Chapter 9   Description of social systems

9.1   Introduction

In this chapter, the main section of the social systems framework is applied to the social systems of interest on the ICT4D project. The social systems are modelled or described using concepts from structuration theory and autopoiesis. In the process, it addresses the following research question:

- How can a systems framework based on social autopoiesis be practically applied in a deeply rural community in a developing country?

Each social system is described separately before the mutual influences between the systems are studied. The descriptions are presented in a particular order. The largest system served, the Zulu system, is described first. The mission, which is a serving system to the Zulu system, but represents a system served to the UP ICT4D project, is described next. Following this, the mutual influences between the Zulu and mission systems are assessed. Lastly, the serving system of this study, namely the ICT4D project, is described. Having done this, the mutual influences among the three systems, but in particular the influence of the serving system on its two systems served, is investigated. This description is used as a basis for the assessment of the impact of the ICT4D project on its systems served.

The background study of Chapter 8 informs the systems descriptions, while the main source of information is empirical data gathered during the case study. The empirical data collection process is revisited before commencing with the systems descriptions.

Why are the systems descriptions done in this manner? The ultimate purpose is to develop an in-depth understanding of all three systems, and their mutual interfaces and influences. *This is done to see whether and how the serving system(s) can influence the self-producing ability and sustainability of the systems served. In this way, the contribution of the ICT4D project to the socio-economic development of the systems served can be assessed*, given the definitions of development presented in Chapter 2. As indicated in ICT4D literature (e.g. Walsham et al., 2007; Silva and Westrup, 2009; Heeks, 2008), there are requirements for successful interaction, such as that the serving system(s) must remain sensitive to the worldviews, values, and authority structures of the systems served. This study highlights such imperatives,

and discusses them under the headings of the systems framework. However, the study wants to go beyond that, to see how the essential social character or nature of each social system comes at play and is influenced during social interaction, to ultimately assess how sustainability and socio-economic development are impacted.

9.2   Empirical data gathered

The context of the ICT4D case study is given in Chapter 8. The setting of the case study is the systems served, namely the Zulu and mission systems within the Msinga local municipality in KwaZulu Natal, South Africa. The case study's ICT4D project is described as the serving system, also in Chapter 8.

In the section below, the data collection process presented in Chapter 3 is revisited, and the data obtained during this exercise are discussed.

9.2.1   Revisiting the research methodology

Chapter 3 discusses the research philosophy and overall methodology of the case study. In that chapter, motivation is presented for the undertaking of an interpretive ICT4D case study, following Avgerou's (2009) "social embeddedness" set of assumptions. A longitudital, single, descriptive case study has been conducted making use of Klein and Myers' (1999) principles for conducting interpretive field studies. The systems framework in Chapter 7 provides the theoretical lens used for data collection as well as analysis.

9.2.2   Nature of data collected

This study focuses on the social context of an ICT4D project, here defined as social systems of interest, with modelling assumptions as discussed in Chapter 8. The empirical data collected is social in nature, and therefore qualitative. Quantitative demographic data obtained from secondary sources has been used in the background study (Chapter 8) to link the social systems with real-world communities. The qualitative empirical data collected during this research project describes the social nature and dynamics of the social systems of interest.

9.2.3 Data collection methods

Typical case study methods were used, namely interviews and the studying of documents (Myers, 2009: 79). The ethnographic methods of participant observation and daily field notes (Oates, 2006: 174) were used to obtain additional rich data during field trips.

9.2.3.1 Interviews

Ten formal, scheduled interviews took place, distributed over the period covered by the field visits listed below (Section 9.2.4). Seven of these interviews were voice recorded. With the other three, an alternative recording method was experimented with: detailed notes were taken during the conversation, which were typed up the same evening with annotations, the result of which was verified with the respective respondents. Whereas the researcher was more comfortable with the latter method, she realised that a recorded interview presents a more complete record of the conversation. The scheduled interviews were all semi-structured, that is, the interviewer asked open-ended questions related to the concepts of the systems framework. Whereas in initial interviews, the concepts of the framework were presented, the researcher subsequently realised it was inappropriate since they were formal, academic concepts. Thereafter, these concepts were not directly presented to the interviewees; instead, the researcher translated the framework concepts into questions that were directly relevant to the life world of the interviewees. As part of the interviews, people were asked to volunteer their life stories. Rich sets of data were obtained within which the researcher could search for information pertaining to the systems framework.

In addition, a large number of informal interviews took place during field trip activities, many of which were unplanned and occurred as the opportunity arose. These were documented either during the event, in the researcher's notebook, or otherwise on the same evening as part of the daily recording of field notes. Informal conversations with the researcher's own project team and particularly with the project leader, in the field or back at the university, were important contributions to personal sense-making.

Informed consent was obtained from all individuals with whom scheduled interviews took place, as well as in cases where informal conversations became important information sources. Where people signed consent forms, the information they supplied is referenced in descriptions below by a respondent number. Other informal conversations are used in data analysis in the same way as field notes, as part of the general description.

The majority of interviews were with people associated with the mission, since these people were accessible to the researcher and could speak English. One scheduled interview was done with a traditional Zulu man who was not a member of the mission church and who could not speak English. The interview required a whole delegation to facilitate it: a male from the mission to address the Zulu man, a Zulu lady who was fluent in both Zulu and English to translate, the researcher as well as a university colleague who observed. Each question went from the researcher to the lady who translated, to the male from the mission who addressed the traditional Zulu. When the Zulu man responded, the information was relayed back in the same manner. This interview only became fruitful when the researcher released control and allowed the traditional Zulu man to volunteer information as he chose.

9.2.3.2   Documents

Documents related to the IT training project as well as to the community were collected. For the IT training project, these include funding proposals, project reports and some meeting minutes. For the two social systems served, not much was readily available that was formally documented. Two meaningful documents obtained were the Msinga Municipality's Integrated Development Programme and an issue of the mission school's magazine.

9.2.3.3   Participant observation

Participant observation included observing those who were participating in the IT literacy training: course presenters as well as attendants, during training sessions as well as outside the training venues. Outside of the formal training, planning meetings were held and informal conversations were observed between trainers as well as between course participants. Other observation opportunities arose while participating in activities of the mission as well as general socialising during field visits.

During the IT literacy training the researcher participated in the needs assessment, planning and writing of funding proposals for the IT literacy training. During the training itself, the researcher did not formally present but assisted with practical class exercises. She further sat in during training sessions as an observer and informally conversed with trainees.

Participating in activities of the mission included attending church services as well as accompanying mission staff on a number of mission activities. In July 2009, the researcher went along during a series of evangelisation home visits to people in a very remote area, accessible only by foot. Four Zulu families were visited, two of whom were active members

of the mission congregation. The delegation sat with the families in their homes, read a passage from the Bible to each, listened as their personal needs were discussed, prayed for them and handed out food and clothes to the most needy of the families. In July 2010, the researcher went along with a worker from the orphan care centre to deliver monthly food parcels to the families caring for AIDS orphans. A pickup truck was loaded with the ingredients for the food parcels, namely maize meal, rice, beans, salt, cooking oil, instant mash, fresh spinach and lettuce. The pickup truck had to travel along tracks in the rural area, many of which were difficult to travel on and not accessible by a sedan car. Although the researcher could not understand much of the conversations that took place in Zulu, she could observe the circumstances in which the people lived as well as their gratefulness for receiving food from the mission. Another visit took place in July 2010, this time accompanying a social worker from the mission's health care facility. The social worker visited two remote families who were in need of social welfare assistance as well as medication. The social worker could speak English and answer the questions of the researcher. Long distances were again covered along inaccessible roads, to people who were very needy.

Social interaction during field trips was one of the highlights of the research and IT training project. The Zulu as well as Afrikaans people associated with the mission were very hospitable, even though they were poor compared to city standards, and keen to receive the university staff at their homes. The same was true when interacting with traditional Zulus not associated with the mission. The group from the university ended up dining and visiting at a number of homes, learning about local cuisine, local social habits as well as the lives of the local people in general.

Another series of social interactions took place when people from the mission school visited the university during their annual campus trip for senior scholars. During the campus trips of 2009, 2010 and 2011, the university staff had the opportunity to receive the learners and their teachers, arrange a campus trip that entailed career education, and house the Zulu teachers and learners in the researchers' homes. The reciprocated hospitality became meaningful to the success of the IT training back in Tugela Ferry, as will be discussed in the data analysis sections.

9.2.3.4   Field notes

After the fact-finding visit in February 2009, each subsequent visit entailed taking extensive field notes on a daily basis. The field notes, which amount to 50 pages of single spaced

typing, include for each day, a diary-like record of events, the data collected during participant observation, recording of informal interviews as well as personal notes: the emotions, impressions and research reflections of the researcher.

9.2.4   Time period

Data has been collected since the first visit to the Tugela Ferry community in February 2009, up to the most recent visit in March 2011. These visits represent five field trips to rural KwaZulu Natal. All visits were associated with the ICT4D training project. From the second visit onwards, each trip involved some kind of IT literacy training. As discussed, this researcher was involved in the training as assistant and observer. Time outside the training sessions was used to study the community in an ethnographic manner. The dates of the field trips were as follows:

19 – 21 February 2009
28 June – 4 July 2009
7 – 10 April 2010
4 – 10 July 2010
11 – 13 March 2011

The extended periods between data collection opportunities allowed for the outcomes of the first training sessions in 2009 to be assessed during subsequent visits. It also allowed for observing how the project evolved over time, and how the approach of the trainers evolved as they gained experience in the particular context. Preliminary interpretation of data collected during the earlier visits was discussed with key people in the community during the last two visits, in order to get their feedback and confirmation.

The time period of just over two years, with repeated cycles of being at the community and away from it, was essential to the researcher's hermeneutic process of sense-making of the situation. During periods away from the community, the researcher reflected on the theoretical framework, the data collected as well as personal experiences in the field. These reflections, together with continual further reading back at home, informed the development of the theoretical framework as well as each subsequent data collection exercise.

9.2.5   Ethical matters encountered

During the data collection process, a number of situations arose that called for sensitivity around research ethics. The first was to obtain informed consent from interviewees who were illiterate and non-English speaking. The university's requirement was a signed informed consent form. The university's ethical committee made the concession that the researcher could obtain verbal informed consent via a translator, and record the conversation. However, when these situations arose, the interviewees were happy to sign a form once it was explained to them. The researcher realised that the underlying ethical concern was not to get the forms signed, but the implicit trust that the interviewees placed in her while they did not have a frame of reference to judge the potential implications of sharing information. The researcher regarded it as an ethical burden on herself not to abuse this trust.

Another matter involving trust was encountered when interviewing Zulu females, of which some conversations took place in English and one involved a translator, who was also female. The Zulu females openly shared intimate personal information with the researcher, with whom they identified with as a female. This was in contrast with Zulu males, who were more reserved during conversations, except if they were interviewed in a formal context such as their work office. Similar to the informed consent situation, the researcher realised she was trusted with more than what she would have been in a western environment, requiring her to take special care with the information shared.

