

**Chapter 6**

**Conclusion**

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## **Conclusion**

### **6.1. Introduction**

The aim of the research has been to contribute towards understanding the interplay between development and ICT-related initiative dynamics at the organisational level and in the community context of Mozambique. To this end, the thesis adopted an interpretative stance and a multiple case study strategy. It is argued that ICT-related initiatives can only contribute to human development if the implementation of these initiatives is aligned with the developmental programmes of the country within the social context.

This chapter concludes the research effort by analysing how each chapter has contributed towards addressing the research questions. The next section continues with the discussion of the research contributions and their implications. The contribution of the study is assessed using criteria formulated by Whetten (1989). The final section discusses the limitations of the study and also includes an overview of opportunities for further research.

### **6.2. Overview of the research**

In Chapter 1, the thesis examined the nature of the research problem. Developing countries, organisations and communities have increasingly been implementing ICT-based initiatives with the implicit objective of improving their developmental levels. Studies have suggested that the implementation of ICT-related initiatives should take into account the social context and the need for situated change in order to fit the ICT initiatives into the organisational or societal context in which they are implemented. The chapter introduced four major viewpoints, which form the basis of the research, namely globalisation discourses, development discourses, transfer of ICT innovation, and the relationship between ICT/IS and organisational change.

Within the globalisation discourse, the focus is on the global and local interaction debate. The literature review of this theme revealed that there are different scenarios for this interaction. One scenario is the linear and deterministic view, which suggests that the local has increasingly been globalised and is merely a recipient of culture from the global. Another scenario focuses on the mutual interaction between the global and local; assuming that the local influences the global just as much as the global influences the local.

The literature review continued with the topic of development. The view adopted in the research is that ICT-based initiatives can only contribute to growth in the context of a developing country if the implementation of such initiatives is directly aligned with development priorities. Moreover, its people must be in a position to adapt, adopt and use ICTs to address local and regional development issues. In this thesis, the developmental view adopted is a socio-economic one for the creation of welfare systems for the satisfaction of the fundamental human needs.

From the literature review and in this research study it was argued that the implementation of ICT-based initiatives developed in 'western' countries cannot be introduced mechanically in developing countries with the expectation of getting the same or similar results achieved in the West. Therefore, there is a need to accommodate the local context in the ICT-related initiatives. It was also suggested that the study of transfer of ICT innovation could be conducted using the translation process from the ANT perspective, instead of the traditional diffusion perspective.

In addition, Chapter 1 examined the literature on the ICT/IS relationship and organisational change. A review of this topic demonstrated that contemporary organisations are entangled with technology. Therefore, one cannot understand organisations without understanding the technology, since ICT/IS and organisational contexts have transforming effects on each other. In this chapter, and also in Chapter 2, a review was also conducted of different approaches to change. These include the contextualist approach where change is seen as emergent, planned, situated and improvised. The study argued that local improvisations are necessary to allow a

fruitful transfer of technology in the context of DC, but that there is a need to integrate this within a planned change perspective. It is assumed that the balance between local action and global vision, as well as planned and improvised actions, can help to achieve more optimal utilisation of resources, which is of particular concern in a poor country like Mozambique.

For the empirical research, three case settings within the Mozambican context were selected. Chapter 1 also discussed the significance of this research for policy makers, IS researchers and professionals, and for managers and users. The key contribution of this study arises from the application and refinement of the framework for the empirical analysis of the three case studies in order to understand the interplay between development and ICT initiatives at the organisational and societal levels.

Chapter 2 presented the background of Mozambique in terms of socio-economic and ICT information. The statistical data found in the literature placed Mozambique as a marginalized country in terms of its technological achievement. It was also found in the literature review that the government of Mozambique is profoundly interested in the role of ICT in the development of the country. This Chapter continued with a literature review of actor-network theory (ANT), structuration theory (ST), and context-based theoretical approaches. The literature review of ANT emphasised the concepts of the sociology of translation, which were later used in Chapter Five to analyse each of the case studies. This part of the review also discussed the relationship between ANT and IS, and also the limitations of ANT. The section continued with the review of the main concepts and ideas of ST. In the review, the ST, ANT and IS relationship were also discussed, and it was argued that ANT is more appropriate for analysing the micro-level and that ST can be applied to link the micro and macro-level analysis.

