT (MT - Mozambican currency *Metical*) for one KWh and in this interval there is no charge for the availability of electricity; (c) definition of the interval of consumption of electricity and each interval has its price per electricity unit. The price of each unit increases in each interval of consumption (see Table 4.3 for the tariff trends).

Under the previous policy the price of electricity was relatively low, and price variations depended on the availability of electricity and not electricity consumption intervals. In general, the price of electricity increased for the customers.

In cases where it was not possible to register the customer's electricity consumption, EDM estimated the cost of electricity consumed. For example, during and just after the big floods in 2000, it was not easy to read the electricity consumption for many residences and the owners were also often unavailable to EDM inspectors. The tariff policy gave three alternatives for estimating the electricity consumed. First, this amount was calculated based on the last six months' electricity consumption. However, many customers did not agree with this method of calculating their consumption. Secondly, there was the possibility of estimating consumption based on electrical equipment installed at the customer's location. This system was also problematic because with the oscillation of energy, the same equipment might not be

in use during certain periods. The last alternative, which was more applicable in rural areas, was to pay a fixed price corresponding to 100KWh. However, this is also problematic because many people in rural areas usually use electricity for only one or two lamps, and the amount stipulated under this policy was far too high, compared to their real consumption.

Table 4.3: Domestic electricity and general tariff (low voltage) (source: EDM, 1999)

Registered consumption (KWh)	Sale Price Domestic (MT/KWh)	Sale Price General (MT/KWh)	Fixed charge for availability of electricity (MT)
0 - 85	466	606	30.000
86 - 165	886	1.152	30.000
166 - 330	1.061	1.379	30.000
331- 495	1.227	1.595	30.000
496 - 990	1.289	1.676	30.000
991 - 1485	1.375	1.788	30.000
1486 - 1980	1.414	1.838	30.000
1981 - 2475	1.464	1.903	30.000
Higher than 2476	1.581	2.055	30.000

Organisation of the IT function at EDM

The IT Department at EDM was established in the late eighties through the data-processing (DP) unit: In 1968, the EDM already had a UNIVAC computer-based information system for the production of the customer invoices. However, other activities within the electricity company had been operating manually. On its creation, the DP unit was charged with the task of computerising the operations of EDM. In 1994, EDM transformed its DP unit into an IT Department headed by a networking Engineer who had graduated abroad. Since May 2001 the IT Department has had a new head of Department (HD) – a systems analyst who is a graduate of Eduardo Mondlane University in Maputo, and who had been working at the EDM since 1986. The HD reports directly to an Executive Director in charge of the Support Services at EDM. The IT Department consists of four sections: hardware management,

networking and communications; database management, software and applications; analysis and development of information system projects; administrative services and help desk. In total, the department has 16 staff members, most of them with a higher qualification in ICT or in related areas. An IT staff member is allocated to each of the corporate departments of finance, human resources and stock control.

The systems analysis and development section is involved in the development of in-house systems and the implementation and operation of all IS projects, as well as the design and maintenance of the EDM Internet home page. The section of hardware and communication deals with networks, communication infrastructure and maintenance of hardware at the head office and in operational areas.

Essentially, when the department (as DP) was first established, the majority of the staff were not from an IT background. Given this lack of expertise, the main IT activities were outsourced by EDM to vendors or IT companies. However, with the increased focus on computerisation at the head office, it was decided to have an IT Department with highly qualified staff who are able to respond more quickly to the IT demands in EDM. Therefore, in 1994, EDM initiated a program of recruitment of new university graduates to help create a new IT structure to easily handle major software, hardware and network-related problems. Although the IT Department is located at the head office, it is responsible for providing assistance to the local IT units in the operational areas within the country.

An IT steering committee headed by the Executive Director in charge of Support Services is responsible for selecting and implementing new ICT-based systems and services within EDM. This committee consists of the head of the IT Department, sectional heads within the department, the head or director of the unit, which will directly benefit from the new ICT facility or system, and key operational staff in other departments. However, the present situation is that each organisational unit that will be a direct beneficiary of the new ICT-related facility or system is leading the procurement and acquisition process and the IT Department is acting as an adviser. EDM has neither an IT strategic plan nor clear procedures for ICT procurement and

acquisition. During the fieldwork, it became clear to the IT Department that there is a need to design an ICT strategic plan and also to define proper procedures for the selection, procurement and implementation of ICT-based initiatives in the company.

At EDM, besides the invoicing system for the operational areas, there is another in-house developed invoicing system for the zones of distribution. This system is based on the Microsoft Access database system. Moreover, the company has other computerised information systems for human resource management, finance, control of the prepaid electricity system and stock control. EDM is also implementing a wireless system to connect all operational areas and regional branches. In the Maputo operational area, the *Galatee* system is already on-line with the Head Office. The plan is to have on-line linkage with all five operational areas for the human resources and invoicing systems.

Table 4.4 highlights the important events that have occurred in the company since its creation.

Table 4.4: EDM summary of important dates/events

Year	Events	Source
1968	First IT-based system (batch mode) already existed before EDM establishment	System Analyst 2_EDM_HO_Interview 10, pp.11-12 New IT Manager information
1977	Establishment of EDM as a parastatal enterprise	Decree law (<i>drecreto lei</i>) 38/77
1984	First interactive IT-based system	System Analyst 2_EDM_HO_Interview 10, pp. 11-12
1989	Award recognition from the Government	System Analyst 1_EDM_HO_Interview 9, pp.10-11
1994	Establishment of IT Department	IT Manager_EDM_HO_Interview 8, pp.6-8
1995	EDM as a public enterprise	Decree law (<i>drecreto lei</i>) 28/95
1997	<i>Agencia</i> Concept	<i>Nova Imagem</i> project proposal document
1999	New tariff Policy	EDM, 1999 www.mozambique/electricity.mz (new page address www.edm.co.mz)
2000	<i>Galatee</i>	IT Manager EDM_HO_Interview8, pp. 6-8

4.3.1.2. History of Galatee

The actors and the story

The *Galatee* project introduction at EDM can be traced back to 1998. The aim was to prepare the company for the Y2K problem and also to offer a better quality service and support to the commercial area through the improvement of the existing invoicing system (*Ingress*) implemented in the early nineties by ICL (International Computers Limited) Mozambique. For this purpose a project team was set up, consisting of staff representing the following departments in the company: Commercial area, Human Resources (Training) and IT. The director of the Commercial Department was the project leader.

EDM introduced *Galatee* (God of Water), a computer-based invoicing system, in all five operational areas between October and December 1999. EDM bought *Galatee* from a French Company called *SAUR* in 1999 and an independent team based in

Abidjan, Ivory Coast, developed the system. The *SAUR* staff integrated the project team.

Several problems with *Galatee* were identified during the course of the interviews. Those problems range from its analysis and design, development and implementation, consultation, ergonomics, training and project management, to a very poor data communication infrastructure in the country. Table 4.5 presents a summary of most of the problems referred to during the interviews in different operational areas.

Although the IT Department was part of the implementation team, its role was insignificant in the beginning of this project, due to the new perspective that the company was consciously trying to introduce concerning the acquisition of IT-based systems. It was only in respect of the selection and implementation of the system that the IT Department's contribution ran smoothly.

The initiator of the project (the Commercial Department) explicitly emphasised the importance of an appropriate policy for maximising revenue, since EDM had been established as a public enterprise in 1995. The process of adaptation of *Galatee* to the Mozambican context was done in a short time and this led to problems.

When first implemented, EDM staff found it difficult to use the new technical tool with its underlying tariff price, particularly relating to the estimation of price procedures, printing and other technical problems. These implementation problems were reported and examined by both *SAUR* and EDM (EDM, 2000b). Technical malfunctions, poor management and user resistance led to a problematic implementation (EDM, 2001a). The project team attributed the technical problem to the fact that many of the project members were not technically skilled, and the IT Department had not been directly involved in the adaptation process. Staff training had been inadequate and did not prepare the cashiers to deal with real-life problems such as tariff inconsistencies and printing problems. The language dialogue in some menus was in French or English, making it hard for the Portuguese speakers. Unfortunately the new electricity tariff procedures were not disseminated effectively to the public before the change occurred. While this information was presented on the

EDM web page, it was inaccessible to most users who did not have Internet access. There were frequent customer complaints about the amount they had to pay for the electricity bill, and long lines of angry complainants were often to be seen at the Head Office or at the Operational Area. Most complaints reported related to a misunderstanding of the electricity invoice. As the invoicing manager stated:

More than 80% of complaints reported here at the head office are related to the new tariff policy. Many people do not know it and, in addition, people here do not like to pay their invoice. [Invoice Manager_EDM_HO_Interview 12, p.16]

In 2000, based on the EDM statistics, the company distributed about 1211.9 KWh, 1013.3KWh of which was invoiced, but only 801.4 KWh was paid for (EDM, 2001b). This data emphasises the need to improve collection procedures for the electricity invoicing.

The technology

To help improve the invoicing system and increase EDM's income, the previous *Ingress* invoicing system had been implemented in the early nineties by a private IT company, ICL. The system needed to be improved and extended and made Y2K compliant. *Galatee* was implemented at EDM as a solution to these problems. *Galatee* was based on Sybase in a Unisys environment.

