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A Study of Targeted Information System Accessibility and Usage by Foreign Domestic Workers in Singapore

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**A Study of Targeted Information System Accessibility and Usage
by Foreign Domestic Workers in Singapore**

by

Sandra C. Boesch

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in
Information Systems

Graduate School of Computer and Information Sciences
Nova Southeastern University

2012

An Abstract of a Dissertation Submitted to Nova Southeastern University
in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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Sandra C. Boesch
July, 2012

Information and Communication Technologies (ICTs) have had a remarkable influence on society. Many argue that the impact of ICTs, either positive or negative, affects all of humanity. Acceptance, usability, and accessibility are key for ICTs to make a positive impact on society. Previous research states that Information Technology (IT) can lead to higher salaries, better communication, and more rapid advancements from emerging to developed nations. Additionally, information technology has demonstrated the potential to improve society's effectiveness and productivity by establishing a means to circulate knowledge, increase knowledge sharing, and provide knowledge accumulation and internalization. Therefore, if information technology can improve knowledge and productivity in society, why are the indigent not leveraging technology to a higher degree?

This formal research provides a benchmark analysis of a set of female Foreign Domestic Workers that have been hired as household maids. This study provides baseline insights of how these women who share low levels of skill, low wages, and to whom English, the worldwide language of the Internet is a second language, interact with technology. This study also contributes research data that can help improve development, design, and implementation of future Information Systems.

It can be concluded that FDWs do have availability of technology as shown in the study results. Yet, these women are not visiting websites designed for their use, such as government portals providing information and services. The study shows that the current Information Systems developed for this segment of the population may not be providing the Design, Quality of information, nor the User Acceptance needed to make these tools successful as compared to social media sites which are being visited by FDWs.

The results demonstrate that Foreign Domestic Worker's interaction with technology is still not integrated in their culture or every day activities although they have the advantage of living and working in Singapore, where infrastructure, technology and communications top ICT's charts and tables as one of the most advanced countries in the world.

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Do not conform to any longer to the pattern of this world, but be transformed by the renewing of your mind. Then you will be able to test and approve what God's will is – his good, pleasing and perfect will.

Romans 12:2

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Chapter 1

Introduction

Background

Globalization continues to create novel technological advancements, through reduction of barriers and restrictions to reach global product and service distribution. Yet, unification of communications and technologies can further intensify social inequalities. This technology disparity is clearly seen as the differences between social groups increase, thus can be distinctly associated with the lack of access to and acceptance of information and technology by some unskilled or uneducated segments of the population (Munch & Skaksen, 2009). The unskilled worker population is facing what could be described as information technology neglect. Information technology neglect is defined in this paper, by the author, as a situation where as information technology evolves; it fails to provide a specific segment of population with effective tools or the proper means to take advantage of such technology.

Information Technology (IT) pertains to the use of computers and computer software to manage data. Consequently, the discipline of Information Systems (IS) is concerned with activities such as processing, storing, distributing, and the use of information in organizations and in society. As such, Information Technology is often perceived as a major facilitator in the creation of wealth through the reduction of costs

of production, manufacturing, development, delivery, and distribution activities associated with global business processes (Igun, 2011). Yet, unskilled populations, who do not have access to technology, are often deprived of the opportunities and benefits that IT can provide. The manual labor segment of the population, including those skilled in trades such as maids, construction workers, and carpenters, do not usually have the same level of education or technical background as lawyers, doctors, and architects; and are particularly vulnerable to IT neglect. Maurer and Lutz state that this segment of the population lacks access to information and content pertinent to and potentially beneficial for them, creating severe information gaps (2012). Furthermore, Munch and Skaksen argue that this segment of the population is being left behind in terms of technology and skill aptitude proficiency (2009).

Migration Taxonomy

The Human Rights Watch report (2011), an international non-governmental organization that conducts research and advocacy on human rights, reported that millions of Asian workers migrate for work because they are unable to find adequate employment in their native countries. The report states that in the history of foreign migration, the majority of foreign workers have traditionally been males, who are customarily hired to perform physical labor occupations such as construction, harvesting, and mining. In the last few decades, according to the International Migration Report published by the United Nations Department of Economic and Social Affairs (2009), North America, the Middle East, Japan, Europe, and Southeast Asia have actively hired females from the Philippines, Indonesia, Malaysia, Burma, and Thailand as live-in maids. Today, sending countries, described as countries from which most of

the immigrants originate, indicate that legal female migration now comprises 55% of all migrant workers reducing the number of male migrant workers to a minority.

Throughout this research, a Foreign Domestic Worker (FDW) is defined as a female maid who has migrated to a foreign country to provide childcare and other domestic services in a home or a business, on a live-in basis.

Problem Statement

According to Lee, Lee, and Kang (2005), information technology has demonstrated the potential to improve society's effectiveness and productivity by establishing a means to circulate knowledge, increase knowledge sharing, and provide knowledge accumulation and internalization. Therefore, if information technology can improve knowledge and productivity in society, why are manual labor workers not leveraging technology to a higher degree?

Up to this point there has been little advancement in formal research of Information Systems as it relates to the lower educated, manual labor segment of the population (Bartel, Ichniowski, & Shaw, 2009). Most of the research in this area has been done by Human Rights organizations or by international labor offices as they track population and employment fluctuations. Related articles have been published in magazines, which data can only be classified as anecdotal evidence rather than data gathered through a formal research study.

To establish a benchmark in this area of IS research and to formalize the gathering of baseline data, a formal study was conducted to examine and quantify the Information System technologies that have been established for Foreign Domestic Workers who meet two distinct qualifications: they have chosen to take a job as

domestic maids which does not require a high level of education or English proficiency level and they have the advantage of living and working in Singapore, where infrastructure, technology, and communications top ICT's charts and tables as one of the most advanced countries in the world.

Goal

This research examined and evaluated accessibility, acceptance, and usage of Information Systems available to FDWs. The purpose of this research was to provide a descriptive profile of this particular population. Quantitative descriptions of *what* information was being accessed or requested by FDWs and *where* and *how* FDWs were accessing this information was gathered to better understand this segment of the population and their interactions with technology. Additionally, this research evaluated FDWs' access to pertinent information and examined if FDWs' levels of education, English skill proficiency, or age were relevant in their access and use of information system tools such as computers, and cell phones, through the use of web sites and help-lines. Finally, an analysis of gathered responses was used to better understand the information technology accessibility challenges, facing FDWs.

The following research questions were raised to expand and formalize data regarding FDWs and their use of available technology and Information Systems:

1. What Information Systems are accessed by FDWs?
 - A ranking of accessed Information Systems provided a list of the most used systems by FDWs.
2. What types of technologies (such as computers, help-lines, Information Systems, or cell phones) are used to access available Information Systems?

- A baseline analysis of how FDWs acquire information provided a preliminary view of actual accessibility, acceptance, and usability of current Information Systems targeted toward this segment of the population.
3. What types of data (such as legal, logistical, medical, entertainment, and so forth) are most requested by FDWs?
 - Through the use of survey responses, the types of data and information most commonly requested by FDWs were ranked and analyzed.
 4. Does age, language or education level make a difference in FDWs' access to available Information Systems?
 - After compiling all survey responses, the data was compared by age, education, and English proficiency to analyze possible differences between access patterns to available Information Systems.
 5. Which organizations are most successful at data dissemination directed toward FDWs?
 - A list of organizations that disseminate data to FDWs was presented to each participant. This collection of data provided insight as to what organizations are recognized by participants as well as which of them are most often used by their intended target market.

A formal research survey methodology was used to identify, organize, and evaluate technologies that have been deployed for FDWs and aided in the understanding of factors required for the successful accessibility and usability of these Information

Systems. This research utilized a survey to collect data from FDWs regarding their access and successful use of Information Systems.

This study provided a better understanding of FDWs as well as provided insight of their use, access, and general knowledge of technology. This research not only provided preliminary concepts about FDWs and technology, but it also provided a baseline of information that up until now has not been formally and systematically gathered. This baseline data including a view into FDWs' behavior toward Information Systems and their activities toward accessibility and use of these systems, provided the foundation of data, which was studied and analyzed.

Analysis stimulated by this research dealing with FDWs and how and where they gather information they are seeking provided details, which can be used to better understand user behavior. This research examined the types of information FDWs want or need to have access to and the types of applications and Information Systems they currently access for information.

Relevance and Significance

Data Accessibility

Friedman, Kahn, and Borning (2006), and Gregor and Dickerson (2007), highlight four main issues when accessing Information Systems by the manual labor segment of the population: 1) Design concerns - the framing, development and evaluation of an information system. 2) Quality of information - the caliber and value the data accumulated provides to the targeted audience, 3) Availability of technology - the accessibility the audience has to the available information and 4) User acceptance - the adoption of Information Systems by the targeted audience. According to Luarn and

Lin (2005), there is a relationship between user acceptance of a technology and user behavior towards the same technology measured by improved work performance, enhanced productivity, and user satisfaction. Luarn and Lin state that user behavior towards technology is individual and unique. Yet, according to Burton-Jones and Hubona (2005), at a certain point in the learning curve, behavior shifts because the user has adapted to the technology. When people make phone calls, for example, or turn on the television set, they no longer perceive these tools as technology because the use of these items is fully integrated into their everyday lives (Burton-Jones & Hubona, 2005).

The main barrier to a successful information system is a lack of user acceptance (Lee, 2008; Leifler, 2008). Consequently, it is important to understand whether Information Systems are actually accepted by their intended users, in this case FDWs. Without acceptance, according to Beaudry and Pinsonneault (2010), discretionary users will seek alternatives to gather data or perform tasks, negating many, if not all, the presumed benefits of the systems put in place. Acceptance theory is therefore defined as the demonstrable willingness within a user group to employ information technology to gather information or execute tasks.

According to Bagozzi (2007), user acceptance is at the core of Information Systems development as it is fundamental in measuring usability and can often predict the likelihood of systems usage. Acceptance behavior can therefore be influenced by an assortment of factors including individual or situational influences, beliefs, attitudes, and applicability. Bagozzi (2007) adds that the degree of applicability or quality of the information available to users is often highlighted as a crucial step in the development of a successful information system. For users, valuable information must be relevant,

scalable, significant, and applicable. Therefore, it is imperative that an information system be easily accessible. Providing ease of use and accessibility to an information system means developing a system that does not require an extensive learning curve or extensive training to access, thereby making the system accessible to most users, not solely to experts (Oulasvirta, Petit, Raento, & Tiitta, 2007). Additionally, according to Sales and Fournier (2007), information technology is the platform that allows multiple layers of interconnections to be formed, enabling globalization. Globalization expands not only through technology, but also through information, languages, and places bolstering the reduction of barriers and restrictions to reach global product and service distribution.

Singapore

Singapore is a micro-state and the smallest nation in Southeast Asia. The country is located at the southernmost tip of Malaysia, with a population of 5.18 million inhabitants as of June 2011 according to the Singapore Department of Statistics (2011). Singapore has been chosen as the location to develop this framework for the following reasons:

- Available Infrastructure
- Information and Communication Technologies
- Available resources for FDWs

Available Infrastructure

With a first-world infrastructure and a highly educated and technologically savvy workforce, Singapore is generally accepted to be one of the most networked societies in the world (Lee, 2005). With almost all homes and businesses in the Central

Business District connected to an island-wide hybrid fiber-optic cable network, Singapore became the first fully connected country in the world (Goh, 2006).

According to the 2010/2011 Annual Singapore Infocom Development Authority (iDA) Report, Singapore has a mobile phone penetration rate of 143.6% and a home broadband penetration rate of 190.8% (see Figure 1). These high penetration rates in conjunction with the deregulation of the telecommunications industry lowered the cost of using wireless devices. These advances made it possible for most of the Singaporean population to own a mobile phone and in many instances, made it possible for users to own both a personal as well as a business mobile phone.

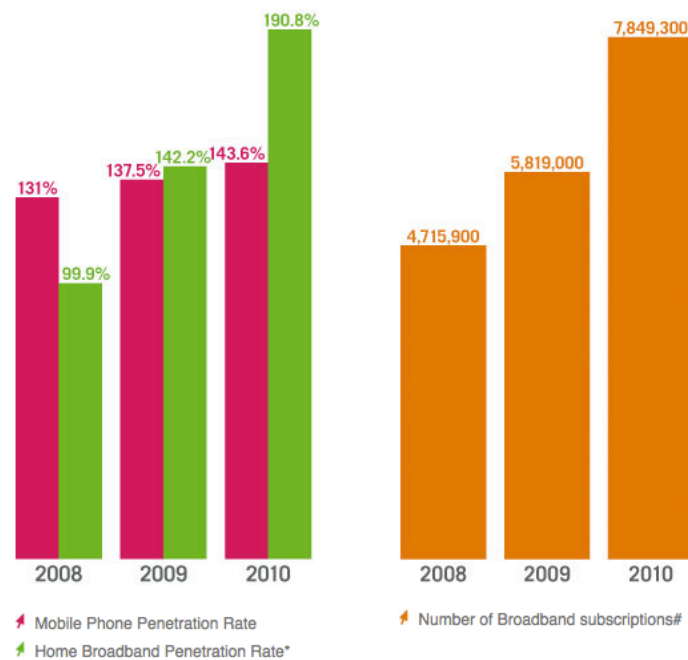


Figure 1. Singapore Telecom Services Statistics for 2008-2010

This report also shows the broadband subscription audience exceeding 7,849,300 from a population of 5.07 million in 2010 (iDA, 2011). These numbers include wireless access plans, but exclude subscriptions to 3G and Wi-Fi hotspots. According to the report these figures are computed using “the total number of

residential broadband subscriptions on a per household basis”. These statistics represent a steady increase of broadband and telephone mobility during a three-year span.

Information and Communication Technologies (ICT)

The Global Information Technology Report 2010-2011 Transformation 2.0 (World Economic Forum, 2011), documented that Singapore continues to top the world rankings due to its advancements in Information and Communication Technologies. This worldwide report also rated Singapore as number one for its government online services. According to Lee (2005), Singapore continues to focus on information technology in order to enhance its national competitiveness and to improve the quality of life for its citizens.

One example of Singapore’ focus on information technology is the implementation of Wireless@SG. Wireless@SG is a free wireless broadband program that runs throughout Singapore. The high percentage of wireless access penetration demonstrates that users have access to multiple broadband connections and that many users have separate Wireless@SG personal and business accounts. Three local wireless operators manage the island wide broadband service: iCELL Network, QMax Communications, and SingTel. Users of Wireless@SG have access to free wireless broadband access, both indoors and outdoors, at public areas such as parks, restaurants, government buildings, and libraries. According to Dennis (2006), Singapore aims to use technology so that IT permeates every aspect of the society, at home, work, and play.

Available Resources for FDWs

In Singapore, the most dependable place to find information regarding working regulations, requirements, and restrictions for FDWs is the Ministry of Manpower,

locally known and referred to as MOM [em: o: em]. MOM is a government agency working within the Ministry of Labor, which provides employment and other relevant services related to working in Singapore. For FDWs MOM provides information on: application for work passes, visa renewals, mandatory medical exams, home leave stipulations, and cancellations of work passes. The work pass is a document all foreign workers must possess to legally work in Singapore.

MOM provides all of the documents needed to fulfill the steps for the work permit requisition process and any other documents that FDWs might need for employment in Singapore. MOM has a main office in the Central Business District in downtown Singapore and is open Monday through Friday, as are most government offices. FDWs are welcome to appear in person to speak to a representative, but this process can be extremely time consuming. MOM also has a Web site, but FDWs would need access to a computer and Internet connectivity in order to utilize the site.

Another source of information comes from the FDWs' home country government web pages. For example, the Philippines maintain an organization called the Philippines Overseas Employment Administration (POEA), which is managed through the Department of Labor and Employment. This organization provides work advisories for overseas Filipino workers as well as postings of vacancies needing to be filled at international destinations. The organization provides a list of foreign employers as well as employment agreements between the Philippines and foreign countries.

The POEA has several offices in the Philippines, but if a FDW has been deployed to work in a foreign country, the only way to access the organization's information is through the website. The POEA site provides high-quality content; yet it

is provided in English, which although stated as the second official language of the Philippines, is not spoken fluently by most Filipinos. The site does not provide translations into Filipino, the national language, or Tagalog, the most popularly spoken language in the Philippines.