The final part of this chapter dealt with the conceptualisation of the framework for the analysis of the findings of the case studies in Chapter Five. The framework consists of three levels of analysis. At the first level, the case studies are analysed through the use of the concepts of translation from ANT. This helps one to understand the process

of building, growing and stabilising of the network of the adoption and use of ICT-related initiatives in the three case studies. The second level of the analysis interprets the results of the case studies in terms of the local contexts in which the ICT-related initiatives are implemented. For this purpose, the human environment model (HEM) and other contextual approaches are taken into account. The final level of analysis is an attempt to interpret the results of the fieldwork by examining the contributions made to the development of Mozambique by the ICT initiatives that have been introduced. This analysis is done through the application of a ST perspective to link the micro and macro-levels.

Chapter Three outlined the philosophical assumptions underpinning this research. These correspond to the epistemological and ontological assumptions of interpretive research. As the aim of the research was to create a better understanding of the interplay between development and ICT dynamics at the organisational and societal level in the context of Mozambique, we chose the case study strategy in order to gain rich insights into the process. In so doing, three case studies were conducted, two in an organisational context and one in a community setting. This chapter presented the research design as well as data collection techniques employed in the fieldwork.

Chapters Four and Five described the case studies. Chapter 4 introduced the case studies that were concerned with the implementation of ICT-based initiatives at the organisational level and at the rural community level. The first case study describes the process of implementation of an IS in the national electricity company. The second case study describes the introduction of a BPR initiative in the central bank, and the third case study describes the first experience in the country of the implementation of Telecentres in a rural community. Chapter Four also described the fieldwork process in the three case studies.

In Chapter Five, the findings of the case studies were interpreted at three levels of analysis. The first level analysed the results of the case studies by using the sociology of translation from the ANT perspective. It also discussed how the network of alliances necessary for the institutionalisation of the sub-units of analysis (*Galatee*,

BPR and Telecentres) depends on the success of the four steps of translation (problematization, '*interessement*', enrolment and mobilisation).

The second level of analysis interpreted the results of the case studies from the social context perspective. For this purpose, the human environment model is applied. In each of the case studies, there was a need to adapt the ICT-related initiative in order to accommodate the local context. The process of accommodating the ICT-related initiative in terms of the local interests and needs contributes to the consolidation of the human environment in which the new ICT initiative should become a member of the actor network. In this chapter, we also discussed how the liberation of the economy and political stability force these organisations to embark on ICT initiatives as part of their organisational change programmes. From this level of analysis it was argued that it is important to attend all components of the HEM in order to avoid leaking of the black boxes established by stabilisation of the actor network.

The final level interpreted the results based on attempting to link the ICT-related initiatives and development. This linkage is made through ST, where the users represent the agency and the ICT initiative represents the rules and resources of structure. To sustain the role of ICT in development there is a need to apply the sustainable development principle, which means that the ICT-related initiatives and others implemented at the local, regional and national levels should be horizontally interdependent with the aim of improving and satisfying the fundamental needs. These initiatives must vertically complement each other and must also be aligned with development priorities and policies. The network created by the adoption and use of each initiative is accepted as a contribution to the whole organisation and industry. The improvement of a particular industry contributes to the creation, growth and stabilisation of the development network in Mozambique.

In the final part of this chapter, the initial framework used to analyse the case studies empirically was refined. This refinement was done on the basis of the findings of interpretations. The refined framework consists of three levels: the micro-level analyses the ICT-related initiatives through a translation process from the ANT

perspective and by applying the due process model as a practical tool to examine the process of introduction of new ICT-related initiatives in a specific setting. The meso-level deals with the analysis of the ICT initiatives in terms of the social context in which they are implemented. Finally, the macro-level tries to describe the interaction between the ICT-related initiatives and development.

