Abstract

The growth of interest and applications of information and communication technologies (ICTs) to provide new possibilities for developing countries have spurred the need for greater scrutiny regarding the role ICTs play in development. This research explores the relationship between ICTs and impacts on human development within the organizational culture of Digital Divide Data (DDD), a computer employment centre in Phnom Penh, Cambodia. It takes a micro-level inductive case study approach and asks: what role does ICT play in the human development of employees at Digital Divide Data? Conducting a social impact assessment, the research utilizes seven sets of output indicators in order to assess the impact at DDD. Through in-depth personal accounts with employees, the research determines that there are significant positive contributions to human development in the areas of income and employment generation, access to education, providing skills and training, and improved health security. However, it ultimately finds that the source of the contributions to human development is not solely attributed to the use of ICTs, but rather DDD's social enterprise model provided additional benefits which also contributed to the human development of employees. The research concludes by discussing issues that can be learned from the case study in order to strengthen the strategic and practical contributions to development.
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List of Acronyms

IT: Information Technology
ICT(s): Information and Communication Technologies
MDG: Millennium Development Goals
HDR: Human Development Report
SME: Small and Medium sized Enterprise
DDD: Digital Divide Data
SIA: Social Impact Assessment
UNDP: United Nations Development Programme
PANTLEG: Pan-Asia Telecentre Learning and Evaluation Group
OCR: Optimal Character Recognition
NGO: Non-Governmental Organization
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To my parents for their unwavering encouragement throughout my life, and for always providing their support, assistance and love.

To all the great friends at SCARP who have made my graduate degree a remarkable experience. We've danced, sang, dressed-up, worked hard, laughed - all of which have given me the inspiration to persevere.
"The Boy in the Bubble"
Paul Simon

And I believe
These are the days of lasers in the jungles
Laser in the jungle somewhere
Staccato signals of constant information
A loose affiliation of millionaires
And billionaires and baby
These are the days of miracle and wonder
This is the long distance call
The way the camera follows us in slo-mo
The way we look to us all
The way we look to a distant constellation
That's dying in a corner of the sky
These are the days of miracle and wonder
And don't cry baby, don't cry
Don't cry
Chapter 1: Introduction

The world is undergoing fundamental changes and transformations. The restructuring of capitalism, the increased process of globalization and integration of economies, and the creation of new productivity sources and organizational forms, have all touched lives around the world. Deeply implicated with these processes of change is the increased diffusion of information and communication technologies (ICTs). ICTs have accelerated innovation, provided avenues of communication across previously distant places, and reshaped the geographies of time and space. Throughout the world, ICTs are changing the nature of information dissemination, communication patterns, business practices and economic development. From remote villages in Asia connected to the internet, to telecommunication workers in North America, nervous their jobs may soon be outsourced, to ways in which personal interactions among friends and families occur; these ICT related changes all have economic, social, cultural and political dimensions. Taken in the aggregate, the transformations have produced an information technology (IT) revolution (Wilson, 2004); where both information technologies impact the nature of social relations, and social relations impact the nature of information technologies.

In hopes of capitalizing on the effects and speed of change, there has been considerable discussion in international development circles about the ability of ICTs to assist in creating potential benefits for developing countries. Kofi Anan, the United Nations Secretary General, has noted the broad influence of ICT, asserting that:

Recent developments in the field of communication and information technology are indeed revolutionary in nature. Information and knowledge
are expanding in quantity and accessibility. In many fields, future decision-makers will be presented with unprecedented new tools for development. In such fields as agriculture, health, education, human resource and environmental management, or transport and business development, the consequences could be revolutionary. Communications and information technology have enormous potential, especially for developing countries, and in further sustainable development. (Mansell and Wehn, 1998, p.6)

As such, ICTs are being heralded as a top development priority in order to achieve systemic change at multiple levels in developing countries. For example, the United Nations Development Programme’s (UNDP) Human Development Report (HDR) now routinely includes indices such as the Technology Development Index which measures penetration of internet connections and global technology hubs in countries and regions of the world; likewise, a report from the World Bank Group entitled “Knowledge for Development” posits ICTs as a powerful new tool for poverty reduction and a catalyst for development (World Bank, 1999). ICTs have been shown to have development applications in education, governance, environmental monitoring, economic growth, human rights promotion, health and other areas.

Worldwide total spending on information and communication technology is expected to increase from $2.1 trillion U.S. dollars in 2001, to over $3.2 trillion by 2007 (WITSA, 2004). At the same time, the overall annual growth rate of the ICT sector is expected to be eight percent, while the average annual growth rate of the world economy is expected to be only three percent (ibid). As such, the ICT sector became the world’s first industry to surpass leading industrial sectors such as automobiles and steel (UNDP, 2004). Likewise, the World Bank lending schemes for ICT grew at six times the overall lending growth rate of the Bank, and ICTs were present in ninety percent of the Bank’s lending projects (Harris and Davidson, 1999).
Although there is an overall worldwide increase, the pressing concern for many in international development is the growing uneven distribution of information technology among countries. This uneven distribution is often referred to as the 'digital divide'. The digital divide is the gap between countries and communities that have access and resources to use information technologies and those who do not. Along with the notions of 'information have' and 'have-not' and 'information rich and poor', the 'digital divide' has evolved into one of the most common ways in which unequal access to information and communication technology is expressed (Uimonen, 2001). The digital divide can be between countries (international digital divide) or between groups within countries (domestic digital divide). Currently, there are vast internet penetration differences between developing and developed countries. For example, as of June 2005 internet usage as a percent of the total population in North America was 68%, compared with only 8.9% in Asia (Internet World Stats, 2005). At a national level, Cambodia, a country with a population of 13.5 million, has 35,000 internet users which makes up only 0.2% penetration rate (one of the lowest in Asia) (ibid). In comparison, neighbouring Thailand has a usage rate of 12.8%, and Vietnam 6.4%; Canada and Western European countries, on the other hand, have between 50 to 65% usage rates respectively (ibid).

Though all countries, even the poorest, are increasing their access to and use of ICTs, the "information have" countries are increasing their access and use at such an exponential rate that, in effect, the divide between countries continues to grow (Bridges, 2001). Recognizing the uneven distribution of access to ICTs have prompted many development agencies, businesses, and social enterprises to further contribute to the diffusion of both technological infrastructure and related capacity building efforts.
With the immense growth of the ICT sector as indicated by global spending trends, there are possibilities that ICTs can be used in effective efforts to complement local needs and play a role in local development, but there is also the possibility for ICTs to reinforce social inequalities and power structures within society through unequal access and affordability between rural and urban, poor and rich, and women and men. Similarly, Castells (1999) argues the role of ICTs in development can act as a double-edge sword. On the one hand, ICTs have enabled countries to grow their economies and modernize their production systems in order to increase their competitiveness faster than in the past (this is best illustrated with the Asia-Pacific economies of Taiwan, South Korea, Hong Kong, and Singapore). On the other, if countries are unable to adapt to new technological systems and unable to provide related infrastructure and capacity such as education, their delay becomes cumulative.

The research presented here takes a micro-level inductive approach to examine the relationship between ICTs and development. It assumes that ICTs can play a significant role in providing new avenues of communication, new mediums of education, and unprecedented economic opportunities. However, it argues that ICTs per se do not solve social problems, but rather an appropriate organizational environment is needed in order for the abilities of ICTs to contribute to development. From this viewpoint, emphasis is placed on the framework or context in which ICTs are employed to determine whether or not ICTs produce positive outcomes for human development. As such, this research asks:

- What role does ICT play in the human development of employees at Digital Divide Data?
- What lessons can be learned from this case study in order to strengthen the strategic and practical contributions to development?
To do so, this research examines the qualitative impacts at Digital Divide Data, a computer employment centre for disadvantaged youth in Phnom Penh, Cambodia. This research will analyze the interplay between DDD's organizational culture, its deployment of ICT, and its impacts on employees in order to draw conclusions about what role ICTs play in human development. The observations are grounded in an evaluation of the impacts of ICTs and related benefits provided at the computer employment centre. An interpretive case study approach, such as this, is needed in the study of ICT development in developing countries. Montealegre (1999) argues that there should be more case study research to redress the lack of theory building in IT literature, and to identify and examine cases to enhance external validity and further support theory. In addition, an assessment of an ICT related organization is a relevant contribution to bridging the gap between ICT theory and the empirical evidence of the impacts of ICTs in developing countries. Michiels and Crowder affirm,

...there is an alarming lack of empirical evidence, or analyses, of actual experiences of applying ICTs locally and their impact upon poor people's economic and social livelihoods. The reality is that few projects pay attention to monitoring and evaluation of ICT outcomes, especially the local impacts of ICTs, with the result that guidelines for effective ICT deployment and appropriation at the local level are missing (2001)

1.1 Conceptualizing Development

Discussion relating to development has centered around three main perspectives: modernization, dependency, and human development. For modernization theorists developing nations lack decisive characteristics to which 'development' is associated; such as the power of technology, a skilled workforce, investment capital, and high levels of education. According to modernization theory, underdeveloped countries must break out of pre-capitalist modes of production for development to occur. Since impoverished nations lack resources and knowledge, it is assumed that development will only come about through
the diffusion of Western traits and by following the historical trajectory of more developed countries. This theory is most associated with the book *The Stages of Economic Growth* by W.W. Rostow (1960) which greatly influenced conceptions of aid and development in the Third World after World War Two. In contrast, dependency theory maintains that developing countries are kept in a position of dependency and underdevelopment due to unequal economic and institutional power structures between First World and Third World countries. Exchanges between First and Third World countries, such as trade, foreign investment, and aid, are asymmetric and tend to stifle the development of the latter and to reinforce their dependence. Emphasis is not on the internal structure of an individual country, but rather on the country's place in the international system. Lewellen states that, "Countries are condemned to impoverishment not because they lack technology or capital but because of their placement with the structure of world capitalism" (1995, p50). Alternative to these two narratives is the perspective of human development or "people-centered development". Human development is primarily based on the priority of human well-being and the ability of individuals to flourish and prosper. Primarily, it sees development as enlarging people's choices in education and health, and increasing the standard of living. It seeks a departure from other development narratives which have posited progress as a national linear process, and examines indices of human conditions. Similarly, in contrast to the other theories, it places the individual or citizen as the central tenet of development rather than the nation state. In the Human Development Reports, the definitive literature on human development compiled on global, regional and national scales, the United Nations Development Programme maintains, "People are the real wealth of nations. Development is thus about expanding the choices people have to lead lives that they value" (2005). This research takes the human development framework as a theoretical foundation.
1.2 Cambodian Context

In order to evaluate the project in Phnom Penh, Cambodia it is necessary to examine the cultural and historical context in which the project is situated; therefore this next section provides a brief outline of Cambodia's recent past and its current situation.

Cambodia has had a recent history of trauma and difficulties. The American War in Vietnam in the 1960s pushed many of the war's troubles into Cambodian territory. The Vietcong, the communist forces fighting the South Vietnamese government, used areas inside Cambodia as a sanctuary in order to launch attacks in South Vietnam; as a result, the American military began 'secret bombing raids' in Cambodian territory in an attempt to expel Vietnamese forces. These raids, and others, would leave lasting impacts on Cambodian society in the decades to follow, through unexploded ordnances and destroyed infrastructure.

In 1975, the Khmer Rouge, led by Pol Pot came to power to establish one of the most violent regimes of the 20th century. The Khmer Rouge carried out a radical program that included isolating the country from foreign influence, closing schools, hospitals and factories, abolishing banking, finance and currency, outlawing all religions, confiscating all private property and relocating people from urban areas to collective farms where forced labor was widespread. The purpose of this policy was to turn Cambodians into "new people" through agricultural labour. It resulted in massive deaths through executions, work exhaustion, and starvation.

Despite the ousting of the Khmer Rouge in 1979 by Vietnamese troops, political and civil unrest followed for nearly a decade. Factions of the Khmer Rouge continued to fight for control over the west of the country, while Vietnamese consolidated political control. It was
not until the late 1980's that negotiations between warring factions finally took place. A
sense of peace and normalcy re-entered the Cambodian political landscape when the
Agreements on the Comprehensive Political Settlement of the Cambodia Conflict was
in Cambodia (UNTAC) whose purpose was to bring reconciliation, disarmament,
rehabilitation and free elections, and a new, internationally recognized government for the
country. Although the success of the UNTAC operations was debated, it did undoubtedly
turn a new leaf for Cambodian people and began the immense process of rehabilitation and
reconstruction.

Over twenty years of war, conflict and instability produced significant social and cultural
upheaval. In a report on the situation in Cambodia, Shawcross wrote in 1994, “Cambodia
needs to be rebuilt in almost every aspect of its life. The nation needs, literally, to be
reconstituted and reconstructed – almost reinvented” (Shawcross, 1994, p2). At the end of
the 1980's there were an estimated 350,000 refugees in camps on the Thai border; and
some 175,000 displaced people inside the country (Macfarquhar, 1991). In 1987, per capita
income was estimated to be only $160 annually -- ranking 195th out of 203 countries (Sharp,
2003).