In Singapore, the Indonesian and Philippine embassies have established small, separate branches dedicated to FDW affairs, and the Indonesian Web site has a good deal of information and varied activities for Indonesian FDWs. This information includes details on: training classes, help-lines, and special radio programs, whose schedules change weekly. Once more, for FDWs to access and receive current information, they would need to access the Internet or make a trip to the embassy on a periodic basis. Yet, according to the reports published by the Human Rights Watch (2011), time off is still not allowed to a large majority of FDWs. Most FDWs work every day of the year without a set schedule, many working 14 to 19 hours a day with incomes of US \$1.00 or less per hour (see Table 1).

Table 1

Average Earned Income for Foreign Domestic Workers (FDWs) Living in Singapore

FDWs' Nationality	Monthly Inc.	Monthly Income	Daily Income	Hourly Income (12 hrs/day)
Filipino	SG\$450*	US\$360*	US\$12	US\$1.00
Indonesian	SG\$400*	US\$320*	US\$11	US\$0.92
Sri Lankan/Indian	SG\$300*	US\$240*	US\$8	US\$0.66

Note. Currency exchange rate dates as of April 10, 2012.

* Monthly income calculated as 30 working days.

According to the Human Rights Watch (2011), FDWs also experience constant surveillance by their employers and, to a lesser extent, physical and sexual abuse. If the

FDW falls into the minority of employees who do have the privilege of a day off, these days off are usually given on Sundays when all government offices are closed. In addition to the governmental organizations mentioned, several non-governmental support organizations in Singapore assist FDWs. These include organizations such as the Bayanihan Center, which aims to “promote skills upgrading among Filipino workers and enhance socio-cultural ties between Filipinos and Singaporeans.” The Bayanihan Center provides many educational courses in subjects such as bookkeeping, cooking, computer fundamentals, and dressmaking to FDWs at minimal fees. The center located on the outskirts of the city is also a hub for Filipino activities and information sharing. The center has a helpline and an online newsletter, which offers notifications of the courses offered, available student grants, and other news.

The Humanitarian Organization for Migration Economics (H.O.M.E.) is a registered society in Singapore that was established to respond to the special needs of foreign communities. H.O.M.E. aims to enhance foreign workers’ skills as it works to intervene with local law enforcement to support foreign workers. This society is comprised of one director, Bridget Tan, and two full-time employees who separately manage the male and female migrant workers, and each division has a small office in two convenient locations for the access of migrant workers.

According to C. S. Bal, a H.O.M.E. division director, each division has a small number of volunteers and the organization has, in the past, done some publicity; yet the vast majority of the migrant workers who come to them have heard about the organization through word of mouth and not through the Internet, the news, or through the organization’s own efforts at publicity (personal communication, May 28, 2009).

Furthermore, according to Bal, new society events, news or developments are usually communicated to the public by word of mouth. H.O.M.E. has a telephone helpline that is managed with the help of volunteers. H.O.M.E. received approximately 100 calls per month in 2009 and has more than doubled to 240 calls per month in 2011 (personal communication, Feb 28, 2012). The organization also has a shelter for migrant workers and provides many other services.

Transient Workers Count Too (TWC2) is a non-profit organization “committed to encouraging greater consideration for migrant workers in Singapore and promoting good employer-employee relations.” TWC2 teams with human rights organizations and other organizations worldwide to liaison with the Singapore government to write and implement new laws and regulations that protect FDWs’ rights. TWC2 has two full-time employees and depends on the availability of volunteers to implement its activities.

TWC2 has an office, a help-line, and a website, but most of their contact from FDWs is by word of mouth. The TWC2 voice helpline received 462 calls in 2008, an increase of 20% from the 353 calls in 2007 (A. Bergern-Aurand, personal communication, August 11, 2009). The organization also provides many other services to unemployed migrant workers, such as free meals, wage dispute mediation, and counseling, as well as supporting other programs that deal with various issues from human trafficking to illegal deployment of workers such as employing FDWs with families or businesses without the required legal documentation.

As a result of these personal communications a list of NGOs that support FDWs was gathered and used in this research to assist in determining, which NGOs were more often recognized and used by the FDW population (see Table 2). The aim of this study

is to leverage survey research methods to analyze current Information Systems targeted specifically to Foreign Domestic Workers who live and work in Singapore. Initial exploration interviews with two Singapore based Non-Government Organizations (NGOs) that provide support to FDWs highlighted a need for formal research in this area.

Table 2

Singapore Non-Governmental Organizations that Support Foreign Domestic Workers

Organization	Description	Objective
AWARE	Association of Women for Action and Research	Provides support services in dealing with the authorities, and legal advice to women in need
Bayanihan Center	Philippine Bayanihan Society	Promotes skills upgrading among Filipino workers
FAST	Foreign Domestic Worker Association for Skills Training	Promotes skill training for foreign domestic workers.
H.O.M.E.	Humanitarian Organization for Migration Economics	Responds to the special needs of migrant communities.
Legal Aid Bureau	Department under the Ministry of Labor and Welfare.	Provides quality legal aid and advice to persons of limited means.
National Pregnancy	Helpline under Ministry of Community Development	Provides counseling and intervention for pregnancy-related problems
Samaritans of Singapore	Non-profit and non-religious organisation	Provides 24-hour confidential support to people thinking of suicide or affected by suicide.
TAFEP – Fair Employment	The Tripartite Guidelines on Fair Employment Practices	Implementing fair and merit-based employment practices
TCW2	Transient Workers Count Too	Advocate policy framework through engagement with policy makers and employers
UNIFEM	National Committee of the United Nations Development Fund for Women	Provide funds and support for: Economic Empowerment and Conflict Area Programmes.

According to A. Bergen-Aurand, director of Transient Workers Count Too (TWC2) and C. S. Bal, director of H.O.M.E., there is indeed a great need to provide FDWs with access to available information regarding their rights and available services (personal communication, August 11, 2009, May 26, 2009). Both NGO directors believe that current Information Systems are not being accessed, as such, members of the foreign worker population are not obtaining the information they need related to their employment, legal, and personal rights.

C. S. Bal (personal communication, May 26, 2009) stated that the preferred method of information transfer by FDWs is person to person. Yet, because of the lack of English language skills, the information received tends to often be inaccurate. A. Bergen-Aurand (personal communication, August 11, 2009), also stated that due to experience from day to day operations, she believes that most FDWs currently get their information by word of mouth, specifically from other foreign workers, but the information is often incorrect or dated.

Barriers and Issues

The following is a summary of barriers and issues this study encountered. Research into the usability and accessibility of Information Systems by FDWs has in the past not been formal or rigorous; and the process to gather data from Singapore FDWs or organizations that support them has been merely anecdotal up until this point.

This research provides the baseline data and formal methodology needed to quantify and validate the usability and accessibility of current Information Systems available to FDWs in Singapore. The quality of survey data received from the research tools was critical to this research. Careful attention was placed on the representativeness

of the sample, data collection methods, as well as reliability and validity of the tool. A primary barrier to this research was the necessity to limit the participating subjects to those who were allowed to leave their employer's home to run errands, conduct personal matters or take a day. All other individuals of the desired sample pool who fit the following categories could not be included:

- (a) FDWs who are not allowed a day off from their employers,
- (b) FDWs who do not frequent the locations where the surveys were to be administered,
- (c) FDWs who although allowed a day off, are not allowed out of the house.

Because convenience sampling was used, each respondent's probability of inclusion in the sample is unknown. For this reason, sampling precision statistics cannot be calculated, making reliability and validity of the tool even more critical. Other barriers are present due to the behavior of the subjects themselves. The participating FDWs might not feel comfortable being honest while answering the survey, which would skew the results. The surveys were anonymous, as such, did not require the participants to provide their name nor to present any kind of identification, yet insecurity or a need to provide the socially acceptable answer may affect their responses. Language was an additional barrier faced. Singapore is a multi-lingual nation. Although English is one of Singapore's four official languages, there are other languages spoken in the country such as Malay, Mandarin and Tamil to name a few, that reflect its multi-racial, multi-cultural and multi-lingual society.

According to A. Bergen-Aurand, director for Transient Workers Count Too (TWC2), FDWs' wage levels are normally linked to national origin, with Filipinos

usually being the best paid due to their basic knowledge of English reading and writing skills, followed by Indonesians and Sri Lankan workers who usually have lower English proficiency skills than Filipinos (A. Bergen-Aurand, personal communication, August 11, 2009). Therefore, the sampling of the research was also limited to those subjects who had the necessary English fluency to read, understand and answer the survey questions. Consequently, the survey tool was developed using basic levels of readability to increase the potential pool of participants. Furthermore, some concepts and questions were written as phrases, not as complete sentences. These phrases are more comparable to the local slang and seem less wordy to participants, which allowed for a higher probability of attaining FDWs' collaboration.

The pilot test, a trial run of the procedures and instruments to be used in the study, was integral in testing whether the readability levels were appropriate and valid. As the study progressed it was noted that by self-selection, Filipino participants indeed provided the majority of the sample subjects.

Limitations

The following external factors had an impact on the results of the study.

- The participants were not part of a random sample; therefore the results are not to be generally applied to the entire FDW population.
 - A random sampling study at this time was not possible due to the lack of databases, or listings of FDWs' contact information.
 - Yet, there are no known reasons to support that the sample to be used would have different questions and need different data than would members from a random sample from the same population.

- The subjects who participated in the survey may not have answered each question accurately.
 - Culturally, because the researcher is a foreigner and the participants are categorized as belonging to the working class population, the subjects might have felt obliged to answer questions in a manner that might have been believed to be pleasing to the researcher.
 - FDWs might have feared that the information shared through the survey might somehow reach their employers or employment agencies. This factor, which might include a fear of retaliation by their employers or employment agencies, could have led to data misrepresentation.
 - The subjects might have been embarrassed to provide accurate information regarding their education level or English proficiency.
 - Participants' self-appraisal answers to fluency questions might not have been comparable to other self-appraisals. For example, the fluency question allowed participants to choose between "Excellent", "Good", "Fair", or "Poor". If a fluent participant self appraised herself as "Fair" while another less fluent participant self appraised herself as "Good" in the 4-point Likert scale, these responses are not comparable.
- The location of the survey gathering could not be controlled.
 - The location could be loud or crowded on the data-gathering day. The subjects might have felt uncomfortable while taking the survey or might not have attained the necessary focus to answer the questions in the best manner possible.

- Some participants changed their mind and did not complete the survey.
 - A few of the participants experienced fatigue after answering the first pages of the survey.
 - Thirteen subjects returned the survey unfinished.
 - The return number could have been caused by factors such as disinterest in the topic, participant's time management issues concluding in the lack of sufficient time available to answer the survey, or fatigue.

Delimitations

The following factors were deliberately imposed on the study by the researcher.

- Participants were restricted to those already present at the given locations where the surveys were to be administered.
 - Times, dates, and locations where human subject research was conducted, although varied, only offered a portion of the total population an opportunity to be involved in the research.
 - No data gathering was conducted after 6:00 pm. An additional pool of participants might have been missed, by limiting the study's collection hours.
 - A large section of the FDW population, who are not allowed outside of their home, have a day off, or run errands, were not be represented in this study.
 - The surveys were written and English and no translated versions were provided.

Definition of Terms

Acceptance Theory

Acceptance theory is defined as the demonstrable willingness within a user group to employ information technology to gather information or to execute tasks (Beaudry & Pinsonneault, 2010).

Entry Point

For the purpose of this study, entry point is the first point of access to information from available Information Systems, such as kiosks, web pages, office buildings, Information lines or help-lines (Author).

Feminization

A perceived societal shift of gender roles from the characteristically “male” toward the "female" (Lu, 2011)

Foreign Domestic Worker (FDW)

Foreign Domestic Worker was defined for the purpose of this research as a domestic maid who has migrated to a foreign country to provide childcare and other domestic services in a home or business on a live-in basis (Constable, 1997).

Illegal deployment

Foreign Domestic Workers can only be employed for the performance of domestic chores for their employers, at the residential addresses stated on the Work Permits. (Ministry of Manpower, 2011).

Information Technology Neglect

Occurs when technology as a science, fails to provide a specific segment of the

population with the proper tools or skills to effectively take advantage of such technology (Author).

Levy

A tax paid to the Singapore government by the employer of a foreign domestic worker (Ministry of Manpower, 2011)

Mall Intercept Approach

A method of data collection in which an interviewer at a shopping mall approaches a sample of those passing by to ask if they would be willing to participate in a research study (Rice & Hancock, 2005).

Summary

This research presented an opportunity to formally study a segment of the disfranchised population that works as household maids commonly referred to as Foreign Domestic Workers. These workers live in Singapore, one of the most technically advanced countries in the world but have very low incomes, minimal education and rudimentary English skills. Singapore as a leader in Information and Communications Technology provides all residents with the best technology can provide through Information Systems, advanced e-government sites, countrywide wireless and a state of the art connectivity infrastructure.

This research gathered descriptive data to conclude a formal study detailing information accessibility and technology usability by FDWs. This benchmark study provides insights of how these women interact with technology and contributes research data that can help improve development, design and implementation of future Information Systems.

Chapter 2

Review of the Literature

Introduction

This study investigated *what, when, how* and *why* Information Systems (ISs) and Information Communication Technologies (ICTs) are being accessed and used by Foreign Domestic Workers (FDWs) in Singapore. This research responds to a need to understand the factors that should be considered in implementing Information Systems or communication technologies for these female workers, who can be described as having low levels of formal education and technical skill. To set the background for the study, the first section in the review of literature presents issues pertaining to the use of Information Technologies (ITs) by low skilled workers with a focus on the female population. The second section describes the implications of adaptability, accessibility and usability of Information Systems and communication technologies. The third section analyzes specific methods employed in this research such as the mall intercept method and outlines sampling procedures utilized.

Information Technologies

Information technologies as described in Chapter 1, address efficient and accurate information retrieval from rapidly growing information resources such as the Internet, databases, and Information Systems. Information Communication Technologies or ICTs are commonly used to establish significant information flows

between rural communities and more developed urban regions. ICTs can be defined as communication devices, applications, or services including: satellite systems, software, computers, cell phones, television, radio and so on. These conglomerate of devices, applications and services can serve to stabilize the social and economic development of emerging countries, by capturing, processing, storing, and allowing access of communication information electronically (Fang, Benamati, & Lederer, 2011).

Various authors contend that information communication technologies have a positive global impact through knowledge base expansion, innovation, and the creation of new markets (Al-Ghailani & Moor, 2009; Anderson & Beckman, 2009; Chidamber & Kon, 2009; Prusak, 2010). Andersson and Beckman (2009), state that the accumulation of knowledge as a result of higher education, scientific research, industrial research, and development through the use of information technology, is a key factor in economic and social development. The authors argue that computer technology has changed the face of the world as it allows for the storage, organization, and management of vast amounts of data, as well as the processing of extensive amounts of information. Computer adoption and the ample acceptance of the Internet is acknowledged by many as the most effective communication platform and the largest information base in existence today. The Internet helped established the software industry, with businesses being involved in the development, maintenance, and publication of computer software as well as on-line services. Technology according to Andersson and Beckman has increased the reach of knowledge. Knowledge is distinguished from information (facts and data that are organized to describe a particular situation) according to Prusak (2010), by the addition of truths, beliefs, perspectives,

concepts, judgments and finally expectations. Moreover, Prusak attains that there is a logical relationship between information and knowledge, and that this relationship can and should be applied to technology as a prime driver of innovation. As a clear example, the conventional telephone was one of the earliest technological developments in communication, yet cellular communication has revolutionized the communication industry (Prusak, 2010; Chidamber & Kon 2009). Additionally, Al-Ghailani and Moor (2009) maintain that technological innovation creates markets for new products and services. These markets, the authors insist, will be impacted by globalization which calls for a higher pace of innovation which will directly increase the pressure of competition.

The previous findings vocalize the positive impact of technology upon society at large. Yet, researchers with challenging views propose that the digital divide, defined as the increasing gap between those who have and those who do not have continues to increase year by year. The following is a list of items that separate the two halves (Chan, 2010; Hing, Sevcik, & Oh, 2009; Kendall, Kendall, & Kah, 2006).