*Revisiting the research questions formulated in Chapter 1*

Various questions were asked in Chapter 1 in order to break down the problem of the ‘interplay between ICT dynamics and development in the Mozambique context within the global trends’. In this subsection, the research questions are revisited in the light of the results of the case studies.

**How do we understand the ICT-related initiatives within the organisations and communities?**

This question was addressed throughout the thesis but with particular emphasis in Chapters 4 and 5. This was done by describing the three case studies and by analysing and interpreting them from an ANT perspective, taking into account the social contexts in which these initiatives were implemented. The framework proposed in this research study is intended to assist in the process of gaining an understanding of the implementation process of ICT initiatives.

**What can be done in order to make the use of ICT more effective?**

The case study results give some idea of how the ICT initiatives might be implemented in order to bring about more effective adoption and use. Firstly, the ICT must be aligned with the productive activities of the organisations in which it is going to be implemented. Secondly, the process of implementing such initiatives should actively involve all affected users so that they can understand the reasons and their place within networks. This could increase the likelihood of the institutionalisation of these new initiatives. The new skills required for the initiators, users, managers and

ICT professionals could be understood through the due process model in order to increase its effective use. This question was also discussed in Chapter 5.

**To what extent is ICT contributing to development in developing countries in general and in Mozambique in particular?**

This question was addressed by reviewing the aspects of globalisation, development and transfer of technology, in Chapter 1. Based on the developmental view assumed in this research, ICT initiatives can potentially bring benefits to the users. In Chapter 2, an analysis of the developing country and its ICT policy was presented, in which the role of ICT and human resource development were highlighted.

In this study, particularly in Chapter 5, it is argued that each specific ICT project at organisational or community level contributes to improvement at the local level. All ICT projects contribute to the building and stabilisation of a multipurpose network for the development of a given industry or community and consequently of the country as a whole. A multipurpose network is an actor-network that enrolls and maintains various actors. Multipurpose implies a configuration of various actor-networks and their integration into one.

The three case studies showed that the contribution of ICT could only happen if the ICT initiatives are aligned with the development programmes and locally adapted. The people involved in and affected by the initiatives need to be well informed about the changes, and they should participate in the network building and its stabilisation.

This thesis makes three types of contributions. These contributions are discussed in the next section.

**6.3. Research contributions**

This section focuses on the contributions of this dissertation. The section is divided into three subsections addressing contribution to theory, methodology and practice.



### 6.3.1. Theoretical contributions

Both theory and empirical findings contribute to our understanding of the interplay between ICT dynamics and development under global integration. This study also contributes to our understanding of the question of how organisations and communities in Mozambique have adopted and used ICT-related initiatives.

The findings of the case studies suggest that the institutionalisation of ICT-related initiatives is favoured when the initiative is integrated with the core productive actions (own interest) of the organisation. Other factors favouring institutionalisation are consultations, debate and negotiations among the actors in order to accept or reject the new actor in the network. Hence the likelihood that an initiative will be adopted and used increases when local interest and support is elicited from all actors, leading to institutionalisation within the larger organisational network.

The application of the sociology of translation helps to analyse the findings of the case studies. The four steps of translation, problematisation, *interessement*, enrolment and mobilisation are followed.

Problematisation and *interessement* indicate how actors (agencies) form alliances, and are enrolled in an ICT initiative if they perceive it as the solution to their problems. *Interessement* is also a fundamental step if the initiative is to be adopted and used in the new network context, and its success depends on the ability and capacity of the agency proposing the initiative to translate the interests of other agencies in terms of their own interests. Also, the actor proposing the initiative needs to counter competing projects.

As the case studies showed, once the initiative has been defined as a solution for a problem – as an OPP, the interest of other actors is aroused. The agency proposing the initiative has to enrol and to mobilise those actors to participate in its project, either by force or persuasion. The former can be employed when the actor proposing the

initiative has the power and the latter when the agency proposing the initiative lacks power. Whatever the case, actors need the resources and authority to negotiate, consult and debate, or forcibly achieve the enrolment and mobilisation of other actors.