After the researcher commenced with data analysis, some interviews were held to confirm with key stakeholders the provisional conclusions drawn. In one instance, the researcher was asked to remove the discussion of a particular matter from her thesis, as the matter was regarded to be polically sensitive within the community. The researcher realised that her own outsider's judgement of what was sensitive to the community did not necessarily correlate with the research participants' perceptions. Fortunately, the mentioned matter was not central to the thesis, otherwise she would have faced a more serious ethical dilemma.

9.3   Relationship between data collection, data analysis and theory development

As mentioned in section 3.5, an iterative process was followed of doing data collection and analysis while simultaneously developing and refining the theoretical framework. During each subsequent visit to the case setting, new insights were gained about the community

investigated, as well as about the ICT4D project. Between visits, reading and reflection were done on the theoretical framework and how it could best be applied, taking into account the incremental knowledge gained about the case setting. The refinement of the framework in turn sensitised the researcher to view the case setting in new ways. The process of iterative sense-making is summarised in Figure 9.1 below:
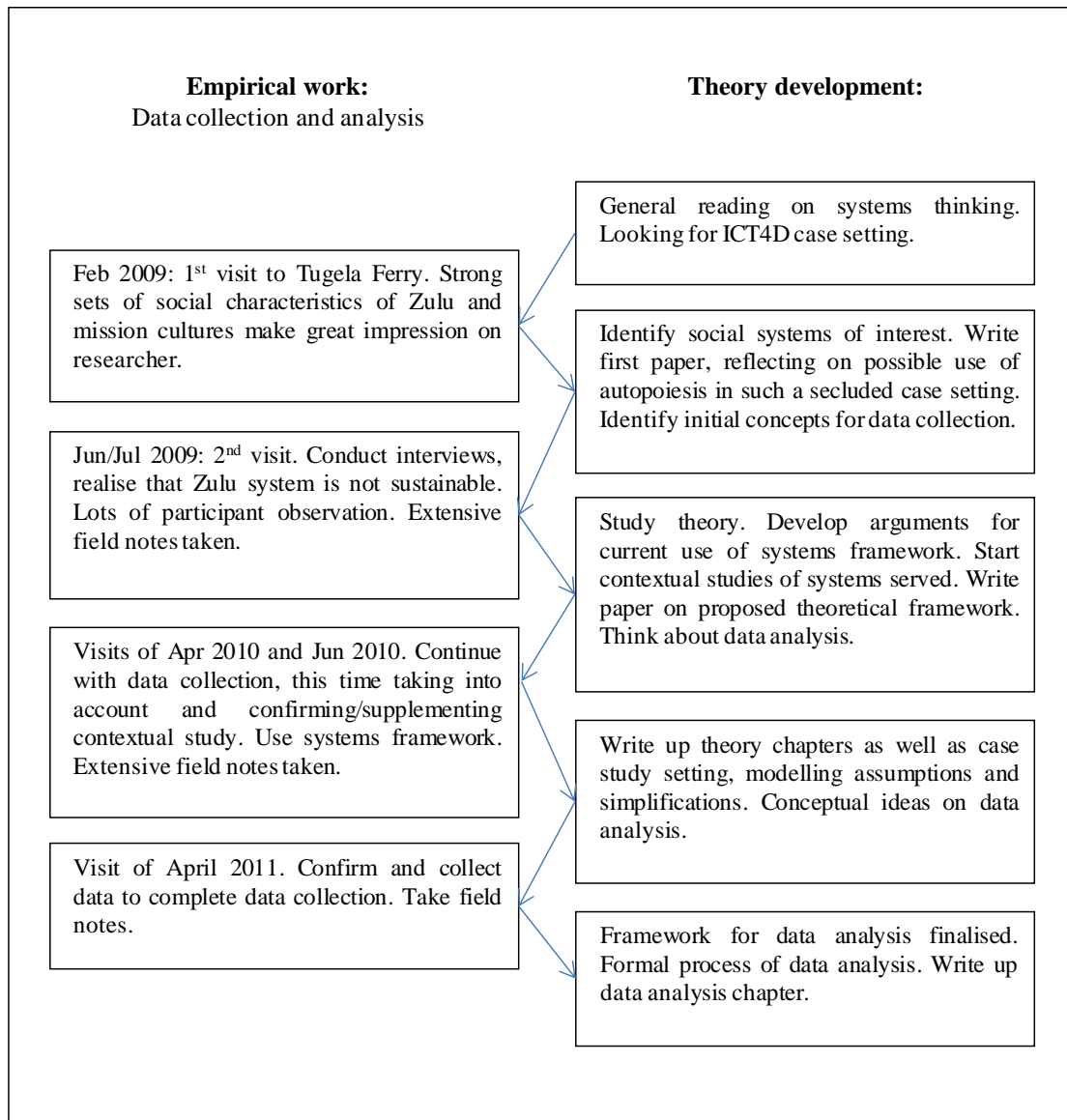
Empirical work:
Data collection and analysis

Theory development:

General reading on systems thinking. Looking for ICT4D case setting.

Feb 2009: 1st visit to Tugela Ferry. Strong sets of social characteristics of Zulu and mission cultures make great impression on researcher.

Identify social systems of interest. Write first paper, reflecting on possible use of autopoiesis in such a secluded case setting. Identify initial concepts for data collection.

Jun/Jul 2009: 2nd visit. Conduct interviews, realise that Zulu system is not sustainable. Lots of participant observation. Extensive field notes taken.

Study theory. Develop arguments for current use of systems framework. Start contextual studies of systems served. Write paper on proposed theoretical framework. Think about data analysis.

Visits of Apr 2010 and Jun 2010. Continue with data collection, this time taking into account and confirming/supplementing contextual study. Use systems framework. Extensive field notes taken.

Write up theory chapters as well as case study setting, modelling assumptions and simplifications. Conceptual ideas on data analysis.

Visit of April 2011. Confirm and collect data to complete data collection. Take field notes.

Framework for data analysis finalised. Formal process of data analysis. Write up data analysis chapter.

Figure 9.1: Iterative process of data collection, analysis and theory development

9.4 Revisiting and applying the systems framework

Preparatory work
Background sketch, including a **CATWOE description** of each system Stating of **assumptions and simplifications**

Concepts of structuration: description from within the systems				
Giddens' dimension	Structure of signification	Structure of domination	Structure of domination	Structure of legitimation
Element of structure:	**Rules (interpretive)**	**Resources (allocative)**	**Resources (authoritative)**	**Rules (normative)**
Modality:	Interpretive schemes	Facility	Facility	Norms
Element of action:	Knowledgeability (of interpretive rules)	Capability (to apply allocative resources)	Capability (to apply authoritative resources)	Knowledgeability (of normative rules)
For a social system: **Rituals** (notion of temporality: everyday, lifetime and institutional time spans) **Social practices**				

Concepts from autopoiesis theory: looking at the systems from outside	
Use Giddens to describe:	**Organisation:** identifying characteristics, in terms of social structure above Structure: social practices **Drift**: changes to social structure as well as social practices over time **Organisational closure:** degree of continued autonomous existence **Structural coupling:** interfacing with other social systems
Derived concept:	**Sustainability**

Table 9.1: Elements of the social systems framework

The following notes on applying the systems framework are relevant to all descriptions of social systems that follow:

- The information presented below is sourced from records of empirical data, such as field notes and recorded interviews. This information is supplemented and contextualised making use of the background study presented in Chapter 8. Where a particular person is referenced, this is indicated by a respondent number.

- In this study, a system is regarded as a subjective mental construct. It is the construct of the researcher.

- Generalisations are often made, and systems modelling requires one to work with ideal types.

- Giddens' dimensions of duality of structure are not mutually exclusive. Often, an information aspect has bearing on two or more of the dimensions. For example, the ancestral belief system is relevant to daily sense-making (interpretive scheme), and is also a source of authority (authoritative resource). As such, information may be repeated but with a different focus.

- For the sake of applying autopoiesis principles, the social system is first defined making use of structuration theory. As such, the notions of 'organisation', 'structure' and 'drift' will not be discussed if this means repeating data previously presented. 'Organisation' refers to the social system's key identifying characteristics, 'structure' to the associated social practices, 'drift' to the organisational as well as structural changes to the system over time, all of which are discussed under the structuration theory headings. 'Organisational closure' refers to the extent to which a system's organisation contributes to its continued autonomous existence. 'Structural coupling' refers to the interfacing of the system with surrounding or neighbouring social systems.

- Related to the previous point: while all of the concepts in Table 9.1 above have been used during data collection, only the systems concepts printed in **bold face** in Table 9.1 will be used to describe the system in the sections that follow. This is for the sake of parsimony; the sum of the bold face concepts has been found to be representative of the systems theory.

9.5   Description of system served: the Zulu system

The Zulu social system is the eventual system served by the mission, as well as by the ICT4D project. This system is also the one that is, from the researcher's perspective, the most 'different'. As such, its description is more detailed than that of the other two systems. While researcher remains an outsider to the Zulu system, her description and analysis was confirmed as an accurate portrayal by a senior colleague from a neighbouring traditional African culture.

The Zulu social system is currently confronted with many changes in their social environment, which in the long term impacts on their culture. Since their current social structure is still rooted in the traditional Zulu culture, the structurational view will describe

the traditional Zulu social structure, after which changes occurring in the culture are described.

9.5.1 A structurational view

9.5.1.1 Interpretive rules

Traditional Zulus have a strong social identity, and in this case it means that belonging to a group and social acceptance by peers is more important than individual self-expression. Sense-making of a situation takes into account one's social identity. As part of their social identity, people in this community identify with each other and care for each other. Caring is a social value that is discussed under the normative rules below.

An ancestral belief system provides a way of interpreting everyday events. For example, hardship or illness in the family is interpreted as a situation that needs to be rectified with the ancestors (Respondent5). In traditional Zulu culture, a sangoma is consulted to tell the person what problem the ancestors have, and how to rectify it.

Traditionally, horizontal and vertical social stratification guide the way social events are interpreted. Horizontal stratification is according to surname families. If my surname is Zuma and another person's surname is Zuma, I treat the person as family even if I don't know them. Some surnames are related, meaning that they belong to the same surname family. An example of how surname families influence behaviour is that when a school teacher disciplines a child of a particular surname family, the child's class mates of the same surname family will identify with the child and possibly come to the child's defence (Respondent6). Vertical stratification is a complex structure influenced by age as well as gender, and will be discussed further under normative rules. An example of how a position in the age/gender structure leads to a traditional interpretive scheme is that a young woman who has come of age but is still a virgin always carries a white handkerchief with her. The handkerchief symbolises her virginity, and a male suitor will jokingly try to grab the handkerchief (Respondent5).