At the head office, there are two powerful Solaris servers for use and backup systems. Data stored in the servers were also backed up on discs (albeit in the same building as the server). In each operational area there were at least two servers linked to the work stations located in the cashier's and client management's offices. The system was designed in such a way that the cashier can use an electronic pen to enter the invoice details at the moment of payment.

The *Galatee* system had previously been used in various countries such as the Ivory Coast, Brazil, France and Poland. There was a need to make certain changes in order to include the local context, for instance, the Portuguese language. By the time of the research, the process of adapting changes was still in progress.

A French financial body (French Cashier) supported the cost of *Galatee*. Designing and programming was carried out in Abidjan, where the development team was based. For the implementation in Mozambique all adaptation occurred at the head office where supercomputer mainframes are centralised and control the network of sales work stations in all five operational areas. They are also connected to the EDM server accessible via a wireless data communications network.

Galatee was developed as a technical tool that could also manage, control and invoice the customers in order to maximise profits. The *Galatee* system has the following modules:

- Production of the electricity invoice and handling its payment
- Management of electricity cut-off for those who are not paying their invoices
- Control of partial payment of invoices
- Client management
- Management of off-line cashier.

4.3.1.3. Organisational and political conflicts

The new strategy is that *Galatee* belongs to the invoicing sector, but its operation and data communication form part of the IT Department's function. Based on this strategy, some technical staff from the IT Department were transferred to the Commercial Department, so as to work closely with the *Galatee* system.

Some staff from the operational areas felt that the involvement of local technical people in some IT-based projects in the company was poor. One of the interviewees expressed the following opinion:

I cannot understand why the Mozambican IT staff are not leading this (*Galatee*) project. This lack of involvement of local IT staff is creating some problems. For instance, all our problems must be reported to SAUR and we are not sure if the language translation of our concerns is well done or not. [IT staff_EDM_BE_ Interview 30, p. 29-30].

Another difficulty relating to the lack of involvement of indigenous people in this project will have to be faced when the *SAUR* team is no longer at EDM (during the writing up of this thesis the *SAUR* team was still at EDM but later on they will go back). Since IT staff were not directly involved in the initial development phase of the system, and assuming that the IT Department will be responsible for maintenance of *Galatee*, there is clearly an urgent need to address the issue of IT Department involvement. This problem of lack of involvement of IT staff in the project had already been identified by EDM, but needs to be readdressed. It is important to bear in mind that the IT Department is an official part of the *Galatee* project team, but its involvement in the analysis and selection process of the software was minimal due to different organisational issues within EDM.

In anticipation of the problems caused by *SAUR* withdrawal, EDM has been requesting greater and more formal involvement of IT staff. To support this technology (transfer), a team from the IT Department recently (May 2001) visited the Ivory Coast in order to make a detailed study of *Galatee* with the development team, and a visit to Poland and Brazil, where the system is running, has also been planned.

Under the previous invoicing system, the responsibility for managing the system in the northern and central branches rested with the IT staff. Within the new management perspective, responsibility is transferred to the Commercial Department. Conflicts arose since *Galatee* concentrated on commercial issues and was separated from IT. Regional IT staff were unhappy with this situation since they perceived it as a loss of power. These problems were exacerbated by poor communication, since no one from the management informed them about the new situation.

When the team from *SAUR* comes here it just makes changes to the system, changes configurations at the server, installs new equipment and does not inform us about anything (the IT staff). Maybe they inform other units here ... for us this meant that they are not considering our work here. And then when strange problems happen with the server, we have to solve the problems. [IT staff_BE_Interview 30, pp. 29-30].

The organisational climate, particularly in one of the operational areas, became tense and fraught with conflict, with rivalries between divisions, and so the staff became demotivated.

In terms of training, two categories of training were organised, one for IT personnel at the operational area and the other for the billing staff (cashiers). In general, all participants considered that the training was too short and that it did not help them much. One of the interviewees commented ‘ For me it was not real training; it was a demonstration of the *Galatee*’ [Cashier_EDM_CH_Interview 35, p.34].

The training sessions for the invoicing staff lasted 3 days, which were spent explaining the new commercial policies and the rationale for the new pricing structures. Staff judged it inadequate, since it did not provide enough information on the user-computer interface aspects, and it was therefore seen as merely a system demonstration. This added to the stress levels experienced by invoicing staff who had to deal with large queues of angry and confused customers on the payment deadline dates. At the same time, with the new computerised system, EDM also implemented a monitoring system, to keep track of the number of transactions, the time taken for each transaction, and the types and amount of invoices dealt with by each cashier. The *Galatee* system did not differentiate between two cashiers working at the same work station at different times. This made it difficult to identify the number of invoices dealt with by each cashier. The first cashier who used the work station was simply considered to have handled all the transactions. The invoicing staff were therefore subjected to a change of computer system and its user interface together with changes in training, role and qualifications, working conditions, handling of performance monitoring and reporting.

There are different opinions regarding the *Galatee* invoicing system project. During the interviews, different users presented the practical problems that they were currently facing. These problems were similar in all operational areas. The problems presented can be grouped into different categories such as: (a) technical, (b) organisational and managerial and (c) people-related. Table 4 .5 gives a summary of

the problems most frequently articulated by the interviewees in relation to the *Galatee* project.

Table 4.5 Summary of the major problems experienced with Galatee in each operational area

Locality	Technical	Organisational and management	People
Maputo	Frequent telecommunication interruptions; Data on the customer account is not always correct, sometimes the invoice paid is not registered in the account; Use of French and English as dialogue languages	Lack of system documentation in Portuguese; Data on the customer account is not always correct, sometimes the invoice paid is not registered in the account	Difficulty in accessing clients' houses to read the meter electricity consumption; Low quality meter reading
Beira	Use of French and English as dialogue languages; Deficient security system	Lack of system documentation in Portuguese; The conversion of the system was too quick	Lack of involvement of local staff in the implementation phase; Difficulty in accessing clients' houses to read the meter; Low quality meter reading
Chimoio	Use of French and English as dialogue languages; Deficient security system No differentiation of invoice in USD and MT currency; System does not register cheque details	Lack of system documentation in Portuguese; The training process was too short	Lack of involvement of local staff in the implementation phase; Difficulty in accessing clients' houses to read the meter; Low quality meter reading

Nampula	Use of French and English as dialogue languages; Deficient security system	Slow updating process of the off-line cashiers; Difficulty with estimation of electricity price procedure; Lack of equipment to register consumption; Lack of billing paper	Lack of IT staff Difficulty in accessing clients' houses to read the meter; Low quality meter reading
Nacala	Use of French and English as a dialogue language; System does not register cheque details	Lack of system documentation in Portuguese; Difficulty with estimation of electricity price procedure; Lack of equipment to register consumption; Lack of billing paper; Shortage of equipment to register electricity consumption; Shortage of materials such as billing paper, toner	Lack of staff, particularly IT

During the empirical study it was also found that EDM does not have an overall strategic plan for its business. However, based on its objectives defined by the new position of the company, it is addressing different strategic issues separately through different projects. Through these projects EDM aims to achieve efficiency within the company. Some problems have cropped up during the implementation of *Galatee*, but based on the improvisation approach, improvements are being introduced in the process.

4.3.2. The BM case study

4.3.2.1. Organisational background

This section covers two main parts, including the historical background of the Central Bank of Mozambique (BM) and its organisational structure. The background of BM is presented over two main periods. The first period was from its inception until the

establishment of the commercial bank of Mozambique (BCM) when the Central Bank separated its commercial function. The second period extends from the separation of commercial functions up to the present.

Bank of Mozambique as a central and commercial bank

The Bank of Mozambique is a Mozambican financial institution which deals essentially with the issue of coins and notes for the whole country, as well as for the supervision of banking and monetary activities within the country.

The history of the Bank of Mozambique is directly linked to the history of the country, monetary and foreign exchange policies and the reform of financial systems. On 7 September 1974, during the signing of the Lusaka Agreement between Mozambique's Freedom Front (Frelimo) and the Portuguese Government for the independence of Mozambique, one of the issues agreed upon was the establishment of a Central Bank in Mozambique. This is illustrated below by the extract from the agreement signed on that day.

A Central Bank, which will also operate as an Issuing Bank, shall be created in Mozambique in order to guarantee that the Transition Government has the means to carry out an independent financial policy. In order to achieve this objective, the Portuguese State commits itself to transfer the attributions, assets and liabilities of the department of *Banco Nacional Ultramarino* to the Bank. A joint commission shall immediately be empowered to study the conditions of that transfer [extract from the Lusaka Agreement, 1974: 10-11 – Frelimo e Governo Português, 1974].

It is under this agreement that on 17 May 1975, just before the Independence of Mozambique, the Bank of Mozambique was created, assuming functions as a central and commercial bank. The main aim was to ensure the value of the national currency and to provide banking services to the entire population and institutions in the country. The main task for the BM in its first years of existence was to develop an integrated banking system within the economic and financial policy of the country. The following is an extract from the decree that created the BM at that time:

In conformity with the government policy, the bank has to promote the implementation of correct monetary policy, supervise the internal and external stability of the currency value through credit criteria and control the economy, the

provision of financial resources to the state, the disciplining of the banking activity and the guidance to the country's credit policy with a view to its development and implementation of the people's interests as its main objective [extract from the decree law 2/75 - Governo de Transição de Moçambique, 1975].