- 1) Access to information and communication technologies,
- 2) Access to content that benefits them socially and economically,
- 3) Skills to take advantage of ICT services and
- 4) The ability to afford to pay for digital services;

A recent study performed in Hong Kong by Chan (2010), determined that information technologies do not always bring about positive effects to society. Chan's study based on data from Hong Kong's 2006 by-census survey on the usage and penetration of IT in industries, revealed that the earnings of less educated workers in

Hong Kong were decreased when information technologies were introduced into their work environment. Chan's research discovered that the positive impact of information technologies measured by higher salaries and an overall improved well being, only applies to highly educated individuals. Contrary to previous research, scientists identified that IT has actually depressed the salaries of many less educated workers. Chan advocates that computers are replacing workers equally, at less complicated manufacturing blue collar and clerical jobs, as well as more complicated tasks such as testing, pharmacy drug dispensing, and language translations.

In an August 13, 2011, New York Times article written by the three time Pulitzer Prize winner, author of the *World is Flat*, Thomas Freidman (2011), states that globalization and information technology have gone to a whole new level, from connectivity to hyper-connectivity. Friedman, proposes that technology and globalization are continually eliminating "routine" work, which once sustained the working and middle-class. Friedman concludes that to get into the middle class, workers must study harder, work smarter and adapt quicker than ever before. As such, Chan (2010), and Hing, Sevcik, and Oh (2009), theorize that in the future even more educated workers will find themselves having to retrain in order not to be displaced by IT. High end jobs like programming, nursing and even piloting will be largely affected by technology within the next 10 yrs (Hing, Sevcik, & Oh, 2009). The authors state that in industrialized countries, hospital wings, restaurants, and airlines managed and run completely by robots will soon be a reality. These advances and innovations highlight the clear technology gap between the industrialized and the developing countries, where the difference between those in the world who are rich, educated, and powerful and

those who are not, is increasing (Zhang, Wu, & Ai, 2009). This discrepancy identifies the difference between those who use digital resources and those who do not, which has developed a large gap between the information rich and the information poor in societies.

According to Kendall, Kendall, and Kah (2006); Hing, Sevcik, and Oh (2009), and Torimiro, Kolawole, and Okorie (2007), the digital divide is continuing to expand as technology advances because rural communities lack technical skills and have on average a lower education level than those living in urban communities. Rural communities often fail to gain the empowerment that comes with having information. The authors observed that societies and nations where technologies have been diffused, generally command a superior human development record. Additionally, researchers identify location, language, and cost as significant areas where a lack of access to information, or necessary skills even if access was available, directly affect development (Freeman, 2011; Gilbert, Masucci, Homko, & Bove, 2008; Joseph & Andrew, 2007; Saghir, 2005; Wajcman, 2010).

Location

Gilbert et al., (2008), describe urban dwellers, as those that can to some extent, be regarded as information-rich and are highly benefited by their geographical location. In contrast, rural dwellers are far from all the major news and information sources such as government offices, businesses, and organizations' headquarters. Technology has become fundamental to most societies by virtue of job opportunities, improved education, and strengthened community networks. However, anyone not able to take advantage of these technologies faces the challenge of increasing inequality. According

to Freeman (2011), technology inequality is especially acute for rural women, as they have been deprived of access to basic education or occupation training along with scientific and technological job opportunities due to cultural expectations requiring females to stay home and take care of the household.

Gilbert et al., (2008) present that rural women are three times less likely than men to have a formal education. The barriers to women pursuing an education according to the authors include the lack of time to attend school, family and household duties, lack of control of funds to pay for education, and socio-cultural norms that give female education a low priority. Similarly, Judy Wajcman (2010), author of *Feminist Theories of Technology*, explains that the tendency to direct women towards non-technological professions leads to women's fear and embarrassment when dealing with ICTs. Furthermore, Trauth, Quesenberry, and Yeo (2008), reported that a technology study conducted in the US, revealed that women associate the word *technology* with male connotations, yet the word *information* was generally seen as being more feminine. According to Joseph and Andrew (2007), the existence of these social influences imposes fear and a sense of discouragement among women, particularly, when it comes to taking advantage of any technology including communication technologies. Empowering women to access knowledge and information has been seen to lessen the technology gap by increasing women's ability to improve decision making skills, to develop access to experts, and to increase the access of timely, pertinent, and current information without the disadvantages of inaccurate or unavailable information, high transportation costs to government offices or hostility from social biases (Freeman, 2011; Joseph & Andrew, 2007).

Language

Language impacts humanity's ability to communicate and comprehend information. Chidamber and Kon (2009), maintain that as English is often categorized as the world's primary language for international communication and technology, there should be concern in the fact that underdeveloped countries in most emerging regions are characterized by high illiteracy rates and low proficiency in their native local languages, not to mention the English language. Most of the ICTs that are available today require that their users understand and interpret information, yet these technologies are far from supplying the frameworks needed to easily interact with these systems in local languages, or to be understood by the average fluency citizen. This is a barrier to the underprivileged populations in developing regions but more so for the women in these areas. According to the *World's Women 2010: Trends and Statistics*, published by the United Nations (2010), women account for two thirds of the world's 774 million adult illiterates. A proportion, according to the study, that is unchanged over the past two decades.

According to Freedman (2010) and Wajcman (2011), research is ongoing to verify whether literacy rates in the rural areas are at a sufficient level to allow unassisted surfing for information on the web. Joseph and Andrew (2007) state that two-thirds of the 876 million illiterate people that exist in the world are women. According to Joseph and Andrew, research conducted in South Africa and India indicated that language was one of the top barriers to Internet use. Additionally, survey results published by Gulati (2008), illustrated that even in cases where women understand a little English, they still face discomfort when it comes to accessing ICTs. Altogether, these factors discourage

rural women from realizing the full potential of ICT use, as the barriers of illiteracy and local language limit the possible interaction with and operation of ICTs.

Cost

When looking at the cost to access information, a few factors must be analyzed. First, the cost of infrastructure development in rural areas where electricity or phone towers might not have been rolled out. Second, the cost of education and skill development, that are needed to reduce the effects of illiteracy and language limitations. The third cost factor is the affordability of technology. According to Saghir's analysis on the technical report by The World Bank (2005), insufficient infrastructure is one of the major bottlenecks for the successful utilization of research and technology. Saghir promotes that basic infrastructure, needs to be in place before technology can start to affect a rural area, especially if electricity and running water are lacking in those areas. The report shows that electricity is widespread in all industrialized countries yet in general, absent in developing ones. To reflect this need, according to the report, The World Bank (2005) has prioritized commitments to energy infrastructure have increased financially worldwide by 40 per cent from 2001 to 2007.

According to Al-Ghailani and Moor (2009) and Gregor and Dickinson (2007), basic infrastructure is an essential step towards development and the use of technology in rural areas. In the midst of globalization, technology affordability is paramount if the all society is to have the ability to compete. The challenges that rural women face limit their ability to take advantage of ICTs since education in English language and in computer literacy is vital in order to operate and understand the information accessed from ICTs. Therefore it is critical that Information Systems developed for the less

educated populations take into account their target markets' abilities and needs to provide the best information through the most accessible format possible.

Acceptance and Use of Technology

Millions of dollars have been spent on information technology development in the United States and around the world over the last 30 years, yet, many researchers debate whether information technology is actually accepted by its intended users (Sharp, 2007; Peters, 2009). User acceptance has been viewed as the pivotal factor in determining success or failure of any Information Systems development project. Both researchers and practitioners have a substantial interest in understanding why people accept or reject information technology.

According to Peters (2009), a decade ago in the business world, technology acceptance might not have been a relevant factor as management's authority, leadership, and influence would have been enough to ensure that employees used the technology at hand. Additionally, Peters, conveys that financial rewards have been key in encouraging workers to use the tools provided to them regardless of their relative ease of use. Today, however, acceptance of Information Systems and technology overall has become imperative due to the number of software applications employees use for work, education, as well as leisure activities. Peters concludes that better design is more relevant now than ever before, as information technologies continue to spread across society and into organizations in such a pervasive manner, making technology pivotal in day-to-day life experiences.

For decades researchers have expended significant effort to building models that test theories, which not only examine but also predict the use and the intent to use

technology. Existing models of ICT acceptance look at the degree to which technologies or communication innovations have been adopted. Many theoretical models have been developed to explain the relationship between user beliefs, attitudes, intentions, and actual system use. The Unified Theory of Acceptance and Use of Technology (UTAUT) model was specifically developed to provide a comprehensive framework for technology adoption analysis (Bagozzi, 2007). The model was formulated based on conceptual and empirical similarities across eight acceptance models, which when tested were found to work best with technology research. Each model included in the UTAUT includes “usage” as the same dependent variable, but uses various antecedents to understand acceptance of technology.

The UTAUT although not used in this research, does aims to explain two main user factors; first, intentions to use an IS, and second, subsequent usage behavior. The theory delineated by Venkatesh, Morris, Davis, and Davis (2003), holds four fundamental constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions are direct determinants of usage intention and behavior. Venkatesh et al., developed the UTAUT model in 2003, through a review and consolidation of the constructs of the following models which had proven successful in explaining IS usage behavior:

1. Reasoned Action Model (TRA)
2. Technology Acceptance Model (TAM)
3. Motivational Model (MM)
4. Theory of Planned Behavior (TPB)
5. Combined Theory of Planned Behavior/Technology Acceptance model (C-TPB-TAM)
6. Model of PC Utilization (MPCU)

7. Innovation Diffusion Theory, (IDT)
8. Social Cognitive Theory (SCT)

Subsequent applications of UTAUT have been published worldwide, some examples are shown in Table 3.

Table 3

Applications of The Unified Theory of Acceptance and Use of Technology (UTAUT)

Author	Application	Result	Participants	Location
Curtis, Edwards, Fraser, Gudelsky, Holmquist, and Thornton, (2010).	Adoption of social media	Found women considered social media to be beneficial, and men exhibited more confidence in actively utilizing social media	409 non-profit organizations	United States
Eckhardt, Laumer, and Weitzel, (2009).	Social influence of workplace referent groups (superiors, colleagues) on intention to adopt technology	Found significant impact of social influence from workplace referents on information technology adoption	152 companies	Germany
Koivimäki, Ristola, and Kesti, (2008).	Perceptions toward mobile services and technology	Found that time spent using the devices did not affect consumer perceptions, but familiarity with the devices and user skills did have an impact	243 individuals	Finland
Verhoeven, Heerwegh, and De Wit, (2010).	Computer use frequency	Found that UTAUT was useful in explaining varying frequencies of computer use and in information and communication technology skills in secondary school and in the university	714 university freshmen	Belgium

Attitude toward adoption has been found to play a key role in technology acceptance within the consumer context. Various alternative approaches have been used in analyzing consumers' acceptance of new technologies. UTAUT, contains four core determinants of user behavior:

1. Performance expectancy
2. Effort expectancy
3. Social influence
4. Facilitating conditions

The UTAUT model has inspired researchers to try its suitability in different contexts. One of the strengths of the UTAUT model is that it considers the role of several moderating variables, namely gender, age, experience, and interest of use. These moderators are assumed to influence the significance of the four core determinants. One of its weaknesses is that research following the UTAUT model can be very complex as it presents more than 40 variables for predicting behavior and intention (Bagozzi, 2007).

Accessibility of Technology

Information technologies are said to be the foundation of innovative productivity growth and the source for the development of a global economy by evolving and sharing communication, information, products, and services (Al-Ghailani & Moor, 2009). One of the core beliefs of this research is that there exists a significant limitation of information accessibility from any information system or technology by the mass population due to a dependence on higher technology such as computer technology and or Internet connectivity.

Attwell (2007) describes the access to Information Systems as a dedicated activity that is location-based for most users; as such, accessing Information Systems is not always convenient and not integrated into the user's life. As information

technologies rapidly become integral to education, commerce, employment, health, safety, and so on, multiple barriers remain to provide effective and affordable access to technology by people with low technical capabilities (Vanderheiden, 2010).

According to Vanderheiden, technologies that can provide improved access channels are not affordable by many individuals or organizations which lead to delayed mainstream developments and deployments. Some of the issues according to Vanderheiden include the cost of keeping up with the increasing number of mainstream hardware and operating systems such as desktops, laptops, net books, and smart phones running on Windows, Mac, Linux, Chrome and so forth, not to mention the millions of additional software applications available today.

The goal, according to Vanderheiden (2010), is to render a richer set of access options that are less expensive to create and distribute and that can address the needs of a wider range of individuals than is possible today. The ideal model would have an infrastructure that can be replicated internationally to bring a wide variety of access options and lower cost delivery systems to individuals and businesses world-wide. A portion of the accessibility problem has been addressed with new technologies that are reaching every member of society, which provide access to information on the Internet that could only in the past, be accessed through application software not available to all (Zhang, Wu, & Ai, 2009).

Mobile devices also referred to as a cell phones, iPads, or tablets, have become essential methods of communication and their market has grown extensively in developing nations. Technology leapfrogging has allowed emerging countries to adopt newer technologies by bypassing intermediate steps taken by developed regions. For

instance, the fast growth of mobile telephony in many developing nations bypassed fixed-line telephony (Ludford, Frankowski, Reily, Wilms, & Terveen, 2006).

According to Teófilo, Martini, and Cruz (2009), to truly provide access to the majority of the people in their own environment, the next evolutionary step in data access systems or data delivery systems is mobile technologies. According to Fang et al., (2011), mobile devices are becoming a primary personal communication tool and the authors predict that mobile technologies will be the next global surge in communication infrastructures. Worldwide use and ownership of mobile phones according to the authors, has increased exponentially since 2002. Furthermore, the 2009 ICT Development Index (2009), published data showing that mobile phones, with global subscribers surpassing the four billion mark, have propagated wider and faster than any prior technology including radios, television sets, wire line/fixed phones, and have done so within a span of 25 years.

According to Koivimäki and Ristola (2008), the first mobile networks were only used for voice communications. Today, mobility is maturing into additional applications and functions such as messaging, and video and data sharing, and continues to demand enterprise integration such as mobile to computer synchronization. The authors state that the demand for mobile applications is growing and a new influx of mobile technologies is now emerging. Teófilo et al., (2009) proposes that mobile devices have transformed the nature of communication accessibility and Internet capability with the development of Short Message Service (SMS). Oulasvirta et al., (2007) state that a mobile communication device is one of the most widespread commodities carried by the majority of the population. The authors propose that usage promises to alter the

global communication environment because these devices are owned, used, and purchased regardless of culture or location. Haverila (2011) adds that the preferred mobile communication device is unquestionably the mobile phone. Mobile phones according to the authors are considered by their users as necessary and indispensable tools providing: familiarity, configurability to personalize, and longevity.

As users continue to adopt mobile technologies, a diverse number of specialized mobile services have been introduced to enhance the individual's access, convenience, and utilization of information (Wu et al., 2011). The authors contend that due to dissimilarity in regional technological infrastructures, government policies, cultures, and competitive landscapes, the mobile phone provides the best access to Information Systems and communication technologies currently available.

Research Methods

This research utilized a convenience sampling construct. Convenience sampling is a type of non-probability sampling that involves the sample being drawn from that part of the population which is close at hand. That is, a sample population selected because it is readily available and convenient (Groves, Fowler, Couper, Lepkowski, & Singer, 2009) In this case a mall intercept method was utilized to obtain the sample population.

The commonly named, mall intercept method, is a method of data collection in which interviewers approach prospective subjects of those passing by in high traffic areas, such as malls, airports, student unions, or cafeterias, to ask if they would be willing to participate in a research study (Rice & Hancock, 2005). Passersby who agree to participate, are interviewed on the spot, given a self-administered survey, or taken to

an interviewing facility that has been set up elsewhere near the original intercept location. According to Groves et al., (2009), the intercept process allows for both *quantitative* data collection and the ability to *qualitatively* hear what respondents have to say about the given subject. While the intercept does collect some yes/no or fill-in-the-blank responses, if properly designed and conducted, the interview can also capture what respondents think or feel in their own language, about the subject at hand. If a self-administered survey is chosen as the tool to gather data, as with any survey, quantitative data is gathered with little or no interviewer bias. Mall intercepts provide a relatively quick and economical way to do sampling, especially of hard to reach segments of a population, and their results can be triangulated with other data such as previous surveys or other data such as subject expert analysis (Rice & Hancock, 2005). Frequently, a small incentive is offered to bolster participation and to minimize the inconvenience and the personal "cost" to respondents.