The isiZulu language provides the linguistic context for Zulu sense-making. A number of mission members who are fluent in Zulu but not native Zulus (e.g. Respondent5), have commented that certain isiZulu phrases and idioms cannot be translated into English or

Afrikaans; these are unique to the Zulu cultural context. The majority of people in the area are fluent in isiZulu only.

9.5.1.2   Allocative resources

Collectively, the primary allocative resource of people in the Zulu tribal system is land. The Zulu tribal area is located within the KwaZulu Natal province and forms a subset of the province. Tribal land is located in patches rather than with neat boundaries. The Msinga local municipality all falls in the Zulu tribal area. The Msinga municipality has six chieftains, and the local tribal chief of each has the discretion to allocate land. If someone is not a Zulu they may be granted permission to occupy and utilise premises in the area. However, the land does not belong to them and reverts back to the Zulu tribe along with improvements made, at the chief's discretion or when the occupants decide to leave. This allocative resource has been instrumental in keeping the Zulu culture intact. Migration figures of non-Zulus into the tribal area are extremely low, as shown in Chapter 8. At the same time, the land ownership system has been a key factor in limiting or constraining economic development. It has discouraged companies and industries from investing in the area (Respondent1). Even Zulu people themselves do not have title deeds for their stands, meaning that they do not have an asset to sell or borrow against. It also means that no land taxes can be collected, so that the local government does not have its own source of income (Respondent1).

Traditionally, the primary allocative resource at individual or household level is a household's livestock. People farm chicken, goats and cattle, cattle being the most valuable. Historically, a herd of cattle has been treated as a fixed asset and cattle were only slaughtered on very special occasions, such as a funeral. The neighbourhood were invited to participate in the event and all the meat was consumed at the function. This was a practical way for people to deal with a large amount of meat, since there were no fridges or other ways to preserve meat (Respondent5). Traditionally, cattle continue to play an important part in traditional lobola or brides-gift arrangements. The brides-gift, to be paid by the groom's family to the bride's family, usually consists of a number of cattle, as negotiated between the male representatives of the respective families. (Respondent8). The above examples where cattle come into play are socially grounded events that by their nature involve extended families as well as neighbourhoods. These examples stress the social nature of the Zulu culture.

The traditional Zulu economic system is a subsistence livelihood system. The subsistence livelihood system precedes notions of money or capitalism and is not geared to generate

surplus cash. In Chapter 8 an explanation is provided as to how the subsistence livelihood system came under pressure during the previous century, since the natural resource base it requires per capita to be sustainable, has shrunk significantly. At the same time, because of various events and changes, the demand for cash by the Zulu household has increased. During a large part of the 20th century, migrant labour, in particular men working on the mines, assisted to satisfy the demand for cash. However, in recent decades employment opportunities for semi-skilled labourers have significantly decreased.

In most cases where Zulus were interviewed by the researcher, it was found that the persons achieved what they did in their life despite a severe lack of allocative resources while they grew up. People interviewed typically suffered severe hardships while they grew up, but nevertheless persevered in completing their school education, which helped them to get employment. Such hardships included walking long distances to school, being the breadwinner of an extended family while simultaneously having to pay one's own school fees, implying long working hours after school and on weekends, and alternating years of study and work in order to save up for each following year of study. For women, it included surviving periods of hardship, in one case literally famine, rather than marrying an abusive husband for the sake of financial security (Respondent2, Respondent1, Respondent7, Respondent8).

The HIV/AIDS pandemic of recent decades has placed an additional financial burden on people in a number of ways. To consult a herbal doctor or a sangoma costs money. The loss of productivity due to illness means that the sick person cannot contribute to the household's livelihood. A funeral is a large social gathering that requires at least one beast to be slaughtered. If the family does not own cattle, a cow or ox needs to be purchased for the funeral, often leaving the extended family in debt: "*You are suffering because you lost your loved one. You are suffering because you must get money to buy food to give to all these people who come to the funeral*" (Respondent7). AIDS related deaths are most prevalent in the economically active age groupings, and children end up being raised by a single parent, grandparents or other relatives, resulting in further economic hardship.

During field visits, it was observed that even the poorest households have mobile phones. People regard the ability to communicate as essential. This need is magnified by the remote location of households and people's social identity (Respondent5). However, there are regular cost implications such as travelling to and paying to charge your phone at an electricity outlet and buying air time. Whereas a mobile phone is a relatively small expense for a person with a

professional income, it is a large expense if one has a subsistence livelihood with no regular income at all. Similar continued demands for cash and the simultaneous inability to generate cash has, over time, depleted the allocative resource base of the typical rural Zulu household, to the extent that many families are not in a position to sustain themselves any longer.

Given the current situation with regard to the subsistence livelihood system, and an employment rate of 21% (see Chapter 8), a large percentage of Zulu families are dependent on social welfare grants as an essential allocative resource. Social grants are available as social pensions for the elderly, disability grants and child grants for mothers without an income. One social grant often has to support an entire household. Several interviewees stressed jobs as the thing that will most improve people's lives (e.g. Respondent1, Respondent7).

Other allocative resources that are relevant to the rural Zulu social system, are infrastructural resources such as roads, water supply, sanitation and electricity. Chapter 8 has shown that 80% of Zulu households in the Msinga municipality are without these resources, even though the current government is working hard at changing the situation. An example of how government is trying to help the community while developing infrastructure, is an initiative where 105 previously unemployed matriculants in Msinga municipality have been given jobs as part of a local waste water management project (Sigogo, 2011).

According to (Respondent4), the Zulu community is not handling inequality or differentiation in allocative resources well. This may be ascribed to the collectivist culture. For example, a person who has a regular income is in principle expected to financially assist the entire extended family. While this practice helps poor relatives to survive, it places a burden on the income earners. Also, "*people are jealous towards a person that is getting ahead in life*" (Respondent4). A capitalist value system that encourages the accrual of allocative resources at individual level appears to be in conflict with a collective value system.

9.5.1.3 Authoritative resources

Traditionally, Zulu tribal authority has been a significant authoritative resource (Respondent4, Respondent5). Under the Traditional Leadership and Governance Framework Amendment Act of South Africa (41/2003), tribal chiefs can allocate land, act as judges in tribal courts and make decisions concerning tribal matters. As discussed in Chapter 8, the fact that national and

local government bodies control the budgets for all infrastructure projects in the Msinga municipality has led to the erosion of tribal authority. "*Money has the power*" (Respondent5).

Another key authoritative resource is the power that the ancestors are assumed to have in the ancestral belief system. Zulus have traditionally made an effort to keep the ancestors satisfied with various rituals. Rituals are usually costly in terms of allocative resources, since they entail the slaughtering of a goat or even a cow. Similarly, the consulting of a sangoma to help sort out a problem with the ancestors is financially a costly exercise. A common belief related habit is syncretism, where people participate in ancestral rituals at the same time as attending a Christian church. Some of the larger churches active in the area, such as the Zionist Christian Church and the Shembe church, allow for this practice while the mission church does not (Respondent4). Most Zulu people "*like churches that are not strict about forsaking ancestor worship*" (Respondent7). Further, an increasing number of Zulus, in particular the more educated, regard ancestral rituals as a cultural practice rather than a belief system (Respondent5).

The traditional age/gender stratification, rooted among others in the amabutho system described in Chapter 8, implies respect for older people in the hierarchy. Females do not have the same social standing as males. "*Women have no social power whatsoever*" (Respondent5). In social and even in traditional family settings, the males, females and children remain separate; they eat and socialise separately. Each group of youths of a particular age grouping is socially educated by the group that is one level older.

Education can be regarded as an authoritative resource (Giddens, 1984: 261). According to the 2001 census, 68% of adults in Msinga have received no education at all (Statistics South Africa, 2001; Section 8.2 of this study). Since almost all children of school going age have been attending school in recent years (Respondent2), this percentage is on the decrease, and the authoritative resource is accordingly increasing up to secondary school level. There are no opportunities for tertiary education within the boundaries of Msinga (Respondent1). Although the increase in education levels is encouraging, it does not necessarily lead to increased employment. "*So many matriculants… are walking around here. Maybe they had good results for matric but they can't go anywhere*" (Respondent1). The fact that the younger members of the community are on average better educated than older generations, provide them with an authoritative resource that comes in conflict with the traditional authority base. At the same time, the older generation acknowledges the value of education and are keen that their children are educated (Respondent4).

9.5.1.4 Normative rules

The most important traditional Zulu value is respect (Respondent8, Respondent7, Respondent5, Respondent3, Respondent4, Respondent6). One needs to respect one's elders and one's own parents. Respect is shown in social practices, in the way one addresses older people with appropriate gestures and words. Unfortunately, unconditional respect has in recent years diminished (Respondent4, Respondent5). A possible explanation for this is that the younger generation have increasingly been going to school as explained above, and are thus equipped with a new knowledge base (authoritative resource). They do not respect older people who are illiterate, who have traditional knowledge about aspects like grazing and who know nothing about technology or the subjects taught at school. Younger people "*do not want to walk barefoot after cattle*" (Respondent4) – they do not have respect for the traditional ways. Another explanation for loss of traditional forms of respect is that many children do not grow up in a traditional family setting any more, because of HIV/AIDS, the historical impact of migrant labour and fewer couples getting married (Respondent5).

Another defining Zulu value is that of mutual caring. Another term for it is ubuntu: I am, because we are. The community's well-being is more important than that of an individual family (Respondent4). According to Respondent4, this value has helped the Zulu community in the past through hard times. In general, people will not walk past you without stopping and enquiring after your family, work, health and so on; Respondent4 gives this as an example that people genuinely care for each other.

Traditionally, the behaviour between young men and women is guided by normative rules. Young women are taught that "*they must not mess around with boys*" (Respondent3, Respondent8). According to Respondent3, this value is the most important defining Zulu value apart from respect. Females are expected to keep themselves chaste until they have agreed to become the wife of a particular suitor. The whole traditional courting process involves the acting out of well defined social roles.

9.5.1.5 Rituals and social practices

Traditional Zulu rituals are often related to significant stages in a person's lifespan. Often, these rituals are connected to ancestral worship. Rituals already begin with child birth, and they continue up to a person's funeral.

When a mother is giving birth, her female companions run around the hut and call to the ancestors to help the woman who gives birth. A year after the baby is born, a feast is held during which the ancestors' blessing is evoked on the baby. Everyone present receives a piece of the skin of the cow or ox that was slaughtered for the occasion. At the youth's coming of age, a feast is arranged to celebrate it, with the double intention of informing the community that the young person is ready to get married. Male suitors are only allowed to court women at a distance, often through messengers, until the woman agrees to get married. The lobola negotiation process that follows is an intricate one that involves the extended families, in particular the adult males, of both the young man and woman. If a person dies, relatives visit the site where the person died to fetch the spirit of the deceased. A candle is lit and kept burning during the journey back, representing the deceased's spirit. The funeral is a large event that involves the entire neighbourhood, during which the deceased's family is expected to slaughter a cow or ox and provide food to everyone attending (Respondent5, Respondent6).