In 1977, as the government had decided on a centralised economy based on a socialist political perspective, some of the banks were closed and their activities transferred to the BM such as the *Casa Bancária de Moçambique* and the departments of the *Banco de Crédito Comercial e Industrial* and of the *Banco Comercial de Angola em Moçambique*. The *Banco de Fomento Nacional* and *Banco Pinto & Sotto Mayor* were dissolved. This was considered to be a way of controlling the financial and monetary issues of the young country which was experiencing a shortage of skilled human resources to run the major banking activities, as well as a means of ensuring the supply of quality banking services to the government institutions in particular, and the population in general (Comissão Permanente da Assembleia Popular, 1977a - lei 5/77).

Based on its desire to offer better services to the public and also to be an actor within the development of the country, BM decided to establish a new bank called *Banco Popular de Desenvolvimento* (BPD) through merging the already existing banking institutions *Instituto de Crédito de Moçambique* and *Montepio de Moçambique*. This new Mozambican Bank was oriented towards supporting the country's development with an emphasis on rural areas and agriculture (Comissão Permanente da Assembleia Popular, 1977b - lei 6/77). In 1993, the BPD was privatised under the management of a Malaysian financial institution and it was named *Banco Austral*. Recently (2002), due to some management problems, this bank was sold in its entirety to ABSA, a South African Bank.

In 1980, five years after the country gained independence, BM, using its competence as an issuing bank, created the national monetary unit, the *Metical* (Comissão Permanente da Assembleia Popular, 1980 - lei 2/80). The *Escudo* notes issued for Mozambique by the Colonial Administration (*Banco Nacional Ultramarino*), as well as the notes with the surcharge which circulated legally in the People's Republic of

Mozambique, stopped having payment value. Then the terms on the basis of which the exchange of notes could be carried out were established. The Governor of the BM commented while speaking on the occasion of the creation of the national currency, said:

... in 1975, we did not have control of the national economy. The creation of a coin would have had little significance at that time. Now we have economic growth and development, which form the basis for monetary stability. The currency must correspond to a balance between consumption and production (Prakashi, 1980).

In 1984, BM introduced foreign exchange management aimed at increasing the revenue in foreign exchange through the participation of various economic actors and, particularly, those generating foreign exchange.

As part of the Structural Adjustment Programme (SAF) framework, Mozambique joined the International Monetary Fund and the World Bank. As a consequence of this, BM, based on its central bank responsibilities, represented the Government when it participated in those international financial bodies.

In the early nineties, BM came to understand that in order to increase the central bank activities, a new specific organisational structure would be necessary to respond to the banking needs of the moment. This was based on the notion that a new organisational structure for the Central Bank function should be developed in the Bank of Mozambique. As a result of this, central bank directors were appointed.

The introduction of overall economic reform in the country and the increasing of the central bank functions of BM, led the Government to decide to split the central and commercial functions within BM. Thus, the commercial duties were transferred to the Commercial Bank of Mozambique (BCM), effective from January 1992, while BM started acting exclusively as a central bank (Conselho de Ministros, 1992 – decree law 1/92). BCM was later privatised in 1996.

BM as the Central Bank of Mozambique

In 1992, the Central Bank of Mozambique (without commercial functions) was established as a corporate body with administrative and financial autonomy. Its main objective was to preserve the value of the national currency. In order to achieve this objective, it defined the following policies and guidelines: (a) having a correct monetary policy; (b) having a credit policy aimed at promoting the country's economic and social growth and development; (c) managing foreign cash assets to maintain an adequate volume as a means of payment necessary for international trade.

As a central bank, BM plays the following roles:

- Adviser and consultant of the Government in monetary and financial issues.
- Manager of the monetary policy.
- Banker of the state and of the institutions of credit.
- Manager of the foreign reserves.
- Supervisor of the financial sector and exchange authority.
- Representative of the Government in international monetary relationships.

In the mid-nineties, based on the notion of decentralisation of the central bank activities in the different parts of the country, BM created regional branches in Beira for the central region and in Nampula to cover the northern region of Mozambique.

With the liberalisation of the economy in the country, the transfer of commercial functions to BCM and the political and social stabilisation of the country, conditions were created which offered BM an opportunity to strengthen its role within the process of recovery and development of the country. BM's mission was to improve the quality of the services offered to its clients, maximise the revenue of the bank and introduce new management practices which could promote autonomy and decentralisation of the decision-making levels through the establishment of regional branches. To achieve these goals, BM identified the following tasks: (a) improvement of its aesthetic infrastructure; (b) strengthening of the banking system; (c) institutional development, with particular emphasis on human resources; (d) improving ICT facilities to support banking management; (e) institutional re-

organisation and promotion of good competencies and better management practices; and (f) establishment of new banking areas.

BM structure

Currently, BM has about 600 employees at the head office and at two regional branches [Training Divion_BM_HO_Interview 7, pp.18-26]. The major clients of the central bank are about twelve commercial banks existing in the country and also the government. It is important to recognise that the majority of these banks were established in the late nineties as a consequence of the stabilisation of the country and liberalisation of the financial market as mechanisms to support the economic and social development of the country (BM, 2000).

Prior to the re-engineering project, BM reflected highly structured organizational structure along functional lines with significant overlap (see Appendix 4.6). The new organisational structure of BM reflects its mission and can be summarised as follows: (a) executive board, chaired by the Governor of the bank and co-chaired by the Deputy Governor, both nominated by the Government, and four Administrators for the areas of: Maintenance, Regional Branches and Audit; Operations, Treasury and Judicial Issues; Foreign Exchange, Organisation and Information Technology; and Studies, Administration and Finance; (b) Two offices and six departments: Audit office, Private Notary Office, Banking Supervision, Research and Statistics, Foreign Exchange, Money Market, Organisation Methods and Information Technology, Banking Operation and Treasury, and Building Maintenance. (The new organisational structure is presented in Appendix 4.7.) In addition to this central structure, BM has two regional branches, namely the Nampula branch for the northern part of the country and Beira for the central.

Table 4.6 summarises the most important dates/events that occurred in the BM.

Table 4.6: BM summary of important dates/events

Year	Events	Source
1975	Establishment of BM as a central and commercial bank	Lusaka Agreement 1974 and decree law 2/75
1977	Establishment of BPD	Law (<i>Lei</i>) 6/77
1980	Creation of <i>Metical</i> (Mozambican National Currency) MT	Law (<i>Lei</i>) 2/80
1992	Separation of the commercial and central functions within BM	Decree law 1/92
1994	Establishment of an IT Department (CSDIPAU)	Service order 41/94
1999	Re-engineering project	Interview with Acting IT Manager [Acting IT Manager_BM_HO_Interview 1, pp. 1-3]
1999	Organisational Restructuring	[Acting IT Manager_BM_HO_Interview 1, pp. 1-3], [System Analyst_BM_HO_Interview 3, pp. 6-7].
2000	IT Master Plan	[Acting IT Manager_BM_HO_Interview 1, pp. 1-3]

Organisation of IT function at BM

BM's IT Department was formally established in 1994 as a Computer System Development and Implementation Project Administration Unit (CSDIPAU). Before that time many information systems at the BM operated manually or outside the bank through request of service from the CPD (Government centre of data processing). Since its creation, the CSDIPAU has had the main objective of developing and implementing computer-based information systems for the banking activities. With a better understanding of the role of IT within BM, this unit was transformed into a Department of Organisation Methods and Information Technology (DOI). Between 1997 and 2000 the DOI functioned under the leadership of an acting director. Since December 2000 the Information Technology Department has been headed by a Director of the Department (DD) – a systems analyst who is a graduate of Eduardo Mondlane University in Maputo, who has also been working at BM since 1994. The DD reports directly to an Administrator in charge of Foreign Exchange, Organisation

and Information Technology at BM. In this new organisational structure the position of IT has grown in importance from just being a support unit to a more strategic unit within the framework of BM.

DOI consists of five units, namely: organisation and methods; hardware management, networking and communications; systems exploration; analysis and development of information system projects and administrative services and help desk. In total, this department has 20 staff members, the majority of them graduates of the local university, EMU, in the areas of informatics or electronic engineering.

The systems analysis and development unit is involved in the development of in-house systems and the implementation and operation of all IS projects, design and maintenance of the BM home page, and maintaining help desks. The hardware management unit deals with networks, communication infrastructures and their maintenance at the head office and in the regional branches. The organisation and methods unit deals with issues concerning the definition and implementation of organizational structure and methods. The systems exploration unit controls the functionality and maintenance of all computerised systems within BM. The administration services unit deals with administrative assistance to all units within the IT Department.