In addition, Cambodia had lost its primary resource, its people. The Khmer Rouge wiped out
or chased out entire educated social elites: doctors, intellectuals, political leaders, school
teachers, and monks. Exact numbers of the people who died are debated; however,
estimates of the death toll have been as high as 1.7 million people or 21% of the country's
population (Cambodian Genocide Program, 2004). In addition, from 1998 estimates, there
were 350,000 handicapped people due to armed conflict and landmines (Tith, 1998).
Unfortunately, Cambodia has the distinction of having the highest number of amputees per capita in the world. The psychological damage of the armed conflicts and the Khmer Rouge era on survivors and their families can certainly never be wholly assessed. Even after twenty-five years of the end of the Khmer Rouge, the Cambodian people and society continue to suffer from the physical and psychological traumas of that period.

It is important to discuss Cambodia's recent history in order to understand how it may influence current socio-economic conditions. The young people at Digital Divide Data, the organization where I completed this research, were born in that tumultuous time of severe trauma and uncertainty. Many were born during or just after the fall of the Khmer Rouge, and they were witness to the stressful dislocation. Several were born and grew up in the refugee camps along the Thai border where families were set in a precarious existence: separated from their homeland, families, and livelihoods. In the early 1990s families were repatriated to Cambodia, after some ten years in the camps, often returning to unknown housing conditions and livelihoods.

Despite Cambodia's significant developments in political reform, health, education, and infrastructure since the early 1990s, it still continues to be low on all development indices. The Human Development Index (HDI), an index prepared by the United Nations Development Programme, rates countries' measurable dimensions of human development such as life expectancy, school enrollment, literacy and income levels. For the 2004 HDI, Cambodia ranked 130 out of 177 countries (UNDP, 2004). A subset of the HDI is the human poverty index (HPI) which focuses on the proportion of people below a threshold level in basic dimensions of human development. Cambodia ranked 74th among 95 developing
counties for which the index has been calculated, the worst performer in East Asia and the Pacific (ibid).

<table>
<thead>
<tr>
<th>Table 1: Selected Socio-Economic Indicators for Cambodia</th>
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<tbody>
<tr>
<td><strong>Total population</strong></td>
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<tr>
<td><strong>Urban population</strong></td>
</tr>
<tr>
<td><strong>Life expectancy at birth</strong></td>
</tr>
<tr>
<td><strong>Adult Literacy (ages 15 and above)</strong></td>
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<tr>
<td><strong>Population living below 1$ a day</strong></td>
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<tr>
<td><strong>Population living below 2$ a day</strong></td>
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<td><strong>Net secondary school enrolment ratio</strong></td>
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(adapted from UNDP, 2004a)

1.3 Definitions

In order to move beyond semantics and to contribute meaningful dialogue, contested terms are outlined below.

- **Information and communication technologies (ICTs):** Any electronic means which transmits, stores, processes, or communicates information. These can include radios, telephones, computers, televisions and the internet. (Further elaboration in Chapter 2)

- **Information:** Data, facts or ideas that have been refined, value-added and organized in a form suitable for human interpretation.

- **Communication:** The effective exchange of information.

- **Technology:** The piece of equipment (both hardware and software) or a technique for performing a particular activity.

- **ICT and development:** Applying information and communication technologies for the intended purpose of assisting individuals, communities or nations in moving toward development goals.
• **Human Development:** Development concept based on the priority of human well-being, and aimed at ensuring and enlarging human choices which lead to equality of opportunities for all people in society: chiefly, the choice to be educated and acquire knowledge, choice to lead a long and healthy life, and the choice to a decent standard of living. Additionally this includes the empowerment of people so that they can participate, and benefit from, cultural, social, economic freedoms and opportunities, and to be creative, productive and enjoy personal self-respect and guaranteed human rights.

### 1.4 Introduction to Case Study

I conducted research with Digital Divide Data (DDD) a non-profit company working in digitization services in Southeast Asia. The head office is located in Phnom Penh, Cambodia, and has two satellite offices; one in the second largest city in Cambodia, Battambang, and another in Vientiane, the capital of Laos. This research is concerned with the two Cambodian offices which combined, employs one hundred and thirty local young Cambodians to digitize documents for North American clients.

Importantly, DDD is a social enterprise working within the ICT sector, whereby they simultaneously deliver financial *and* social return on investment. Social entrepreneurship is "the art of persistently and creatively leveraging resources to capitalize upon marketplace opportunities in order to achieve sustainable social change" (Social Enterprise Alliance, website). As such, the founders of DDD saw an opportunity whereby they could use tools of globalization to both deliver a competitive rate and high quality digital product to their clients, while positively contributing to social change in communities in Southeast Asia. North American clients provide revenue for services and functional operations for the organization and social mission objectives, while international aid agencies (UNDP and Asia Foundation) and private donations further support the organization's social mission and expansion efforts. DDD is an example of a growing phenomenon of organizations blurring the traditional lines between strictly for-profit companies and non-governmental organizations.
Contributing to development. For instance, DDD is registered as an NGO in Cambodia and the state of California, while gaining business clients for job contracts and revenues.

DDD provided a unique opportunity to study the relationship between ICT and development. Firstly, DDD is entirely an ICT-based organization. It gains clients in North America and around the world for digitization and data-entry services. Communication and negotiations between offices, managers and clients are primarily completed through the internet. Additionally, the core business function of digitizing documents is completed entirely on computers. Secondly, because it operates as a social enterprise, DDD presents a unique and relatively new development model, one which creates positive feedback loops where client revenues feed in to providing fair salaries, ongoing education and healthcare for its employees. The cumulative aspects of benefits are what sets DDD apart from other ICT related projects, and ultimately their ability to contribute to social and human development. Thirdly, DDD attempts to attract currently excluded populations of the information revolution - individuals who are typically ignored or excluded from accessing opportunities in the growing information technology economy. As such, DDD proactively hires from marginalized populations of Cambodian society, such as the socio-economic disadvantaged, orphans, rural migrants, physically disabled, and women. Lastly, having only started in 2001, DDD is a young organization, and staff are excited and committed to ensuring its success. It is on the cutting-edge of creating income generating opportunities in Cambodia, and is now expanding to new offices and increasing staffing numbers to be able to assist more disadvantaged individuals in Southeast Asia.

The relationship with DDD was originally formed through the EMERGENCE Canada project, a research project funded through Social Sciences and Humanities Research Council of
Canada, which examines the impact that information and communications technologies have on the changing nature of work in the new economy. DDD was contacted with the intention of being used as a case study in the project. This thesis evolved in tandem with my involvement with the EMERGENCE case study research.

1.5 Research Methods

The research was conducted in three phases: the first covered background research on appropriate research methodologies, the role of ICT in human development and international development, the generation of impact indicators, and creating preliminary interview questions. The second phase consisted of a three-month field research trip to Phnom Penh, Cambodia in order to better understand the local realities of an ICT related organization. This phase consisted of primary data collection through personal interviews, on-site observations, and review of pertinent documentation. The third phase involved data analysis, further secondary research on ICT and international development, and the organization and writing of the findings.

During my field experience, I conducted twenty-one interviews with employees at many levels of DDD operations (see Appendix A). I was well aware that, as an outsider, I was likely to influence the respondents, and I tried my best to bridge the cultural differences with the employees so they could answer questions as truthfully as possible. To do so, I had to gain the trust of the employees before I could intrude on their privacy. I wanted employees to get to know my presence and my research objectives. Before I began conducting any interviews I introduced myself to the whole working team at a weekly meeting and presented my research objectives and methods. In addition, I participated in other formal meetings,
informally talked with employees as they entered or left work, and ate lunch with many of them. Once employees appeared to be comfortable with me, I gently asked if they would like to participate in a taped interview about their experiences at DDD. I informed them that it was completely anonymous, and that we could conduct the interview at any time or location that was convenient for them. Waiting until employees got to know me and conducting interviews in an informal manner, helped bridge cultural gaps and hopefully avoided some of the biases in answers that would result from a more detached, outside approach.

1.6 Thesis Structure

I begin in Chapter 2 by investigating the notions of information and communication technologies in development. The purported benefits and the varied concerns which have surfaced in writing about ICT and development will be discussed. It is suggested that indeed there are many positive impacts ICT can, and have brought, to the development context; however, there needs to be an ongoing effort to address delivery, monitoring and evaluation of projects in order to optimize the intended benefits. Chapter 3 outlines the framework of evaluation. It will discuss the rationale and approach of the evaluation. Both Social Impact Assessment and Community Telecentre literature will be discussed in order to inform the evaluation. Chapter 4 will outline the descriptive case study, detailing Digital Divide Data’s operations. In Chapter 5 I interpret the impacts observed among employees. This is based upon the in-depth interviews, general observations and document material. Chapter 6 will present implications for planners to consider in guiding the design of small-scale ICT projects in a developing country context.
Chapter 2: ICT and Development

2.1 Technology in Development

Technology has often been synonymous with development. Uimonen (2001) suggests that technology forms the basis of notions of modernity, of which its universal achievability and desirability underpins the dominant development narrative. The height of this thinking came during the post Second World War period. In the 1950’s the dominant view was that technology represented the solution to development, almost to the extent that technology became development and development became technology (Wilson and Heeks, 2000). At the time, this was most characterized with large infrastructure projects, such as hydroelectric dams. Similarly, the development paradigm presented by Rostow (1960) saw technologies from western societies assist the advancement of nations from one stage of development to the next.

The causal relationship between technology and development has been criticized since the post war era, and has evolved to include human and social implications of technology. Likewise, the 2001 Human Development Report addressed the need to understand the relationship of technology and human development. The report moves past purely technical aspects of technology and considers the social and human dimensions. It argues that positive feedback loops are created between technological change and human capabilities. First, technology can directly lead to greater advances in human capabilities (Figure 1). Many
products can directly improve the health, knowledge, standard of living and the ability for people to participate more in the economic, political, and social aspects of a community. Secondly, technological advances can indirectly lead to improving human development through economic growth. Technological advances can increase employment and income generation within the technology sector which could then lead to better or more resources for education, health, communication; all building human capabilities. Inversely, increasing human capabilities, such as higher levels of education also has powerful contributions to increase human ingenuity and flexibility to further amplify technological change. In this way, technology and human development can “be mutually reinforcing, creating a virtuous cycle” (UNDP, 2001, p28).

Figure 1: Links between Technology and Human Development
An assumption implied in this analysis is that technological change will be culturally and economically appropriate for local people. However, technology will only be useful for individuals and communities if they are able to use it to meet their needs. E.F. Schumacher, in his influential book *Small is Beautiful* (1973) criticized the effects of large technological projects, and proposed small scale economics and technology to contribute to more desired results. He maintains that technology will only be beneficial for local people if it is compatible with local cultural and economic conditions. He suggests administering appropriate technology which is seen as giving control to individuals and communities where the technology could be applied locally. Appropriate technology supports the development and use of sustainable approaches to meeting human and ecological needs through geographically, economically and culturally suitable technological tools and methods.

2.2 Information and Communication Technologies Defined

The debate continues over the role of technology and development with the introduction of information and communication technologies. From one perspective, ICTs can be thought of as continuing the tradition of technological determinism seen in the post-war era, the view that the effects of any new technology are simply defined (i.e. determined in a fixed way) by the inherent capabilities and functions of the technology itself; on another, ICTs can be seen to transcend the traditional roles of technology to enable greater human interaction and communication.

At its simplest level, ICTs are the fusion of computers and telecommunications. Computers enable people to work creatively, but there are limits to what can be accessed. By adding a communications channel, such as the Internet or other information services, it significantly
extends the capability of the computer. In this vein, ICT can be thought of as any "electronic means of capturing, processing, storing and communicating information" (Heeks, 1999, p.3), which could include radios, telephones, televisions, computers and the internet. However, there are two separate elements at play in ICT; the technology itself and the information and communication on which it operates. The technology is the hardware; the cables, the connections, the computers, the microprocessors; while the information is the data, texts, images, graphics, etc used within the technology.

Figure 2: Range of Technologies and User Relevance

<table>
<thead>
<tr>
<th>Individual Internet Terminal</th>
<th>Individual fixed Telephone</th>
<th>Television</th>
<th>Multi-User Mobile Phone</th>
<th>Multi-User Internet</th>
<th>Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Computer</td>
<td>Mobile Phone</td>
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</table>

Rich Users

Poor People

(adapted from Wiegel, 2004)

Figure 2 compares the division between rich users and poor peoples' accessibility to forms of information and communication technologies. The figure can be applied at an international or domestic level within a developing country. As the figure demonstrates, the accessibility of ICT to poor people is relative to that technology. For example, poor people have minimal access to individual telephones, but even less access to individual computers; whereas, rich users have access to all technologies. Thus, within the concept of the digital
divide there are varying degrees of accessibility which is dependent on the medium of the technology.

ICTs can be further categorized into different sectors of the economy such as health, education, media or business, where they can provide assistance. Heeks and Duncombe (1999) use small to medium sized enterprises (SMEs)* in developing countries to understand ways in which ICTs contribute to development. They utilize SMEs as a starting point because they argue SMEs can provide the best returns on ICT investment; efficiently creating tangible benefits for poverty alleviation in developing countries. More specifically, they suggest SMEs which are market-oriented, and have identified niche products or services leading to profitable and sustainable market opportunities should be the priority focus for ICT interventions. They have termed these market-oriented SMEs 'ICT-Flyers'. They state "[ICT-Flyers'] are better placed than others to make use of ICTs, and they provide a greater capacity to generate wealth, employment, exports, innovations and to build a wide range of local and external business linkages" (p10).