During a visit to a Zulu household, the researcher observed artefacts which were pointed out to her as symbols of ancestral worship: goat skins hanging from the roof, and bones stuck in the thatch of the roof above the door.

The above mentioned rituals and practices are only a selection of those associated with Zulu culture. Whether these rituals form part of serious ancestral worship or are performed in a more secular way, they are important social and communicative events, indicative of a social identity.

9.5.2 Autopoiesis concepts

9.5.2.1 Organisation

The Zulu identity is characterised by the tribal leadership system and land ownership system, ancestral worship, respect, ubuntu, the inability of the subsistence livelihood system to move people out of survivalist mode, a weak fit between the traditional and capitalist value systems, and economic dependence on externally instated social welfare grants. There is an internal tension between traditional culture and progression according to the values of western society.

9.5.2.2 Organisational closure

The Zulu social structure (which is its organisation, from an autopoiesis perspective) has largely remained in place and is clearly observable during social practices. On the one hand,

the permanence of this structure can be ascribed to a strong sense of social identity that is maintained. On the other hand, it could be ascribed to the geographical, social and economic isolation of Zulus under the tribal land system.

9.5.2.3 Drift

The "*influence of the western lifestyle, and the focus on education and material advancement*", as opposed to "*being together, being part of the community, to have gatherings, to talk, to sing*" – these changes are experienced as traumatic to the Zulu community (Respondent4). Although progress is seen as being necessary and good, older people observe the results of these influences such as the diminishing respect for age, and find it difficult to interpret. Respondent4 wishes that people could be better facilitated through the process of change.

9.5.2.4 Structural coupling

The Zulu tribal leadership needs to interface with South African government organs. It appears that where such interfacing is done with mutual respect and with the interest of the Zulu community at heart, the structural coupling is successful. An example is the recent establishment of joint decision-making structures between tribal leaders and the South African government.

Structural coupling between Zulus at individual or household level and social systems outside their own, occur with mixed levels of success. The entire Zulu community is meant to benefit from a functional education and health care system instated by national and provincial government from outside the community. However, the education received is not necessarily enough to become employable in the formal sector. The 80% portion of the community that is very poor is not in a good situation to interface with the 'outside' world. For example, they do not necessarily have the knowledge or means to apply for the social grants that they qualify for. The 20% that is relatively more affluent are in a better position to interface, since they are literate, able to speak English, have a means of transport and so on.

9.5.3 Sustainability

In its current state, the Zulu social system does not appear to be economically sustainable. The historic context of this situation is given in Chapter 8, and the current factors that systemically influence the economic situation are discussed under the allocative resources section above.

Socially, some characteristics of the system contribute to sustainability and others not. The concept of caring, or ubuntu, contributes to sustain the system. However, the unequal relationship between males and females does not help to improve the socio-economic situation of females and also contributes to the spreading of HIV. Changes to the life world of the Zulus have led to a breaking down of traditional values and social structures which used to provide stability to the community. The individualist values that underlie capitalism do not combine well with the social identity of the community. Zulu traditions and social practices have largely remained intact despite the fast-changing environment. While the researcher initially interpreted the continuation of these vivid traditions as evidence of a successfully self-producing social system, she increasingly came to the conclusion that they may have remained intact to such a large extent because of the geographical, social and economical isolation of the community.

9.6 Description of system served: the mission system

The Tugela Ferry mission is a serving system of the Zulus, while it is a system served by the ICT4D project. As such, it has an important interfacing role. The mission is characterised by an uncompromising Christian faith. In the past decades they have established institutions which have become benchmarks of caring as well as socio-economic development: an orphan care centre, a medical centre and the mission school. The mission's social structure is discussed below, followed by a description of the mutual influences between the mission and the traditional Zulu social systems.

The mission is described as a separate social system because it has characteristics that clearly distinguish it from the traditional Zulu system. However, the vast majority of mission workers and congregation members are Zulu speaking. These people have left behind some aspects of their Zulu identity and retained others, as discussed below. The mission and Zulu systems are distinguished for purposes of analysis, as indicated in the assumptions section in Chapter 8. They are differentiated by key aspects of their social structure and social practices.

9.6.1 A structurational view

9.6.1.1 Interpretive rules

Everyday situations are interpreted by this community through the lens of Christian faith. For example, it has been difficult for the community to make sense of the many AIDS-related

deaths in recent years. However, they turn to God for hope and comfort: "*God has a reason*" (Respondent3). People are encouraged to read the Bible themselves, and interpretation of scripture is facilitated by the pastors rather than being done on behalf of congregation members (Respondent5, Respondent6).

The mission accommodates the Zulu social identity. Every church group that meets regularly, such as the youth, young couples and the ladies' group, has its own choir and a substantial part of their weekly gatherings is taken up by singing together (Respondent6). Music has traditionally been an important part of Zulu social life (Magubane, 1998: 62), and singing together is a significant activity.

9.6.1.2   Allocative resources

One of the characteristics of the mission is its ability to source external funding for projects and for some of its institutions. The medical centre is doing medical research in the rural community in collaboration with two American universities and as a result they receive research funding that assists them to provide medical services. The orphan care centre has received funding from the World Health Organisation's Global Fund to set up infrastructure and new projects. The church is linked with other faith-based institutions, predominantly in Germany but also in the United States. They are also networked with some churches and institutions in South Africa. The faith-based institutions assist, for example, by sponsoring needy children to attend the mission school or by sending volunteers to help with particular projects. A few farms and organisations in the neighbouring vicinity donate food, which is used towards the monthly food parcels for families who have orphans in foster care. The mission has also instituted its own income-generating initiatives, such as a local bakery and restaurant. According to Respondent4, the mission's ability to source and manage external funding for socio-economic development projects differentiates them from neighbouring Christian churches, who do not have the means to take on similar projects.

The mission's infrastructure and facilities are very valuable to them in the execution of their activities. The mission has a campus that is within walking distance from the Tugela Ferry town centre. The site contains the main church building, housing facilities, a kitchen, the school building and bakery, as well as store-rooms and offices. These buildings have symbolic value to the members of satellite branches, who usually gather in more humble buildings or even under a tree in a remote location. To them, the main church buildings signify that they "*belong to a church that is prominent*" and has a "*visible presence*" in the community

(Respondent4). The housing facilities of the mission allow them to receive visitors from time to time, usually volunteer workers or people attending a church conference.

The hospice at the medical centre takes in people who are terminally ill, the majority of whom are rehabilitated and able to return home although required to take chronic medication, such as antiretrovirals. The building has been designed with health principles in mind, having very large windows and good ventilation (Respondent5). The windows allow in a lot of sunlight as the ultraviolet rays kill tuberculosis germs. The orphan care centre has day care facilities, accommodation facilities for orphans and vulnerable children (OVCs) who cannot be placed in foster care, as well as accommodation facilities for care-givers. The building where the mission school is housed has a separate room for each grade, even though the rooms are small. Preschool children are housed on separate premises. The school uses the church as a school hall. There is open space for school children to play but no sports fields. The school has a computer centre containing 12 networked personal computers. This facility, together with the mission's accommodation facilities, enabled the ICT4D project team to present IT literacy courses at the mission site.

It needs to be noted that there are government schools as well as government health services distributed through the Msinga municipality. The mission's medical centre focuses on services that supplement government primary health care, for example the hospice. The school differentiates itself by providing education for congregation families who wish for their children to have quality education taught along with Christian values (Lobza Gazette, 2009: 4). The fact that the mission school's academic performance significantly exceeds that of other schools in the district, as discussed in Chapter 8, is one measure of the relative value it adds to mission families.

9.6.1.3 Authoritative resources

According the Christian faith, God is the ultimate source of power. When faced with a challenge, people pray about it (Respondent3, Respondent7). "*We live by faith, I can tell you*" (Respondent3).

The authority structure of the mission appears to be democratic; there is no one person in the church that has absolute power. The church has a committee of elders that jointly take decisions (Respondent6). It does not appear that people's position in church, such as being an elder, is a significant source of status, although people in official positions are respected.

The mission's institutions provide authoritative resources, in the form of knowledge and education. The knowledge possessed by the leading figures at each institution is transferred to mission personnel and to the respective communities they serve as far as possible. At the school, children are not only taught the school syllabus. Teachers take an effort to transfer practical knowledge about dietary habits, personal hygiene, good housekeeping and planning ahead for events (Respondent6). At the orphan care centre, care-givers and foster families receive guidance on the physical, emotional, nutritional and medical care of orphans. Social workers at the medical centre take care to assist people to generally improve their livelihoods. For example, the researcher observed during a field trip that a family receiving social welfare assistance was also helped to start a vegetable patch. Nursing volunteers from the medical centre assist remote patients in taking their medication regularly and to improve living conditions, for example teaching tuberculosis patients to air their huts.

9.6.1.4 Normative rules

The mission attempts to practically embody the Christian value of caring. The orphan care centre has been established with the motive that "*Christ loved the orphans and the widows*" (Respondent3).

At the mission school, rules of conduct are laid down explicitly and strictly. The researcher found more than one set of school rules pasted up in the buildings. Girls are not allowed boyfriends while they attend school (Respondent6, Respondent5), but instead encouraged to "*keep themselves pure until marriage*" (Lobza Gazette, 2009: 3). Pregnant girls are expelled. The result is that the teenage pregnancy rate is relatively low – the result of an attempt by the school to get learners to live out Christian values. At the same time, this rule has a positive developmental impact as it encourages girls to finish their education.

Congregation members are encouraged to dress conservatively. Ladies are encouraged (rather than coerced) to wear skirts. In Zulu culture the sexual area of a woman is from her hips down to her knees, and the western habit of wearing pants and especially tight jeans imply that the sexual areas are too visible (Respondent5). Unmarried people are expected not to have intimate relationships. For a woman to have a boyfriend or to spend time alone in the company of a male always implies intimacy in this community, so the sexes are expected to socialise separately. Congregation members are expected not to eat meat presented at a traditional funeral, since the meat has been offered to the ancestors (Respondent5). They are expected to completely break from ancestral practices, even if these are practiced in a cultural

rather than religious context. The church believes that ancestral practices may be demonic (Respondent4) and that it weakens the church, collectively and individually, if syncretism is practised (Respondent6).

The church leadership is expected to set the example in living out the church's strict value system. In this community, there are no secrets; it will soon be known if someone preaches one message and lives out another. Since the practical living out of their values was experienced to be of greater impact than what is preached, this point is taken very seriously by the mission church. Living an impeccable life is "*very costly*" and requires "*a lot of discipline*" (Respondent3).