Basically, when the IT Department was first established, the majority of its staff members did not have any IT background. The first Director of DOI was a BM staff member with no degree in IT or related fields. Given this lack of expertise in BM, the main IT activities were outsourced to vendors or IT companies. However, due to the increased focus on computing at the head office, it was decided to have an IT Department with highly qualified staff so as to be able to respond more quickly to the IT demands. Therefore, BM has, since 1987, been programming the training of its staff through giving them scholarships for further IT education at the university, and has also started a recruitment programme of new graduates from the university. Moreover, a new IT structure was set up to handle major software, hardware and network-related problems in BM. The IT team within BM is relatively young and is in

the process of being built up. The IT Department is directly located at the Head Office and provides assistance to the local IT units in the regional branches within the country.

The major computing programme was initiated in 1990 when BM was also responsible for commercial banking duties. Thus, the majority of IT systems identified at that time were oriented more towards the commercial role and not to the central role of the bank. The system specification requirements were made during 1990, and they had not been updated before the delivery of the systems, which only occurred after the separation of the two bank functions. Most of those systems were acquired from abroad (England and Portugal). The IT equipment was purchased through a national IT company. However, this company subcontracted to others. There was a delay in providing equipment and computerised information systems, with most of them only being delivered after the separation of the two bank functions. In the process of managing this project, two major problems were faced by BM. First, most of the systems installed did not reflect the actual situation of the bank. Second, the control of the subcontracts was very difficult. As a result, in terms of computerised information systems, it was necessary to adapt them to the real situation in BM, which was very complex since the developers were based outside the country. It was this situation that gave rise to the BPR project.

4.3.2.2. The BPR initiative

After presenting BM's historical background and IT infrastructure, a description of the two subprojects follows.

Restructuring of the organisational structure

The re-engineering project consisted of two subprojects: the reorganisation of the bank structure and the development of an IT Master Plan. The sub-project for the restructuring of the organisation was carried out by the internal team, basically consisting of staff of the Organisation and Methods Unit within the DOI and the Human Resources Department. The Unit of Organisation and Methods was

responsible for proposing new organisational structures and also alterations to the existing organisational structures in the bank. The team carried out the project during 1999 and at the end of 1999, at the annual meeting of the Executive Board, a new structure was presented to, and approved by, the Board.

It is important to bear in mind that this project of restructuring the organisational structure of BM began in 1996. In this year, a study was carried out of BM documents in order to verify the departmental functions as defined in the organisational procedure manual. One of the results found in the documentation study was that one in four employees at the bank had a leadership position within the organisational structure. After presenting their results, the study was interrupted. This could imply that top management felt that it was not the proper time to make changes in the organisational structure, since some management positions were going to disappear, with serious consequences for people's lives (in terms of salary and fringe benefits). This view is illustrated in the interview with a senior staff member of the department responsible for the designing of the new organisational structure:

Some users departments' managers had the idea that this process might contribute to them losing their power. They do not understand the role that IT can play for their work. They do not see IT as an enabler but as a barrier [Business System Analyst _BM_HO_Interview 3, pp. 6-7].

In 1999, the study was restarted as part of the re-engineering project managed by DOI. At that time the top management was very committed to running such a project and they considered that it was a suitable time to reinstate the project of defining a new structure for BM. Some interviewees commented on the difficulties they faced during the interviews for the restructuring process.

Unfortunately, many employees feel insecure about losing their jobs and being replaced by machines. This might be related to what has been happening in many organisations here in the country during the privatisation in general and also it occurred in the privatisation process of the Commercial Bank of Mozambique, where some people lost their jobs [System Analyst 1_BM_HO_Interview 2, pp. 3-6].

In addition, some managers have the idea that through IT they are going to lose

their power instead of regarding IT as a facilitator of their work [Business System Analyst_BM_HO_Interview 3, pp. 6-7].

In early 1990, many employees of BM were involved in data gathering in connection with the development of computerised information systems. Unfortunately, most of these systems at the time of delivery were more related to the commercial function of the bank. Therefore, the employees who remained at the central bank did not see any direct results of the interview process at that time. As a consequence some employees are not sure if the results of this project will be in place soon or will be delayed again. [System Analyst 2_BM_HO_Interview 4, pp. 7-8].

Based on these comments, it can be said that the process of restructuring the organisation was sensitive owing to three facts. (a) In general, many BM employees were afraid of losing their jobs through this process; (b) some employees were afraid of losing power within the existing structure and (c) in general, employees were not open to being interviewed, because just before the separation of the two functions there were many interviews conducted on banking activities in order to identify the IT needs.

This study of the restructuring of the organisation was carried out in a tense environment. It was quite evident that some people in the DOI were uncomfortable about the process of reorganisation, mostly because they were preoccupied with the consequences of the implementation process. They were particularly concerned about the fact that the new organisational structure was not aligned with the human resource policy and there was also a lack of clarity on how the two subprojects were going to be interlinked. This was due to the fact that at BM there is a large salary structure difference between the management and professional positions, and those who are already in management positions are afraid of losing them. Another issue that cropped up during this study was the cultural aspects of leadership positions. Usually people who assume positions as professionals are not prepared to change their status, in line with a popular saying in Mozambique: ‘once a boss always a boss’. The fact that BM does not have an explicitly defined strategic plan, made it difficult to define the organisational structure based on the mission and vision of BM.

Organisation and Methods Unit staff were of the opinion that in the beginning of such a process of change, the executive board must be clear about the implications, clearly state for all employees what the process of change will be and be committed to conducting this process of change. This means that the Board has to monitor the whole process from beginning to end to ensure that top management is involved and committed to the process and that repetitions are minimised. For one project team member, the difficulties faced during the process were basically due to the fact that the department, which was responsible for this important change within the organisation, was structurally in a very low position [Business Analystist_BM_HO_Interview 3, pp. 6-7].

The results of the process of redesigning the new organisational structure were very confidential. In general, the majority of the bank employees did not know what the targeted structure was until it was published some months after its approval by the executive board. In fact, through the organisational restructuring subproject there was a reduction of the number of departments (from 18 to 12).

IT Master Plan development

In 1999, the Executive Board approved the appointment of the consulting company to develop the IT Master Plan as a second subproject within the re-engineering project. The project team, consisting of *Perago* consultants and members of DOI, was set up in February 2000 and by the end of May 2000 the team came up with the first IT Master Plan for the bank. The IT Master Plan produced for BM consists of two main components: the principles and the business function support. A description of each of the components is given below.

The main principles of the plan consist of:

- Technical and data integration within BM
- Training of users in applications and tools
 - Integration of various functions into an end-to-end business process
 - Standardisation of systems, data and processes
 - Visible impact within a short period of time (one year)

Establishment of sound IT discipline

All information received from an institution must enter BM through a single point.

These strategies and actions were aimed at guiding BM in the area of IT throughout the 2001-2005 period. The major features of this master plan were based on achieving a substantial level of change in respect of three issues: computerisation of the major functions of the BM, inter-connectivity and networking of the branches and counter parties, and integration of systems. Table 4.7 below summarises the other areas in which the IT Master Plan provides support for the achievement of the BM business objectives.

Table 4.7 Summary of areas for which the IT plan is expected to provide support (source: Perago, 2000)

Support areas for IT plan	Details
Line functions	Bank supervision; systematic credit risk monitoring; monetary policy; management of liquidity; market operations; external debt management; loan and donor funds administration; economic analysis and national payment systems.
Line support functions	Accounting and legal services.
Support functions	Human resources management systems and payroll; library management systems; logistic and general administration, and building management.
Information dissemination	Communication within BM through e-mail and Internet services; use of Internet for internal information; MIS for the Governors and Board, and publishing BM information.
Tools	Work flow management systems; access to external information services (e.g. Reuters, Blommbergs); office tools; centralised time series database for monitoring historical information.
Communication Infrastructure	To facilitate the communication between BM and counter parties (government, commercial banks, non-monetary intermediaries, central banks of other countries, etc.).

The IT Master Plan presents a range of recommendations on different issues on which BM needed to take action. In terms of computerisation, it was recommended that the BM should strive to make more effective use of IT in the business function lines, as well as in the support activities. Also recommended was the improvement of inter-connectivity within BM through the use of the Internet for internal communication, and the adoption of a MIS (Management Information System) for the Governors and the Board. In relation to the national payment systems, it was recommended that the BM work closely with the Ministry of Planning and Finance in order to establish a modern client payment mechanism for Government. Presently the payment between Government and BM is made through a mechanism called *Titulos*, which is based on

a colonial regulation dating from 1901. It is clear that this mechanism is inadequate for modern needs.

4.4. Rural development - Telecentre case study

4.4.1. Overview of the case history

The genesis of the project can be traced back to May 1996 when the Information Society Africa Development Conference (ISAD) was held in South Africa. This was the first ISAD conference held in a developing country where it was recommended that International Agencies should assist developing countries with the application of ICTs to boost their developmental activities.

In response to this appeal, in 1996, the Canadian Government's International Development Research Centre (IDRC) decided to launch a programme called *Acacia*. This programme supports Canada's contribution to the goals of the African Information Society Initiative, and was endorsed by African governments in 1996 as an action framework to build up Africa's information and communication infrastructure.