They suggest four main functional areas of ICT within SMEs in developing countries.

1) ICT as an enterprise output.
   ICT used for production of information-based outputs, both tangible and intangible, such as computers, networks, or software.

2) ICT as a primary information processing technology.
   For enterprises involved with processing information from outside the operations, such as cataloguing, sorting and filing information-sets for other firms. This includes data entry services, software customization, and ICT-based business services.

3) ICT as a secondary information processing technology.

* Studies of SMEs in developing countries tend to classify enterprises according to scale dimension – primarily by number of employees. An enterprise is said to be a small to medium enterprise if it has fewer than 250 employees (McIntyre and Dallago, 2003)
Covering communication and data processing within an enterprise for faster more efficient exchange and storing of information. This business communication includes email/instant messaging/mobile telephones and business information systems.

4) ICT as a related support activity.

Enterprises involved in computer training, consultancy and content provision, and other services.

The classification outlined by Heeks and Duncombe (1999) is useful to understand the role of ICTs in the Digital Divide Data case study. DDD is a small enterprise working in ICT related services and therefore falls within two of the above categories. Firstly, DDD uses ICT as primary information processing technology – at its core, DDD provides ICT-based services such as data entry and processing services for overseas organizations and firms. Secondly, DDD heavily relies on ICTs as a secondary information processing technology. For instance, ICT is used for business communication (through email and other web-based communication), accessing information for business inputs (accounting procedures and management accomplished on computer software programs), and finally accessing information to markets and customers (all product transactions are completed via the internet).

2.3 Information and Communication Technologies and Development

Understanding the potential of ICTs, many development agencies are placing increased importance on ICTs to deliver development goals. The United Nations Information and Communication Technology Task Force argues the mainstreaming of ICT into development can act as a powerful tool to attain the internationally agreed Millennium Development Goals
The eight ambitious goals attempt to reduce poverty and improve lives which 194 countries pledged to tackle at the Millennium Summit in 2000. They state, “ICT are an important catalyst in... an effort to achieve the MDGs, not only in furthering communication and exchange of information, but also in support of specific development initiatives” (Gilhooly, 2005, p.207).

Likewise the World Bank states, “There is a growing acceptance that ICT can play an important role by providing new and more efficient methods of production, bringing previously unattainable markets within the reach of the poor, improving the delivery of government service, and facilitating management and transfer of knowledge, a key factor in reaching the MDGs” (2003, p.8).

A Regional Human Development Report entitled, “Promoting ICT for Human Development in Asia 2004: Realizing the Millennium Development Goals” (UNDP, 2004b) was the first large scale attempt at exploring the linkages between ICTs and human development objectives of the MDGs. The report examined how ICTs can be used effectively to bring about positive development and social change. Using the eight MDGs as benchmarks, the Report presents the experience of nine Asian countries: China, India, Indonesia, Malaysia, Mongolia, Pakistan, Sri Lanka, Thailand and Vietnam. Researchers weighed many factors including:

- the proportion of cell phone subscribers, Internet users and personal computer owners,
- charges for Internet and phone service,
- Internet access in schools,
- the proportion of women professional technical workers,
- Competition among service providers.

The report found enormous variations in ICT availability across countries and use of higher and lower end technologies, infrastructure, connectivity, cost, human skills, availability of

* For more information on the Millennium Development Goals please see <www.un.org/millenniumgoals/>
locally relevant content, and types of ICT applications for human development. Despite the large variations between countries, the assessment of ICT use and diffusion in Asia revealed clear progress in telecommunications, use of personal computers and internet penetration.

Importantly, this report found significant ways in which ICTs are able to transcend other forms of technology. They found that ICTs are able to break barriers to human development in three important ways:

- **Human Knowledge:** ICTs, and in particular, the internet are becoming key delivery tools of educational infrastructure and content. For sections of the populations who did not previously have access to education, ICTs can be used to access educational material and information.

- **Participation:** The internet has provided a new medium for governance, community and political mobilization. In societies where mass media have been strictly controlled, the internet creates space for alternative perspectives and participation in the public sphere.

- **Economic Opportunity:** The ICT sector in developing countries is growing, and thus the need for ICT educated individuals is also growing. As such, ICT provides new and unprecedented economic opportunities to people who have proficiency in handling ICT tools.

These distinctions are important when thinking about the impact ICT can create for people in developing countries, especially in terms of the relationship with human development. Chacko (2000) reveals that “with regards to specific areas of human development strategic deployment of ICTs can help in advancing human development by alleviating poverty, enhancing education and improving healthcare” (p.99).

All of these positive contributions however, are based upon the assumption that individuals already know how to use ICTs. For instance, individuals cannot access educational material on the internet nor acquire ICT related employment, if they do not know the basic
operational components of computers or the internet. Therefore it is critically important to combine education and computer literacy to foster benefits of ICTs. Wade (2004) uses the analogy that cheap books can not cure illiteracy, just as ICT cannot break down barriers to human knowledge, participation, or economic opportunity without education and training.

Friedman (2005) in his book on the impact of ICT on international socio-economic relations sees ICT as a great ‘flattener’ of the world. What Friedman means by "flat" is “connected": the lowering of trade and political barriers and the exponential technical advances of the digital revolution has made it possible to do business, or almost anything else, instantaneously with people across the planet. He describes ten forces (e.g. the convergence of political events, innovations and companies) which contributed to the flattening of the world. From the fall of the Berlin Wall, to supply-chaining, to increased outsourcing from North American firms, these multiple new forms and tools for collaboration have created a new global playing field. This new global playing field can be accessed by anyone with the means and know-how of ICT to compete with anyone else around the world.

One of the most pertinent issues Friedman raises is the importance of the individual in the new global playing field. He tracks the history of globalization to three great eras. The first period, from 1492 to 1800, was characterized by countries (inspired by religion or imperialism or a combination of both) leading the way into greater global integration through exploration. The second era lasted from 1800 to 2000, where the key agent of change and integration was multinational companies. Spearheaded by the Dutch and English trading companies, this era was powered by markets, trade and labour; and saw the birth and maturation of the global economy. The third era, only beginning about five years ago, is
driven by the individual. The world is shrinking through the ten 'flatteners', and this is empowering individuals to be able to collaborate and compete globally. Importantly, Friedman states, "[the third era] is going to be more and more driven not only by individuals but also by a much more diverse – non-Western, non-white – group of individuals. Individuals from every corner of the flat world are being empowered" (2005, p.11).

In summation, ICTs can play an important role in development; they can break barriers to participation, human knowledge, and economic development which other forms of technology have not done before. They can assist individuals from anywhere in the world to become 'players' in the world economy. However, there are some concerns about "ICT being oversold as the key" to development (Wade, 2004).

Some are not so optimistic about the generous support ICTs have been given within international development. Banerjee and Loo (2002) argue that technological applications are profoundly conditioned by the interaction of economic, political and cultural forces at micro and macro levels and that one of the central weaknesses of ICT is that initiatives begin with technology and then deduce its consequences for development. They maintain that there is nothing inherent in the forms and characteristics of any technology that predisposes it to effective use in addressing development issues. Because technologies are complex and situated within particular social, economic and political contexts, they can lead to greater social harmonisation and empowerment just as they can lead to the creation of greater disparities and new forms of social exclusion (ibid), particularly the disparities created between those who have access and knowledge to use ICTs and those who do not.
Using a speech by the World Bank President and the World Bank online development portal, Thompson (2002) uncovers ways in which the World Bank, at a rhetorical level, positions the deployment of ICT to reinforce the modernization paradigm. He identifies major components of the World Bank's discourse surrounding ICTs and development which amount to the creation and systematization of a set of discursive relations which support and extend a markedly North American worldview. He maintains that the World Bank utilizes ICT discourse as a predominantly technological project, assumes ICT as a neutral force in development, and has unquestioning technological optimism bordering on determinism (ibid).

Likewise, Wilson (2003) expands on this argument to include seven international organizations, and the approach in which they discuss ICT and development. She argues a dichotomy is set up within ICT and development discourse between those countries that are defined as developed and those that are developing, which is extended to produce a category of people called the 'information-poor'. The binary between the developed and underdeveloped, the information-rich and information-poor creates an imperative that the underdeveloped must 'catch-up' with the developed – the essence of modernization theory. Wilson states the dichotomy appropriately structures a "model of development based on automatic and unproblematic catch-up, leapfrogging, and progress to the ideal represented by the developed countries" (ibid, p12). Wilson does not negate the potential role of ICT initiatives in developing countries, but used in these terms, the concept of ICT as a vehicle to 'catch-up' to developed countries is problematic because it will not lead to technology being used as a tool for locally specific and relevant development objectives. As such, she seeks to problematize ICT discourse and its assumption in order to highlight ways in which ICT can move beyond being used as simple 'catch-up' tools, and to, make development in
the image of those currently excluded from the information society, and to make development in their own image.

Wade (2004) too does not dismiss the power that ICT can have on development initiatives, but would like to signal the unbridled assumption held in development discourse that ICT can ‘leapfrog’ long held development issues like illiteracy and educational issues. He states “the alleged success [of ICT projects] is generalized with little attention to the ‘scaling up’ problems of providing teaching and maintenance” (p187). Moreover, he maintains that ICTs for development can be seen as a fad, stating “fads have advocates, who skew information to favour their cause and disfavour alternatives, who build up alliances to promote their cause...and who insulate themselves from disconfirming evidence” (p202). Because of this fad, reportage about ICT project benefits usually outnumbers reportage about costs. He is apprehensive regarding the lack of discussion raised between ICT plans, intentions, opportunities, and actual verified actions on the ground.

This discrepancy is further elaborated by Heeks (2002) in what he calls the ‘design-reality gap’. He asks, do most information system projects (ICT) in developing countries succeed or fail? Through three gap typologies (north-south gap, hard-soft gap, and private-public gap) he concludes that most information projects in developing countries totally or partially fail. He theorizes information system failure in developing countries as a gap between expectations and realities. For instance, the hard-soft gap argues that most ICT related projects are thought of in terms of equipment and infrastructure, rationality, and objectivity, but in reality, many organizations do not adhere to these ‘hard’ principles. Rather, they are governed by ‘soft’ factors such as people, culture, politics and emotions. He identifies many possibilities in which the design and expectations of a project are not closely in tune with
reality. He disaggregates the gaps into dimensions of: staffing and skills; information; technology; objectives and values; processes; management and structures.

2.4 Summary

Directly through improved access to resources and indirectly through economic gains, ICTs have many positive contributions to human capabilities in developing countries. However, there is an increasing body of literature which warns against the oversupply of ICTs in development without the appropriate means of delivery and monitoring. Most of the arguments against ICTs in development are not about the ICTs in and of themselves, but about the access, quality, equality, content and control over the delivery of projects. The literature recommends the appropriate recognition of context, monitoring, and evaluation of projects in order for them to be successful. The need for education in computer literacy is also highlighted in order for ICTs’ full contribution to human capabilities. Through the appropriate integration of applications, ICTs will hopefully be able to assist developing countries and citizens move to a more equitable and prosperous future. Building on these ideas, a framework for evaluation will be marked out in the following chapter in order to evaluate and understand the impacts seen at DDD.
Chapter 3: Framework for Evaluation

3.1 Social Impact Assessment

Social impact assessment (SIA) is a field of research and practice used by researchers to consider the impacts of planned or unplanned projects, policies or programs. It is used for analyzing, monitoring, and managing the social consequences of development and ultimately, the effect of that development on society. Becker defines it as “the process of identifying the future consequences of a current or proposed action which are related to individuals, organizations and social macro-systems” (1997, p.2). As a result, SIA attempts to minimize the costs and maximize the benefits through interpretation. By identifying impacts in advance, better decisions can be made about which interventions should precede and how. Once harms and undesired consequences can be identified, mitigation measures can be implemented, and project redesign can occur.

Accordingly, SIA can help inform and assist local people, and provide project teams, financiers and other decision makers with the necessary information to enhance the benefits and lessen the social costs of a project. In essence, an SIA can inform the structure of projects so that it can respond to people’s needs, priorities, and aspirations, enhance project benefits and prevent or mitigate the adverse effects of the intervention. Moreover, an SIA should describe the expected short and long-term impacts of a proposed project on local people/communities, social structures/dynamics and local institutions. An SIA should also generate project alternatives based on local people’s needs, priorities and perceptions and
on broadening the project to include prospective project 'losers'. For Derman and Whiteford (1985), SIA "represents an effort to increase knowledge before, during, and after development projects and to incorporate the target population into the planning and active stages of the project".

3.2 Researcher Limitations and Positionality

Any assessment raises important questions about the limitations and assumptions of that assessment. For instance, what is considered change? How do we measure that change? Will the measures be accurate? Can we measure causality, or the degrees to which one thing causes another? In a developing country context, and while an outsider is completing the evaluation, the situation becomes more complex: In what ways does the evaluator bring biases to the assessment? How does the researcher’s positionality affect the research design and implementation? On whose behalf is the research being conducted? Under what models of social change and economic development is the evaluation occurring?