The mission shares with the traditional Zulu system an emphasis on respect (Respondent3). However, this notion of respect does not imply the same degree of inequality, for example between genders. The mission encourages, as an alternative to the strict age/gender hierarchy of traditional Zulu culture, a more equal treatment of females and tighter social relationships within the nuclear family: between husband and wife and particularly between fathers and their children (Respondent6). However, the traditional Zulu influence is visible and accommodated by the church as long as it is not perceived to be destructive. For example, during the church services the ages and genders are roughly separated. On the one side of the church, the elder men sit in front, followed by adult men and with the male youth behind them. On the other side of the church, females sit in the same order.

9.6.1.5   Rituals and social practices

Regular activities at the church include the weekly worship services on Sunday mornings and prayer meetings on Wednesday evenings. There are groups that gather on a weekly basis, such as the high school youth, the working youth, young couples and women's group (Respondent6). Important seasonal rituals on the church calendar are Easter and Christmas (Respondent7). Rituals related to stages in a person's life are much fewer than in traditional Zulu culture. The male-female courting ritual involves the head pastor as mediator between the male suitor and the woman. A brides-gift may still be payable. The wedding ceremony is at the church. Funerals also involve a church service, but burying ceremonies are not as extensive as the ones involving ancestral rituals.

All meetings held at the mission are opened with a prayer, even if meetings are not directly church-related. When the ICT4D project team did computer training, the training sessions and planning meetings were opened with a prayer by a mission member who was present.

The fact that the rituals of the church are much fewer than the rituals people have to leave behind from traditional Zulu culture, is acknowledged as a shortcoming (Respondent6). In particular, the lack of constructive recreational activities for the younger people is recognised as a shortcoming. The youth are often told what not to do, but they need something to do instead.

9.6.2   Autopoiesis concepts

9.6.2.1   Organisation

The mission is characterised as a faith-based organisation which aims to convert people to the Christian faith. One of their most important ways of doing this, is to try and practically make a difference in the lives of the Zulu people, many of whom suffer from extreme poverty, illness and dire social circumstances. The mission institutions are each dependent on a few key individuals in leadership roles who have dedicated their lives to the church and its causes.

9.6.2.2   Drift

The mission has, in the decades since it started as a satellite branch of another mission and through its independence just over 10 years ago, successfully established itself alongside the Zulu social system. However, their position cannot be seen as comfortable or even stable. Financially, they are continually struggling to break even. Although sources of income are uncertain they make an effort to sustain their aid projects. The church leadership appears to be open to messages from God to take on new initiatives or to change the way in which they are working. Thus, the "drift" is to where they perceive God is leading them.

9.6.2.3   Organisational closure

The mission church pro-actively creates a boundary of difference and distinction by the clear value system that members are expected to live in practice. Congregation members are expected to clearly set themselves apart, particularly where it concerns male-female relationships and ancestral practices.

9.6.2.4   Structural coupling

The mission has learned to live within and alongside the traditional Zulu community in a peaceful manner. There is a clear mutual respect between the two systems. The Zulu people interviewed who were not part of the mission congregation, were positive about the mission's presence (e.g. Respondent2).

The mission shows the ability to successfully interface with external donors, something which has assisted them to develop and grow their institutions, and to make a significant developmental impact within the Zulu social system. They are also able to interface with government institutions, such as the Department of Social Welfare and Home Affairs, to assist needy families to apply for social grants, or with Department of Justice to place orphans with foster families. The mission school interfaces with tertiary education institutions, arranging for example an annual visit to South African universities, and helping matriculants to apply for university bursaries.

9.6.3   Sustainability

In the case of the mission, it can be clearly seen how its continued self-producing organisation, its organisational closure as well as the success of its structural coupling with several neighbouring social systems, has contributed to its relative sustainability.

9.7   Mutual influences: Zulu and mission systems

In this section, the mutual influences between the Zulu and mission systems are described. While the researcher's primary concern is the influence of the mission system on the Zulus, there is a reciprocal influence. Some general system related matters that arise from the systems descriptions are subsequently discussed.

9.7.1   Using the systems framework to describe mutual influences

The mission shares with the Zulu system its key traditional values of caring (ubuntu), respect and male/female chastity. The practical displaying of caring has significantly helped the mission's social acceptance in the broader community. As mentioned, the mission over time has realised that their scriptural message has a much larger impact through their deeds than through their words (Respondent3). The traditional Zulu value of respect is re-presented by the mission as a reciprocal one: males and females must respect each other, not just the one

way round. The mission shares the traditional Zulu value of chastity: that young males and females must keep separate until their intention to marry becomes official (Respondent3). From the above, it can be seen how the mission has successfully applied some important traditional values of the Zulu social system in order to gain acceptance in the Zulu community, and in other cases redefined traditional Zulu values such as respect, in order to work towards a more sustainable social arrangement.

The tribal leadership of the Zulus is recognised by the mission as authoritative resource. The blessing of the tribal leadership is sought in any new endeavours of the mission. For example, if a pastor wants to enter a new area to preach there, he first talks to the Induna who oversees tribal matters in that area (Respondent4). At the same time, the Zulu community has learnt to respect the authority of the mission and its institutions. People can see for themselves what happens if a sick person goes to the mission's medical centre, compared to a sick person that visits the sangoma or herbal doctor. Also, people who are not members of the church will go to the head pastor for advice on social matters (Respondent3). It can hence be seen how the mutual respect between the two social systems help them co-exist in a constructive manner.

The mission aims to provide the Christian faith as an alternative sense-making scheme (as well as authoritative resource) to ancestral belief. People have to forsake ancestral rites when they join the mission church. This is done in a peaceful manner so as to discourage conflict, although it may result in conflict. Conflict occurs when some members of a family, or families in a community, join the church and refuse to participate in ancestral rites. Such people may be ostracised by their traditional Zulu community. However, it appears that related incidences of violence are the exception rather than the norm. Women often convert to Christianity more easily, having very little to lose by forsaking traditional Zulu culture, while for a male his traditional social status is negatively affected (Respondent4).

The allocative resources that the mission has brought into the community have enabled them to successfully assist with socio-economic development in the Zulu community. The Zulu tribal leadership has availed the Zulu allocative resource of land to the mission, without which the mission would not be able to operate in tribal area.

The mission provides the authoritative resource of education, together with a value system that enables learners to negotiate between this new source of authority, their traditional Zulu background as well as the western society.

People working full time for the mission experience a spiritual meaning in their lives, because they are able to live out their calling, but also because of the goodwill and ubuntu that they experience among the Zulus. They give their lives to the community, and are looked after by the same community: "*I do not have a pension. The community has been looking after me since I came here and I know they will continue to do so*" (Respondent5).

Using the terminology of autopoiesis, the mission can be said to mediate structural coupling between the Zulus to whom they provide services, and between other institutions. For example, they mediate structural coupling between school learners and universities, and between people that can benefit from government grants and services, and the institutions providing those services. For members of the church, the mission provides a value system with boundaries, contributing to organisational closure for people who are part of the mission system.

The mission contributes to the improved sustainability of the Zulu system. The mission assists in providing allocative as well as authoritative resources to the broader Zulu community, thereby empowering people to better sustain themselves. "*As the need and distress in the community increased, the mission became more of a resource, and in the process grew closer to the Zulu community*" (Respondent5). The social "us" and "them" boundary of the past has diminished as Christian people became known for their willingness to help anyone in need (Respondent5).

Many core Zulu values are respected by the mission, including caring/ubuntu, respect and chastity, as well as a collectivist culture. For Zulus who want to join the mission, some normative and interpretive rules are replaced by a Christian outlook and values. The mission assists all people in the community, not only members of the church, to better interface with service providers and external institutions. This interfacing or structural coupling strengthens the Zulu system. Since the mission is small compared to the Zulu social system, the mission's impact on socio-economic development is qualitative rather than quantitative.

The above discussion indicates how the concepts of the systems framework can be used to describe the mutual influence between the Zulu and mission systems. It can be used to explain the success of the mission in establishing themselves in the community. The concepts of the framework also indicate how the mission's endeavours potentially contribute to socio-economic development and the systemic sustainability of the Zulu social system. The latter conclusion is of vital importance to the ICT4D project. The interest of the ICT4D project is

the socio-economic development and sustainability of the larger Zulu community, who the ICT4D project team do not have direct access to. If it can be shown that the ICT4D project strengthens the mission's ability to deliver services to the Zulu social system, then it can be claimed that they indirectly contribute to the development and sustainability of the larger Zulu community in Msinga. This point is revisited when describing the influences between the ICT4D project (serving system) and the mission system in sections that follow.

9.7.2 Some general system-related matters

From a systems point of view, helping people to apply for social welfare grants and to obtain antiretrovirals is not a sufficiently systemic way to address the problems of the Zulu social system. These are short term solutions that help people remain alive but that do not necessarily address the causes of the symptoms. Improving people's education, not only in terms of formal schooling but in terms of the practical knowledge discussed earlier, is a more systemic solution. Providing people with a value system that includes mutual respect between males and females as well as sexual morality, is also a systemic way to deal with the problems presented.

Also of systemic relevance, is that the mission appears to be, in terms of its purely religious services, equally involved with the relatively affluent 20% of the Zulu community and in the very poor 80%. The main church building is accessible to the affluent, and the congregation initially consisted mostly of the people from that group. However, the remote satellite branches have all been established in areas where the poorest sector lives (Respondent4). The caring projects of the mission are also primarily aimed towards the poorest.

The scalability of the mission's influence is a systems concern. It has been mentioned earlier that the mission is concerned with the quality of their influence in the community, rather than in numbers of people converted. The scalability of their interventions is limited. They rely on people who have experienced a spiritual calling or who are there because they want to make a difference. The teachers at the mission school receive far smaller salaries than their counterparts in neighbouring government schools. The bulk of the school's income is the school fees paid by the parents, almost all of whom can be classified as poor. At the medical centre, the professionally trained doctors, nurses and social workers receive salaries, while around 200 nursing volunteers from the community assist with the home-based care of patients in remote rural locations for no remuneration. There is a fairly high turnover of teaching and nursing staff, most of whom leave to better paying jobs. In spite of this, these

institutions manage to remain sustainable. However, they are not in a position to drastically expand. Even with more monetary resources, working in this community requires a commitment and caring attitude that cannot be bought.

"Unintended consequences" is a term used in Giddens' (1984: 5) structuration theory, as well as being part of systems terminology. An unintended consequence observed at the school, is that their outstanding academic performance, sustaining a 100% pass rate for 10 years compared to the provincial average of around 61% (Chapter 8), is putting severe pressure on the teaching staff. Teachers have to work many additional hours to meet the high expectations. It appears that this pressure, more than the small salaries, contributes to the high turnover of staff.