Research suggests that face-to-face interviews yield more complete data compared with telephone or survey methods. Groves et al., (2009) proposes that uneasiness with the interviewer or suspicion about what will be done with the data, compel telephone or survey respondents to be less candid with their answers, yet face-to-face interviews allow for more trust in addition to more socially acceptable answers. Mall intercepts are thought to be socially acceptable as people feel that a mall or public place is a more appropriate place to do research compared with their own residence where their private space is encroached upon.

The face-to-face or personal nature of the mall intercept is believed by Rice and Hancock (2005) to yield more complete or in depth answers. Respondents answering

the same questions by a telephone interview compared to mall intercepts are more likely to provide significantly distorted responses regarding socially undesirable behavior; such as drinking or getting speeding tickets, than mall intercept respondents, which the authors conclude proves that mall intercept respondents will provide more accurate and less distorted answers as they perceive more anonymity from a mall intercept than a door to door or telephone interview which causes respondents to be more easily identified.

Summary

This chapter reviews the factors that should be considered in implementing Information Systems or communication technologies for Foreign Domestic Workers, who can be described as having low levels of formal education and technical skill. As stated in detail in this chapter, adaptability, accessibility, and ease of use of Information Systems and communication technologies have a large impact on the disfranchised and less educated workers, specifically the female migrant population.

Technology could be said to be only useful and meaningful when it brings positive changes in a person's life and empowers them to face day-to-day challenges.

The goal of this study is to develop a formal benchmark to determine, and analyze the perceptions and behaviors of FDWs toward technology as they gather knowledge and information, which in turn brings about desirable changes in the way they think, feel, and act.

Chapter 3

Methodology

Research Model

On the title page of the 2010-2011 Global Information Technology Report this statement is found “Technology has profoundly and positively reshaped the world in which we live - for individuals and for whole societies.” The authors propose that helping the world to communicate has never been as important as relevant or as possible as it is today (World Economic Forum, 2011). The World Economic Forum along with thousands of contributors, organizations, and universities are leading the way in providing increased communication opportunities to the disfranchised populations. It is believed that by providing this segment of the population with access to information and connectivity to technology, a new engine of growth for global economy will emerge.

A descriptive study was used in this research where participants provided both quantitative and qualitative data through survey responses that were examined to establish what is the conventional use of current Information Systems (ISs) technology by Foreign Domestic Workers (FDWs). This research examined traditional communication and information gathering norms of FDWs in Singapore by researching, analyzing, and providing a formalized study of *where* FDWs go to find the information they seek, *what* information is more often requested and finally, *how* information is

being disseminated to this group of workers. The research also took into consideration *if* and *how* FDWs' access to pertinent information was affected by FDWs' education level, English skill proficiency, age and accessibility to information system tools such as computers, Information Systems, help-lines, blogs, and websites.

The following research questions were broken up and addressed in specific sections of the survey:

1. What Information Systems are accessed by FDWs?
 - A ranking of accessed Information Systems provided a list of the most used systems by FDWs.
2. What types of technologies (such as computers, help-lines, Information Systems or cell phones) are used to access available Information Systems?
 - A baseline analysis of how FDWs acquire information provided a preliminary view of actual accessibility, acceptance, and usability of current Information Systems targeted toward this segment of population.
3. What types of data (such as legal, logistical, medical, entertainment, and so forth) are most requested by FDWs?
 - Through the use of survey responses, the types of data and information most commonly requested by FDWs was ranked and analyzed.
4. Does age, language or education level make a difference in FDWs' access to available Information Systems?
 - After compiling all survey responses, the data was compared by age, education, and English proficiency to analyze possible differences between access patterns to available Information Systems.

5. Which organizations are most successful at data dissemination directed toward FDWs?
 - A list of organizations that disseminate data to FDWs was presented to each participant. This collection of data provided some insight to what materials are reaching their intended target market.

The results of this research answered the research questions and contributed to the understanding of data accessibility frameworks for users from the manual labor population. Since currently there exists little empirical data regarding the manual labor population's access to Information Systems, these results should offer alternatives for future research, adaptation, and testing endeavors.

Specific Procedures to be Employed

Research Sample and Selection of Participants

As noted in the Barriers and Issues section in Chapter 1, the intended population for the requirements phase of the research are FDWs working in Singapore. As there is no available database, adequate information, or listing of FDWs' contact information, a random sampling study at this time was not possible. Yet, as this research aims to provide a benchmark study and analysis of the population and their access to information, a sample of the population was used to gather data through non-probability convenience sampling. Although, working with a convenience sample by definition means that the results gathered will not scientifically allow for generalizations about the total population to be made, there are controls within this research design, which serve to lessen the impact of employing a non-random convenience sample, thereby ensuring the results to be more representative of the population.

Initially, the human subjects data gathering phase of the research was held during seven weeks where surveys were conducted at three different locations within Singapore, at different times of day and during different days of the week. Second, there are no known reasons to support that the sample to be used would have different questions and need different data than would members from a random sample from the same population. The sample base was generated by conducting the mall intercept method at locations that cater to FDWs. By centralizing the research on FDWs who were found at the prescribed locations, the research focused on: (a) FDWs who are typically allowed to leave their houses to run errands, conduct personal matters, or spend time off and (b) FDWs who were present at the selected locations during collection of the surveys.

The mall intercept is a face-to-face interviewing method akin to the door-to-door research method in that the researcher may pinpoint a location or population whom to research (Groves et al., 2009). By using the mall intercept method, participants are intercepted or approached at different locations and asked to participate in a study. If the participants were willing to participate, they would then be asked a series of oral questions by the researcher, complete a survey, or are invited to participate in a more detailed interview.

The human subjects research completed in this study was originally planned for two locations, Lucky Plaza and the Bayanihan Center. Lucky Plaza is a centrally located mall that provides a variety of products and services to FDWs. The second location was the Bayanihan Center, an organization located in the southern border of Singapore where classes are offered to FDWs at minimal costs. The Bayanihan Center is also seen

as a safe place for FDWs to meet and gather during days off. Shortly after the human subjects research phase started, a third location, H.O.M.E., was added to supplement FDWs' participation. H.O.M.E is a humanitarian organization that responds to the special needs of migrant communities. H.O.M.E. also provides classes to FDWs at a central location in Singapore.

A total of 118 surveys were compiled. Forty-eight surveys were collected from Lucky Plaza, another 46 were collected from the Bayanihan Center and 24 were collected from H.O.M.E. The schedule shown in Table 4, outlines the data gathering timeline. During the seven-week data-gathering phase, the researcher independently approached each participant.

Table 4

Research Study - Data Gathering Schedule

Week	Data Gathering Schedule	Surveys Gathered	Running Total
Week 1	March 4 th – 10 th	12	12
Week 2	March 11 th – 17 th	24	36
Week 3	March 18 th – 24 th	15	51
Week 4	March 25 th – 31 st	23	74
Week 5	April 1 st – 7 th	17	91
Week 6	April 8 th – 14 th	12	103
Week 7	April 15 th – 21 st	15	118

During the mall intercept sessions, prospective participants were approached. A brief one-minute explanation of the research was provided and the prospective participants were asked if they were interested in taking the survey. Two large signs were displayed near the researcher. One sign read, “Are You a Foreign Domestic Worker?” The second sign read, “Fill out a survey and get a FREE gift!” Additionally, the survey introduction letter, shown in Appendix A, was displayed. If the prospects

approached were willing to fill out the survey, the researcher provided directions to the participants before starting. The surveys were handed to each participant on a clipboard. Each individual was provided a pencil with an eraser. The participants were to answer the questions individually and return the surveys before departing. The researcher did not provide assistance of any kind during the filling out of the survey. When the participants were finished, the researcher reviewed each survey to make sure all the questions were filled out and provided each participant with the free gift. A stylish flashlight pen was used.

Data Collection Method

The tool chosen for data collection is critical to any research study. Telephone, mail, and Internet surveys were ruled out as possible gathering instruments for this research due to the difficulties in finding needed contact information such as addresses, phone numbers, and/or e-mail addresses of a large enough sample population of FDWs. Therefore, an in-person survey was chosen as the instrument to gather human research data. The survey, provided in Appendix B, is divided into three sections: 1) information gathering questions, 2) a resource/technology questions and, 3) demographic questions.

The information gathering section included both, open and closed ended questions. Here, participants were given the opportunity to disclose the types of information they customarily seek in a day-to-day basis on various subjects such as legal, personal and cultural perspectives. This section provided the benchmark for the type of information that is most frequently requested by this population. Examples of questions or data required by FDWs might include, status on their work pass, their rights regarding laws and regulations, local events news, and free class schedules.

Additionally, a list of entry points, defined in this paper as the point of access to information from available Information Systems such as web pages, help lines and so forth were ranked by each participant. This data provides insight on FDWs' behavior and further defined which methods of data gathering are more or less accepted by this population.

The second section gathered data regarding respondents' use and access to technology. Questions asking *where* and *how* FDWs were accessing information was gathered to better understand this segment of the population's interactions with technology. Additionally, participants were asked if they owned technology such as cell phones or computers. Participants were given a list of options to better identify their usual access to these technologies even if they did not own them. Additionally, questions regarding use of Short Message Service (SMS) messaging were also included in the survey. Data collected from the personal interviews discussed in Chapter 1, suggested that SMS messaging was highly used by FDWs, therefore, some questions about SMS and phone use were asked to validate the data provided by representatives from H.O.M.E. and TWC2.

The last section focused on FDWs demographic information. This section facilitated the collection of participants' age, education levels and self-appraisals of English language proficiency. This section was placed at the end of the survey to ensure the early questions receive the most attentive consideration. After compiling all survey feedback, the data was analyzed by age group, level of education, and English fluency to examine possible differences between access patterns to available Information Systems.

To test reliability and validity of the survey, a small-scale preliminary study, also called a pilot test, was utilized to analyze the meaning, as well as the consistency of questions. Pilot testing is commonly used when an instrument or method of data collection is being used for the first time or for the first time with a particular group. This trial run can uncover potential problems before they become costly mistakes. The pilot tests provided information on how long data collection could be expected to take and how participants would react to the survey.

Survey validity is usually determined by how well the tool measures the concepts it is intended to measure. Executing a pilot test provides the researcher with an opportunity to compare individual answers from respondents who completed the trial survey to analyze both reliability and validity of the tool. The pilot test was executed with 11 FDWs. These participants answered the survey in the same manner that was intended off the larger test population. After the surveys were compiled, individual interviews were performed with each participant to discuss each question and answer to ascertain that the feedback generated was adequate.

Written surveys yield clear and straightforward analysis of the data tabulated. Written surveys also have the added benefits of being familiar to most people therefore generally, not making participants apprehensive. Additionally, surveys reduce bias from the researcher's own opinions as there are typically no verbal or visual clues to influence the respondent. On the other hand, written surveys usually result in low response rates. Yet, by conducting the research in person and on location, this limitation was not a factor. Another disadvantage of a written survey is the possibility of respondent's low reading and writing skills. This factor was addressed by writing the

survey at a basic reading level and focusing on multiple choice or ranking questions although some fill in the blank questions were utilized (Saris & Gallhofer, 2007).

Instrument Validity

The survey used in this research was developed from scratch and evaluated for validity. According to Saris and Gallhofer (2007), formal definitions of validity include four components: face validity, content validity, construct validity, and criterion-related validity (Saris & Gallhofer, 2007). A survey or research tool according to the authors has face validity if it is well organized and clear. Face validity can be determined by the researcher before the survey is deployed to research subjects. A survey has content validity if the questions relate to the subject matter of the study. A survey with criterion-related validity is directly comparable with other data gathered regarding that same subject; for example FDWs who have no access to technology and no days off should not have high instances of access into the e-government Information Systems. And finally, a survey has construct validity, if the tool measures what it is intended to measure, in this case, instances (*how often*) and methods (*how*) that define FDW's access to information technology (Saris & Gallhofer, 2007).

To maximize the survey validity, questions were worded so that their meaning was the same to each respondent. When FDWs read the questions each question should be clear and organized in such a way that their responses are not fragmented and the data can be meaningfully utilized and analyzed by the researcher. For this reason most of the questions were written to be multiple choice or scaled questions, although open ended questions were used to gather behavioral data. The reliability of a survey versus its validity according to the authors differs in that a reliable survey obtains the same

data in repeated observations. Different responses to the same question can be then assumed to be based on different respondents not in different interpretations of the questions. As such, question wording is critical in establishing survey reliability (Saris & Gallhofer, 2007).

As it is extremely important for the research tool to have high degrees of reliability and validity. The pilot study was utilized to determine the reliability and validity of the tool. A representative sample of 11 individuals from the target population was used to validate the survey. After participants completed the 22 question survey, an interview with the subjects took place. Each question was discussed to verify clarity of meaning and reliability of responses gathered as well as language used. The pilot test brought up the need to make a few minor changes. After modifications were made, the final survey contained 27 questions. Detailed discussion on the changes to the pilot test are discussed in Chapter 4.

Research Methods to be Employed

Descriptive research methodology was used to collect Foreign Domestic Worker's data regarding their interactions and access of Information Systems. Collections of quantitative data provided a benchmark knowledge base of this segment of the population and their use of technology. This data was tabulated along a continuum in numerical form. Additionally, qualitative data was also collected as participants were required to answer open ended questions which provided the researcher with patterns of interaction when using technology to gather information. This data describes events concerning FDWs' information gathering processes and their actual use of technology. The data was organized, tabulated, analyzed, and summarized

to provide a clear representation of where, when, and how FDWs data access interacts with technology.

As this research depicts the formal study and benchmark of FDWs' access and use of Information Systems in Singapore, statistical methods, in the form of descriptive statistics were used to describe and summarize data collected. Descriptive studies allowed the researcher to summarize data such as measures of central tendency including the mean, median, mode, and deviation from the mean as well as, variation, percentage, and association between variables. Since most of the questions in the survey were quantitative, information was tabulated along a continuum in numerical form to provide a behavior trend in the FDWs' use of technology.

Institutional Review Board (IRB)

Because this research involved gathering data from human subjects, an IRB (Institutional Review Board) approval process was required. The purpose of an IRB review is to assure that appropriate steps are taken to protect the rights and welfare of humans participating as subjects in a research study. One of the major ethical issues concerning a human research study is subject vulnerability. Subjects are seen to be vulnerable if they are coerced into participating in a study or if they belong to a group that are susceptible to higher risk than others such as prisoners, pregnant women, children, or the emotionally impaired.

The subjects in this research were adult women who were approached at public locations and participated in the study on a voluntary basis. The subjects could decline the invitation to participate as well as stop taking the survey at any time. As the research was confidential and anonymous, the names of the participants were not requested. The

only personal information gathered was general demographic data to help the researcher analyze and present results at a later time.

This research as stated previously took place at three separate locations Lucky Plaza, the Bayanihan Center and H.O.M.E. The data-gathering phase lasted seven weeks. By using the mall intercept method, the following steps were taken:

1. After approaching subjects on location, the researcher verbally described the research to prospective participants. The researcher then asked the potential subjects if they would be willing to answer a 15 to 20 minute survey. If the subject responded negatively the researcher moved on to locate a new prospect. If the subjects were willing to participate in the study the researcher provide the Survey Introduction Letter (Appendix A), which obtains additional details on the research.

2. If the participant agreed to participate in the study the researcher introduced the survey as follows:

- a. The survey contains 27 questions and takes approximately 15 to 20 minutes to complete.
- b. The survey is part of a research dissertation study.
- c. The survey is anonymous which means participant's names are not required and no records will be compiled or tracked regarding the identity of the participant.
- d. The survey relates to subject's access, use and ownership of technology.
- e. After 100% completion of the survey each participant will receive a thank you gift.

f. The participants can stop taking the survey at any time, but the gift can only be collected if the survey is 100% completed.