Acacia is an international initiative for communities and societies in Africa. Its mandate is to increase the value of local knowledge and understanding in community-based decision-making and empowerment through various approaches, including the use of ICTs (IDRC, 1997). *Acacia* is a major IDRC initiative for Sub-Saharan Africa that is expected to invest \$60m (Canadian dollars) over the 1998-2002 period in research and use of IT in communities in Africa through pilot projects (Yahaga, 2000).

Mozambique was the first country designated to benefit from this programme (June 1997, followed by South Africa (July 1997), Senegal (December 1997) and Uganda (June 1999). In Mozambique, three projects are running under this initiative - the IT

policy project (finished and approved by the government in December 2000), the Telecentre project and Internet access in schools (SchoolsNET). The latter two are the first to be run as pilot projects. The Telecentre project has a budget of US\$ 483 508, the IDRC contribution being US\$ 346 756 and the local about US\$ 136 852 (Gaster *et al.*, 1998).

The history of the Telecentre project in Mozambique is analysed in three phases; August 1997 to 1999 as the initiation phase, from 1999 to 2000 as the implementation phase and from 2000 to 2002 as the phase of consolidation of the project (the latter part is not the object of this study).

4.4.2 Initiation Phase

The Mozambican *Acacia* National Strategy was initiated at a workshop with different stakeholders, held in February 1997 in Maputo. The Government of Mozambique and the IDRC signed a Memorandum of Understanding setting out the broad parameters of the *Acacia* programme in Mozambique during the Global Knowledge '97 conference in Toronto in June 1997.

The Telecentre idea for Mozambique was first introduced in 1997 at the above-mentioned workshop organised by the Informatics Centre of Eduardo Mondlane University (CIUEM) and the IDRC (CIUEM, 1997). The Telecentre project is the fruit of a joint initiative between the Government of Mozambique, CIUEM and IDRC, developed within the framework of *Acacia* to encourage development in the rural areas through providing the communities with easy access to new ICTs.

One of the results of this workshop was a task entrusted to the CIUEM to conduct a feasibility study for a Telecentre project in Mozambique. It was also intended that the Telecentre project would not only develop a methodology for locating such centres, but also identify pilot sites that would channel *Acacia* support to the Telecentre programme. Thus, a project team that included social scientists as well as information

communication technology specialists was established. The Telecentre project would examine different technical models of connectivity including wireless, radio and telephones. This project would also identify tools that could facilitate the use of ICT by non-literate and semi-illiterate populations in the areas of the projects.

The starting point for the detailed project was a general feasibility study carried out in 1997 by a multidisciplinary team co-ordinated by CIUEM. The study decided on the locations for the pilot Telecentres, on the grounds of interest and demand on the part of the local communities (Gaster *et al.*, 1998). The results of this study were presented at a workshop organised by CIUEM in 1998. Based on the results of this study, the Government of Mozambique informed IDRC that favourable conditions existed for piloting the idea of a Telecentre in two districts of Maputo Province, namely Manhiça and Namaacha.

The selection of the districts was not an easy task. It was based on a number of criteria:

- Local interest and firm commitment from the district administration
- Level of socio-economic development
- Existence of a pool of potential users
- Current means of communication
- Technical and economic viability
- Easy access to support/advice and maintenance.

Objectives of the Pilot Project

The project was designed so as to increase the use of information technology in rural community areas, through the establishment of Telecentres in selected districts. The project had the following objectives:

- To contribute to the development of Manhiça and Namaacha, providing improved conditions of access to communications, information and education.
- To study and test the usefulness and viability of the Telecentre.

- To reduce the existing imbalance between the big cities and the rest of the country with regard to access to knowledge and the capacity to produce and disseminate information.
- To contribute towards consolidating the local community and stabilising the population, in particular with regard to young people.
- To improve the quality of the services provided by the public administration and the private sector, and contribute to the decentralisation of public services.

These objectives were translated into the following specific objectives:

To establish and start up two Telecentres in Manhiça and Namaacha, respectively, providing access to telephone, fax, e-mail, Internet, computer use, printing and photocopying.

To train the clients in computer use, giving priority to teachers and students from upper secondary schools, representatives of civil society and men and women from the most marginalized groups.

To support the Telecentre management over 4 years, seeking progressive sustainability.

To measure the quality and relevance of the Telecentre's services. To evaluate the Telecentre's impact within the target groups - education sector, public administration, civil society bodies, economic agents - and the community in general.

To test equipment, systems, programmes and other materials from the user's point of view and for quality and durability.

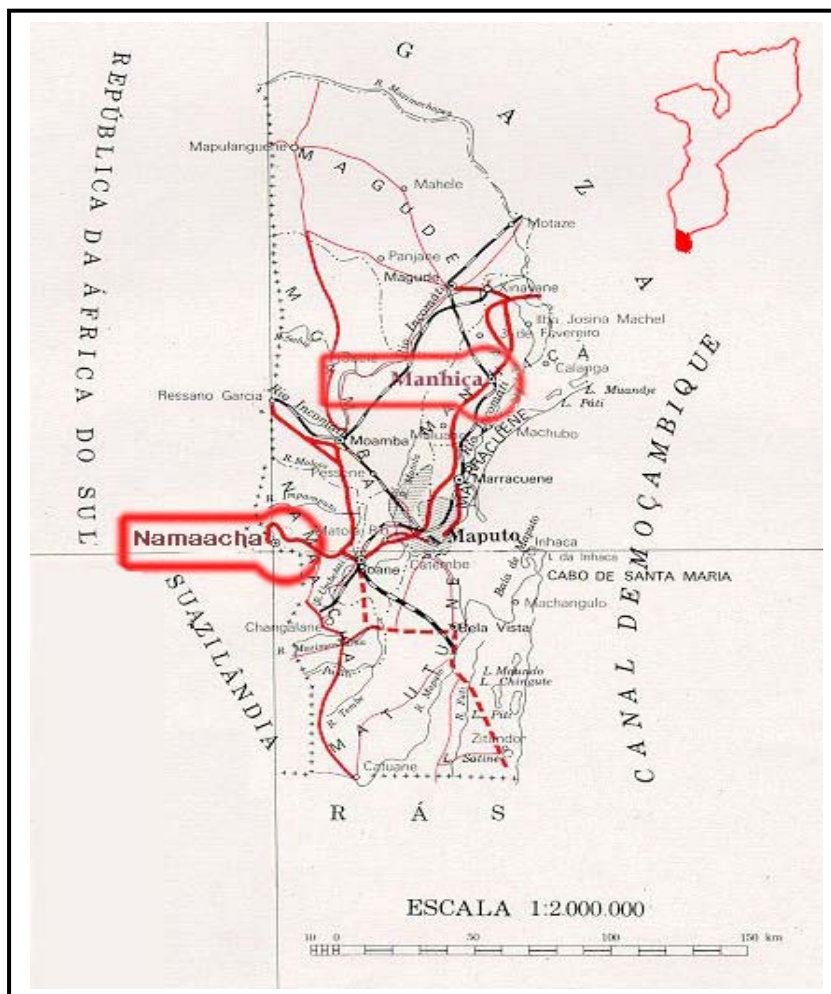
To create a body of Web content that meets the needs and desires of the users.

During assessment, it became clear that achieving some of the objectives by the end of the pilot project in 2002 was too ambitious an undertaking. For example, although one of the objectives of the Telecentre in Mozambique was to contribute towards consolidating the local community and stabilising the population, in particular with

regard to younger people, such an objective cannot easily be achieved within the relatively short duration of the pilot project (1999-2002).

Basic information concerning Telecentre's districts

The field study took place in the two districts of Maputo Province where the first Telecentres were implemented in Manhiça and Namaacha. The Manhiça district is located in the northern part of Maputo province, and borders on the Bilene district, in Gaza province. It is located 78 kilometres from the capital of the country, Maputo, and has about 130,000 inhabitants. The Namaacha district is in the southern part of Maputo province, and borders on Swaziland. This district is situated 70 kilometres from the city of Maputo and has 31,259 inhabitants, with some tourist potential (INE, 1999).



Map 4.1: Map of Telecentre's districts

In both districts, the majority of the inhabitants are rural. They speak the local languages (Shangana and Ronga), and Portuguese (the official language). In Manhiça, the population is characterised by the migration of men to the South African mines for employment.

In these districts there are different public and private institutions. The Manhiça district has some industrial potential in the areas of Maragra, Xinavane and Palmeira. In total, Manhiça currently has about 39 institutions, enterprises and non-governmental organisations. It also has 1 secondary school, one middle-level teacher training institute and a number of primary schools. In Namaacha, there are around 28 institutions, enterprises and non-governmental organisations. There is also one secondary school, one basic-level teacher training centre and a number of primary schools.

In both districts, the Telecentres do not have premises of their own. Instead, Manhiça rents space at a private institution. The installation of the Manhiça Telecentre covers an area of about 75 square metres, with no physical divisions between the areas of the various services. The Namaacha Telecentre is on the premises of the Namaacha Secondary School, in the district capital. It covers an area of about 120 square metres, and is organised in such a way that the spaces for the different services are separate.

Table 4.8 below presents a summary of the basic data related to each Telecentre.