In the sections that follow, the next system of interest to the study is described: the ICT4D project as serving system. Such a description will enable the assessment of mutual influences between the serving system and its systems served, in order to see whether the serving system contributes to the development and sustainability of the systems served, which is the ultimate aim of the study.

9.8   Description of the serving system

The intention of the ICT4D project is to effect socio-economic development in the broader Zulu community, by means of IT literacy training. It started off as a serving system to the mission, which has been its main emphasis to date. However, it has also resulted in initiatives which are aimed at serving the broader Zulu social system. The section below is mainly written from the researcher's point of view, as a member of the serving system, while it is supplemented with data obtained through interviewing her own colleagues.

Along with the particular ICT4D team come a set of interpretive and normative rules which they have inherited from a western education, and from the global IS community that they form part of. The values that they bring along collectively if not individually, include an adaptability to rapid technological change, a view of technological progress as being good, a view of time as being precious and tightly measured and where people are expected to be available around the clock, a view of space as being virtual as technology makes distant locations and events more accessible, and a task-oriented focus that places a high value on efficiency and effectiveness. They bring along assumptions of capitalism, which values the ability to respond to market needs and integrate into the larger economic system, in order to

generate surplus income that contributes to the accumulating of individual wealth. They come from a global world with a secular, blended set of norms that accommodate and tolerate different cultures and religions, and where ethics is a dynamic concept that evolves as technology enables new social situations, such as with social networking.

Within the broad set of assumptions and views sketched above the ICT4D research community, as a subset of the IS research community, can be classified into different streams of thinking. Each stream of thinking is characterised by its own set of beliefs and assumptions. The stream of thinking that this particular ICT4D team most closely aligns with is the "social embeddedness" stream (Avgerou, 2009: 12). It assumes that ICT has the potential to improve the socio-economic conditions where it is implemented, but the manner in which it is implemented must be "locally decided". Local people should decide for themselves what their development goals are, and the way ICT contributes to these goals must be the result of local improvisation.

The description of the serving system that follows is primarily based on empirically collected information related to the immediate context. While describing the social structure of the particular ICT4D team, an attempt is made to remain cognisant of the larger set of values that they convey, consciously or subconsciously. Since the main activity of the ICT4D team, as serving system, involved interaction with the mission system served, the description that follows discusses this interaction and provides provisional reflection on it.

9.8.1 A structurational view

9.8.1.1 Interpretive rules

The main sense-making scheme that characterised the ICT4D team was that of rationality. 'Rationality' refers here to a means-end way of reasoning that goes beyond practical rationality to include theoretical rationality (Kalberg, 1980:1152). The university team came with academic and technical knowledge, and possessed reasoning skills that were acquired in the university and western work environment. When confronted with a challenge, they tend to debate and reason about it, and consider the various angles of the matter. This researcher found the difference between her own rational outlook and that of the local people in Tugela Ferry at times frustrating. "*During interviews and conversations, I ask people about facts and details, and often struggle to get it…. the people here do not think in terms of facts, statistics and analysis. Those things do not matter to them. What matters, is more the essence of what is*

happening, and to be part of the social activities… these people prefer to tell stories" (Turpin, 2010).

The ICT4D team set it as their goal to make sense of particularly the Zulu culture, values and sense-making schemes. The mission sense-making schemes were more "available" to the team, since all of them at some stage participated in a Christian faith, whether reformed, orthodox or catholic. The ICT4D team itself was multicultural, at one stage consisting of 5 team members originating from 4 African countries: South Africa, Kenya, Ethiopia and Eritrea. They shared an interest in learning about other cultures, including each other's cultures. All were fluent in English, two were fluent in Afrikaans and one was fluent in Zulu. English was the lingua franca that helped them to interact with each other and with the Tugela Ferry community. However, the knowledge of Afrikaans and Zulu assisted team members to establish communication of a more personal nature within the case setting, since some of the mission workers were Afrikaans speaking and almost everyone else in the community had Zulu as their home language.

The rational sense-making scheme that characterised the ICT4D team was embedded in the technology and software that course attendants needed to learn. Overall, it was found that course attendants who have had longer exposure to practical and perhaps theoretical rationality, such as those who have recently completed their schooling at the mission school, or who was studying for a diploma, found the software and technology less intimidating. The spreadsheet software was perceived to be the most challenging to the course attendants overall. Care was taken to use practice examples from their own environment during class exercises. Respondent9 found that one could not generalise about course attendants: for example, one elderly man who probably did not grow up with proper schooling was the fastest to grasp the spreadsheet concepts.

Once the ICT4D team started to understand the practical implications of the Zulu collectivist identity (as an interpretive rule of the Zulu social system, also characterising Zulus involved with the mission), they started using it to the benefit of the training. It was found that people progressed better through the course material when they could work together and explain the work to each other. While facilitating a train-the-trainer session, Respondent9 observed that the Zulu course presenter initially tried to emulate Respondent9's own way of presenting. He asked the woman to do it in her own way, and observed how she relaxed while a spontaneous to-and-fro chatter emerged between the presenter and the class. According to Respondent9, they were busy with a collective sense-making exercise, and were working to reach common

agreement in the group. Respondent9 also realised that establishing a social rapport with the group during breaks made a big difference when teaching; it was important to the group to be socially recognised by him and to be able to relate to him. Assessments had to be done on an individual basis. It was observed by the researcher that the course attendants found this to be very stressful, even though they were able to complete the assessments successfully on their own.

The ICT4D team's ability to grasp something of the interpretive, social sense-making rules of the course attendants was witnessed by both course presenters interviewed (Respondent9, Respondent10) as a communication breakthrough, which assisted not only in the successful conveying of IT concepts but also resulted in training that was better grounded in the social structure of the mission system served.

9.8.1.2 Allocative resources

The project was able secure funding from the University of Pretoria as well as UNESCO, which helped to pay for expenses related to training courses presented in 2009 and 2010. Without this funding, it would not have been possible to initiate the project. The mission assisted with allocative resources in the form of accommodation, subsidised meals and making available the school's computer studies classroom originally equipped with 10 computers.

The team was able to bring along equipment and training materials printed at the university. Equipment that facilitated the training included a data projector as well as desktop software to ensure that all the personal computers were ready to be used for training. Some of the teachers and mission members who attended the training brought along their own laptops, so as to allow more people to be trained in the same venue. During the period of involvement, the ICT4D team helped to maintain as well as supplement the computer hardware at the school, so that they currently have 12 working computers.

The local businessman who took the initiative to start a training centre in Tugela Ferry (see section 8.7.3.5) invested substantially in renting and equipping a room and the purchasing of personal computers and software. For the courses presented at this centre, community members paid course fees to cover the costs incurred. The courses were established with the ICT4D team's facilitation, but were presented by local trainers.

The ICT4D team's ability to utilise what allocative resources were available at the mission school, to improvise with equipment, to source funding from their own institution as well as from a third party, combined with the resources contributed by individuals and at institutional level by the mission, all assisted to enable the IT training. The fact that all parties contributed resulted in joint ownership of the resource base, which was important in the collectivist culture setting. Apart from the ICT4D team's strengthening the allocative resource base at the mission, the utilisation of allocative resources led to the enhancing of authoritative resources, as discussed below.

9.8.1.3   Authoritative resources

The authoritative resources brought by the ICT4D team that was of direct relevance to the project, was their knowledge and experience in teaching IT literacy courses, technical know-how to fix hardware and software problems, to set up a network and to install relevant software.

The ICT4D team had an implicit social status, being associated with the university. This appeared to be especially pronounced in a rural community where tertiary education is not readily available. Further, the official certification of the IT training by the University of Pretoria carried significant weight with course attendants.

The ICT4D team presented the first series of courses in response to a request from the mission, at the mission premises. As such, the broader community associated them with the mission, when they walked in the street or interfaced elsewhere with the community. Missionaries are perceived to have a certain authority and local people have a high level of respect for the work of the mission, which meant that the ICT4D team inherited some of the mission's respect and authority base. At the same time, the ICT4D team leader made an effort to arrange meetings with the main pastor of the mission, as well as with the Zulu tribal chief, in order to introduce himself and to get their respective blessings for the work undertaken. The ICT4D team's recognition of local authority bases helped the project to run smoothly.

The fact that mission staff did not have to pay for the courses presented at the school appeared to reduce the intrinsic value and status of the course. People did not attach a high value to a course that was "for free". This matter was raised by local representatives during a planning meeting in June 2009, before the first course commenced. It was decided to communicate to course attendants the actual cost per attendant of presenting the course. The actual cost was

high and in the same order of magnitude as what was charged elsewhere in the region for computer literacy courses. In doing so, the ICT4D team succeeded in managing perceptions as to the value of the course.

Another aspect that affected the perceived value (and authoritative status) of the course was its time duration. During a later series of courses presented by newly trained local trainers, course attendants compared the time period over which the course was presented with the duration of another computer literacy course presented in the region. The material covered was similar in content, but the university's course was presented over a shorter period. While the ICT4D team was proud of such efficiency, a shorter course was perceived by the local community to have less value and status (Respondent9). This was a problem for the ICT4D team because they were pressed to deliver, and stretching out the training had cost implications.

Overall, in terms of authoritative resources, the ICT4D team's perceived authority, being associated with the university, was significant. This perception was over and above the actual authoritative resources they contributed in the form of skills. In addition, the broader Zulu community associated the ICT4D team with the mission, the latter which in itself had local authoritative status. The ICT4D team made an effort to acknowledge the sources of authority of both mission and Zulu systems, which assisted their smooth interaction with the community. The perceived authority of the course they presented benefited from its university association but to an extent suffered in status because it was presented "for free", and at a later stage because of its short duration.

To assess the ICT4D team's contribution to the authoritative resource bases of the mission as well as the Zulu system served, one would have to go beyond the number of people trained or enrolled for training (just over 80 by October 2011), to see whether and how the new skills have been enacted to become authoritative resources in the community. Evidence of enactment is discussed in the general assessment of the influence of the serving system, in a following section.

9.8.1.4   Normative rules

A value that was shared among the ICT4D team was their keenness to make a difference, by becoming practically involved in the community through teaching, and by means of their research. Another value brought along from the university was academic integrity. When

doing training and assessments, the trainers had to ensure that course attendants had been reasonably equipped to pass the assessments. Assessment had to be to a previously agreed standard since it carried the university's name.

Before the first training commenced, the ICT4D team was told by the mission liaison that the people attending the course required firm ground rules. The team was requested by the liaison to type up the rules of the course (such as starting times), paste it visibly on the wall of the training centre and discuss it at the onset of the course. This matter was stressed to be very important.

In general, during field visits, the ICT4D team adopted the normative values of the mission. They tried to enact the values of caring and respect. These were also assumed of them in practice. For example, one of the mission's ways of showing their care is to give pedestrians lifts in their cars (few local people have their own transport and public transport is not always accessible). It is generally known that a local person can stop a mission vehicle if there is still space inside, and request to drive along. During one of the field trips, this researcher was asked if she was willing to take two students back home in her car and drop them in Johannesburg. Having been able to fulfil the request was confirmation of her association with the mission.