3. Once the survey is completed the researcher will verify that all answers were provided.

Resource Requirements

Table 5 outlines the resources that were required for the study:

Table 5

List and Cost of Resources Needed to Execute the Study

Count	Item	Use	Cost per Item	USD Total
1	Recruitment Sign 3” by 2”	To prominently display the study	\$15	\$15
15	Clipboards	Provided to each participant	\$3.50	\$52.50
2	Boxes of pencils with erasers	Provided to each participant	\$4.80	\$9.60
150	Seven page - color surveys	Provided to each participant	\$1.05	\$158
150	Flashlight Pens	Survey gift for participants	\$1.00	\$150
2	Gifts	Appreciation to Home and Bayanihan Center	\$20	\$40
Total				\$425.10

In this study, FDWs who were present at three data gathering locations in Singapore were asked to participate in the research by filling out a survey. The locations were 1) Lucky Plaza, a mall located at 304 Orchard Road, Singapore, 238863. 2) The

Bayanihan Center, a non-government organization that aims to promote skills upgrading among Filipino workers, located at 43 Pasir Panjang Road, Singapore, 118503. 3)

H.O.M.E. the Humanitarian Organization for Migration Economics whose classes are given at 25 Paterson Road. Singapore, 238510. A request for permission to conduct the survey was presented and approved by all locations. The criteria for the sample population is as follows:

- a. Participants must be a FDW, who is currently employed.
- b. Participants must be 22 years old or older as legally no FDWs can apply for a Singapore work pass unless she is 22 years of age.
- c. Participants can be of any country of origin.

Summary

Insights uncovered through this benchmark analysis, provide a pool of formally validated quantitative and qualitative information which can be extremely useful in designing and implementing Information Systems or ICTs for the disfranchised population. As noted throughout the review or literature, there are opposing views regarding technology's use, acceptance, and accessibility; and more importantly on technology's effect on humanity at large.

The ICT optimists highlight the benefits that technology and the Internet could bring, such as:

- Direct involvement of citizens in democracy,
- Access to education resources and
- Utilization of life saving technology during disasters.

However, ICT pessimists indicate that technology and the Internet actually contribute to the increasing inequalities in the world between the information rich and poor, such as the constant need to get more education which the poor cannot afford neither in time nor money. The cost of technology hardware, and finally the lack of the necessary infrastructure to take advantage of technologies in many areas (Al-Ghailani et al., 2009).

As supplementary research is conducted on this study's target population, who can be described as having low levels of formal education and technical skill; innovative ideas on how to provide ICTs to this group, need to be implemented. To provide access to pertinent information, data must be available within the constraints of the users' day-to-day lives, minimizing the demands that are now required; such as long trips to where the hardware and software are located, renting a computer or paying for Internet access, which can be costly; purchasing hardware which may not be an option to people making a few dollars for a day's wage; educating themselves on software tools available which may or may not be in their native language.

Due to the amount of information generated and the demand for information worldwide, there is a continual need to process, store and retrieve information in new ways. Leifer (2008) proposes that designing a system that will be accessible to the non-skilled population means providing a solution that does not require gaining additional skills. This research is a stepping-stone to obtaining data and to improve the design of systems that will aid populations with the same characteristics as FDWs.

Chapter 4

Results

Introduction

This chapter provides an overview of the pilot test and subsequent research study conducted with Foreign Domestic Workers (FDWs) for the purpose of examining and quantifying the Information System technologies that have been established for FDWs in Singapore.

Quantitative descriptions and qualitative analysis presents a descriptive profile of this particular population describing: what Information Systems are available and most commonly accessed by FDWs; how these FDWs access and use available technologies; what types of data are most often requested by FDWs; how age, language and education may impact access and use of Information Systems; and finally which organizations are most successful in disseminating information to this segment of the population.

Additionally, this study examined the data collected through surveys to analyze FDWs' level of acceptance, access, use, and interactions with technology. Significant results from the data collected by the study will be highlighted in this report. Lastly, this chapter concludes with a limitations section, which outlines issues discovered during and after conducting the study.

Pilot Test

The pilot study was designed to test the survey tool and process logistics prior to the larger study. The following were the main objectives for the pilot test:

- To ascertain appropriate language level readability.
- To confirm that participants understood the questions in the survey.
- To check survey tool reliability and validity.
- To verify that there was no need for interviewer intervention during data gathering.
- To certify that the survey tool was effortless to fill out.
- To test that the survey tool could be completed within the proposed time frame of 15 to 20 minutes.

The pilot study was conducted on Sunday, February 20th, 2012 with 11 FDWs who are representative of the population being studied. Each subject was approached at the Lucky Plaza Mall and asked if they might be interested to participate in a research study. If they were interested in participating they were asked to sit on a bench while a few more participants were located. The 11 subjects were actively employed and were available to participate in the study on their day off.

Table 6 shows the demographics of the participants involved in the pilot study. Most of the pilot test participants were in the older range categories, eight FDWs (72%), were in their mid-thirties to mid-fifties while only three (27%), were 35 years old and under. Data corresponding to the participants' education showed a very high rate of FDWs who had attended college. It is worth mentioning that most Filipino FDWs must get a certificate from a "college" in the Philippines to have their application as a foreign maid accepted by agencies in Singapore. To many FDWs, attending college does not mean having a diploma but fulfilling the one-week course required to work

internationally. It is pertinent to explain that as education grades or class classifications in the United States differ from schools in other parts of the world, some of the data collected will have to be analyzed with differing scales.

Table 6

2012 Pilot Study - Foreign Domestic Worker Demographics

Foreign Domestic Workers	Range	Frequency (Out of 11)	Percentage
Age	18-25	1	9%
	26-35	2	18%
	36-45	4	36%
	46-55	4	36%
Education	Primary School	1	9%
	Middle School	--	0%
	High School	2	18%
	Vocational Training	0	0%
	Some College	8	73%
English Proficiency (Self Assessed)	Speak		
	Excellent	--	0%
	Good	7	64%
	Fair	4	36%
	Poor	--	0%
	Write		
	Excellent	--	0%
	Good	10	91%
	Fair	1	9%
	Poor	--	0%
	Read		
	Excellent	--	0%
	Good	10	91%
Fair	1	9%	
Poor	--	0%	
Nationality	Filipino	11	100%

Because the school systems in Indonesia and the United States are comparable, the education questions in the survey were broken down to follow American education structures. Yet, it is important to highlight that if Filipino FDWs surveyed selected

middle school as their highest-grade level achieved, the data would mean that they finished 6th grade in elementary school. Table 7 presents differences between American, Philippine, and Indonesian school systems.

Table 7

Comparison of American, Philippine and Indonesian School Systems

American Grade/Level	American Typical Age	Philippine Grade/Level	Philippine Typical Age	Indonesian Grade/Level	Indonesian Typical Age
Pre-School Kindergarten	5-6	Pre-School Kindergarten	5-6	Pre-School Kindergarten	5-6
Elementary		Elementary		Elementary	
Grade 1	6-7	Grade 1	6-7	Grade 1	6-7
Grade 2	7-8	Grade 2	7-8	Grade 2	7-8
Grade 3	8-9	Grade 3	8-9	Grade 3	8-9
Grade 4	9-10	Grade 4	9-10	Grade 4	9-10
Grade 5	10-11	Grade 5	10-11	Grade 5	10-11
		Grade 6	11-12		
Middle School				Middle School	
Grade 6	11-12			Grade 6	11-12
Grade 7	12-13			Grade 7	12-13
Grade 8	13-14			Grade 8	13-14
High School		High School		High School	
Grade 9	14-15	1 st Year	12-13	Grade 9	14-15
Grade 10	15-16	2 nd Year	13-14	Grade 10	15-16
Grade 11	16-17	3 rd Year	14-15	Grade 11	16-17
Grade 12	17-18	4 th Year	15-16	Grade 12	17-18
Vocational	18-22 (varies)	Vocational	16-20 (varies)	Vocational	18-22 (varies)
College	18-22 (varies)	College	16-20 (varies)	College	18-22 (varies)
University	18-22 (varies)	University	16-20 (varies)	University	18-22 (varies)

On the technology side, none of the FDWs who participated in the pilot test owned a computer, although some had access to one. Yet, every FDW surveyed owned a cell phone. Most participants (73%) sent SMSs or texts at least once a day. Table 8 summarizes pilot study results of FDWs' use of technology. A very high number, 82% of the participants, visited websites such as Facebook, Yahoo, and Google but none of

them mentioned visiting any Singaporean organizations on-line. Additionally, more than half, 64% of the participants said they visited organizations in person. All participants in the pilot test had at least one day off a month.

Table 8

2012 Pilot Study - Foreign Domestic Worker Technology Usage

Foreign Domestic Workers	Frequency (Out of 11)	Percentage
Own a Computer	--	0%
Own a Cell Phone	11	100%
Access Websites	9	82%
Visits Organizations (In Person)	7	64%
Skill Level SMS/Text	Self Assessed	
Beginner	0	0%
Intermediate	4	36%
Expert	7	64%
Frequency of Texts		
10+ per day	1	9%
1-10 per day	7	64%
1-10 per week	1	9%
Five or Less/month	2	18%
None	0	0%

The pilot test took place from 2:00 pm to 4:00 pm on Sunday, February 20th, 2012. The researcher used the intercept method to locate candidates who would be willing to participate. Once enough participants were interested in being part of the pilot test, they were given an introduction to the study and were handed the paper and pencil survey to complete (see Appendix B). The first participant completed the survey on the 12-minute mark and the last participant finished at the 22-minute mark. Only one person out of the 11 participants, Pilot Participant # 2 failed to answer every question in the survey. She skipped 4 out of the 22 questions outlined in the survey. After the

participants were finished filling out the survey, the researcher went through all the questions with the participants as a group, and asked them to share what they thought each question was asking. The participants reviewed all survey questions with the researcher and said that the questions were clear and that they understood what was asked except for question 7 which they stated to be very confusing.

As a result of the pilot test, some changes were made to the final survey to increase the reliability and validity of the tool. Question 7 from the pilot survey, was reformatted into a 4-point Likert scale format. The grid box, which was originally presented to the participants, was confusing and did not provide consistency in the data collected. Questions 10 and 13 in the original tool were re-ordered and formatted so that the data regarding participant's cell phone use could be directly compared to participants' computer use. Question 3 under the demographics section of the survey was also changed to provide an "Excellent", "Good", "Fair", and "Poor" 4-point Likert scale format. Lastly, the survey questions were re-ordered to confirm that questions and sections were clearly aligned and provided the best and clearest presentation to the participants. The pilot study data gathered was not included in the study at large, since several questions in the data collection tool were edited after the pilot study was completed.

Research Study

The formal study was executed from Sunday, March 4th, 2012 to Saturday, April 21st, 2012. In compliance with the mall intercept method, the researcher approached participants at three locations: Lucky Plaza, a shopping mall often visited by FDWs, the Bayanihan Center where FDWs can take classes for very low fees, and H.O.M.E. an

organization that provides a variety of classes and support for FDWs. A large standee recruitment sign stated that the research in progress was restricted to FDWs and that participants would receive a free gift for volunteering. The survey introduction letter, included as Appendix A, was also prominently displayed for the participant's information. If the participants were interested in taking part in the research and had 20 minutes of spare time they were asked to fill out the study survey (see Appendix C). A clipboard and pencil with an eraser was provided for each participant.

Two unexpected factors required the researcher to adjust slightly to gain the 100 participants required. First, construction and renovation of the Lucky Plaza shopping center made for a loud and inconvenient atmosphere hindering the participants' ability to complete the survey comfortably. Additionally, the Bayanihan Center changed their class offerings to be provided only on Sundays, as registration numbers were not large enough to support enrollment for classes during the week. According to an interview with Kate Bosaiu, an employment agent from the AV Manpower Management Agency, the fall in numbers of registrants in classes during the week coincides with many expatriate employees leaving Singapore to return to their home countries (personal communication, March 27, 2009). According to Bosaiu, FDWs working for expatriate employees usually have more flexibility in time than other FDWs. As a result a third location, H.O.M.E., was chosen, where more participants could be located.

H.O.M.E., the Humanitarian Organization for Migration Economics as mentioned in Chapter 1, is a registered society in Singapore that was established to respond to the special needs of foreign communities. H.O.M.E. holds a large range of classes for FDWs. After speaking with the Director, Bridget Tan, the researcher was

given permission to visit their institution and ask students for their participation as they entered or left the premises to attend classes.

A total of 131 surveys were distributed at three locations to attain the 100-desired number of participants. Of the total number of participants approached at these locations and given a survey to complete, 13 (10%) did not complete the survey. These participants started to fill the survey out but a few minutes later stated that they had to leave or that they did not want to complete the survey. A total of 12 visits to the three locations were needed to collect the total number of surveys. Weekend visits to the Bayanihan Center and to H.O.M.E. yielded a high number of participants per session. During the week sessions at Lucky Plaza yielded the least number of participants per session with very few volunteers completing the study at those times.

Communication with the participants was conducted in a clear and organized manner. The researcher did not ask the participants to change any information as the surveys were returned, but all surveys were quickly examined as they were turned in, to ensure that the majority of the questions were answered. When a completed survey was turned in, the free gift, a stylish flashlight pen was given to the participant.

The researcher also had copies of the Survey Introduction Letter (Appendix A) as well as business cards in hand, in case participants wanted to get in touch with the researcher in the future, yet only a few packets were taken. Finally, a thank you letter was sent to the H.O.M.E. office (see Appendix D) as well as to the main office of the Bayanihan Center (see Appendix E) thanking them for their assistance and support in the data-gathering phase of the study.

Participant Demographics

From the 118 participants in the study, the majority belonged to the 26 to 35-age range. There was only one participant from the 56 to 65-age range. The data displayed in Table 9 presents the demographic results from the study and is labeled to identify the number of responses received per category. The data shows that a very high number of FDWs had enrolled or taken classes in college.

As mentioned earlier and as explained by Miss Bosaiu, from the AV Manpower Management Agency, Filipino FDWs are expected to take a one-week class at a local college to get a qualification necessary to work overseas. These colleges are not always accredited, and these results may not represent actual college attendance in the process of acquiring a college degree (personal communication, May 28, 2009). Additionally, Miss Bosaiu stated that potential employers from Singapore, Malaysia, and China, like college education to be listed on their employed FDWs' resume but employment agencies are not required to check their academic legitimacy.

In the English proficiency metric, most participants rated themselves as having a "Good" or "Fair" ability to speak, read, and write English with a smaller percentage representing themselves as having an "Excellent" level of English proficiency. Only one Filipino FDW rated herself as having a "Poor" level of spoken English proficiency and one Indonesian FDW rated herself as having "Poor" reading and writing English proficiencies. The vast majority of the 118 participants (80%) were Filipino; 23 (19%) were Indonesian; and one FDW was from Myanmar. Most of the participants had at least one day off every two months, i.e. one day off every 60 days, but a few reported to not having any days off.

Table 9

2012 Research Study - Foreign Domestic Worker Demographics

Foreign Domestic Workers	Range	Frequency	Percentage (Rounded)		
Age (118 Results)	18-25	4	3%		
	26-35	70	59%		
	36-45	34	29%		
	46-55	9	8%		
	56-65	1	1%		
	66+	0	0%		
Education (118 Results)	Primary School	8	7%		
	Secondary (Middle) School	11	9%		
	High School	33	28%		
	Vocational Training	21	18%		
	Some College	45	38%		
English Proficiency (109 Results)	Speak	Excellent	16	15%	
		Good	59	54%	
		Fair	33	30%	
		Poor	1	1%	
	(104 Results)	Read	Excellent	23	22%
			Good	51	49%
			Fair	29	28%
			Poor	1	1%
(102 Results)	Write	Excellent	18	18%	
		Good	51	50%	
		Fair	32	31%	
		Poor	1	1%	
Nationality (118 Results)	Filipino	94	80%		
	Indonesian	23	19%		
	Myanmar	1	1%		

Participant Access and Use of Technology

Technology results from the study identified 42 FDWs (37%), who reported owning a computer. This number was much higher than expected. Results also showed

that use of computer access point are more evenly distributed than use of cell-phone access points among the options provided in the survey. The following list is a modified version of the actual survey questions (see Appendix C):

- a. ___ Yes, I can use my employer's cell phone/computer.
- b. ___ Yes, I have my own cell phone/computer.
- c. ___ Yes, I can go somewhere to access a cell phone/computer.
- d. ___ Yes, my friend lends me his/her cell phone/computer.
- e. ___ Yes, I own a cell phone/computer but I cannot use it while working/computer.
- f. ___ No, I am not allowed to use my employer's cell phone/computer.
- g. ___ No, I do not own a cell phone/computer.

On the other hand, as expected, the vast majority of FDWs, 113 (96%), of those surveyed reported owning a cell phone. Only five FDWs (4%) reported not owning a cell phone and of these 3 FDWs (60%), reported having no access to a cell phone.

Figure 2 presents the results of computer versus cell phone accessibility by FDWs. The penetration of cell phone ownership within this segment of the population is clearly validated to be very high.