The above paragraph suggests that it would be worthwhile to study how initiators, ICT professionals, managers and decision-makers communicate with users and the rest of the organisation or community.

Although some research studies have been done on how organisations or communities in developing countries adopt and use ICT (Du Plooy, 1998; Silva, 1997), very little has been done on Mozambique (Kluzer, 1993). The work developed by Du Plooy addresses the issues of adoption and use of ICT in organisations in South Africa in terms of creating a proper social context where the adoption and use can ‘healthily’ happen. Silva (1997) discusses the issue of power and politics within the process of institutionalisation of ICT-related initiatives in organisations in Latin America. The work done by Kulzer a decade ago was about Mozambique but the main focus was on economic issues related to the distribution of computers in that country. Although there are studies on the adoption and use of ICT-related initiatives in developing countries, none of those focusing on Mozambique have, as their main focus, the interplay between ICT dynamics and development in the global integration context.

### ***6.3.2. Methodological contributions***

The main methodological contribution of the research has been the combination and application of concepts from ANT, ST, contextual approaches and HEM, globalisation and development to study the process of adoption and use of ICT-related initiatives for development within Mozambique.

Another methodological contribution lies in the experience gained through the application of case study strategy and an interpretive approach and techniques applied for data collection. This experience may be useful for other studies on the adoption

and use of ICT-related initiatives in organisations and communities in the context of developing countries.

Finally, a methodological contribution relates to the appropriateness of applying theoretical concepts and theories developed in other contexts. The applicability of some research theories and models developed in other developed countries to studies in the context of a developing country has been questioned owing to the differences that exist in social and cultural settings. The successful use of these theories in this study contributes towards providing examples of the interpretation of case studies from developing countries like Mozambique.

### ***6.3.3. Practical contributions***

One of the practical contributions of this research is the detailed insight provided by the three case studies. The case studies reveal that ICT-related initiatives should be linked to productive activities of organisations. This implies that for effective implementation, emphasis should be placed on the importance of understanding the social contexts of work, task and organisation. This will help to increase the social integration of the ICT initiative and, hopefully, its institutionalisation.

The case studies also reveal that ICT professionals and managers need to acquire new skills of negotiation and communication in order to persuade other actors to join the network of adoption and use of the ICT-related initiative.

Another practical contribution is the framework for analysing the process of adoption and use of ICT initiatives, in order to gain an understanding of the interplay between ICT and development in a specific context. The contribution of this research is to understand, based on theoretical assumptions, how the ICT initiative can be institutionalised and also how it contributes to development. To this end, the due process model can be used as a practical tool.

#### 6.4. Assessing the contribution

In 1989, Whetten, in his article on “What constitutes a theoretical contribution” identified four important components to be taken into account as part of a theoretical contribution. They are as follows:

- What? What factors and concepts should be included as part of the explanation of the contribution? For this purpose, two criteria are taken into account, comprehensiveness, the inclusion of all the relevant factors and *parsimony*, excluding those that have little role to play in improving the understanding of the contribution.
- How? Subsequent to the identification of the factors and concepts that are part of the contributions, the researcher should reflect on how these factors are interrelated.
- Why? Why select certain factors? What are the underlying assumptions of the theory or model? The logic of the proposed conceptualisation should be of interest to other researchers.
- Who, where and when? These enquiries define the boundaries for generalisation.

Based on Whetten’s framework for the evaluation of the theoretical contribution, a set of questions are now asked in order to assess the theoretical contribution of this study.

*What is new? Does this study make a significant contribution to current thinking?*

The contributions of this study are three-fold: Firstly, they lie in the review of the relevant literature on the interplay between ICT-related initiatives and development in the context of a developing country like Mozambique.

Secondly, the contribution lies in the empirically rich insights provided by the case studies and in the refined framework for analysis of the adoption and use of ICT initiatives. This framework can be used to guide the process of introducing new ICT

initiatives in organisations and communities, and to help gain an understanding of the interplay between ICT and development.