These issues must be addressed in any evaluation because too often projects are designed and implemented without adequate attention being given to underlying theories and assumptions (Whyte, 2000). For the evaluation of DDD, these concerns were recognized and addressed in the research design and implementation. The SIA took an interpretive framework where understandings of social phenomena were arrived at inductively by reference to the subjective states or meanings of the particular actors (Fitzgerald, 2004). As such, a reflexive and inductive methodology was used which stemmed directly from substantive data. The SIA evolved through continuous interplay between analysis and data collection.
I spent three months at DDD’s head office in Phnom Penh from March to May, 2005. These three months allowed me to learn about the organization, become involved with daily functions, and form relationships with employees; both inside and outside of work context. In addition to conducting the social impact assessment for this thesis, I also completed research for the organization regarding an assessment of educational institutions in Phnom Penh. While 80% of employees attend some educational institution, DDD understands very little about the schools employees attend. As well, DDD would like to form stronger relationships with a few technology-related institutions in order to hire recent graduates. To this end, I created an education directory comparing and contrasting five institutions based on teaching standards, entrance requirements, and course curriculum.

Khosa (2000) argues that SIA is based on two assumptions: first, that the future can be hypothesized with enough certainty to make considering potential changes which might be caused by the introduction of new projects or development worthwhile; second, the policy makers will accept the assessment and respond by modifying the design. He follows that these originate from and reflect the positivist orientation of SIA, an orientation based on the assumption that there is a clear distinction between facts and values, that truth is completely represented by observable and scientifically verifiable facts.

I did not approach the research from a positivist, all-knowing perspective. Rather, I approached it in the sense that all knowledge is situated within larger constructions of power, place, and position within society; and that researchers are embedded within these positions (Haraway, 1991). This embodiment thus constructs ways of seeing the world, and ways of seeing the object of research. In this way, the assessment and the observed impacts at DDD can be seen as a partial perspective.
3.3 Social Impact Assessment Limitations

Van Schooten et al. (2004) argue that SIA literature has confused 'social impacts' and 'social change processes' and that there must be a critical distinction made between the two for more appropriate analysis of direct and indirect impacts. They maintain that variables such as increase in population, increase in ethnic or racial diversity, or presence of temporary workers are not, in themselves, impacts. Under certain circumstances they may result in social impacts such as loss of community cohesion, fear or uncertainty amongst residents, but if properly managed, these demographic changes may not create impacts. For them, 'social change processes' are set in motion by project activities or policies and can be measured objectively, independent of the local social context. In their distinction, social change processes include demographic, economic, geographic, institutional and legal, emancipatory and empowerment, and sociocultural processes. On the other hand, they contend that 'impacts' need to be experienced or felt in corporeal or perceptual terms. Accordingly, social impacts result directly or indirectly from the social change processes that are invoked by a project. They argue that impacts can be felt at different levels; the individual, the family or household unit, social organizations, institutions, or a community or society as a whole. Some are felt by the body as a physical reality, and others are perceptual or emotional.

Using elements of Van Schooten et al.'s distinction between impacts and processes, while recognizing the value laden nature of research, a SIA was chosen as a framework for analyzing the impacts of DDD, and its related programs, on its employees. The SIA guided the evaluation and gave legitimacy to the research; however, literature surrounding telecentre evaluation provided tangible examples of how the research should proceed. The
following illustrates how telecentre evaluation and design was used to aid in the assessment of DDD.

3.4 Telecentres: A Guide for Impact Indicators

"Because telecentres generate new knowledge, learning and patterns of behaviour, we must evaluate them not only as a new technology, but also as a set of social processes mediated through a technology" (Whyte, 2000)

Anne Whyte (2000) in Assessing Community Telecentres: Guidelines for Researchers outlines a framework for research design, identification of variables and indicators, collection of data and their ultimate analysis and interpretation. Although the guidelines are for use in examining community telecentres, they can be useful in better understanding small scale computer related employment centres as well. I will draw upon literature examining and assessing community telecentres to inform the framework for evaluation.

Telecentres, in their most general sense, are physical spaces that provide public access to information and communication technologies, notably the internet for educational, personal, social, and economic development. This can also include long-distance communication and information services, including phone, fax, and computers. Although, they can be public or private ventures, franchises or be provided by international donors, the principal goal of all telecentres is to provide ICT access points to rural and previously computer illiterate populations.

Using the evaluation tools for telecentres is appropriate for a SIA of DDD. For example, DDD at one level can be seen as a telecentre in the fact that entire operations are based on information and communication technologies. Likewise, both DDD and telecentres provide training and computer literacy. Most telecentres provide both basic and specialized training
for patrons regarding computer functions, while DDD employees receive ongoing training related to their job function. Employees are able to access the internet in their time off and use the computers to complete school related work. Importantly, telecentres, like DDD, are seen as a contribution to the struggle for universal access to information and communication technology for geographically and socially marginalized populations.

However, DDD differs from the community telecentre model in the fact that it is an employment centre. It is not open to the public in the way telecentres can act as a focal point of technology-related services and education at a community level. It hires local people for secure, long-term employment to complete computer related data-entry projects; therefore, there are different terms of agreement between employees and managers at DDD compared to telecentre patrons and administrators.

My approach also differs from that of telecentre evaluation in that it examines the impacts on the employees, rather than an evaluation of the centre itself. Instead, my interests are not on DDD operations themselves, but rather the relationship of existing operations and employees' human development. Although I do examine DDD’s policies and operations in order to more fully understand its effects, I do not critique the operations in any systematic way.

3.5 Inputs and Outputs

Like Van Schooten et al. who make a distinction between 'social impacts' and 'social change processes', Harris (1999) maintains that there is a critical distinction needed between inputs and outputs in Telecentre evaluation. First, input measures are activities that a telecentre
engages in. "They are not immediately associated with the benefits that the community enjoys, but they are regarded as essential pre-conditions for those benefits to emerge" (p.133). As such, they relate to activity as opposed to results. The first class of input measures is concerned with the physical resources that make up the telecentre and consists of accommodation, equipment, and people. The second class of input measures include services the telecentre provides. These can include internet services, training, information, technical and institutional support. Also included are the education and health benefits provided at DDD.

Secondly, outputs measures are connected with the accomplishments of the telecentre within the community it serves. Outputs are the broader benefits that the community enjoys as a result of utilizing the services of the centre. Output measures can include community-based indicators such as education, health, social exchanges and social preservation. Harris notes, “In most cases they would contribute in one way or another to sustainable human development... [and] it cannot be doubted that output measures provide the acid test for telecentre evaluation. Therefore, more attention needs to be paid to the definition and measurement of output measures than to the input measures” (ibid, p.135).

Heeks (1999) also uses an input and output framework but uses it within a systemic pattern. He uses small/micro-enterprise development in understanding the relationship of ICTs and poverty alleviation. He maintains that enterprises act as systems with input entering the system, goods and services being produced, and then an outcome or output at the end. In this way, he adds the element of sequence in understanding inputs and outputs.
The following table demonstrates Harris and Heeks' distinction between inputs and outputs in the context of DDD.

### Table 2: Inputs and Outputs at DDD

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goods and Services</td>
<td>Education</td>
</tr>
<tr>
<td>Production (Data Entry)</td>
<td>Health</td>
</tr>
<tr>
<td>Onsite Health Care</td>
<td>Economic</td>
</tr>
<tr>
<td>Training</td>
<td>Behaviour</td>
</tr>
<tr>
<td>Experience</td>
<td>Satisfaction</td>
</tr>
<tr>
<td>Monthly Salary</td>
<td>Family</td>
</tr>
<tr>
<td>Technical infrastructure</td>
<td>Community</td>
</tr>
<tr>
<td></td>
<td>Operational Sustainability</td>
</tr>
</tbody>
</table>

#### 3.6 Use of Indicators

Indicators are important measuring devices and are the heart of any evaluation (Whyte, 2000). They define concepts and assist in controlling the scope of variables, and in essence define what is to be measured. They can be both quantitative and qualitative. However, all indicators are based on assumptions about what is relevant, and indicators are therefore expressions of value to some extent (ibid). The validity of the indicators is based on assumptions which extend through data collection, analysis and interpretation.

For the assessment of DDD, selection criteria attempted to be as broad as possible when choosing indicators, but at the same time had to be practical in size and scope. The indicators had to be consistent and complementary in terms of measurability, timeliness, and significant within the impact assessment. The selection process required examining all the possible areas of impacts, and determining which areas may be the most relevant. It was recognized that the indicators for the project and their acceptance were highly variable, and dependent on the particular context, socio-cultural level and characteristics of the group. Thus, I tried to choose broad and adaptable indicators, which would evolve over the course
of the assessment. Preliminary indicators were generated by disaggregating DDD's outputs; however, through interpretive and reflexive data collection, indicators evolved over the course of the study to develop the most pertinent tools of measurement.

Table 3 shows the units of analysis on the left, the output in the middle and the corresponding indicators on the right.

Table 3: Indicators Used in Evaluation of DDD

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Indicator</th>
</tr>
</thead>
</table>
| Economic | • Expenditures  
|          | • Purchasing power  
|          | • Assets  
|          | • Savings  
|          | • Future employability  |
| Education| • Literacy levels (Khmer and English)  
|          | • Computer literacy and skills  
|          | • Attendance and subject at school  |
| Health  | • Access to medical supplies  
|         | • Education  
|         | • Issues related to disability  |
| Behaviour| • Attitudes  
|         | • Happiness  
|         | • Values  
|         | • Aspirations  
|         | • Satisfaction  |
| Family | • Living arrangements  
|        | • Alterations in family structure  
|        | • Number of children (actual and desired)  
|        | • Autonomy  |
| Community| • Networks/sets of relationships  
|          | • Cohesion (actual and perceived)  
|          |   • Among employees  
|          |   • Relation to 'external' community  
|          | • Ability to participate in community  |
| Operations| • Baseline (quantitative) data  
|          | • Quality of support services  
|          | • Organizational structure  
|          | • Management skills  
|          | • Leadership structure  
|          | • Process of decision making  
|          | • Financial viability  
|          | • Relationship to employees  |
3.7 Interviews and Stories

At an international conference related to telecentre evaluation in Quebec in 1999, the PAN-Asia Telecentre Learning & Evaluation Group (PANTLEG) provided an innovative approach to evaluation. In order to measure the impacts of the telecentre initiatives, the group investigated the idea of collecting stories from telecentre operators and users. According to the PANTLEG group:

Stories, whilst anecdotal, offer a rich picture of the impact of ICT interventions in local, complex and dynamic social settings. They are accessible and variable during short visits and they acknowledge the often indirect influence that development interventions have on the behaviour of their beneficiaries. Moreover, stories as evaluation concede that the benefits of telecentre activities are often detectable only after they have been installed, contrary to traditional approaches to information systems, in which expected benefits are usually specified before the technology is installed. (quoted in Gomez and Reilly, 2002, p.63)

Likewise, Sandercock (2003) suggests that stories, both the act of telling and the act of listening, need to become a more integral part of planning processes. She states, “story is an all-pervasive, yet largely unrecognized force in planning practice...let's liberate and celebrate and think about the power of story” (p.183). It is with this intention that the interviews with employees had an element of story telling. I wanted to examine how their lives have changed through the past, present and into the future, and how DDD has been a part of that change. I wanted the evaluation to be qualitative in nature, and have human stories to strengthen it. I collected information with an open ended research objective to try to allow the information to surface from the employees.

With the element of story telling and qualitative data in mind, I developed interview questions related to the above indicators. I tailored the questions to fit the position of the interviewee. For example, I posed very different questions to the operators than to upper management.
The purpose of the interviews with management was to gather information about the company policies and operations; however, the interviews with the operators and team leaders were to gauge the impacts of those operations and policies. The questions posed to operators centered on the idea of ‘change’.

I conducted twenty-one interviews (Appendix A). Six of the interviewees were from upper management, while the other fifteen were either current employees or recent graduates of DDD. The recent graduates who moved onto a different job were selected to give an alternative perspective. In total, there were thirteen male and eight female interviewees. All of the employees were between 21 and 25 years of age; all but two employees attended school outside of work; and all live with friends or family, except two who live in monasteries. It is difficult to assess the level of education attained prior to DDD, as formal education in Cambodia is often non-existent or incomplete in some areas of the country. In the city, some employees may have attended religious institutions to gain school related experience; however, it would be fair to say that most employees have minimal formal education. The interviews were used as the primary form of data collection, but document materials and observations also were incorporated.