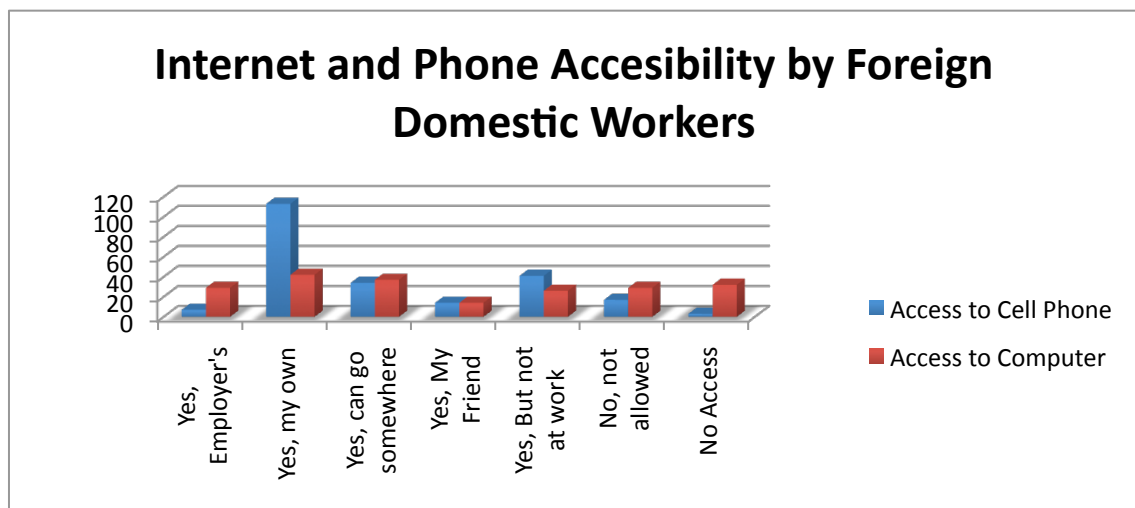


Figure 2. Foreign Domestic Worker Cellular Phone and Computer Accessibility

According to the data gathered, as shown in Table 10, 91 FDWs (77%) stated that they visited sites on the web. The sites more often named in the fill in the black question were Facebook, Google, Yahoo, MOM (Ministry of Manpower), and their national embassy. Additionally, 66 FDWs, roughly two thirds of the participants, stated they visited organizations in person. The data also revealed that the top three organizations visited by FDWs were: 1) MOM with 25 participants (45%), 2) H.O.M.E. with 19 participants (35%), and 3) Employment Agency with 16 participants, (29%). A table with details on identified organizations most often visited face-to-face can be seen in Appendix F.

Table 10

2012 Research Study - Foreign Domestic Worker Technology Usage

Foreign Domestic Workers	Frequency	Percentage
Own a Computer	42	37%
Own a Cell Phone	113	96%
Access Websites	91	77%
Visits Organizations (In Person)	66	60%
Skill Level SMS/Text	(115 Results)	
Beginner	12	10%
Intermediate	46	40%
Expert	57	50%
Frequency of Texts	(118 results)	
10+ per day	58	49%
1-10 per day	34	29%
1-10 per week	17	14%
Five or Less/month	6	6%
None	3	3%

According to the data gathered through fill in the blank question number six, the main reason that keeps FDWs from visiting organizations in person was identified to be the lack of time to do so, or the fact that the offices were closed on Sunday, which is the only day the FDW had to run personal errands. A few FDWs stated that the reason they did not visit organizations in person was because they were shy. In relation to technical expertise, 50% of the FDWs rated themselves as being experts at cell phone SMSing or texting. Forty-nine percent of the participants sent more than 10 SMSs or texts per day.

Data Preparation

The survey tool used for the research had 20 data gathering and technology usage questions and seven demographic questions as shown in Appendix C. When all questions were broken up there were a total of 107 data points obtained from each survey. Each data point response was then entered into a Microsoft Excel spreadsheet. The questions were labeled in rows and the respondents' answers were labeled as columns. Two tabs were used to analyze the data. The first is a "numeric" tab where the answers were given a number value. The second, a "text" tab, was used to key in all other answers that could not be converted into numeric values such as short answer questions or address information.

Data Gathering and Technology Usage

Survey questions 1 and 2 were both rank order-scaling questions where the participants had to order their answers to represent their preferences from 1 to 6. Question 1 requested participants to order answers by the method most commonly used to gather information when provided a list of six data gathering options. The list also had a blank space in case the participant wanted to add an option that was not already

listed. For ranking purposes, number 1 signified the first or preferred method of data gathering the participant would use to find information they were seeking. Number 6 in this scale would signify the method least used to gather information. Correspondingly question 2, requested the participants to order answers regarding what sources of information that were most commonly used when provided a list of six options that were pertinent to them. This question also had a fill in the blank option if the participant wanted to add a source of information not already listed. The question options were formatted similarly to question 1, and were ordered in numbers 1 through 6. Number 1 signified the source, be it location or organization, most often visited to gather data. Number 6 signified the source least often visited by participants to gather data. These results were entered in the “numeric” tab.

Question 3 in the survey tool was a short answer question requesting qualitative information regarding websites, which were most often visited by FDWs. If FDWs did not visit any websites, the participants would then answer question 4, another open-ended short answer question where the participants could explain why they did not visit websites. These results were entered into the “text” spreadsheet tab and were analyzed manually. This data and results are presented later in the chapter.

In the same manner, question 5 was a short answer question, requesting participants to fill in the names of organizations they visited most often. Question 6, correspondingly, was an open-ended fill in the blank question where FDWs were to explain why they did not visit organizations in person if question 5 was left blank. These results were also entered into the “text” spreadsheet tab and were analyzed manually. The results for questions 3 through 6 are presented later in this chapter.

Question 7, which included a list of 15 topics of interest to FDWs, was analyzed to validate participants' interest in different topics. Participants were asked to rate each topic in question form, with the appropriate number from 1 to 3. Number 1 indicated that the FDW had asked that question or a similar question in the last year. Number 2 indicated that the question or a similar question had not been asked by the FDW in the last year. Finally, number 3 indicated that the FDW was not sure if she had or had not asked the question in the past year. This data was entered into the "number" tab as numbers "1", "2", and "3".

Questions 9 through 14 were 4-point Likert scale questions that rated the data received from six information sources: friend, employer, employment agency, national embassy, government, and non-government organizations. These questions provided the perceived quality of information received from each one of the main sources in the areas of Correctness, Clarity and Usefulness. The results were numbered 1 through 4 and entered in the "number" spreadsheet tab.

a.	Absolutely Correct 1	Somewhat Correct 2	Somewhat Incorrect 3	Incorrect 4
b.	Absolutely Clear 1	Somewhat Clear 2	Somewhat Confusing 3	Confusing 4
c.	Absolutely Useful 1	Somewhat Useful 2	Somewhat Not Useful 3	Not Useful 4

Questions 15 and 16 displayed a list of 12 organizations that provide information and services to FDWs. In question 15, the participants were asked to identify, from the list of 12 organizations, the ones they had heard of or recognized. In question 16 participants were asked to identify which organizations they had ever used. Each organization was classified by obtaining a "1" (true) or a "2" (false) rating. The true rating signified that the FDW had indeed heard of or used the organization and the

rating false indicated that the FDW had not heard of or used the organization. The answers were tabulated in the “number” spreadsheet as being true or false.

Questions 17 and 19 were developed to ascertain FDWs’ access to computers and cell phones. These questions were worded similarly, each with 7 options, which allowed a clear comparison between access points for both technologies. These results were also converted to true and false entries with “1” (true) and “2” (false) ratings. Questions 18 and 20 were related to texting and were used to gather participants’ self-perception of SMS and text skill level, as well as frequency of text messaging.

Demographic Data

Questions 1 through 7 of the personal information section were demographic in nature and were used to look for relationships among the 20 data gathering and technology usage questions. The data was examined to find associations if any, between the factors collected such as age, education, and English proficiency compared with access to the Internet, SMS skill levels, or types of technology used by FDWs to access information.

The last survey question was a short answer question that required the participants to write down the general area of Singapore where each resides. This data was entered into a Google map shown in Figure 3, which clearly shows the areas of Singapore that were represented in the study (Boesch, 2012).



Figure 3. Residence Location Map of Foreign Domestic Worker Survey Participants

Analysis and Findings

Findings from the study are presented below in order of the survey questions. As such research questions 1, 2 and 4 which represent data regarding what Information Systems are most commonly accesses, what types of technologies are used and a view to FDWs age language and education are presented together and in a matrix compare and contrast format. Research questions 3 and 5, which provide findings on the types of data and organizations used by FDWs are presented at the end.

The data presented below can provide insights to gain a better understanding of FDWs behavior and to see if these FDWs are experiencing Technology Neglect or if they are able to access, use and adopt technology as it changes and advances. The analyzed data as shown in the radar chart (see Figure 4), presents the most frequently used methods of gathering information by FDWs. The results closer to the edges of the radar chart show FDWs' preferred options, those chosen as 1st 2nd or 3rd. The results closer to the center show FDWs' least preferred options, those chosen as 4th, 5th and 6th.

The top chosen options by FDWs were non-technological options: 1) “I ask someone face-to-face”, and 2) “I call a friend”. The third highest chosen option was a technical option: 3) “I call a help-line”.

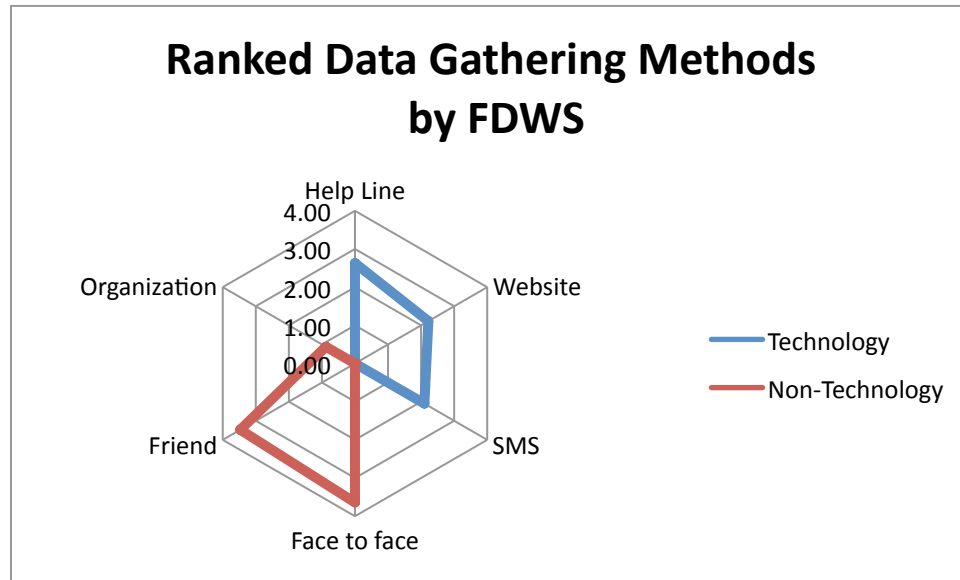


Figure 4. Data Gathering Method Preferences by Foreign Domestic Workers

Methods of Gathering Information

When these same data points are cross analyzed with age, education, and English proficiency, there are a few interesting results. The age data ranges used in question 1 of the demographic section of the survey were: 18 to 25, 26 to 35, 36 to 45, 46 to 55, 56 to 66, and 66+. There were no participants who belonged to the 66 and over age range category so that range was left out of the data analysis. Furthermore, as there was only one participant from the data range 55-66, her data was also excluded in this section so that analysis could focus on the majority of the participants.

The education level ranges used in question 2 of the demographic portion of the survey (see Table 9 and Appendix C) are: Primary School, Secondary School, High School, Vocational Training and College. Lastly, the English proficiency question

requested that the participants self-assess their English speaking, reading, and writing proficiency by answering the “Excellent”, “Good”, “Fair”, and “Poor” 4-point Likert scale provided in question 3 of the demographic portion of the survey.

Although the data can be presented in multiple formats, the following figures will display choices FDWs deemed number one or two as they ranked the six *methods* options of gathering data listed in question 1. Options listed as the first and second choices, are for the purposes of this research, viewed as the most often used methods of finding information. The choices listed as fifth and sixth are the least used methods of gathering information. Figure 5, displays how the preferred rankings of the *methods* used by FDWs are broken down by age. The preferred methods to gather information are consistently shown to be asking questions ‘Face-to-Face’ or asking a ‘Friend’ yet there are a few interesting results.

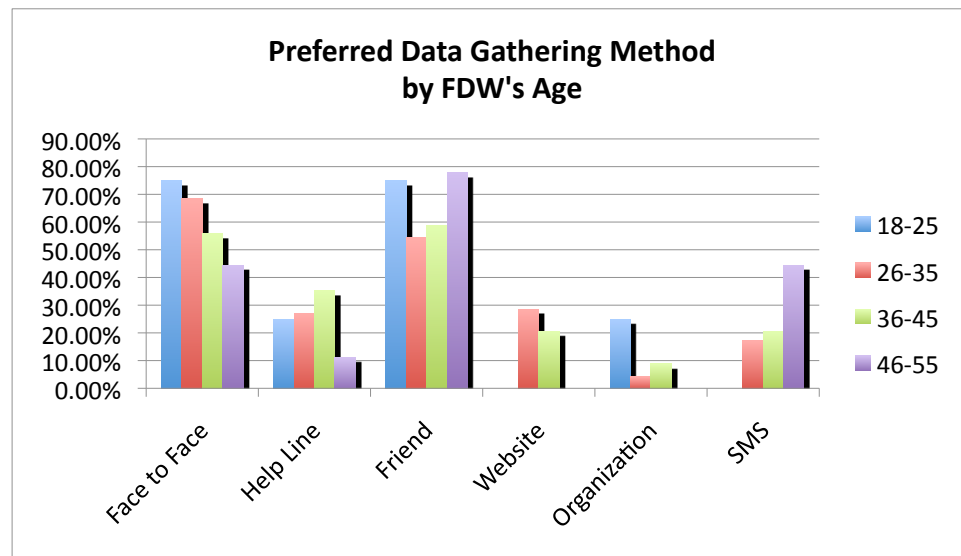


Figure 5. Preferred Data Gathering Method by Foreign Domestic Worker Age Range

Although the total number of FDWs in the 18 to 25 age range is proportionately smaller to the other sections, no FDWs in the younger or older age range preferred

accessing the website as their first or second choice. Also, none of the members of the older age range choose “Organization” as their top method for gathering information. Yet, what is more interesting is that from the entire pool of FDWs, it seems that the older age range grouping is the one that prefers sending SMS or Texts. This data shows that as FDWs age they feel more comfortable sending SMSs and texts and consequently the older the FDW the less they depend on the “Face-to-Face” method of acquiring information.

The results for question 1 (Appendix C) which asked FDWs to rank their preferred *method* of gathering information from a list of six options (Face-to-Face, Help-Line, Friend, Website, Organization, and SMS) was also analyzed by FDWs’ levels of English proficiency, through spoken, written, and reading self-assessments captured in a 4-point Likert scale of “Excellent”, “Good”, “Fair”, and “Poor”. As only two FDWs chose the option of “Poor” for the English proficiency question the analysis that follows does not include the results for the “Poor” option.

The data shown in Figure 6, provides a look at FDWs who self assessed themselves as having “Excellent”, “Good”, or “Fair” *spoken English proficiency* skills. This data was then mapped to their preferred methods of gathering information. According to the results it can be surmised that those FDWs who rated themselves as having “Excellent” spoken English proficiency rely more on their spoken ability to seek information thus relying less on technology.