Thirdly, the contribution lies in the combination and application of different theories developed in western countries to study the process of adoption and use of ICT in a developing country. The fieldwork description and the data techniques applied in this study process can also help other researchers in conducting similar studies in other developing country contexts.

*So what? Is it likely that the theory will change the way in which ICT-related initiatives are implemented in organisations and communities in the Mozambican context?*

Based on the assumption that the implementation of new ICT-related initiatives will continue in Mozambique in general, this study seeks to contribute to the way in which organisations and communities may implement ICT-related initiatives in order to increase the likelihood of their institutionalisation. In this regard the framework presented in Chapter Five is a contribution that can be used as a practical tool to guide the implementation process. This study also draws implications in terms of building new skills and knowledge for users, managers and ICT professionals.

*How so? Are the underlying logic and supporting evidence compelling?*

In Chapter One, the research problem was reviewed from four different viewpoints: Globalisation, ICT innovation transfer, organisational change and development. Three theoretical perspectives were used in order to interpret the results of the case studies, namely ANT, ST and the human environment model. In Chapter 2, the context of Mozambique was described and different social theories were discussed and in Chapter 3 different research approaches were also discussed. This led to the choice of the interpretive approach and case study strategy to conduct this study. In Chapter 5, a framework for the analysis of the interplay between ICT-related initiatives and development in the context of a developing country was developed, based on the

interpretation of the results of the case studies presented in Chapter 4. The research conclusions presented in Chapter 5 were therefore drawn from a solid base of evidence.

*Well done? Does the research work reflect seasoned thinking, conveying completeness and thoroughness?*

The research problem, as well as the results of the case studies, was viewed from different angles. The various research approaches were discussed in Chapter 3 and the interpretation of the results was undertaken from multiple perspectives in Chapter 5. The interpretation perspectives used were ANT, Human environment (social context) and ST and development. The last chapter of the thesis is used to review the research, and, in particular, the research questions and the contributions made by the research study. This indicates thoroughness and reflection on the part of the researcher.

*Done well? Is the dissertation well written? Does it flow logically? Are the central ideas easily accessed?*

The research topic and a broadly relevant literature review were introduced in Chapter 1. A background of the Mozambican context was presented in Chapter 2. The study continued in a logical way to review different theories that constitute the theoretical basis for this thesis. The research approach followed was discussed in Chapter 3. The researcher stressed throughout the thesis that the major premise is the question of the adoption and use of ICT-related initiatives in order to contribute to sustainable social development in Mozambique. Empirical studies were done in the context of Mozambique and their results were analysed on the basis of the theories introduced in this thesis to help refine a framework for analysis of the interplay between ICT-related initiatives and development. The quality of writing in this thesis was ensured by engaging the services of a professional language editor. The index of terms and the glossary allow for easy access to the central ideas.

*Why now? Is the topic of contemporary interest to scholars and practitioners in this area?*

Recently, Mozambique has launched different ICT-related initiatives in organisations and communities with the main purpose of improving the provision of customer and citizen services. To this end, it was important to conduct empirical studies in the context of Mozambique in order to contribute to a better understanding of the process of adoption and use of these ICT-related initiatives. Moreover, the need to understand the process of institutionalisation and use of ICT in the context of developing countries has been of interest to different scholars in the area of IS. This study emphasises the consideration of local context in the process of the adoption and use of ICT and, in this way, contributes to the discourse on a new approach to implementing ICT-related initiatives in organisations and communities in Mozambique.