Interviews and data collection was restricted to DDD employees and operations because I wanted to focus on employees and their life at DDD, and how their life has changed or been improved. The research was a micro-level examination of the operations and benefits within the organization. The research did not go outside of DDD because I wanted the research to maintain a micro focus. This allowed for a deep comprehension of DDD’s operations and culture. Like all research methods, maintaining the focus on DDD presented some research limitations; namely, on the scope of planning implications of the research findings. To be
more precise about knowledge claims, more case studies would have to be undertaken. Likewise, research could have expanded to include such areas as Cambodian ICT policy or the ICT sector in Phnom Penh in order for planning implications to be more persuasive.
Chapter 4: Case Study

4.1 Overview

Digital Divide Data (DDD) is a social enterprise with the twofold aim of providing technology related employment to disadvantaged youth in developing countries, and of providing a commercially-run data handling service to international and domestic clients. DDD's main office is in Phnom Penh, Cambodia, and a branch office located in Battambang, the second most populated city in Cambodia. In addition, a group of North American specialists work to secure clients in the North American 'source' market.

Within Cambodia, DDD is registered with the Ministry of the Interior as a domestic Cambodian non-governmental organization (NGO) and in the US it is registered as a non-profit corporation in the State of California in order to accept tax deductible donations.

DDD has a unique business model and dual mission of "promis[ing] to facilitate their employees' human development through the provision of fair wages, health care, education, and career advancement opportunities" (Digital Divide Data, 2005) and also "promis[es] to deliver highly accurate, well priced digitization services that meet customer needs at competitive prices" (ibid). As such, DDD's management attempts to address some of the current inequalities and problems of marginalization in Cambodia by providing skills, experience and confidence to their socio-economic disadvantaged employees. DDD employs physically and socio-economically challenged young people to perform a variety of data entry and digitization business functions.
DDD gains contracts with North American companies, universities, and organizations to provide digitization and data processing services such as HTML coding, entering tables, optical character recognition (OCR), scanning services and creating text documents. Through a double entry verification system, a system with two operators typing the same document to compare discrepancies, DDD produces high quality products for North American clients.

4.2 Social Enterprise Business Model
Traditionally there have been three main sectors in society: the public sector (the government and its associative agencies), the private sector (for-profit companies of all sizes), and the nonprofit sector (agencies and organizations delivering goods and services on moral and ethical grounds). Today, however, these once distinct groups are blurring to create new ways of dealing with societal needs. For instance, non-profit organizations are adopting entrepreneurial strategies, for-profit companies are entering into areas previously occupied by governments, and partnerships are forming between public sector agencies and other sectors.

One relatively new organizational structure, which does not conveniently fit into the above mentioned sectors, is the social enterprise. A social enterprise pursues both financial and social return on investment, which is promoted as its 'double bottom line'. Activities of social enterprises fall within such configurations as nonprofits attempting to maximize earned income from programs, earned income strategies or business ventures that have an ancillary social purpose, or social purpose business ventures. In all, the emphasis is placed on contributing to social needs while developing earned income (through business ventures) rather than relying on philanthropy or government subsidies.
The CEO of DDD says, “Overall, we call ourselves a non profit company. We kind of have the intent that we’re non-profit in the sense that we are founded not to make anybody rich, but to make better futures for people. We’re a company that is committed to having a sustainable business model so that we are not dependent upon philanthropy.”

DDD’s non-governmental organization (NGO) status has been beneficial for operations as well as fostering DDD’s social mission. First, being classified as a NGO in Cambodia, has allowed DDD to receive funding from international development agencies; namely funding through the United Nations Development Programme for expansion plans to Battambang. Second, the NGO status in the United States has permitted private donations for social and educational initiatives and assistance. The philanthropic donations have enabled DDD to expand and strengthen the social and educational programs. It is hoped, however, as the CEO states above that as the business grows, the revenue received through data entry will pay for the social benefits rather than donations; and thus DDD will become financially sustainable, while still providing the means for quality education, healthcare and social endeavours. Third, DDD has been able to carve a unique market niche with its NGO status. In a competitive North American market, DDD has able to advertise to potential clients as a socially responsible outsourcing organization. When compared to companies with similar prices and turnaround time, DDD is able to add assurance that the contact will be completed in a socially responsible manner; something that is appealing to many companies.

Having said this, DDD would still be able to contribute to both of their missions without being classified and working as a non-governmental organization. Such is the case in the DDD Laos office. Because of the Laos government’s suspicion of non-governmental organizations, DDD opened and is operating without the NGO status, and is working as a
for-profit company. This has created unique sets of issues for Laos office: namely, that they do not receive funding from international development agencies. However, DDD is still able to provide the high level of training and education that the Cambodian offices offer to all employees. Thus being both an NGO and a business, DDD’s success lies not in the name or title of the business model, but in the board of directors’ and employee’s dedication and commitment to its mission of providing training and educational services to employees.

4.3 History

While on a one-month vacation in Cambodia in November of 2000, a Canadian-born American social entrepreneur was struck by the incredible impetus among young Cambodians to learn English and computer skills despite the fact that there was a lack of available employment opportunities. In Phnom Penh, the capital city, he found that there were Internet Cafés on nearly every corner and banners advertising English schools and computer training programs everywhere. However, when talking to locals about the prospects of getting work related to those fields, he was told there were very few opportunities.

In February of 2001, he returned to Phnom Penh with a group of four friends, rented an apartment, and began talking to people about what they could do to help create technology related jobs to improve people's lives. He states, “At first we were going to help people start their own businesses, but we realized that there wasn’t much of a local economy, people didn’t have a lot of management skills and we weren’t going to be there full time, so we wanted to do something to bring in revenue from the outside”. At the time, CNN had just aired a special about call-centers in India, which caught his attention and he started thinking about outsourcing as a catalyst for generating jobs in Cambodia. Because most people’s
English was not very good, rather than answering telephones, he envisioned that people could do data entry services instead.

The DDD founders developed a business plan with newly hired local Cambodian managers. Part of the plan was to send the managers to India for training with another information and communication technology company. For one month the managers learned technical skills, company operations, and on-site training regarding ICT. Upon the completion of their training, they returned to Phnom Penh and opened DDD's first office with 20 employees.

Another aspect of the business plan was to hire employees from disadvantaged backgrounds. DDD wanted employees who had at least some knowledge of computers and English, but who otherwise could not secure a formal job. This meant teaming up with local NGOs who provide computer and English training to disadvantaged populations. The NGOs provided the initial skills and knowledge and DDD hired some of the graduates of the programs. DDD actively targeted people with physical disabilities and/or people from socio-economically deprived situations. This included young people with polio, amputees, orphans, rural migrants, and former sex trade workers.

From the outset, DDD did not simply want to provide employment to its workers, but wanted to also assist in improving the capacity of its employees. To accomplish this, DDD set out policies for education scholarships and on-site healthcare. As part of their mission DDD committed to paying 50% of its workers' tuition to attend an educational institution of their choice. Moreover, if employees were unable to afford the other 50% of the tuition, DDD agreed to provide financial loans at no extra charge or interest. A specified amount would
therefore be deducted from the employees' pay each month. To accommodate their work and study schedules, DDD shaped work shifts to only six hours per day in order for employees to attend school.

Over the years, and because of its successes, DDD wanted to expand its operations into other cities to provide technology related jobs to more disadvantaged populations. DDD now has 170 employees in three separate offices. With secured funding from the United Nations Development Programme, DDD expanded its operations to Battambang, Cambodia's second largest city in October 2003. Shortly after, it opened another office in Vientianne, Laos. The intent in expanding to Battambang was to explore whether or not this model could successfully generate employment opportunities in more rural areas. Likewise, by expanding to Laos, DDD hoped to demonstrate the transferability of their model to other countries in the region.

4.4 Organizational Structure

A North American team of advisors and board members shape the large picture and direction of DDD, and initiate contracts with North American firms (Figure 3). This group has four main members including the Chief Executive Officer, Chief Sales Officer, President, and Board Chairman. Many of the larger decisions such as hiring and accounting issues which happen on the ground in Asia must be passed by the CEO in New York. As such, the team is in constant communication with the Asian offices through email and online chatting services.
The Phnom Penh office is composed of 130 employees and is structured around a team environment. At the Operator level (front line workers) there are 105 staff who work in teams of 7-8 people. There are three types of Operators:

- Data Entry Operators enter data into Clipping and Microsoft Access from electronic images and paper records respectively;
- Verification Operators double key the data into clipping to ensure that the electronic information is accurate; and,
- Quality Assurance Specialists thoroughly inspect 10% of the jobs for mistakes and omissions.

Working teams are comprised of only one type of operator, and each team has a Team Leader who is responsible for the management and morale. Team Leaders have more work experience and are responsible for understanding all phases of the job. The Team Leaders report to the Project Leaders and upper management, and act as liaisons between these groups.

Moving up the chain of responsibility, the six Project Leaders are in charge of several Team Leaders. They have more technical computer skills and must have abilities to drive complex projects. They are in charge of multifaceted projects which require them to identify project specifications, deadlines, and technical requirements needed to execute projects. They also must be effective communicators because they must translate the job specifications from operations manager and clients to the Team Leaders. The Phnom Penh office also has a General Manager, Operations Manager and Human Resources Manager.

DDD also relies heavily on North American interns who conduct projects and complete specific tasks and studies. The projects range from financial accounting, capacity building, management training, developing local client market, and helping set up new offices. The interns work at DDD’s Phnom Penh office between two weeks to six months on a
contractual basis. Although interns may only be with the organization for a short time, they play a significant role in helping to shape DDD's direction.

**Figure 3: DDD Organizational Chart**

DDD has many meetings in order to keep all staff up to date with operations, and to make important decisions. First, DDD Board Members meet three times a year to discuss broad visions and long term planning. Secondly, each office has a weekly meeting for all employees to attend. This meeting is for managers to relay information to the shifts about relevant issues for the week, and a time where workers are able to raise concerns,
questions or clarifications they may have. Thirdly, there are separate departmental meetings such as project leaders or accounting to discuss progress of jobs and issues. Fourth, with each new job, Project Leaders meet with Team Leaders to explain job guidelines and specifications.

4.5 Labour Force

Most employees have not held formal employment positions prior to their work at DDD. Some have had informal jobs such as selling items from their family store, or working on a farm, and some have acted as translators or English teachers for their friends or family. Some also mentioned gaining short contracts with NGOs or the government during election time, but nothing permanent. In essence, this is the first secure and formal position for many.

As previously mentioned, DDD proactively hires individuals from disadvantaged backgrounds. That is, they take into account the socio-economic and/or physical characteristics of individuals in hiring practices. This means enquiring about the employees' history and attributes related to family, living conditions, physical disabilities, or economic welfare. All employees, with the exception of upper management, are between the ages of 20 to 26. Most are single, and live with either their immediate or extended family. There is gender equality at all levels of the organization, with both men and women in the junior and upper management positions.

DDD has two work shifts per day. Each shift consists of about 60 employees who work six hours a day, six days a week. The hours of the shift are from 6am to 12pm, or 12pm to 6pm. Operator wages start at fifty dollars per month for employees with a three month probation
period, after this the wages increase to sixty-five dollars a month. Additionally, every anniversary of employment, each employee receives a wage increase of an additional five dollars per month. The maximum an operator can earn is seventy-five dollars per month; however, if an operator becomes a team leader they make an additional five dollars per month.

4.6 Training

All employees must pass tests to gain employment at DDD. It is required that potential employees complete a personal interview with the general manager, a typing test which requires them to type a minimum of 35 words per minute, a test on general knowledge of computers, and an oral English test. Once the employees are accepted for employment, they must pass a three month probation period. The employee is placed within a working team, and fellow staff members assist new employees to learn about current project responsibilities and specific duties. The working team, in which the new employee is placed, collaboratively helps the new employee ease into the work environment.

The team aspect of DDD is also used when there is a new digitization project. The Operations Manager briefs the Project Leader(s), who then pass the information on to Team Leaders and their team of 7 to 8 Operators. This format ensures that information is communicated among a small group effectively, rather than the workforce at large. This is also used when there are many projects occurring at the same time in the office.

Most employees enter DDD as an Operator and can then be promoted or moved into different positions within the company. The company actively promotes internally whenever
it can. For instance, when the expansion to Battambang occurred they were able to promote an employee to the Branch Manager position. As well, they promote operators to Team Leader positions as employees leave DDD for other work and also when expansion occurs. This has been a great incentive for many employees to continue to work and be productive, as each position brings financial incentives and status. At each level of promotion, the employee is placed on a three month probation period in order to gain the required skills to properly perform the job function.

To contribute to on-going capacity building, managers and Project Leaders from other offices have been sent to the Phnom Penh office to receive managerial training. In December 2004, an American intern was hired specifically to facilitate management training sessions at the Phnom Penh office. When asked about what he learned at the training sessions, one Project Leader said,

"...maybe the most useful was how to write a good email, or how to talk to client...how to estimate the jobs, we have to know were the job is going to be, so we can prepare for new jobs or we can ask for new jobs...We also have to know the technical because if we get a job and we don’t know how to do it, we can’t do it. We have to do the sample and we have to know what the clients want and the output they want and so we have to learn."

DDD invests in their employees in order for them to contribute positive returns. DDD also would like the employees to be able to leave with more experience, training and skills which will place them in a better position to gain further employment.