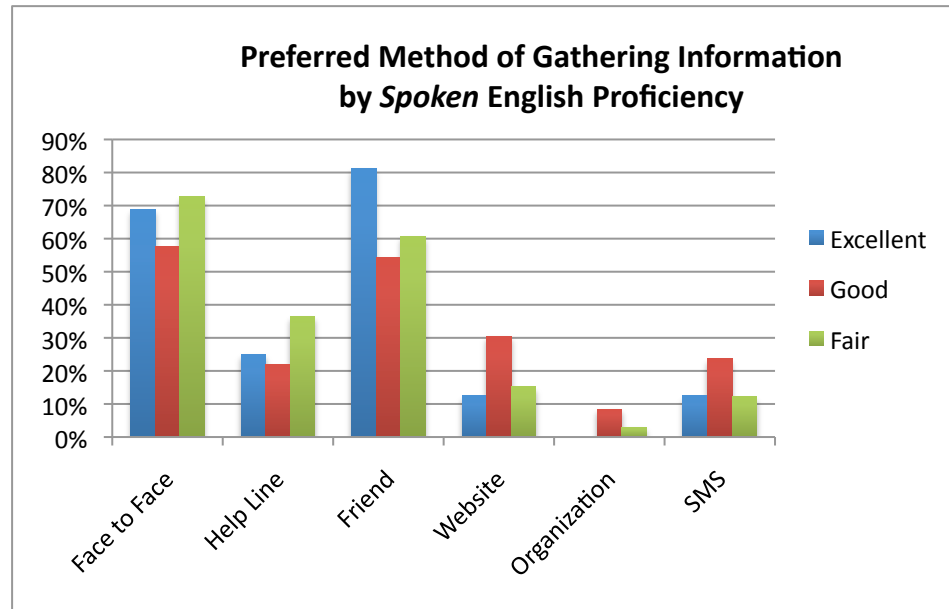


Figure 6. Preferred Data Gathering Method by Foreign Domestic Worker’s Self – Assessed Spoken English Proficiency

These FDWs tend to ask a “Friend” or gather data “Face-to-Face” yet none of them chose “Organization” as their first or second choice of gathering data. The data shown in Figure 7, presents the data of FDWs who self-assessed as having “Excellent”, “Good”, or “Fair” *reading English proficiency* skills. Data shows that FDWs who stated that they were “Fair” readers are 50% more likely to choose “Face-to-Face” as their preferred method of gathering data than those FDWs who self-assessed themselves as “Excellent” readers.

Additionally, if FDWs assessed themselves as “Excellent” readers, they were three times more likely to choose SMS as their preferred method to gather information compared to FDWs who self-assessed themselves as “Fair” readers. Therefore, the higher the self assessed reading proficiency by the FDW the higher their use of SMS and texting.

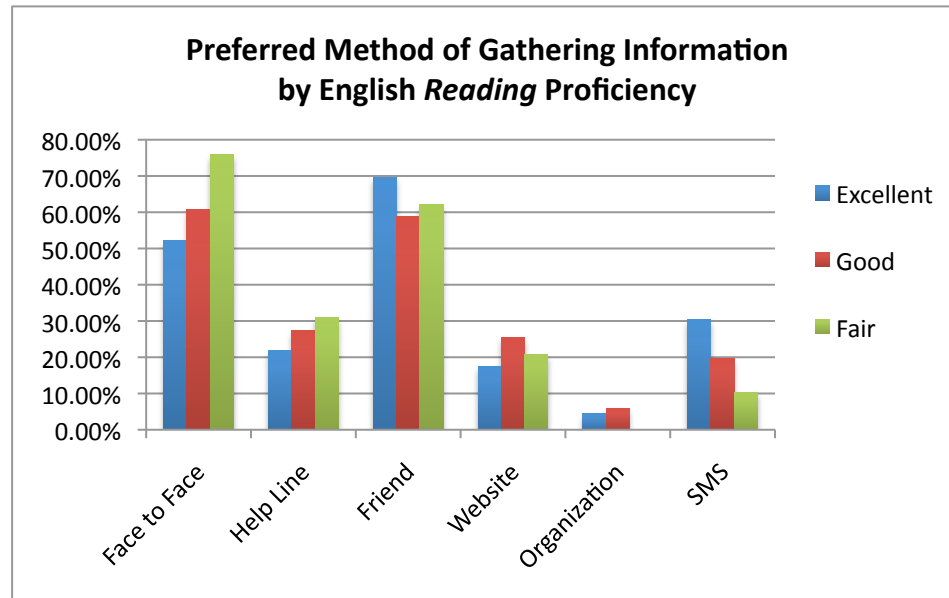


Figure 7. Preferred Data Gathering Method by Foreign Domestic Worker’s Self – Assessed Reading English Proficiency

A trend for “Help-Line” and “SMS” usage is clearly seen as well. The higher the FDWs’ self-assessed rating on reading proficiency, the lower their admitted use of “Help-Lines”. This data may seem to show that proficient English readers stay away from calling help-lines where they have to verbally explain themselves. On the other hand the higher the FDWs’ self-assessment on reading proficiency, the higher their use of SMS. This data would seem to suggest that proficient English readers feel more comfortable receiving information through SMSs. Lastly, it can be seen that those FDWs who rated themselves as having a “Fair” English reading proficiency tend not to use “Organizations” as their preferred method of acquiring information.

Data results shown in Figure 8, presents methods of data gathering compared to FDWs who self-assessed themselves as having “Excellent”, “Good”, or “Fair” *written English proficiency* skills. The data showed that the higher FDWs rated their ability to write, the less likely they were to choose “Face-to-Face” and “Help-Line” as a preferred

method of information gathering. Moreover, the higher FDWs rated their ability to write the more likely they were to use SMS as a method to gathering information.

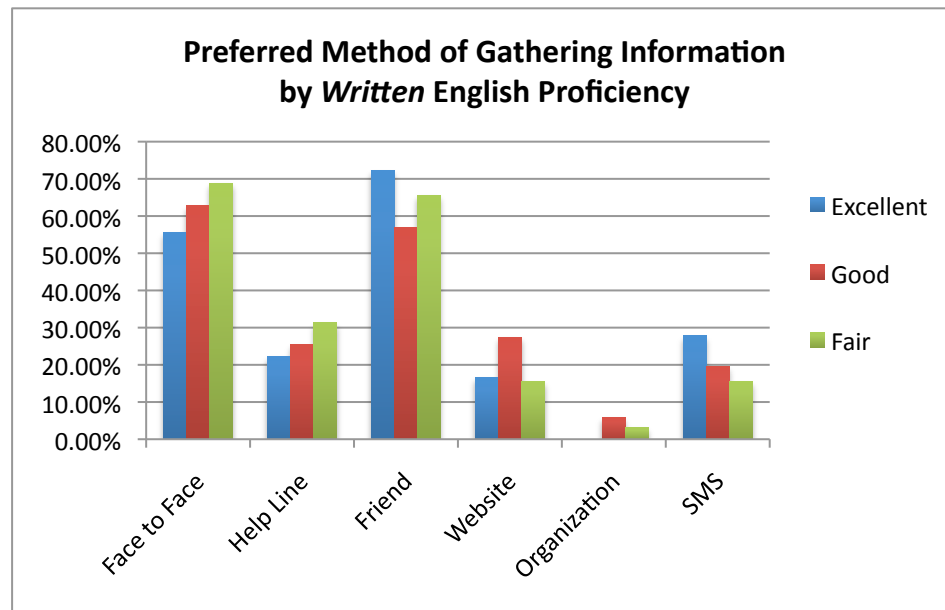


Figure 8. Preferred Data Gathering Method by Foreign Domestic Worker’s Self – Assessed Written English Proficiency.

Data Gathering Sources

Survey question 2 requested FDWs to rank and order their preferred sources of information from a list of six options (friend or family, FDW, agency, government organization, national embassy, and NGOs). These data points were cross analyzed with age, education, and English proficiency. Figure 9, displays how the preferred rankings of the *sources* used by FDWs are broken down by age. The preferred sources of information are shown to be “Friend” and “Agency” which are consistent with FDW behavior established in question 1 where ‘Face-to-Face’ or asking a ‘Friend’ were the preferred methods of gathering information. FDWs in the 18 to 25-age range are 127% to 257% more likely to use government organizations as a source of information when compared to other FDWs in separate age ranges.

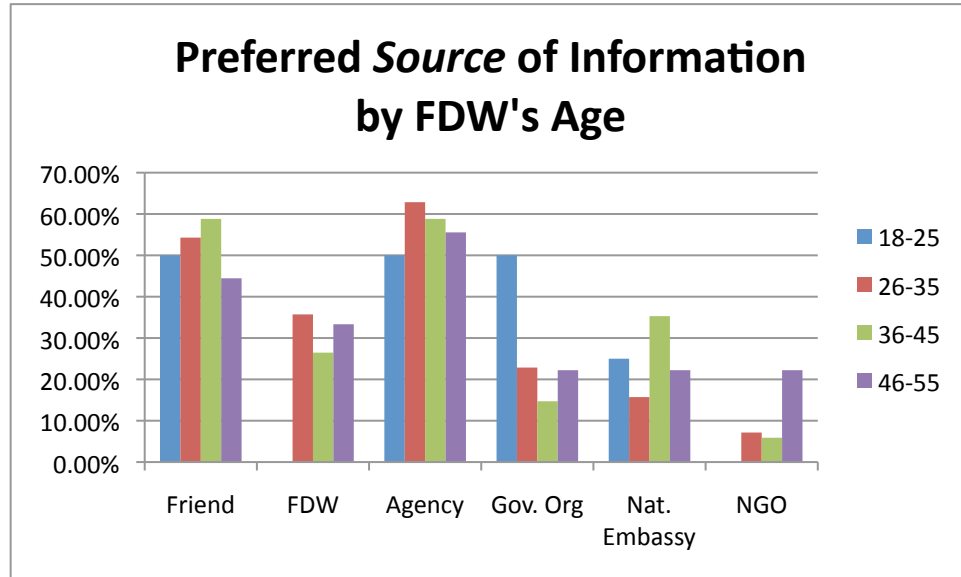


Figure 9. Preferred Source of Information by Foreign Domestic Worker Age Range

The results for survey question 2 (Appendix C) which asked FDWs to rank their preferred *source* of information from a list of six options (Friend, Other FDW, Agency, Government Organization, National Embassy, and NGOs) was also analyzed against FDWs' levels of English proficiency obtained through spoken, written, and reading self-assessments measured by an "Excellent", "Good", "Fair", and "Poor" 4-point Likert scale. As previously explained, the data for the single FDW who chose option "Poor" for the English proficiency question, was not included in the analysis. The data shown in Figure 10, provides a look at FDWs who self-assessed themselves as having "Excellent", "Good", or "Fair" spoken English proficiency skills, mapped to their preferred *sources* of gathering information.

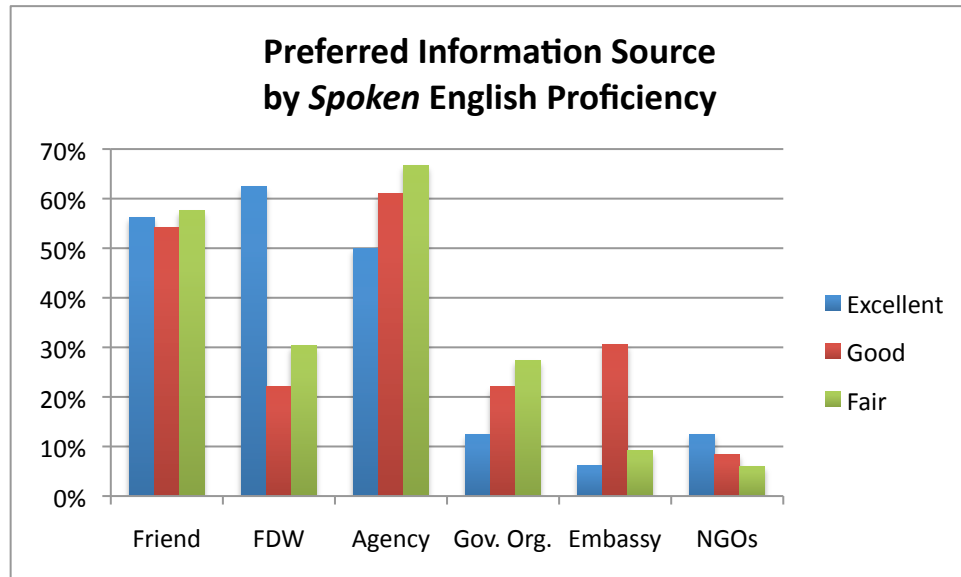


Figure 10. Preferred Information Source by Foreign Domestic Worker’s Self-Assessed Spoken English Proficiency

The data shows a trend in that the better a FDW speaks English, the less likely she is to rely on employment agencies and Government Organizations as a source of information. At the same time, if the FDW believes her English spoken skills are only “Fair” she will rely more on employment agencies and Organization at large to find information she needs. Once again, the data shows that if the FDW self-assessed herself as being a “Good” speaker; she uses her national embassy more than other FDWs survey. The data also shows that if a FDW believes herself to have “Excellent” spoken English proficiency, she is 110% to 186% more likely to ask other FDWs about information she is seeking.

The results shown in Figure 11, presents the data of FDWs who self-assessed themselves as having “Excellent”, “Good”, or “Fair” *reading* English proficiency skills with their corresponding answers for survey question 2 (see Appendix C). Data shows that FDWs who stated they were “Excellent” readers are much less likely to use

employment agencies as a source of information compared to those FDWs who self-assessed themselves as being “Good” or “Fair” readers. FDWs who assessed themselves as being “Good” or “Fair” readers mainly use employment agencies and friends as sources of information, while “Excellent” readers can be seen to be more evenly distributed across all information source options.

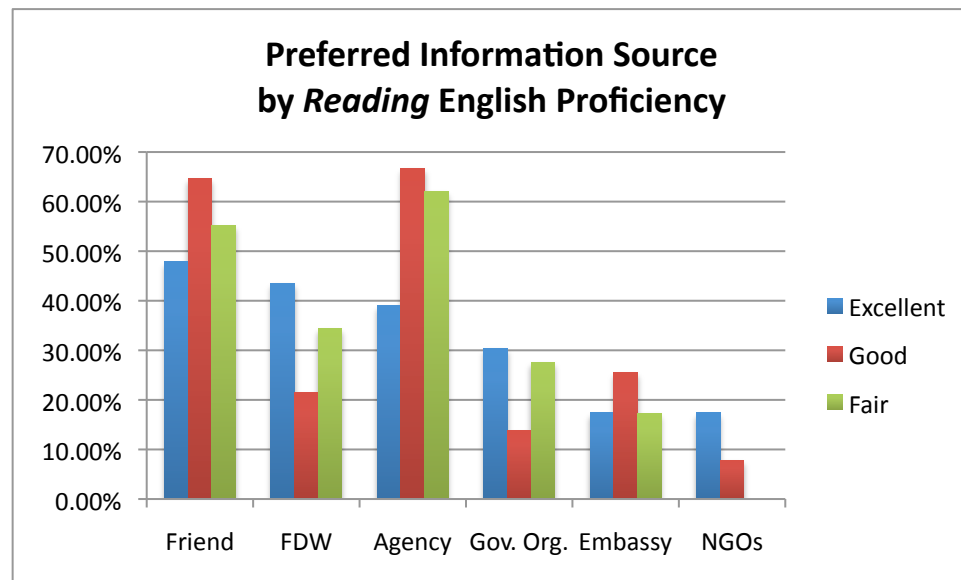


Figure 11. Preferred Information Source by Foreign Domestic Worker’s Self–Assessed Reading English Proficiency

Data results shown in Figure 12, presents the results of FDWs who self-assessed themselves as having “Excellent”, “Good”, or “Fair” *written* English proficiency skills compared to their corresponding answers for survey question 2 (see Appendix C). The data shows that the higher FDWs rated their ability to write, the less likely they were to use a “Friend”, their employment “Agency” or their national “Embassy” as a source of information. Yet, these same FDWs were more likely to gather information from Government Organizations.