*Who cares? What percentage of academic readers is interested in this topic?*

Besides the researcher, this topic is of interest to Mozambicans who are involved in applying ICT-related innovations in different sectors as part of the country's development. This might be of particular interest to ICT professionals, managers and decision-makers in terms of the implementation of ICT-related initiatives that contribute to development. Within the IFIP organisation there are active working groups that deal with ICT in organisations and developing countries. For example, IFIP WG 8.2 is concerned with ICT and organisational change; IFIP WG8.6 is an active group for ICT adoption and use, and IFIP WG 9.4 deals with the social issues of ICT in developing countries. These groups and others regularly organise conferences on the topic of the adoption and use of ICT in organisations and other themes. The topic might also be of interest to researchers and agencies involved in the issues of addressing ICT-related initiatives for development in the globalisation arena. The topic is thus clearly of major concern to the academic ICT/IS community and it is a very active area of research.

### **6.5. Limitations and suggestions for further research**

There are three major limitations to this study that have implications for further research work. The first limitation is related to the fact that the framework for the analysis of ICT innovations for development derived in Chapter Five was not applied during the process of introducing ICT-related initiatives in organisations or communities, but was derived by analysing the three case studies of this dissertation. This being the case, it is suggested that further research studies should take into account this framework during the process of introducing ICT-related initiatives, quite apart from analysing the interplay between ICT and development.

As expounded in the dissertation, this study attempts to illustrate the process of the adoption and use of ICT initiatives in Mozambican organisations and communities and its interplay with development. However, the fact that the case studies represent specific ICT-related initiatives unique to the Mozambican context may make the lessons learnt not entirely transferable to other developing countries, organisations and communities. Thus, it would be interesting to expand the study of the adoption and use of ICT for development first to other organisations, community contexts and sectors within Mozambique and secondly to other developing countries in order to further emphasise cross-cultural influences. For example, a study might focus on the implementation of ICT and related technologies and management practices in the Mozambican financial sector to determine what developmental contributions they make to the specific sector, and more broadly, to the developmental effort in Mozambique. Another example could be a study of the implementation of ICT-related initiatives in public institutions to examine to what extent these initiatives are taking place and what developmental contributions are being made to the public administration and the country. This would help to expand our knowledge on the dynamics of the process of adoption and use of ICT-related initiatives for development.

A final limitation, perhaps applicable to most studies of organisational change, is the fact that change itself is an ongoing process. The presentation of the ICT-related



initiatives in three case studies does not suggest that the actors involved have stopped changing or introducing new programmes. During the process of writing up this thesis, different initiatives were already taking place in each of the case study settings.

Indeed, towards the end of writing this thesis it was learnt that the *Galatee* system is still not completely implemented and also that some of the problems observed during the fieldwork persist. In addition, the IT Department at EDM submitted a project requesting the study and review of the ICT status and its relation to the business. Some new services are in place, such as a toll-free number: the EDM customer can now phone and obtain information about payment, which he/she can pay through bank facilities. It would therefore be interesting to do an empirical study on the closure of the actor-network for the introduction of *Galatee* at EDM by applying the framework for analysis proposed in this work.

At BM, the new organisational structure is in place and the IT Master Plan is in its implementation phase. An integrated system is being developed by a contracted software company that uses SAP, and *Perago* is doing quality control of the implementation of the entire IT Master Plan. As regards the BM case, a further area of research could be to analyse to what extent the two actors (IT Master Plan and the organisational structure) resulting from the BPR project are institutionalised after the implementation.

The organisations involved in two of the case studies opted to outsource some of the ICT services. The relationship between outsourcing companies and organisations that hire their services could be another area of further study. It would be interesting, for example, to apply the sociology of translation, together with the due process model, to understand how outsourcing firms exercise an influence on organisations and *vice versa*.

At the Telecentres of Manhiça and Namaacha, the actors are busy trying to identify the sustainability mechanisms for the continuation of the Telecentre initiative beyond 2002. In addition, more Telecentres are being established in different regions of the

country. A further research area could be to conduct a comparative study of the Telecentre experiences across the country by looking at the cultural and even ritual issues that might influence the way in which communities could institutionalise Telecentres.

While it is agreed that some of these developments will have implications for the cases studied, some form of closure has to take place in order to complete a Ph.D. thesis within a certain time limit and space. In the words of Van Maanen (1988:120), '... we know our analysis is not finished, only over'.