4.7 Spatial Dimensions

Located near downtown Phnom Penh, along a road with mixed-use activities, DDD’s head office is in a four-story, former residential building. On one side of the building, residential
units still exist, while the other half has been converted to DDD's office environment. The building's physical structure was not built with DDD's specifications in mind. To this end, it seems a bit disorderly, with half floors, small to medium sized rooms and varying ceiling heights. However, this provides a certain element of 'family' or a place that is more than simply a place for work. It does not have the large 'factory' feeling as workers are in small to medium sized rooms. In addition there are kitchen units on two floors left over from the residential uses of the building, which employees can use for their lunch and dinner.

Outside there are rows of employee's motorcycles and bicycles. At the entrance, there are two large garage-like doors to enter the building into a spacious room, with groups of desks and computers. This first floor is accessible for disabled workers, and includes a small bathroom at the rear. Also located here is accounting and the doctor's clinic. The second floor contains the IT department, one locked room with the servers and another room for computer repair and maintenance. The third floor has another large spacious room with 28 computers in groups of four. This floor is also home to the Operation Manager's office, and the Quality Assurance computer room with 5 computers. Another floor up contains the Project Leader's office, an office for the foreign staff and another room for eight operators. The top floor has a small seating area for group meetings, and the General Manager's office. All offices, except the rooms with operators, have air-conditioning.

4.8 Information and Communication Technologies at DDD

ICTs play an integral part of the functional aspect of DDD, without which DDD would not exist. DDD secures clients primarily in North America, but also has local clients in Cambodia and Laos for digitization services. Firms send DDD microfiche files for conversion into
electronic documents that can be searched, indexed, re-formatted, and organized into dynamic and manageable information sets. For instance, some of the files DDD has previously converted to electronic versions are contracts, agreements, books, newspapers, articles, proof of claim forms, microfiche and microfilm. The materials are electronically scanned and converted into a digitized format using DDD's proprietary software. Employees perform single and double-key data entry while viewing and manipulating the image-based data. Then the content is validated and entered into a tailored database, or other customer-specific format, such as ASCII, HTML, XML, and then sent back to the client.

In addition to the core function of digitization services, another important aspect of ICTs within DDD operations is the use of technology for communication. First, email and faxing are essential for management in communicating with clients about job specifications and transferring data-sets. The speed and efficiency of communication is essential for the negotiation of job specifications between two continents. Secondly, ICTs within DDD can be identified as a secondary processing technology as defined by Heeks and Duncombe (1999). Since the CEO and Chief Sales Officer are located in New York, while the daily operations occur in Southeast Asia, ICTs form the basis of business communication, where email and instant messaging are used as a primary form of communication between various offices and personnel.

At the Phnom Penh office there are 60 desktop computers for operators and another 12 for management, in addition to two laptop computers. Management computers and one computer accessible to Operators have access to the internet.
4.9 Challenges associated with using ICTs in Cambodia

All output at DDD is completed on computers. Clients must send microfiche files to DDD's sales representative in North America, who then sends them to Southeast Asia. In Asia, where the data conversion is completed, a well functioning computer workstation is extremely important for productivity and efficiency. It is an ongoing challenge for the DDD technical staff to keep all sixty computers and other hardware functioning properly. If larger problems arise, often DDD's work is put on hold until the computers and hard-drives can be fixed with proper technical assistance. In addition, electricity is a stumbling block for the offices. There can be power outages at least twice a month in Phnom Penh and Battambang. This can have huge ramifications for the organization; losing unsaved data, productivity and revenue if the power stays out for an extended period of time.

Another issue the Operation Assistant mentions in regard to ICT use is the poor internet connection at the Phnom Penh office. Currently the modem is only 64k, which is very small for the quantity of information that needs to be downloaded. In addition, documents will often contain images which slow the modem even further. At the moment however, upgrading the system to a larger modem is financially out of reach for DDD.

The Operations Assistant elaborates on the challenges of using ICT. Originally from Burma, he acts as the liaison between the Sales Officer in the US and the Project Leaders in Cambodia. His function is to acquire the job specifications from the Sales Officer, discern the specifications and convey them to the Project Leaders at the Phnom Penh office. He receives the files and customer formats in English from North America, and must find an appropriate, and often simpler, method to describe the rules to a group who have limited
English skills. He maintains that using ICTs in this way is demanding because difficulties in translation constantly impede the process:

"Here in Cambodia what I'm doing is that I can only speak English with [project leaders]...they then pick up maybe 40 or 50 percent. The rest we have to use the computer to teach them...For them it's basically visual aid, look at how I did it and also ask me questions regarding that. Maybe this is one of the barriers with ICT where there's a lot of it related to the English language to understand it easier..... This takes more time because you have to go through the whole process and show it to them"

In addition, the use of ICTs, as opposed to person to person communication, makes it more difficult to effectively communicate job specifications. For instance, the Operations Assistant mentions constantly having to check with the Sales Representative to enquire if a particular job is being done correctly. Because of the thirteen hour time difference between the west coast of North America and Cambodia, the Operation Assistant is often at work very early in the morning or late at night conducting an instant message conversation with the Sales Representative in order to provide status reports and receive clarification.
Chapter 5: Analysis of Findings

As a way to examine the impacts witnessed at DDD and to understand their relationship to human development, I wanted to explore the change employees witnessed in their lives while working at DDD. In other words, what was their life like before they worked at DDD? What is it like while working at DDD? Where do they want to go in the future? Using employees' stories, this chapter will shed light on the change that the employees have seen in their lives, and how working at DDD has affected them. The impacts have been categorized from outputs in Table 3, page 36.

5.1 Economic

One of the biggest impacts DDD has had on the Cambodian population is employment generation. Over a period of only a few years, and with the growing market for digitization services, employee numbers have grown exponentially. At the Phnom Penh office there are currently 130 employees, and in Battambang there are 21, a 500% increase since the original 18 employees. This job creation has had direct and tangible affects on the lives of its previously unemployed workers.

Employees now have a newly acquired monthly wage. The average monthly salary for an operator is seventy dollars per month; however this wage can differ among workers depending on the length of time they have worked at the organization. Where 77.7% of the Cambodian population is living below $2 a day (UNDP, 2004a), seventy dollars exceeds the monthly salary for Cambodians in a similar job at the same number of hours worked in a week. This relatively high monthly income provides employees and their families with
financial security. With the income they now receive, they are in a better position to purchase much needed supplies.

When asked about the change she has seen in her life since working at DDD, one Operator said,

"Oh it really changed; because when I work here, you know I'm so happy...I can support myself and don't want to ask for money from my mother..."

Many of the interviewees mentioned the desire to make decisions by themselves. One team leader responded,

"Before I think I'm just a small child, I can't do anything and I don't know the action in my society but right now I get to know it because I have a job like this and I can manage myself. For example, if I earn the money from this organization, and I can manage my money. How I can put some into myself, and how I can give some to my brother and sister"

One physically disabled graduate said,

"[DDD] help the disability in Cambodia to have a time to get an opportunity and get a job and to make money by themselves and to have money to pay for their school, and for their living also. Especially they help disabled people in Cambodia, young people and women."

Another Operator who has worked with the organization since it opened mentioned that he used to ride a bike to work, but since working at DDD, he has been able to save some money to purchase a motorbike. Although it was expensive to purchase, he said it gives him the independence and mobility to be able to work, live and study in different places in the city.

The psychological aspects of not having to worry as much about money, has significantly impacted employees. In Cambodia, individuals and families typically have to live day-by-day
not knowing where, or if, they will find money for food. However, employees at DDD receive a secure salary each month which reduces the daily financial burden for employees and families. As the above quotes explain, the stable income earned at DDD has provided some of the employees with some financial autonomy. Many employees recounted that they would like to have a sense of independence from their family. A feeling of independence is a central issue for some of the employees. Having a secure income has allowed them to purchase things or chose to do things on their own. In addition to the motorbike in the above case, some of the items employees are now able to buy are books, other school materials, clothes, food, leisure items, and petrol for their motor bikes.

Although many employees use their salary for themselves, many give some or all of their wages to their families. This money then becomes a significant contribution to the overall family income; where families will pool their resources to share. Some of the employees' families live outside of Phnom Penh in remote villages, and the monthly income contributions have had multiple spin-off effects for these families and villages. For most families, this salary is a major contribution to the overall family income and provides for essential items and necessities. For example, one Operator who is from a province outside of Phnom Penh said that after the tuition loan reduction from his wage at DDD he still earned fifty-five dollars a month. He keeps fifteen to twenty dollars for himself and sends the rest to his brothers and sisters who go to school in his home province. "The money I send them, they use it for their school uniforms and school materials, like book or pens and somethings else."

Despite the fact that employees receive a higher wage for the same number of hours worked, many employees still find it very difficult to make ends meet each month with the
income they receive. They find it extremely challenging to be able to pay for housing and related services, such as electricity, water, food and transportation. For instance, one female employee just recently dropped out of her marketing and management program in order to keep the twenty dollars a month normally paid for her courses. She and her husband have been married for three years, just recently moved into a small apartment and are finding it difficult to make ends meet. “I just have eighty dollars per month, and to pay for living and studying it’s not enough. Sometimes we only have a little thing to eat, we cannot buy everything we want to eat, just eat to live.” She hopes to return to her studies one day, but currently needs the money for her and her husband to live.

5.2 Education

DDD's organizational structure (financial assistance and short work day) allows employees to attend school. The impact of being able to attend university is significant. Students are able to attain higher levels of education, which is something that was previously beyond the reach of most employees. The ability to attend university places the employees in position of greater advantage relative to other Cambodians. With this opportunity employees are able to build a future for themselves and their families. Because of this, over eighty percent of DDD employees attend school outside of work. The CEO says,

“[education] is one of the things that people care most about actually, is that [DDD] gives them an opportunity to finish their education. Most of our employees are in their early twenties and had to drop out of high school to support their family. This is a way of both earning some income to support themselves and their families and also to be able to have money and the time for school, because they are only working six hours a day”.

Employees are able to attend a school and program of their choice. The type of schooling ranges from diplomas in English or computer related courses to Associate and Bachelor
degrees at university. The location and subject of study is entirely up to the employee; however, English, IT, management, and accounting are the most popular subject studied.

Not only are employees gaining educational experience in formal schooling, they are also gaining marketable skills and training on site at DDD. DDD hires youth often with very little previous employment experience, and securing a position provides them with crucial first job experience. They gain technical computer skills, typing, information manipulation, and some programming. They also learn assets like working in an office environment, team work, and English. One Manager who was promoted up from an Operator position states,

"When I first started...I have no confidence, in making decisions, talking to people, doing sales, something like that. But right now it's help confidence, communication. I know how to talk, I know how to write, how to express my idea...I understand more about, like, other people, especially foreigners...The learning, like, cross-cultural learning, learn from different people, [makes me] more flexible"

Another employee asserts that

"before I just know about typing and I only study computer for half a month for typing skills. I don't know any other program. Before I don't know how to open the computer and can't use the other programs like word, excel and powerpoint, access and internet. Now I can know something about the computer, everything round the computer".

Importantly, DDD is providing much needed skills and training related to computer technology. As the previous quote suggests, employees are gaining first-hand experience and computer literacy such as how a computer operates, typing, word, and excel. With the expanded experience and skill-set learned at the job, employees are placed in a better position to find other jobs in the growing tech-industry.
DDD has a strong education scholarship program, and with 130 employees in Phnom Penh, it has become a significant ‘buyer’ of education services. The quality of education in Cambodia varies widely, and because of this, DDD is at the beginning stages of discussing and eventually working with some technology programs and other local educational institutions to shape their training programs to teach the skills DDD needs to grow its business.

5.3 Health

At the Phnom Penh office, DDD provides an on-site doctor who provides employees with access to health advice and services free of charge. The doctor works three days a week, and sees approximately 6-8 patients on each of those days. The most common ailments include headache, sore throat, stomach ache, but has also included typhoid and communicable diseases. The doctor is given seventy dollars per month for medical supplies, and prescribes medicine to the employees directly. The clinic has basic medical apparatus such as a stethoscope, bandaids, IV bags, small cot, and medicine. If employees have more severe medical issues and must be sent to the hospital or another clinic, DDD will pay for seventy percent of the medical bill for the employee. Although the Battambang office does not have a clinic, because there are too few staff to keep it active, all staff are subsidized 70% of doctor bills at an off-site clinic. In addition, DDD provides funding of up to 70% towards the cost of eye glasses, motorcycle helmets, wheelchairs, or canes for disabled employees.
This health care program gives employees basic medical attention in order to remain healthy and safe. More importantly, it gives employees and their loved ones the assurance that if medical issues arise, they will be able to deal with them.

As one Phnom Penh operator illustrates,

“You know my mother, my mother doesn’t worry about me, because she know I can support [myself], and when I have some problem with my health, she doesn’t worry because we have a doctor”

In a country where health is sometimes regarded as expendable, this assurance provides employees and their families with health, financial security and peace of mind.