Table 4.8 Telecentre basic data (() during the first year of implementation)*

Data item	Manhiça	Namaacha
Population in the district	130 000	31 259
Population in the village where the Telecentre is located	22 000	10 000
Number of public and private institutions	39	28
Number of people trained in Basic computer skills (*)	64	65
Number of visitors (including users) in the Telecentre(*)	73 928	15 912

4.4.3. The implementation phase

The Telecentres offer various services, from e-mail and Internet access to printing, photocopying and public telephones, and place heavy emphasis on an educational role. The project team started the implementation of the project by preparing the site for the Telecentre and also by training the managers of these centres. The selection of the managers was based on their skills and academic qualifications and on being part of the local community. This preparation process took place late in 1998 and went on until August 1999, when the Telecentres were officially opened.

On 7 August 1999, the inauguration ceremony of both Telecentres took place in Manhiça. This ceremony was chaired by the Minister of Economic and Social Affairs, representing the central Mozambican Government, the Director of the *Acacia* programme representing the IDRC in Africa and the Rector of Eduardo Mondlane University. Different people representing NGOs, public and private institutions, the local community and others, participated in the official ceremony held at the Telecentre of Manhiça. Photographs 4.1 and 4.2 below show scenes from the opening ceremony. It is important to consider that, in some places within the country, this type of ceremony is accompanied by different events connected with the local culture of the community. In addition to this ceremony there was also a traditional ‘blessing’ by the local traditional leader of Manhiça district (the traditional leader informed the deceased leaders about the event and asked them to grant the initiative their protection in order to assure its success). Finally, a party with the whole community took place as a way of commemorating the opening of the first Telecentre in the country.



Photo 4.1 Traditional 'blessing' event during the Opening Ceremony



Photo 4.2 Community Party during the Opening Ceremony

As a way of implementing the objectives defined for this project, it was necessary to identify the main components and how they contribute to the achievement of the goals of the project. This project has the following specific components:

Training

One of the major components of the project is capacity building. Training is a critical element of capacity building to ensure the sustainability of the project. The project will provide training for various categories of ICT-related training, ranging from simple use of the computer to the use of Internet facilities and web page design.

Implementation of Internet and e-mail services in both Telecentres

Implementation of Internet and e-mail services in both Telecentres

The project was designed to establish and strengthen the local Internet service to foster Internet access by schools, hospitals, public and private institutions and the community in general, particularly for young people and teachers.

Promotion of enabling mechanisms for the use of ICT at district level

The project was designed to promote an enabling regulatory and environmental policy for Internet use and growth in rural areas in the country. This embraces two issues. The first is the promotion of universal access to information through the appropriate deployment of the Internet infrastructure, particularly in schools and in the rural areas. The second is to encourage the adoption of a reasonable fee structure for access to the national telecommunication network infrastructure, including leased lines and dial-up services, for the purpose of accessing the Internet.

Creation of Library facilities in the Districts

Since libraries do not exist in the rural areas, the project was also designed to create library facilities within the Telecentre, so that the education process for the young generation can be enhanced in the districts.

Besides the above specific components, the project was also designed to establish a range of services including photocopying, telephone and fax.

The main Telecentre events are summarised in Table 4.9.

Table 4.9: Summary of Telecentre events

Year	Event	Source
1996	Launch of <i>Acacia</i> programme in Mozambique	www.IDRC.org
1997	Workshop at the Cardoso hotel in Maputo	CIUEM, 1997
1998	Workshop for the presentation of the feasibility study results	Gaster et. al. , 1998
1999	Opening of the first Telecentres in Mozambique	www.Telecentre.mz
2000	Evaluation study of the Telecentre a year after implementation	Macome and Cumbana, 2001

On the strength of the data gathered, it was possible to identify the different actors and their influence on the operation of the Telecentre. Collectively, the users of the Telecentre are the most important actors within the Telecentre. The initiation of the implementation of the Telecentre was influenced by the process of convergence of the interests of three major groups, namely CIUEM, IDRC and the Mozambican Government. The main actors involved in the implementation of the Telecentre initiative and their influences are summarised in Table 4.10.

Table 4.10: Main actors and their role and influence on the implementation of Telecentres in Mozambique

Actors	Spheres of influence	Degree of influence
CIUEM	Implementing and managing the Telecentre Technical support	High
Project co-ordinator	Responsible for the whole project, representing the CIUEM in the field	High
Telecentre Manager	Day-to-day operational management, implementing activities plan, accounts. Reports to CIUEM through project co-ordinator. Works closely with CAL	High
CAL	Consultative local body Works closely with the CIUEM	Medium
MAAC	Supervision of the Project and represents the IDRC and the Government	Medium
IDRC	Provision of financial and technical support	Medium
Government	Regulation of policy and provision of financial and political support	Medium



Photo 4.3 Telecentre Namaacha



Photo 4.4 Telecentre Manhica

Viewpoints of different actors involved in the Telecentre initiative

The opinions expressed by different people who were interviewed during the fieldwork are presented next. These people can be categorised into different groups, such as public and private institutions, educational community, public users and potential users, CAL and the project team.

Public and private institutions

The interviews were carried out at various institutions and enterprises operating in the Manhica and Namaacha districts. A summary of the characterisation of the interviewees' institutions per district is presented in Appendix 4.8. The lowest level of schooling ranges from illiterate to 6th grade. It should be pointed out that there are more illiterates in the agricultural and industrial companies. The highest educational level is that of "licenciatura" (university degree in Mozambique), though in many companies the most qualified workers have only a secondary school education.

All 24 interviewees representing the different sectors (public and private) in both districts had a positive reaction to the project. When this field study was in progress,

one NGO and one business company were connected to the Internet, two businesses organisations had formerly had access to the Internet but were no longer connected due to the high telephone fee, and the rest of the 22 interviewees' institutions had never been electronically connected. The initiative of having a Telecentre with an Internet facility was welcomed. All interviewees were of the opinion that the Telecentre is helping to enhance the access and use of ICT by the communities.

The quotes below reflect the views of some of the Telecentre's users in Manhiça and Namaacha concerning the role of the Telecentre in their local context. These words provide glimpses of their vision, concerns, hopes and perceptions of the role that Telecentres may play in the local context.

The challenge is to make the ICT infrastructure serve local people's needs and legitimate interests, especially those living in rural areas. In order to exercise the responsibilities and rights of citizenship, people need to use information. This implies the necessity to acquire knowledge and information to improve the performance of their activities (e.g. support to public administration sector). [Senior officer_DAdm_Manhiça_Interview11, pp.17-18].

...We are living in the 21st century and information and communication have become a need for organisations, and also in general for the society as a whole [Manager of ISousa Company_Manhiça_Interview 4, pp. 5-7].

... Improving local capacity to obtain and use information properly for basic needs is one of our objectives within these Telecentre initiatives [Senior Manager_Political Party_Namaacha_Interview 15, p. 23-25].

In terms of the strengths of the project, all the interviewees highlighted the improvement and increase in computer facilities within both Telecentres. In the case of Manhiça, the opinion was expressed that the area now seems to be too small for the large number of users that the Telecentre has. In addition, it was also suggested that in order to increase the number of users of Internet-related services, the CIUEM should transform the Telecentres into Internet service providers as a matter of urgency, so that the local institutions would only be charged for local calls, which would lower the costs of Internet use. The other issue that captured the attention of the

interviewees, was training. Training has to be considered as an important element in ensuring the sustainability of the project, and as a means of introducing local people to ICT. There is a chronic shortage of human resources in the field of ICT in the country in general, and in those districts in particular.

The interviewed organisations recognised that through the Telecentre they could benefit in different ways such as:

- Training of their employees in computer use;
- typing, photocopying and binding their documentation at relatively low prices;
- reducing postal and travel costs by sending messages by e-mail;
- accessing the different information related to their business at regional and world level, e.g., the value of goods and services;
- facilitating the exchange of information between commercial partners and similar bodies.

In terms of project weaknesses, some interviewees expressed their concerns about the aesthetic aspects of the Telecentres' infrastructure. This occurred more frequently in Manhiça where the Telecentre operates in very small premises without divisions, and hence people have to be packed together in the same physical space in order to be served. This situation is even worse during training sessions, when some users might be using telephones while others would be engaged in training. They considered the costs of computer training courses to be high as compared with the purchasing power of the local population. Another problem presented was related to the poor quality of electricity offered by EDM in the district, this being more critical in Namaacha. One interviewee commented:

Frequently it is just impossible to work with a computer here in Namaacha because of continuous power cuts. At the moment I am attending a computer course at the Telecentre, but most of the time we have to interrupt the course because of power cuts or energy oscillation. It is a problem in the whole village.
[Teacher_CMA_Namaacha_Interview 19, pp.28- 30]

Education community

In this sector, the opinions were derived from interviews and from the last part of the two questionnaires conducted at the same time as this study, for the evaluation of the first year of the Telecentres' existence. The educational institutions involved were:

Secondary School of Manhiça

Primary Teacher Training Institute of Manhiça (IMAP)

Secondary School of Namaacha

Primary Teacher Training Centre of Namaacha (CFP).