The ICT4D team also tried to acknowledge Zulu norms and work along with these. Ways of showing respect during greetings and social interactions were attempted. For example, when the ICT4D project leader went to meet the tribal chief, he bowed his head while he was talking and looked to the ground, this being the way one should address the chief. Within the Zulu social structure, people socialise easily with the same gender but not with the opposite gender. It was found that the ICT4D project leader, being a male, could more readily interact with Zulu speaking males and also collect data more easily from males during conversations. Similarly, this researcher, being female, found that traditional Zulu females readily warmed to her, even though she barely knew them. Zulu males were far more distant with her, except when they held a professional position and she went to see them in a professional capacity, usually in their offices.

A difference in normative rules that the ICT4D team had to learn to deal with was between their own task-oriented approach and the local people's people-oriented approach. The ICT4D team valued the efficient and effective completing of tasks, and assumed the goal of many social interactions was the successful completion of a joint task, with the focus on the task

rather than the other people. In contrast, the local project champions as well as course attendants wanted confirmation that they were valued as people before committing to complete a task. The ICT4D team had to slow their pace at the onset of a new task, to spend time showing personal interest in the individuals involved and make sure everyone present received a chance to talk (Respondent10). At the same time, the local champions setting up the computer training centre benefitted from learning to be more task-oriented. In this case, they had to learn to value the timely completion of a training module, at the cost of always pleasing course attendants (Respondent10).

The ICT4D team members who did research had their personal research ethics as normative rules. The vulnerability of the Tugela Ferry community required ethical sensitivity beyond what is usually included in the university's formal ethical clearance process and guidelines. Research respondents were trusting and not in a position to protect themselves if they were to be exploited. Among them were people who were illiterate and could not speak English. Special measures had to be taken to obtain informed consent in such cases. Although it was possible to obtain verbal informed consent through a translator and record the conversation, respondents were willing to sign their names on a form if the contents were explained to them in Zulu by a person they trusted. Empirical summaries, descriptions and analyses were confirmed with literate people from the community who acted as cultural interpreters as well as community gatekeepers. In one such case, a research output based on empirically obtained information had to be revised because the matter was considered to be too sensitive to document.

To conclude: the ICT4D team's attempts to acknowledge the normative rules of the mission as well as the Zulu systems helped to legitimise their initiative. At times, they had to negotiate differences between the values associated with the IT training and the local values, for example between task-oriented and people-oriented values, in order to achieve training objectives while acting in a socially legitimate way.

9.8.1.5   Rituals and social practises

Since the first reconnaissance visit to Tugela Ferry, during which contacts were established at the various mission institutions, the ICT4D project leader made a habit of regularly contacting key people at the mission. These were the people who had to become the local project owners of an IT training initiative. As discussed in section 8.7.3, the ICT4D team had to wait for a

local person with authority to invite them to do the training. The regular social telephone conversations eventually paid off and he was invited to present training courses.

Since 2009, it has become a social practice for the University of Pretoria to receive and host the Grade 11 learners of the mission school during their annual visit to universities. Learners and their teachers are accompanied through the university campus, information sessions are organised at the different faculties, and accommodation is provided for the group. Two members of the ICT4D team have each time assisted in hosting a few learners at their homes. This researcher experienced the intercultural exposure as meaningful to all parties involved, especially to her own children. The ICT4D project leader has taken the social interaction to a next level by inviting contacts at the mission to come and visit and stay over at his home in Pretoria. To date, a few people have taken up the offer. The visitors, being Zulu speaking and having a collectivist identity, could in this way start including the ICT4D project leader in the "us" of their identity. An example of such inclusion was when the headmistress at the mission school started calling him "my son". Another example was that when the ICT4D team first arrived at the mission during their July 2010 trip, a senior person at the mission said: finally, all the visitors have left! The project leader told her that the ICT4D team were also visitors, to which she responded that they were not visitors, they were "part of us" (Respondent10).

As mentioned in Chapter 8, the ICT4D team as a whole frequently socialised with members of the mission congregation while visiting in Tugela Ferry. At times, the team was invited together to dinner at someone's house. At other times, people individually visited with mission members whose company they enjoyed, or who could assist them in informal conversations with their data collection. Mutual participation in practising hospitality, in Tugela Ferry as well as in Pretoria, was an important factor in the social acceptance of the ICT4D team (Respondent10).

While visiting in Tugela Ferry, the ICT4D team took on some of the mission's social practices. Joint meetings with mission staff were opened with prayer. Women wore loose-fitting long skirts similar to female mission staff. Males and females were accommodated separately. The ICT4D team members attended the mission's church services, usually the prayer meeting on Wednesday evenings.

In conclusion, the practising of social rituals, including reciprocal hospitality, played a central role in the ICT4D team's becoming accepted by their mission hosts. The ICT4D project

benefitted from the team's being perceived as "part of us" by the mission, while on a personal level they benefitted from meaningful intercultural experiences.

9.8.2 Autopoiesis concepts

9.8.2.1 Organisation

The serving system is a small team of university staff characterised and distinguished by their technological and academic knowledge. They have joint goals of wanting to successfully transfer IT skills and establish a sustainable training facility in Tugela Ferry, as a means to socio-economic development. In the process, they want to obtain research results. As such, they are a goal-oriented system.

9.8.2.2 Organisational closure

The ICT4D team consistently acted out their identifying characteristics as presented above. This assisted them in becoming a social system in its own right – a serving system.

Secondly, they were able to take on some of the key identifying characteristics of the mission social system and to become socially accepted by the mission, to the extent that they could be regarded as part of the mission system. This internalisation enabled them to contribute to the systemic strengthening of the social structure of the mission from within.

9.8.2.3 Drift

The particular ICT4D team has been active for less than three years, a short period compared to the life span of the other two social systems. During this time, the following changes could be observed. Initially, there was a keenness by team members to train people themselves. This changed to a keenness to help establish a locally managed IT training centre. During the first training presented by the ICT4D team, some conflict was experienced between different trainers on the same course, who had differing personalities as well as different opinions on presenting training material. During following courses, the ICT4D project leader was sensitised to these differences and could manage them better. Over time, the method of training was adapted to take into account the social identity of the course participants. They were encouraged to work in groups and assist one another. This method was not only more effective but also took a significant burden off the course presenter.

As mentioned above, the nature of the relationships between the ICT4D team members and the local people whom they interacted with changed over time to become more personal. This was most visible in the case of the ICT4D project leader. Overall, the drift of the ICT4D serving system was towards closer structural coupling with the mission system, as discussed below.

9.8.2.4 Structural coupling

The establishment of good interpersonal relationships between the ICT4D team and the people at the mission led to effective structural coupling with the mission as system served. The structural coupling was further strengthened by the ICT4D team's participating in mission practices, such as attending church services. The ICT4D team abided by mission normative rules and values, for example by dressing conservatively and by presenting ground rules during the training course.

Not much formal interaction with the traditional Zulu social system and the ICT4D team was required by the project. The meeting of the ICT4D project leader with the Zulu tribal chief to obtain his blessing was sufficient for the project to continue.

The ICT4D team's ability to interface with the university's management and with potential third party funding sources enabled them to achieve funding to execute the project.

The effective structural coupling of the ICT4D team with the mission system and with other institutional role-players was key to the success of the ICT4D project.

9.8.3 Sustainability

The ICT4D team does not have continued funding to remain involved in the community. They are limited by the availability of people to do training for virtually no financial reward. When people's research projects (in particular the two PhDs) are completed, their commitment to be involved may be reduced. The setting up of a local training centre that had the potential to become self-sustaining was an important goal to them.

9.9 Mutual influences: serving system and systems served

The primary interest of the discussion that follows is the influence of the serving system on the mission system as well as on the traditional Zulu social system. However, the serving system was influenced at the same time. Influences will first be described making use of the preceding descriptions by means of the systems framework. Such influences will be further substantiated with empirical evidence, where available.

9.9.1 Influence of the serving system

The analysis by means of the systems framework indicates that the serving system enhanced the authoritative resource base of the mission staff by providing them with IT skills. The IT knowledge equipped people from each mission institution to do their daily work more efficiently, or to take on new administrative responsibilities that require IT literacy. Since the mission is a serving system of the broader Zulu community, the new skills enabled them to serve their clients better.

Three teachers interviewed a year after the first training course in 2009, said that they were now using a computer to set up tests and process marks at school. One of the teachers said that he bought a computer during the first course and has since started using it for his own photo business. A member of the mission staff said that he could now use a computer to do a quotation and an invoice, as well as send email. These skills helped him in his own business In general, he believed that the computer training "*opened chances for many people.*" Also, "*the people can see that the mission does something good, and not only for their own people*" (Respondent3). Someone from the orphan care centre said that she found the Excel skills especially useful. She uses it to keep track of the donor funding, and where it needs to be allocated. She also uses it for the processing of salary payments (Respondent6). A person at the mission who interacts with the teachers regularly, witnessed that the teachers were not only using their new IT skills at school:

"*People have more confidence, not only to do school related tasks, but also to do things for other people. They volunteer, to help in committees, or to type CVs for other people. It is not as if they are just typing their tests. There is immediately a wider application….since it is a social system, one person's skill is everyone's gain*" (Respondent5).

One of the key functions of the mission's medical centre is research, related to tuberculosis as well as HIV/AIDS. The medical research, in partnership with a few American universities, is of a very sophisticated nature. Information collected from patients in the field need to be in electronic format.

"*By developing the [IT] skills of the staff, the medical centre can attract more research, because they can provide more... the staff benefit in terms of exposure and knowledge, because they get drawn into the research project. But the staff also becomes more useful to the research projects, because it is not necessary to appoint external people to capture the data. It used to cost enormous amounts of money to bring in people. And then the people cannot understand Zulu, and they do not understand the hospital's filing, and they have to redo a lot of things. The people are not part of the social structure... the social structure opens all the doors to get access to information... as a result, the people that are hired to do this work is only half effective. If you can have a person who is integrated [with the social structure]... who understand the illness... and who has the [IT] skills, then everyone wins... And what you also do, is people become employable [here]. They do not have to leave to find a job*" (Respondent5).

The same impact of the IT training on the nurses as well as the research of the medical centre has been independently observed by (Respondent6).

The empirical evidence indicates that the impact of the IT skills was not limited to people's immediate jobs. Some people have small businesses to supplement their income from the mission, and the IT skills are helping them in their businesses. Other people are using their skills in their wider community involvement. In the case of the medical centre, the skills of the nurses can lead to increased efficiency with the medical research, empower the nurses to become research assistants and even help to attract more research projects.