5.4 Behaviour

In Cambodia physical disabilities are a stigmatization, and since disabled people often have little chance for upward mobility, they often pose a financial burden on their families. This is especially the case in rural areas, where farming is the main livelihood. Disabled people find it very difficult to participate in this form of manual labour. As a result, many move to the city where they attempt to find less physically labourious employment. These opportunities are very difficult to come by because, as one disabled employee says,

“Even though we have a law with disabled [in Cambodia] some enterprise or NGOs still have discrimination with disability when they saw us they look down at us, and they don’t believe on our ability and don’t believe that we can work for them”

DDD has attempted to address some of these concerns by hiring both rural migrants and disabled people. All employees understand that DDD assists disadvantaged people, and because of this, most of them are very proud to be working for an organization which respects and values people with varying degrees of disability. As one of the Operators said,
“At [DDD] there are many disabled persons and I learn from them because they are disabled, but they are not hopeless. They try to work and they always have a bright future. So when I come to work here I feel I should try hard to study and work too, cause it depends on them...they still try to work and do something as a normal person, so I think that is good”

Through this recognition of difference, employees gain confidence and self-assurance and a positive work environment is built. At DDD there is a sense of acceptance among employees. There is also a sense of commitment to DDD and to what it does as an organization for those marginalized groups. All staff are able to learn from, and with other employees. There is a strong sense of sharing and caring for one another. For instance, one employee conducts English lessons twice a week in the evenings in the back room of the office. He has three main students, his coworkers. This way, he is giving back to DDD, who partially funded his university expenses.

One negative aspect employees mentioned was how much busier their lives had become since gaining a position at DDD. In addition to working their six hour shifts six days a week, most employees also attend school. Many of them mentioned the large amount of work (school related work and housework) they have to complete. Many mentioned a feeling of exhaustion, tiredness, and general lethargy.

Eye irritations and sore muscles were also indicated as problematic for employees. These two concerns are probably due to the continuous typing and transcription work they complete sitting at a computer for thirty-six hours a week. Likewise, the work they complete does not require much mental stimulation, which may create lethargy among the workers. General stress was also mentioned related to ‘making ends meet’. Some employees do not
have enough money to make it through the month and consistently have to think about how to pay for the most basic of things like food, lodging and transportation.

5.5 Satisfaction

Despite some issues of lethargy, employees are very happy to be working for DDD. Many suggest that they would not be able to find employment which does not require much experience and that has equivalent benefits. DDD sees itself as a stepping stone for other, possibly more desirable, employment opportunities for its workers. Part of DDD’s strategy is for employees to gain experience and skills for approximately four to five years and then move on to other employment. The CEO states, “we really actually push ourselves to have people go on to better jobs afterwards. So [DDD’s] kind of an entry point. We are willing to give up some of our good employees to kind of go on to better jobs afterwards”. Employees also recognize this fact. As one Operator put it, “[DDD] provides chances for its employees. Like…they provide grants to study at university, they give chance to look for a new job. You see DDD is just a bridge, so that’s what I like”. Many Operators appreciate that they can use the skills and training they are receiving at DDD, to be able to ‘bridge’ to a better job in the future.

An Operator, aged 25, worked at DDD for one and a half years. He suffers from polio, and has limited use of his left leg and arm. During the time he worked at DDD he was able to attend the University of Law and Economics in Phnom Penh and finished with a diploma in enterprise management. He also was elected by his coworkers to be the leader of the Social Mission Committee at DDD. He said this position gave him many valuable skills and helped him build his confidence, as he had to represent all the employees’ needs to management.
He did this by speaking at meetings and organizing various social events. Although he enjoyed working at DDD very much, last year he decided that he wanted a different job, something where he could apply some of the concepts he was learning at school. He found a position as a Field Assistant for the National Centre for Disabled Persons. He now works with disabled people in the countryside on a project called Training and Information for Business Development. The project connects disabled people with appropriate jobs and provides a means to develop their skills. He really enjoys his new job as it provides him with greater responsibility, more challenges, and a sense of fulfillment for a worthy cause. He says that working at DDD strongly helped him acquire his current job: "they chose me for the position [because] I have worked with disabled for a long time. [At DDD] I work with disabled so they conclude that...I can do that with disabled in their village and project too". He now earns one hundred and fifty dollars per month, which is double what he was making while he was at DDD. This enables him to rent a small house in the village in which he works. In addition, he has become the primary money earner for his family. Each month he gives a portion of his salary to his family; he is the only male of five siblings, and his father has retired. Despite his physical disability, and with the help of DDD, he has been able to use the skills and experience he gained at DDD to become a strong and independent person.

One of the major discontentment employees have is with their work environment. The building is former residential units which have been converted to office use. It has many floors and rooms which have been changed over to computer work stations. There are two main computer rooms with approximately twenty computers in each and then two other smaller rooms with about ten computers each, totaling sixty work stations. Staff complained about the heat and humidity of the office environment, saying it is very hot and uncomfortable. One operator stated, "its so hot from the sun, and also from the computers..."
and from the people...the environment is not good". The heat can reach upwards of 40
degrees Celsius in Phnom Penh during the hottest months. There are rotating fans which
cover most of the work area, but the heat of the day is often overwhelming. One of the
reasons employees have complained about the heat is the fact that other departments such
as IT, accounting and other Management positions have air-conditioning in their office
space. This unfortunately has created some animosity between Operators and other
departments. The Operators feel they should have an equal work environment which would
include air-conditioning.

5.6 Family

Many of the employees moved to Phnom Penh and Battambang from rural areas to search
for work. Once they arrive, many live precariously, not knowing where they will reside or how
they will find work. Often they move in with friends or relatives temporarily. Some do not
have family in the cities, and will go to a monastery to find refuge and food. The
displacement has significant ramifications for the family structure; rural families often lose
field labour or house work, and the loss of siblings to provide for elder family members; while
urban families deal with changing living arrangements, and other financial implications
related to an additional person in the household. Although these changes have been
witnessed among the employees, having a position with DDD has not directly influenced the
family structure. In other words, DDD's operations have not caused restructuring of the
family unit, but rather the rural-to-urban migration was already in progress, and DDD has
been able to respond to it by hiring rural migrants.
The biggest impact within the family unit is financial. As mentioned earlier, many employees give some or all of their salaries to their family in the country. This income is a huge advantage for families as they are better able to purchase much needed supplies and contribute to their overall economic prosperity. Money will often go toward sibling education, supplies needed for agriculture, and food. Families are better able to respond to education, health and livelihood strategies and critical issues which they lacked resources to do before.

5.7 Community

The CEO and other North American workers would like DDD to be as non-hierarchical as possible, to reflect American norms and values. However, social differences and hierarchy between managers and workers are much more acute in Cambodia than compared to those often found in North America. DDD has attempted to reduce the hierarchy by providing workers with a voice in some decision making, and by creating a Social Mission Committee comprising of three elected operators. Although the intentions behind the creation of this committee are good, its capacity has not been adequately developed to assist with the horizontal integration of the organization.

To be able to institute a Social Mission Committee requires a great deal of capacity and managerial integration. For instance, the Social Mission Committee’s mission is to create a fun and active social environment for employees, while also positively contributing to society. Activities have included day trips to the countryside, the coast, and to schools where DDD donated books and pens. Although some activities have occurred, members of the Committee are not currently able to make decisions as much as they would like. Because of the perceived and actual sense of hierarchy, the Committee argues they do not have enough power within the current organizational structure to enact change. Currently, the
Committee is made up of Operators, but the activities they organize have to be approved by managers. One frustrated Social Mission Committee member stated, “We don’t have ideas because all our ideas must get passed by the managers, so everything keep at management”. In other words, the committee feels hopeless in their attempts to pass ideas through management for approval, and because of the social hierarchy in which they work, they do not press the issue with management. To compound issues, because of the slow management process, the Committee is now losing confidence among its fellow coworkers. The same social committee member argues “The problem is that the social committee don’t have any activities since last year…and now some of the operators say ‘why we have social committee? We have social committee for what?’ They don’t do nothing and we don’t have any answers to reply to them”.

Because of the social hierarchy within the organization and in Cambodia in general, on one level, Operators do not want to question Management, but on another, Management does not fully take into consideration Operators’ ideas. Without understanding this context, a North American employee questioned why the Social Committee had not conducted any social activities for a long time. The North American employee simply assumed that the Social Committee was not working hard enough, when in fact members would like to do more activities, but the structure that is currently in place does not allow them to make decisions.

Although some issues of hierarchy exist within the current framework, the Committee has been able to build a sense of community and institute some positive contributions. They have helped organize the anniversary festivities. Each year DDD takes all employees on a field trip for two days to a local holiday destination. The annual event is a time to celebrate
the achievements of the organization and to instill a sense of community among the employees. In addition, part of the trip is devoted to contributing to society at large. One of the trips the Committee organized was a tree planting event; another time the employees donated books and other material to a local school. In this way, DDD does not only contribute benefits for employees, but also contributes to the wider society.

In addition, DDD attempts to create a positive, healthy space in which employees are able to develop their skills, ask questions, and build confidence. They want the office to be a space that builds social support, where employees are nurtured- as opposed to a factory type atmosphere often associated with outsourcing. This is reflected in the camaraderie and friendship between the staff. There is a real sense of belonging and pride between employees and within the organization in general. For instance, employees may often come to the premises early or stay late to meet friends, do school work together, or use the Internet. In fact, a couple who met at DDD got married in February, 2005.

5.8 Operations

The overall success of DDD has allowed operations to expand to employ more disadvantaged individuals. Operations began with only twenty employees, but now have expanded to three offices and one hundred-seventy employees. This growth has also enabled employees to be promoted within the organization, such as the Branch Manager of the Battambang office.

The youngest of four children, he moved to Phnom Penh from the countryside shortly after finishing high school in order to look for work. He lived with his elder brother for many years while attending a Christian Church, where he learned basic computer skills and English. In
2001, he heard that a non-profit organization, working with computers was hiring new Operators. As he had very little previous experience, he was nervous to apply. After an interview, he was delighted to hear that he got a position as Operator for data-entry. He says, "I started as Operator for about five months, and then got promoted as Team Leader, and immediately I took more responsibility. [Management] looked at my job performance and they knew that I can do a good job". He worked as a team leader for another one-and-half years, and then as DDD expanded to another office in Battambang, they required two new upper management positions. He wanted to increase his experience, but again was nervous in applying for a management position, "At first I was very worried because I think that managers job is very difficult like, meaning responsibilities, make decisions and then coach people and communications, and doing sales. But [the Managers] strongly encouraged me". With capacity training completed with local Managers and an expatriate team sent to Battambang for the initial set up of the new office, he is now the Branch Manager responsible for the operations of twenty-one staff. In conjunction with his job, and half of the tuition paid by DDD, he attends the local university to complete a degree in Management and Economics. He says he has been able to expand his abilities and experience by putting the concepts he is learning at school into practice at DDD. When asked how he enjoys working at DDD, he says, "I think DDD make me change. I have never thought I become a manager. I think that, I mean, sometime in the future I think I can become a teacher maybe, but I never thought I would become a manager."

DDD has had impacts on the region and within the ICT industry in Cambodia. First, they have been, to some extent, a catalyst in the technology industry in Phnom Penh. The CEO says,
"We have hoped that we would help create a bit of an IT sector in Phnom Penh and that is starting to happen. There is a company doing call centres there, domestic call centres actually, call centres and computer programming, so there has started to be a bit of a domestic marketplace."

DDD is helping to bring technology related jobs, knowledge and experience to a country previously ignored by the technology industry. With this unique model, other organizations have attempted to do similar work and have looked to DDD as a model which could be replicated. The replicability of the DDD’s model has been evident through the many enquiries it has received. Businesses and organizations found locally and from around the world in Bangladesh, Pakistan, Myanmar, Mongolia, Iran and Jordan have contacted DDD with their interests in launching similar programs at those locations. As such, it appears that DDD’s social enterprise model is gaining prominence.

5.9 Summary

As DDD is operating within a market economy, it has afforded some distinctive possibilities compared with traditional development initiatives. Primarily, it is able to provide formal employment opportunities to individuals who probably would not have had the chance. Having a secure job provides marginalized groups opportunities to gain social equality by empowering them with a highly desirable skill set in the growing information technology sector. Secondly, it has provided scholarships to attend further schooling. For most Cambodians, furthering their education is a highly prized endeavour; it provides the possibility of securing more successful employment. This chapter has attempted to weave an understanding of how the impacts of ICT and DDD have improved the human condition of the people involved. Considering these impacts, the next chapter will examine the implications for planners in addressing ICT for development.
Chapter 6: Risks and Planning Implications

This research has attempted to add to discussions surrounding the role ICTs play in development by examining one project in Cambodia. It has taken an inductive and reflexive approach to data analysis; that is, it has highlighted detailed research on DDD in order to point towards general principles for planners to consider. Therefore, what can be learned from this organization that could be of use by other projects of similar size and context? Building upon impacts seen at DDD and their relation to human development, this chapter will first explore some risks of applying ICTs in development. Secondly, it will discuss the role that ICTs played within the human development seen at DDD, and finally present issues to consider when designing, implementing or administering ICT related projects in a developing country context.