The education community interviewed for this study felt that the Telecentre concept was an innovative approach to helping solve some of their educational problems, particularly relating to the availability of information. However, they expressed their concern about the small number of people who were to be trained during the project. As reasons for this, they basically referred to the long waiting list for taking part in the training programme, the shortage of computers for the users (just 3 in each Telecentre) and the costs of basic computer skills training courses. The interviewees welcomed the idea of having a library at the Telecentre because that did not exist in schools. The interviewees also expressed concern about the amount of paper and types of books. Another issue raised by the interviewees was that in the communities, the project did not seem to have made provision for publicising the facilities provided by the Telecentres.

The overall opinion of the educational interviewees was that, in the short term, the education sector in these districts would benefit from the Telecentre service. In terms of Internet use, they believed that the telecommunication and electricity infrastructure would be improved and more students would use this service. They were also confident that in the long term, this project could have a positive impact on the development of rural communities.

Public Users

During the fieldwork period it was also important to solicit the opinions of those who are using the Telecentre facilities. In general, this category of interviewees is

interested in all services currently available at both Telecentres. The Telecentre's users expressed great satisfaction with the implementation of the initiative because they could now use facilities that previously had only been available in the major cities. The majority of them came to the Telecentre to use services related to photocopying, telephone, fax and computer use.

Although a considerable number of users were utilising the computers within the Telecentre for their typing needs, it was stated by this group that not all the users could pay the current fee for attending computer courses and using the computers. The main reasons for not being able to pay were related to the low household income of the residents of the Manhiça and Namaacha districts. Likewise, there was almost no use of the Internet service because the cost of the telephone calls was high, since the connection is with the CIUEM server, with a poor quality of telecommunication and electricity infrastructure. Therefore the users suggested an evaluation of the possibility of the Telecentres becoming Internet and e-mail service providers for the residents of their respective districts.

The quality of Internet service was poor due to the slow connection. The other services met the users' needs. The users considered the Telecentres to be extremely important for their daily activities, as previously they had only had access to public photocopying services in the two districts. Moreover these services, which were available in a bank in Manhiça and in a hotel in Namaacha, cost five times the price charged in the Telecentres. This also applied to the public telephone, which was only available at the TDM shop.

Most of the Telecentre users who used e-mail said they did so in a personal capacity. Some of them used it with the help of others. There were several reasons for this, notably that they were not familiar with e-mail technology or computers. One user said he did not in fact know how to write using a word processor. One of the weaknesses pointed out by the users was related to the Telecentre infrastructure, i.e. the small physical size of the Manhiça Telecentre and the fact that no separate spaces

were allocated to the different services. One of the interviewees gave an example to illustrate the situation:

For example, while you are reading in the library, there might be people having a conversation on the phone. And usually the people here have a tendency to speak loudly on the phone [Student_IMAP_Manhiça – extract from the questionnaire].

Potential users

The category of potential users refers to those who for various reasons are not Telecentre users but who, by the nature of their activities, could potentially use some of the services in the future.

There were different reasons for not using the Telecentre. Some were unaware of its existence, others had such a low household income that it did not permit them to have access to the services offered by the Telecentre. Thus, it was suggested by this group of interviewees that the different activities being undertaken in the Telecentres should be publicised in the districts.

Although this group of interviewees was not currently using the Telecentre, one of the aims of the fieldwork was to glean more information about their expectations of the Telecentre. It was found that almost all potential users contacted stated that they needed to use the Telecentre, but could not for various reasons.

CAL and Telecentre Managers

The opinions of CAL members were canvassed through group discussion meetings. A list of the participants and the minutes of the meetings are part of the fieldwork materials, in which 12 - 14 people participated in the group discussion meetings held in Manhiça and Namaacha, respectively. Each meeting lasted approximately two and a half hours. The Telecentre managers took part in the CAL meeting and they were also individually interviewed about management issues.

In general, all participants welcomed the Telecentre initiative as a way of introducing ICT in rural communities. An old man who participated in the meeting, commented that:

I saw a computer for first time in life here at the Telecentre. I had only heard from the radio that such a kind of machine existed, but I had never seen it before. Now I can even use it. It is a great thing for me [Extract from the minutes of the CAL meeting Manhiça, p.41].



Photo 4.5: A CAL meeting in Namaacha

During the meetings with CAL in each Telecentre, different issues were raised. The following can be considered as the most important ones:

Training

The participants generally felt that training was very important and needed to be considered as a strategic issue within the Telecentre framework. This was essential if the number of Telecentre users was to increase, and would also contribute to the sustainability of the Telecentre. It was also observed that to date, only a small number of people had been involved in training activities, owing to the poor quality of electricity, the prices of training courses, and the limited number of computers available to the public, etc. The participants suggested that the training programme at the Telecentre could be organised in modules ranging from basic to advanced computer skills. It was deemed important that through this project, local people could be introduced to the use of ICT. There is a chronic shortage of human resources in the field of ICT in the country in general, and in those districts in particular.

...If in the Telecentre we do not have users of ICT-related facilities, and the quality of these facilities is so poor that nobody uses them, we will have a big problem, because in our concept of the Telecentre these are the two main services that make this centre different from a telephone, or a photocopying shop. [Project Manager_CIUEM_Interview 21, pp. 38-39].

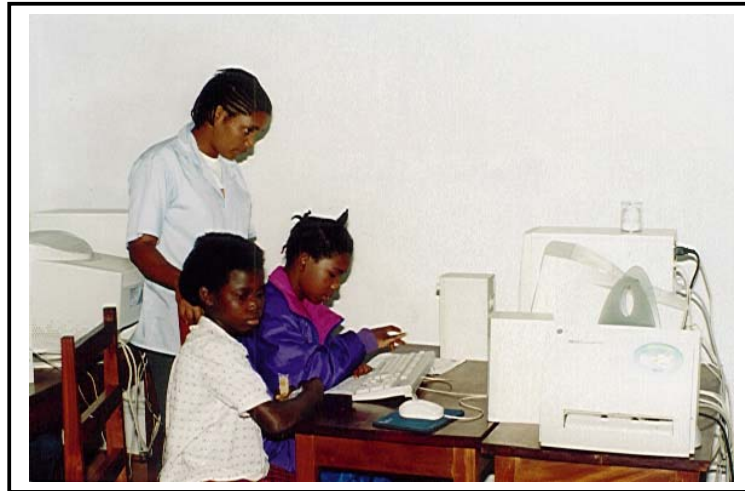


Photo 4.6: Younger users at the computers in the Namaacha Telecentre



Photo 4.7: Younger users at the computers in the Manhiça Telecentre

Management

The CIUEM is one of the most active organisations in the area of ICT in the country, having pioneered the use of electronic networking in the country in 1992. Since the Telecentres were opened, the CIUEM has guaranteed their operation through technical, financial and management support. The participants recognised the work done by the Telecentre managers as good. The Telecentre managers were able to deal with technical aspects in order to offer a basic level of maintenance of the computer equipment. They also had training in financial management. For the project team, the management of the Telecentre initiative is not an easy task.

The Telecentres faced problems with the workload, particularly if one manager was absent from the Telecentre. It was very difficult for one person to cope with all the users coming to the centre for different purposes. It was suggested that the number of staff be increased, so that they can work in shifts and in that way the opening hours of the centre could be extended. Another issue addressed during the group discussion meetings was the role of CAL, which was seen to be slightly passive, especially in Namaacha. It was suggested that the CAL should rethink its activities so that it would know exactly what was going on with the Telecentre and also contribute to publicising the Telecentre initiative within the community.

Services

In terms of access to the Telecentre services, users of all age groups and both sexes were found in both Telecentres. There was a striking predominance of the 17-25 year-old age group and males. Most users in Namaacha were from the villages, due to the topography of the land around the villages, which is unsuitable for constructing houses. In Manhiça, the users came from the town and from some neighbouring villages and districts, located some 10-30 kms away.

The use of the Internet service was very low at both Telecentres, relative to the use of other services. The reasons for that were similar to the training constraints (price, number of computers, poor quality of electricity and slow telecommunication). By

contrast there were a considerable number of users of other services such as the telephone and photocopying. This was due to the fact that these technologies are not completely new to most of the users.