The local training facility that has been established early in 2011 has the potential to become a significant allocative and authoritative resource to the owner, trainers and the community. Although the facility is not making a profit yet, it has the potential to do so, in which case the owner and trainers will financially benefit. The community benefits by enhancing their authoritative resource base, which is due to help them in the similar ways as it helped the mission staff, namely to do existing jobs better, in the running of their own business, and in helping other people. If the course attendants are unemployed, it may help them to find

employment. At this stage, empirical information is not yet available on the impact of the IT training on the first trainees at the local training facility.

Other concepts of the systems framework can be used to describe the influence of the serving system as follows: The allocative resource base of the mission system has been enhanced by supplementing their computer infrastructure and servicing their existing personal computers. Regarding normative rules, the academic integrity with which courses were presented, set a baseline for the presenting of further courses locally. The interpretive scheme of rationality had to be transmitted along with technology training, for example spreadsheet manipulation requires logic to be followed. This did not necessarily have much of an influence on the interpretive schemes of local people. It was found that course attendants with previous exposure to activities that required rational sense-making mastered the technology more quickly, in particular the Excel skills.

Direct and secondary beneficiaries of IT literacy training			
Teachers: • Learners • Small businesses • Wider community, informally • Wider community, via local training centre • Teachers, earning from local training centre	**Nurses:** • All patients in their care • Medical research projects • Nurses become more employable on research tasks	**OVC staff:** • Orphans and vulnerable children • Families with OVCs in foster care • Donors (more efficient book-keeping)	**Other mission staff:** • Mission administration • Small businesses • Wider community, informally

Table 9.2: Direct and secondary beneficiaries of IT literacy training

Table 9.2 indicates the people and institutions affected by the IT literacy courses presented at the mission. It is clear that not only the mission but also the wider Zulu social system benefits from the training. The wider community benefits insofar as they are direct clients of the mission projects, employees at small businesses managed by mission staff, or people of the neighbourhood being helped with small IT tasks such as having their CVs typed.

9.9.2 Influences on the ICT4D team

The ability to set up relationships to facilitate the IT training as well as the successful completion of training courses enhanced the authoritative resource base of the ICT4D team,

individually and collectively. The ICT4D team started to be viewed by university colleagues as authorities in the ICT4D field. Their personal commitment and perseverance were noticed by colleagues and respected.

Personal exposure to a rural community that was relatively unaffected by the materialist value system that dominates in an urban, western environment, and where a value system of caring was prominent, was found to be personally enriching to this researcher. Her normative as well as sense-making schemes were affected in the process. The researcher's need to make a difference through her research was rewarded when she received feedback from a stakeholder at the mission that her completed research is regarded to be a meaningful resource. A final version of her draft thesis was given to the mission contact for comment. The feedback was that she covered a rich and varied collection of perspectives, including material from which the local stakeholders could learn and that would be valuable to them when doing future interventions in the Tugela Ferry community.

9.9.3 Assessment of serving system's impact on development

How do the systemic influences of the serving system on the system served, translate into an impact on socio-economic development?

In the social systems description of the serving system, it was indicated that the contribution of the ICT4D project on the mission system was mainly in terms of enhancing their authoritative resources, with the potential impact of enhancing allocative resources. Allocative resources could be enhanced as people's income earning capability was improved, whether in terms of their small businesses or in their capacity of trainers at the new local computer training centre. By enhancing the capabilities of the mission staff, not only to serve their specified clients but also to generate income and informally assist their neighbours, the IT training has assisted in strengthening the staff's own positions as well as that of the mission in service delivery. In the case of the medical centre, the mutually strengthening effect of the new skills of the nurses and the research capability of the medical centre has been indicated. As such, the mission system as a whole, and the mission institutions individually, have been assisted to better self-produce, to become more self-reliant and hence to become more sustainable.
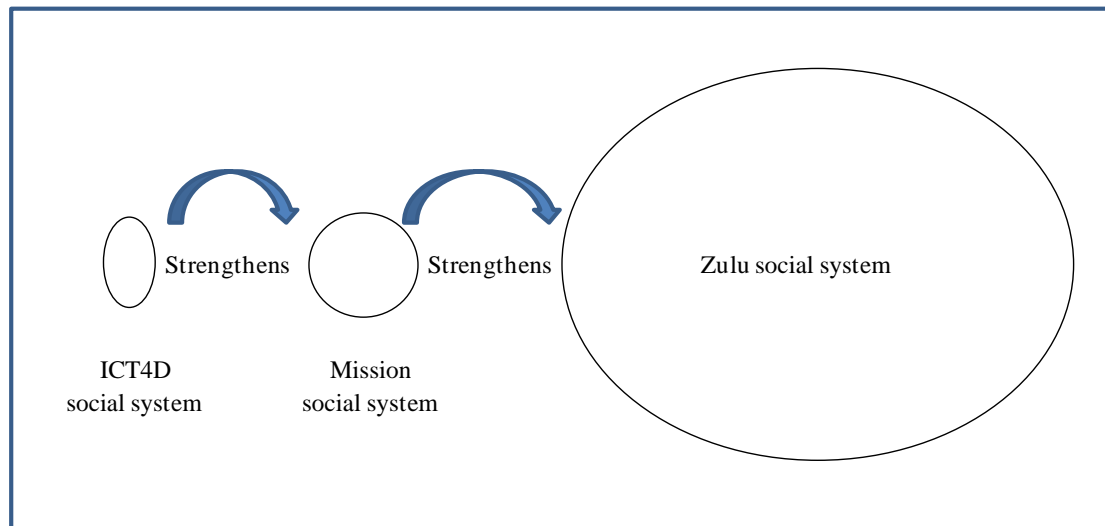
Figure 9.2: The strengthening influences among the social systems of interest

The mission system's contribution to the sustainability and socio-economic development of the Zulu social system has been described earlier. It can be argued that by the IT training's strengthening of the mission as a system, as shown in Figure 9.2 above, the mission's ability to serve the Zulu social system is enhanced. In particular, the local IT training centre established by mission members with the assistance of the ICT4D team, with the goal to train people from the broader Zulu community, is an example of potential socio-economic development.

9.10 Summary of findings

In this chapter, the social systems framework has been used to describe three social systems of interest in the ICT4D case study: the Zulu social system, the Christian mission and the ICT4D project as serving system. The same systems framework has been used to describe the mutual influences among the interacting systems. The study of the mutual influences of the social systems on each other, in particular the influence of the mission system on the traditional Zulu system, and the influence of the ICT4D serving system on the mission system directly, and the Zulu social system indirectly, has been used to indicate the serving system's impact on the self-production ability, self-reliance and hence sustainability of the systems served.

In each case where a serving system attempted to serve another system and managed to do it successfully (the mission serving the broader Zulu system, and the ICT4D project serving the

mission), it appears that the system was served in a particular manner. Firstly, the serving system managed to interface successfully with the system served. The equivalent autopoiesis term for interfacing is structural coupling. The serving system made an effort to understand the social structure of the system served namely their interpretive and normative rules, as well as authoritative resources. The serving system applied those same processes of social structuration when interacting with the system served, provided that the social structure was compatible with their own. For example, the mission worked along with the collectivist identity of the Zulus, as well as the Zulu value of caring, but not with their ancestral belief system. The ICT4D team acknowledged the authoritative resources of the mission. They utilised the collectivist social identity during training but not during course assessments. The interfacing or structural coupling was in each case so successful that the serving system to an extent became one with the system served, even though each system retained is own identity. For example, in the case of the mission it was stated earlier that the social "us" and "them" boundary of the past has diminished as Christian people became known for their willingness to help anyone in need (Respondent5). In the case of the ICT4D team, the headmistress at the mission started calling the ICT4D project leader "my son". As part of interfacing or structural coupling, the serving system also made an effort to recognise the social practices or rituals of the system served. Within the mission, the groups such as the youth or young couples gather in a way that recognise their collectivist identity, for example by singing together for long periods. The ICT4D team participated in the social practice of hospitality (Respondent10), both receiving hospitality and extending it back in Pretoria.

As a result of the successful structural coupling of the serving system and system served, the serving system could influence the system served to a large extent from 'within', since the serving system was perceived by the system served to have become part of it. The serving system could enhance the social structures of the systems served, in particular their allocative and authoritative resources, so that they could more effectively self-produce. The mission provided to its members alternatives to the Zulu normative rules that were perceived to be self-destructive, such as the male-female relationship, with one of mutual respect. The ICT4D team had a significant influence on the authoritative resource base of people active in mission institutions, such as the teachers and nurses, and thereby strengthening the institutions but also the institutions' ability to serve the broader community. Another way that the serving systems strengthened the systems served, was by mediating structural coupling between the system served and external institutions. For example, the mission facilitated interaction with government departments to help people from the Zulu community obtain birth certificates and subsequently, social welfare grants. They also assisted in the interfacing with the Department

of Justice to help orphans get placed with foster families. The ICT4D team facilitated the mission school's campus trip, helping to expose the Grade 11 learners to study and associated funding opportunities.

By assisting the systems served to more effectively self-produce their own social structures, and to structurally couple or interface with other service-providing institutions, the serving systems have assisted with socio-economic development, as defined in Chapter 2. According to autopoiesis theory, having contributed to the served systems' self-production and structural coupling imply that the systems served have become more sustainable.

9.10.1 Implications for future ICT4D projects

The systems descriptions focussed attention on some of the ways in which the serving systems managed to achieve their aims of strengthening the systems served. These insights can be applied when planning other socio-economic development initiatives. Some suggestions are distilled from the summary of findings above:

- Make an effort to understand the social structure of the system served, in terms of its interpretive and normative rules, as well as authoritative resources;
- Use this understanding to effectively interface and communicate with the system served, and in the process establish structural coupling;
- Having achieved structural coupling, try to influence the processes of social structuration of the systems served from within their own frames of reference;
- Acknowledge and leverage capabilities and resources within the systems served that can help to further strengthen them;
- Facilitate structural coupling between the system served and other social systems that may assist in strengthening the system served; and
- Identify destructive practices that continue to be reproduced in the system served, and find ways to counter these.

It is important to note that neither the mission nor the ICT4D serving systems achieved their aims by calculated or 'cold-blooded' approaches of effecting systemic influences. Their honest intention to make a difference and to respect the interests and existing social practices of the systems served were instrumental to their being accepted by the systems served.

9.11 Conclusion

This chapter has presented the analysis of the case study's empirical data. The analysis was done in the form of social systems descriptions, making use of the social systems framework in Table 9.1. A systematic application of the concepts of the systems framework was used to provide rich descriptions of the individual social systems, followed by descriptions of their mutual influences, with particular focus on the influence of each serving system on its system(s) served. The ICT4D project's contribution to the socio-economic development of both the mission and wider Zulu social system could accordingly be assessed. It was shown how the serving systems' assisting of the systems served to more effectively self-produce their own social structures, and to structurally couple or interface with other service-providing institutions, have assisted in their socio-economic development.