6.1 Risks

When technology is seen as the epitome of progress, there is a tendency to disregard its implications and potential outcomes, making questioning or critiquing it very difficult (Westrup, 2000). As such, there is a risk that technology can become an end in and of itself without the necessary discussions about its implications, uses and its inherent assumptions and values. For example, what values are imbedded in ICTs? Are they carriers of Western authority, or are they resources for developing countries to be employed as is suitable? What are the tacit implications of use for countries, communities and individuals? Only when these issues are taken into deeper consideration can ICTs truly contribute to beneficial outcomes for individuals.
There is also risk that, with increased funding and interest in ICT projects within an international context, projects may become simple replications of others created in different settings. There could be a tendency of moving operations and technology from one location to another because of the projects' successes. However, if a project is successful in one place, it is not sufficient to say it will work in other locations; thus local culture and context play an important role in design and implementation. Westrup et al. (2003) suggest that culture is becoming, and should become, a more integral aspect of research, design, and use of ICT. They argue notions of culture can assist in the research, implementation and use of ICT in a variety of settings in order for ICT projects to become more sensitive to the intended local audience.

There is a risk that ICT projects, as they require technological applications, will be seen more as short-term success. Although short-term successes are important for project development, for ICTs to be truly sustainable and effective toward furthering human development goals, ICT projects need to be long-term enterprises. ICT projects require building the human resource capacities at several stages of use and management. Morales-Gomez and Melesse (1998) suggest one way of achieving long-term sustainability is to use ICTs as tools for preparing the next generations of citizens to build society in their likeness. This requires tying ICTs to education and capacity building of young people who can assume positions of leadership over the next decades.

6.2 Role of ICTs

The DDD case study has shown that there have been significant impacts observed in employees' lives related to health security, further education and experience, income generation, building self esteem and confidence; all contributing to human development.
However, a specific goal of this research was question what it is about ICT that has contributed to the human development at DDD. I would argue that the effects observed at DDD are caused by a combination of factors, one of which is use of information and communication technology.

It has been shown that ICT only played a limited role in the development seen at DDD. The fact that employees only transfer data to computers and play a passive role with the information, could be seen as ICTs not providing much as a tool for development. In addition, it could be argued that DDD only marginally uses the communication aspect of ICT. For example, communication channels of ICTs are only used for securing contracts and clients in the 'source' market in North America, and that only management and board members (a limited number of employees) use the communication aspect of technology. Operators (the bulk of employees) do not need the communication aspect of ICT to complete their task. They only need the ability to type from the microfiche file to a computer, which does not need to be connected to the internet. In this sense, DDD is not dependent on the use of ICT (i.e. there is nothing inherent in DDD's functions that necessarily depends on the use of ICT).

However, the human development observed at DDD is dependent on the function of ICT. ICTs play a central part of DDD because DDD would never exist without the speed and efficiency of sending information across the globe in seconds, and the changing relationship between capital and labour. That is, DDD's existence is a function of the availability of the spread and penetration of ICTs, and the growing integrated global economy. Even a couple of decades ago, it could be argued DDD could not have existed because the advent and
diffusion of ICTs were not yet sufficiently developed. In other words, technological diffusion has enabled DDD to build an innovative model in a previously ignored geographic location and ensured that marginalized populations gain access to, and education about, technology. ICTs also play an important role in communication between offices and personnel on two continents. Central job functions such as communication between clients and staff to initiate and secure contracts, ensuring correct job specifications and sending finished product back to clients, is dependent on the availability of ICTs. In this sense, the proliferation of ICT has allowed DDD to begin providing income generating opportunities, computer experience, health and education to previously ignored communities.

Finally, it is a third perspective which best describes the source of human development impacts at DDD. The observed human development impacts are caused by a combination of the forces of the global IT revolution and aspects of DDD's social enterprise model. The observed human development is partly due to the fact that DDD is able to electronically send information-sets from North America to a previously ignored area within the global economy (i.e. Cambodia). Without the ability to do so, employees would not have the same choices to acquire income generating opportunities - one aspect of human development. The related benefits which DDD is able to provide through its social enterprise model are also significant in understanding the source of human development witnessed at DDD. Because DDD is able to gain funding from both development agencies and clients, they are able to provide a diverse array of benefits such as an education scholarship to all employees, onsite health care, better than average wages, and with organizational expansion, the ability to internally promote their employees. It is the cumulative aspects and variety of benefits which ensures and enlarges human capabilities and choices, and which
leads to the equality of opportunity for the formerly disadvantaged individuals. The choice to lead a decent standard of living, the choice to be educated and acquire knowledge, and the choice to lead a healthy life – the central tenets of human development – are all strongly ensured while working at DDD because of a combination of its social enterprise model and its ability to use ICTs.

6.3 Implications for Planners

In addition to examining the role ICTs play in human development at DDD, this research would like to point towards lessons which can be learned from this case study in order to strengthen the strategic and practical contributions to development. Drawing on the DDD case study, the following are some issues that should be considered.

6.3.1 Human Development

- *Broaden projects to include a people-centered approach if projects are to be equitable and prosperous.*

A key finding from the ICT for Development Platform held in conjunction with the World Summit on the Information Society in Geneva in 2003, was that “ICT for development…projects that focus their investment on the deployment of technology have mostly been unsuccessful and unsustainable” (Weigel and Waldburger, 2004). That is, projects which place emphasis on the technological aspects rather than the human dimensions are more likely to fail. Projects and investments must move away from the purely technological drive of installing computers and infrastructure, and emphasize a people centered approach or include a human development component in projects. Thinking about a project in terms of human development, that is, enlarging the choices of individuals to lead to equality of opportunity, will more likely ensure that projects are delivered successfully and more equitably. As part of the human development approach, projects
should have clearly defined goals and objectives (both long and short term) which address the human element. In other words, how will a project affect health, education and livelihood of the individuals and communities involved? When these issues are considered and addressed in project design, implementation and evaluation, projects will become more rewarding. Greater consideration of the human impacts of ICT enterprises will also contribute to the broader context of the Millennium Development Goals set out by the United Nations to combat poverty and address other development issues.

6.3.2 The Importance of Context

- Understand and take into consideration the nature and significance of the local and wider context.

Projects must be able to integrate the theoretical macro principles about ICTs and development while adjusting them to the local conditions. This means providing relevant information for users. One of the failures at DDD is the lack of relevant, contextualized information for employees. Although employees learn the applications of computer technology, the content with which they work lacks local relevance. Most of the contracts are from North America. Data and information are often from old American newspapers and journals – meaning information cannot be used directly or locally. In this way, the computer facility is not giving employees useful information, but rather the important skills (general understanding of how a computer functions, typing and other office skills) which are needed to transfer these skills elsewhere.

The broader socio-economic and cultural context must be addressed in order to avoid the possibility of creating new forms of technological and financial dependencies. As such, projects should complete a programmatic and technical needs-assessment in order to
determine community desires, requirements and needs. This will better ensure that the project is best tailored to fit the needs of the community in terms of extent, type, scale and level of technologies introduced.

6.3.3 Integrated Programs

- The design and implementation of ICT projects must be conducted in a holistic and integrated fashion if projects are to be successful.

Providing a variety of ways for individuals to become involved in their own development is important for them to participate in ways that are compatible to their needs and in which they feel comfortable. It is not enough for a community telecentre to simply provide computers for use, but it must be tailored to involve education, avenues for individuals to develop skills, and provided through diverse techniques. For instance, DDD provides the financial resources for individuals to attend a university or school of their choice; this gives the employee's freedom to go to a school which best fits their educational needs. Using a holistic approach, a project will also be better suited to meet the needs and aspects of human development. As such, policies and programs need to be flexible and diverse enough for the capacities of participants involved.

An integrated approach also means removing the barriers for full participation in activities. That means providing the means of transportation to get to and from activities. For instance, DDD financially assists employees in purchasing bicycles and helmets. This could also include child care services for parents who have little opportunities to gain access to education and employment because of child care needs. Like DDD, it also means targeting populations who would have more difficulties gaining ICT experience and resources such as the poor or the physically disabled.
Luckily, DDD has been able to leverage funds from international development agencies to expand and further develop its social mission. Through this funding they have been able to provide education scholarships and healthcare, subsidized helmets and eyewear, and social endeavours like the formation of the Social Committee. Having the integration of all these benefits allows employees to prosper on various levels. It is the cumulative package that DDD provides which allows a decent standard of living, acquisition of knowledge, possibility of leading a long and healthy life – all aspects of human development.

Another unique quality of DDD is the fact that before setting up the organization they established networks with local non-governmental organizations working with disabled and disadvantaged groups in the area of computer training and English. This allowed DDD to develop a work plan built upon previous experiences in the local area. The strategic alliances with local NGO's provided valuable local knowledge and personnel during the design and implementation stages. The relationship continues today to provide ongoing support and expertise.

6.3.4 Ongoing Evaluation

- Monitoring and evaluation will assist in keeping to targets and objectives of the project.

With so many development institutions advertising the benefits of ICT as a development tool, it is important to understand ways in which projects are affecting individuals involved. Importance must be placed on gathering qualitative and quantitative information on the effects of projects, including ongoing impact evaluation, in order for projects to be tailored or redesigned to better produce the intended benefits. This could be used to guide further targets for the project, and assess the level of impact the project has had on individuals.
Self-evaluations and learning mechanisms for assessing progress or failures toward improving community and individual welfare objectives are examples of methods that could be employed. In addition, part of an evaluation is creating appropriate indicators to track development impacts and objectives. It is critical to have relevant indicators which take the localized context into account.

Similarly, ensuring there is congruence between the design and implementation of a project is critical in project development. Heeks (2002) argues it is important to understand the intentions of projects, the visions, and the intended outcomes, and then be able to examine the reality based on institutional and individual capacity, technological expertise and infrastructure. Using three categories of failure (north-south gap, hard-soft gap, and private-public gap), he argues that too often projects fail because they do not properly take these factors into account. As such, projects must consider a conceptual framework that can highlight areas of maximum impacts and support approaches that include both bottom-up and top-down interventions, while recognizing the local conditions and realities of a project.

6.3.5 Provide Growth Opportunities
- *Give participants a voice in decision making processes at all levels.*

Provide avenues for people to be involved with their own growth, and also with the growth of the project or organization. From inception, through the programmatic and substantive design to monitoring and evaluation, it is important to ensure that participants are able to be involved. Individuals will be given greater opportunities for personal growth if they are allowed to contribute in meaningful and constructive ways. This also means creating organizational structures which value and foster participant involvement in decision making.
It requires a deep commitment to further understanding the diverse organizational and personal barriers to participation. For example, at DDD, this means interpreting the social hierarchy at play which impedes the mandate of the Social Mission Committee. By doing so, it will create spaces for further involvement in decision making, and hopefully result in giving voice to the individuals for whom the project was intended.

Projects should also contribute meaningfully to capacity building efforts for issues which may not be directly related to the project. This may involve providing career, personal or educational counseling. Although DDD is able to provide scholarships for education and promote individuals into positions of greater responsibility with organizational growth, they could better address the need for career counseling. There are many employees who do not have guidance in choosing courses or schools which are appropriate for their needs or objectives. Ideally a staff member at the Management level would be devoted to educational and employment counseling. In this vein, and for other projects, there should be someone to assist in the broader mandate of helping individuals integrate into their community, assist with job searches and school related issues.

6.3.6 Foster Innovative Social Enterprise Models

- Create an enabling environment which can foster innovative organizational structures.

Fostering innovative organization structures to create value out of new ideas, new products, new services or new ways of doing things could be harnessed to address social issues. For instance, DDD was able to identify a social issue in Cambodia (lack of jobs and opportunity for education) and has been able to create innovative solutions. Through the social enterprise model, a relatively new organizational structure, DDD is able to provide both
employment opportunities and social benefits such as scholarships for education and health care, thus offering solutions to social problems. The social enterprise model can offer different opportunities outside the traditional roles of public, private and nonprofit sectors. They are able to provide innovation, resourcefulness, creativity and unique solutions to social problems in areas where traditional sectors are less flexible.

6.4 Conclusion

Information and communication technologies certainly present developing countries and communities with new opportunities. The DDD case study has attempted to examine one application; that of a computer employment centre. ICTs can assist in building competences, generate employment, and if presented in conjunction with education, can provide opportunities to gain the critical primary skills and training which are needed to find further employment in the growing ICT sector. However, the personal change that employees have witnessed during their employment with DDD is caused by a combination of both the availability of ICTs and DDD’s social enterprise model.

The research showed that if designed and executed with human development as a focus (as stated in DDD’s mission statement, and translated through its diverse avenues for gaining experience, skills and training), ICT projects can produce significant positive contributions. By focusing on human potential and capabilities, it is possible for ICT related organizations to add valuable contributions to some of the most disadvantaged populations. It is not until the most marginalized individuals and groups gain access to development initiatives that overall societal shifts toward development will occur.
Since information and communication technologies have only been actively deployed for the past decade they are still at the early stages of reaching their full potential. With increased infrastructure penetration, computer literacy campaigns, and diversity in uses, the advent of information technologies to contribute to development around the world will only increase. Although there is a feeling of optimism surrounding the potential of ICTs, there are many areas which need further examination and research. Research is needed to more fully understand the possibilities and the impacts of initiatives in order to learn from past experiences and build future possibilities. This study has identified several impacts in one particular case, and has pointed toward areas of greater discussion and implications in the emerging discourse on ICT and development.
Bibliography


## Appendix A: Interviewees

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<tr>
<th>Position</th>
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