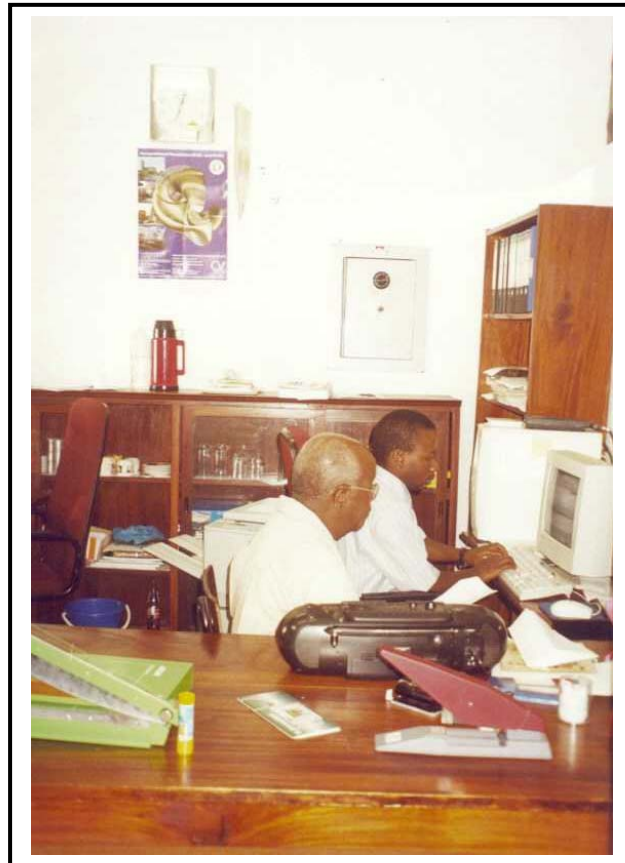


Photo 4.8: An old man using one of the Telecentre's services (Manager typing a document for him)

Sustainability

For the interviewees in general, and in particular the members of CAL and the project team, the issue of sustainability of the Telecentres after the termination of the project was very important and had to be analysed critically. One factor that might contribute to the sustainability of the Telecentres relates to the physical space for the installations. This had to be appropriately organised to enable the different services to be made available. It was therefore considered important and useful to identify an independent space and building to fulfil the needs and not to rely on renting space. The current sites had clearly shown certain deficiencies in terms of divisions and facilities.

Another key factor concerned revenues. Part of the Telecentres' activities was financed from their own revenue. It was deemed important to carry out a financial analysis in order to know exactly what the real revenue and operating costs were, so as to be able to determine whether the Telecentre was financially sustainable or not.

A further consideration that received particular attention was the identification of the management team for the period after the pilot phase. The CAL members were of the opinion that a candidate (individual or institutional) who could provide continuity to this initiative should be identified, so as to increase the benefits to the area covered by the current Telecentre. One member of CAL expressed his opinion, saying:

We must have our eyes very open and be attentive, so that this initiative does not fall into the hands of bad business people. In this country we have experienced different companies that were privatised and today they have closed down and thousands of people are now unemployed [extract from the minutes of the CAL meeting Manhiça, p. 43].

It was a hope of the CAL members and of the project team that the IT Policy being formulated and approved in December 2001 would enable the State to subsidise telecommunications services and further reduce the cost of buying computer equipment. These steps would contribute to universal access for the information initiative.

Publicity

The participants also addressed the issue related to the publicising of the Telecentre services. For participants of this study, publicity was an important issue if the implementation of Telecentre in their community was to be successful. They stated that many people from the community were still unaware of the existence of the Telecentre, especially those who were neither students nor teachers. In order to increase the number of users by transforming potential users into real ones, an intensive publicity programme needed to be designed to promote awareness of the Telecentre's activities in the regions.

CIUEM and Project team

Through its management and the project team, the CIUEM expressed its opinion of the Telecentre experience. Both groups of interviewees expressed favourable opinions about the project, which had contributed to the success of activities undertaken in the Manhiça and Namaacha districts, and also led to the introduction of some new services, such as e-mail. The Telecentres had a positive impact on the organisations that operate in the Manhiça and Namaacha districts, and on the community in general. The use of Internet-related services, photocopying and other facilities at the Telecentre had reduced the need for travel to Maputo City to obtain services and to communicate with relatives, business partners and others.

In terms of strengths, they highlighted the extension of the Telecentre initiative to other rural areas within the country as an important way of solving the lack of infrastructure relating to information technology in the rural areas. This could contribute to the achievement of one of the Telecentre's objectives, namely 'to reduce the existing imbalance between big cities and the rest of the country with regard to the access to knowledge and the capacity to produce and disseminate information.' Other issues considered important were training in the use of computers and in using Internet-related services. They believed that training needed to be improved in terms of course material, course organisation in well-defined modules and also the capacity of the trainers.

The opinion of the project team and the CIUEM was that it was important during this project phase to identify the constraints and factors that contributed positively and to enhance them; and to be open to learning from this first experience in the country. In this way other similar projects would benefit from the lessons acquired from this experience. The feeling that the implementation of the Telecentre concept was not an easy task, was expressed by one of the interviewees:

The success of the Telecentre initiative does not reside in installation of equipment but its contribution for the development in the rural in medium and long term. Since the beginning of this project we have been sure that this is a big

challenge and not an easy task, but we want to challenge this [Project Manager__CIUEM__Interview 25, pp. 33-39].

In terms of constraints, the project co-ordinator and the Director of the CIUEM considered the poor quality of electricity and the high cost of telephone calls as serious impediments. Currently, the members of the project team are identifying short-term solutions to both problems. The project manager specified the solutions to the problem:

For the telephone cost we are going to try a dedicated line system and for the electricity in Namaacha we are going to change the whole system and get electricity from another source, directly from the school, because it has good quality electricity compared to the whole village. [Project Manager__CIUEM__Interview 25, p. 38-39].

Some internal weaknesses were also identified, such as a lack of management skills on the part of the manager, in particular as regards issues of financial control and accountability.

The issue of sustainability was addressed during interviews with these groups, who felt that the Telecentre had to become an integral part of the local community. The role of CIEUM was seen as an experiment that would prepare the local people to manage the initiative in the future. Another aspect concerned the revenues of the Telecentre. It was observed that the Telecentres were generating revenues, and the project co-ordinator stated that 'now part of their running costs are being paid by themselves'. However, 'in financial terms, we have controlled the whole process so that by the end of the project (2002) we can say something conclusive about revenues'. The project team, together with CAL, is planning to discuss the future of the Telecentre after the completion of the pilot projects.

4.4.4. Telecentre summary

Based on the information gathered from the interviews, group discussions, observation, formal and informal conversations, it can be stated that the initiative to set up Telecentres in Mozambique has responded to the desires of the rural population through the use of new information and communication technologies. This has contributed to the success of activities undertaken in the Manhiça and Namaacha districts, since some services were introduced in these districts for the first time through the Telecentres.

Constraints on the running of the Telecentres and their suggestions for lessening their impact, as identified through the interviews, are summarised in Table 4.11 below. These help to provide a framework for action.

Table 4.11: Summary of Telecentres' constraints and suggestions to overcome them

Categories	Constraining Factors	Suggestions for lessening the constraints
Sustainability	Funding for running such initiatives, (particularly of external support stops); community preparation in terms of understanding of the Telecentre concept, use and local involvement and raising awareness (publicity) and continuous staff training.	Raise awareness and foster community interest in the Telecentre and its service; local mobilisation of efforts; increase the yearly number of people trained in the use the ICT-related services, particularly young people; and achieve self-sufficiency by operating other services such as bookshops.
Infrastructure	Inadequate training resources; Internet connectivity (high cost and low quality); inadequate electricity supply; lack of own Telecentre installation; and need for appropriate educational resources and pedagogical materials	Create conditions to get own proper installation; and improve electricity and telecommunication infrastructures, by looking at other alternatives for service provision.
Strategic alliances	Need for local content relevant to local issues; and development of its partnerships (e.g., with private sector, community groups, educators, various level of Government, NGOs, etc.)	Developing the Telecentre must assume a key role in community development efforts; becoming a central focal point for coalitions and contacts of civic organisations; assisting in the development of a well-trained local workforce and also helping to create job opportunities; Improve local management e.g. through training of district administration officials; and Establish, local, national and international linkages, contacts and funding schemas.
Policy and politics	Appropriate pricing level for low-income users and lack of national universal access and other policies to support Telecentres.	Increase government support and awareness; revise telecommunication pricing as a way to reduce the rural isolation; design ICT policies that contribute to the universal access to information; and raise awareness for change in the educational culture through use of other methods and tools based on ICT.
Staff	Need for ICT intermediaries (to organise and find information for people); information literacy; lack of training of ICT staff at the national and local level; and finding, attracting and keeping staff (e.g. intermediaries, managers, and technicians who become well trained and then move on to better paid jobs).	Contribute to skills development of employees and community members; prepare younger generation in ICT skills as an opportunity to gain employment; train users in computer literacy, Internet use and information literacy; and introduce new training programmes directly related to local needs.

4.5. Summary

In this chapter three case studies were described which illustrate different experiences of the adoption and use of ICT-related initiatives in organisations and communities. All three experiences were planned beforehand and had support in the implementation process from other organisations such as international and national agencies, and consulting companies. Table 4. 12 is a comparative summary of the three case studies described in this chapter.

Table 4.12: comparative summary of the case studies

	EDM	BM	Telecentres
Type of study	Organisational	Organisational	Community
Object of study	Information system <i>Galatee</i>	Management techniques - BPR	ICT facilities in rural areas - Telecentre
Initiation of the initiative	Inside	Inside	Outside
Change approach	Planned Based on existing system - adaptation	Planned First experience in the BM	Planned and emergent Completely new initiative in these two districts
Support – external agency	Consultant (<i>SAUR</i>)	Consultant (<i>Perago</i>)	Intermediary institution (<i>CIUEM</i>)

This description will be used in the next chapter for the interpretation of the field results, based on the initial framework for analysis conceptualised in Chapter 2.