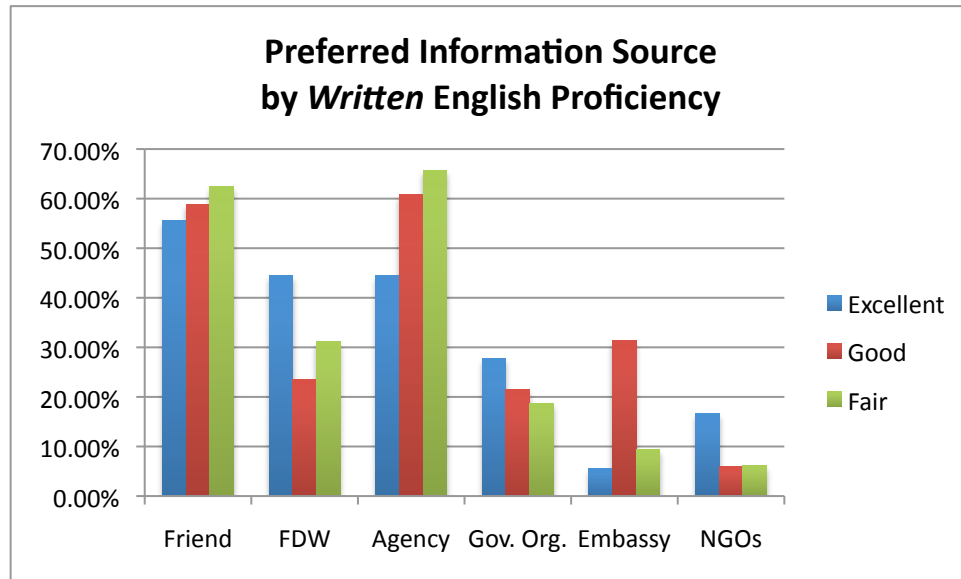


Figure 12. Preferred Information Source by Foreign Domestic Worker’s Self–Assessed Written English Proficiency

Survey data also shows that NGOs are a preferred source of information mostly among those FDWs who self-assessed themselves as having an “Excellent” spoken, reading, or written level of English proficiency.

Figures 13 and 14 represent education results for FDWs as they are compared with survey questions 1 and 2. The results in Figure 13 present which methods of gathering information are preferred by FDWs when compared with their education levels. The data shows that FDWs with primary degrees are just as likely to use a help line than those FDWs who stated they had attended college. Additionally although those who attended secondary school, high school or vocational school were more likely to use help lines the overall distribution was flat. As expected FDWs who attended secondary, high school or college were more likely to SMS when compared to FDWs who only attended primary school. Again the use of organizations to gather information was very low across the board.

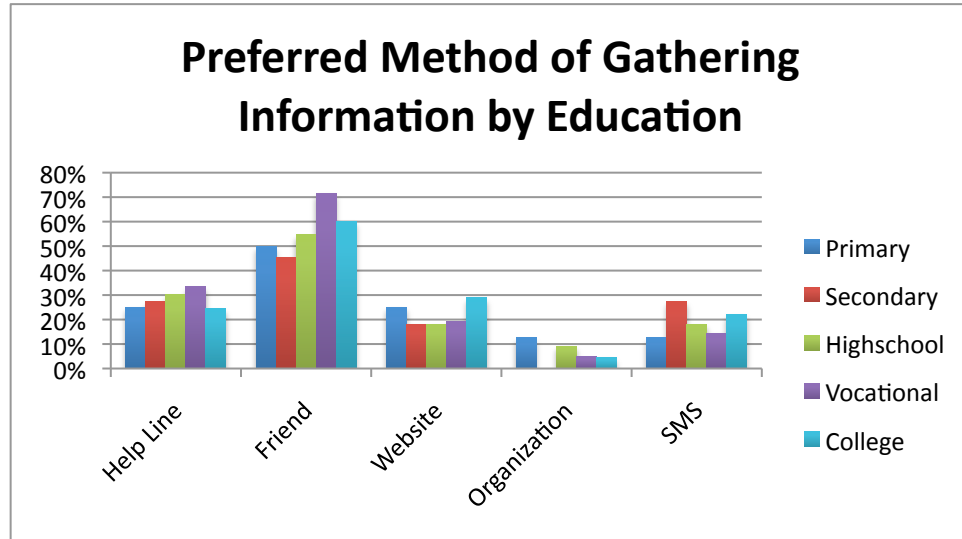


Figure 13. Preferred Data Gathering Method by Foreign Domestic Worker's Education Level

The results in Figure 14 present which sources of information are preferred by FDWs when compared with their education levels. It is interesting to point out that FDWs with vocational training were more likely than the rest of the FDWs to use their embassy or organizations as sources of information.

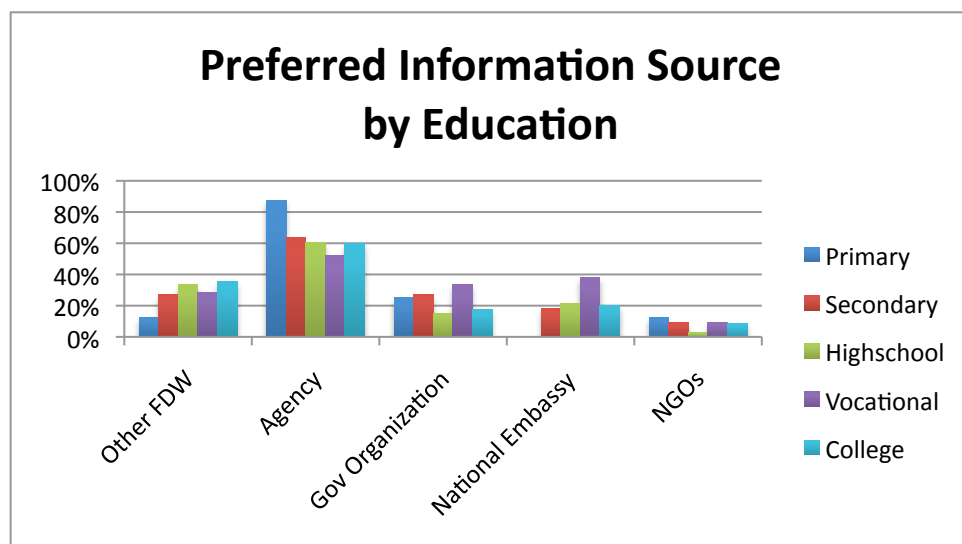


Figure 14. Preferred Information Source by Foreign Domestic Worker's Education Level

The results from survey question 7 (see Appendix C) were based on the list of 15 topics related to FDWs' interests. Participant's ratings of each topic are depicted in Figure 15.

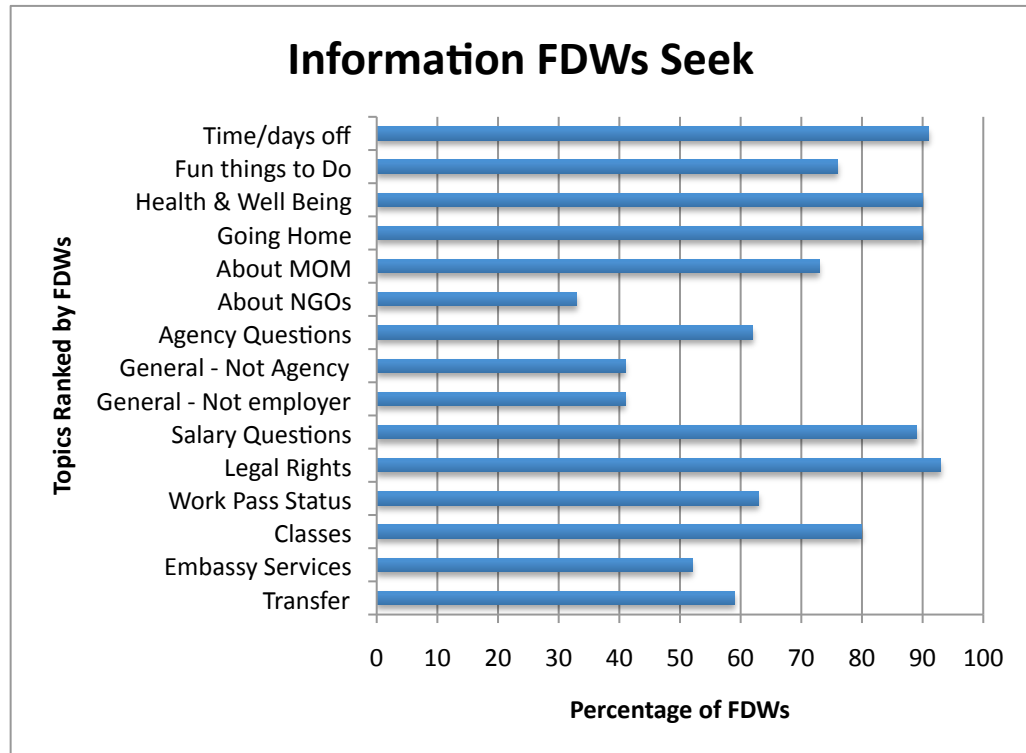


Figure 15. Topics of Interest Ranked by Foreign Domestic Workers (FDWs)

The questions most often asked by FDWs were:

- “Questions about time/days off”
- “Questions about health and well being”
- “What rights do I have as a Foreign Domestic Worker?”

The questions least often asked by FDWs were:

- “Questions about non-government organizations”
- “General questions I don’t want to ask my employer”
- “General questions I don’t want to ask my agency”

Survey questions 9 through 14 (see Appendix C) asked participants to rate data or information they received from a list of six sources (Friend, Other FDW, Agency, Government Organization, National Embassy, and NGOs). Each source of information was ranked by how FDWs perceived the answers' correctness, accuracy, and usefulness through a 4-point Likert scale. FDWs' answers are shown in Table 11.

Table 11

Foreign Domestic Worker's Perceived Correctness, Accuracy, and Usefulness of Information Sources

Source	Top Responses	No. of Responses	Percentage
Friend	Somewhat Correct	72 of 114	63%
	Somewhat Confusing	42 of 106	40%
	Somewhat Useful	59 of 105	56%
Employer	Absolutely Correct	57 of 114	50%
	Somewhat Clear	45 of 103	44%
	Absolutely Useful	52 of 103	50%
Employment Agency	Somewhat Correct	50 of 112	53%
	Somewhat Clear	43 of 102	42%
	Somewhat Useful	52 of 101	51%
National Embassy	Absolutely Correct	63 of 111	57%
	Absolutely Clear	52 of 99	53%
	Absolutely Useful	59 of 97	61%
Government Organization	Absolutely Correct	56 of 114	49%
	Somewhat Clear	44 of 100	44%
	Absolutely Useful	51 of 101	50%
Non-Gov organization	Somewhat Correct	65 of 105	62%
	Somewhat Clear	54 of 103	52%
	Somewhat Useful	55 of 100	55%

It is important to note that there are a varied number of responses for each question in this section. The differences in the number of responses can be explained in

several ways. First, if the participants did not have experience asking questions from a given source, the section was left blank. Second, if the participants could not recall the last interaction with a given source, the questions were also left blank. And finally, some participants might be experiencing fatigue by this portion of the survey and left the questions blank.

When the data was analyzed individually, information from “Friend” had the most picks for perceived as “Somewhat Confusing” while information from the national embassies was perceived as “Absolutely Correct”, “Absolutely Clear” and “Absolutely Useful”. Information from the “Employer” and “Government Organizations” were next in perceived correctness, clarity, and usefulness to FDWs.

Survey questions 15 and 16 (see Appendix C) listed 12 organizations that currently support FDWs in Singapore. The participants were asked to mark which organizations they recognized in question 15, and to mark which organizations they had used in question 16. Figure 16 shows the results.

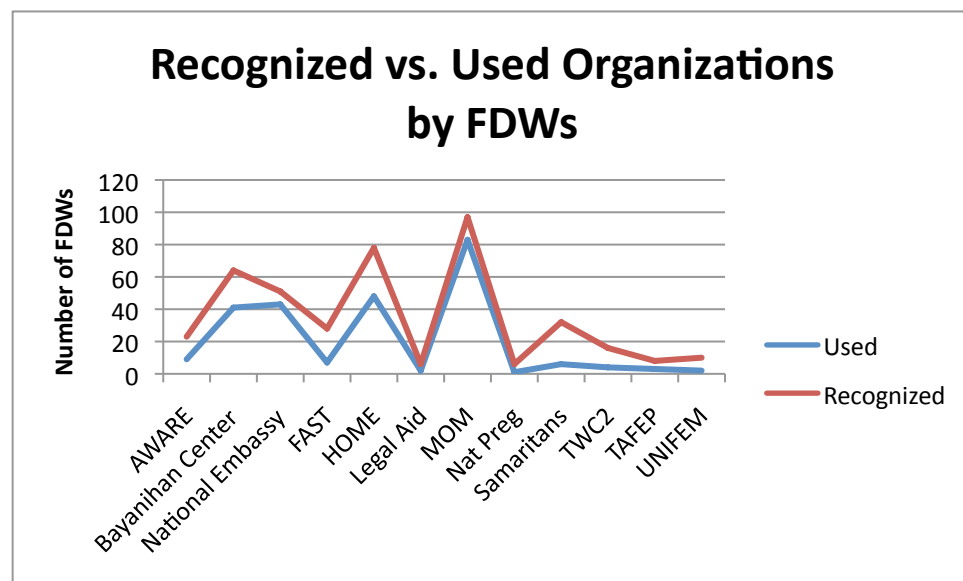


Figure 16. Organizations Recognized vs. Used by Foreign Domestic Workers

The most recognized and used organizations were MOM, H.O.M.E., National Embassy, and the Bayanihan Center. The survey presented an “other” option where participants could add any organizations that they had heard of or used that were not included in the survey list. Out of the 118 surveys only three entries provided additional organizations. The first additional entry was “church” the second and third entries were for “ACMI” the Archdiocesan Commission for the Pastoral Care of Migrants and Itinerant People. See Appendix G for a summary of all organizations, their objectives as well as for more details on ACMI.

To better understand information dissemination towards FDWs in Singapore, every organization included in the survey was contacted and asked to share their primary communication strategy. The dissemination strategy options were Internet, Print, Services, and Word of Mouth. Internet communications include the use of web pages, blogs, forums, and emails. Print communications include all written information from newsletters, brochures, and handouts to newspaper particles. Services includes classes, help-lines, and counseling assistance.

Additionally, word of mouth was added to the list as most organizations stated that their patrons very often bring their friends and acquaintances to the organization. All organizations participated in every communication strategy. Some as the results from the survey show, are more successful than others, but all organizations participate in communication dissemination to FDWs in one way or another. The results to the organization communication research is listed on Table 12.

Table 12

Communication Strategies from Singapore Organizations that Support Foreign Domestic Workers

	AWARE	Bayanihan Center	National Embassy	FAST	HOME	Legal Aid Bureau	Ministry of Manpower	National Pregnancy	Samaritans Singapore	TAFEP	TWC2	UNIFEM	Church	ACMI
Internet														
Web Page	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
E-mails			✓											
Blog/Forum			✓				✓		✓			✓		
Print														
Newsletters			✓				✓	✓						
Newspaper Articles	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Brochures	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Services														
Classes	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
Counseling	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Help-Line	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
Word of Mouth	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Summary of Results

The FDW information and resource/technology research was conducted with a total of 118 volunteers of which 94 were Filipino, 23 were Indonesian and one was from Myanmar. A total of 131 surveys were distributed to prospective participants. Of these surveys, 13 (10%) were returned incomplete, thus were not used in the final report.

Volunteer participants answered a seven-page paper and pencil type survey consisting of 27 questions (see Appendix C). The research captured both quantitative data from numerical answers as well as qualitative data from the short answer questions placed throughout the survey. The survey tool was validated through the execution of a pilot test. The pilot test (see Appendix B) was administered to 11 participants who provided

valuable information. Due to the feedback and results of the pilot test, the final research survey tool was edited for clarity and reliability. The research was carried out at three locations. First, a mall frequently visited by FDWs, Lucky Plaza, as well as two non-government organizations H.O.M.E. and the Bayanihan Center, that hold classes at minimal fees for FDWs.

The data results showed that 97% of participants own a cell phone while an unexpected 37% own a computer. A high percentage of FDWs (38%) stated they had attended some college, yet this data would need to be validated with future research due to the process and certifications required from FDWs by employment agencies as explained in detail in this chapter. The data also shows that information from FDWs' "National Embassy" was perceived as most correct followed by information provided by "Employer" and "Government Organization". It was also shown that data provided by "Friend" was perceived as the least correct, clear, and useful incorrect to FDWs. Additionally, results showed that 57 (50%) of FDWs perceive themselves as being experts when rating their skill in texting SMS messages from an "Expert", "Intermediate", and "Beginner" 3-point scale. Moreover, 49% of participants reported texting more than 10 times a day while only 3 participants reported not owning a cell phone. Conclusions from the data gathered will be presented and reviewed in Chapter 5.

Chapter 5

Conclusions

Conclusions

In this chapter, the research questions originally stated in Chapter 1 will be reviewed along with the conclusions drawn from the results of this study. In Chapter 4 the research results were outlined according to the survey questions. Here, a summary of the findings will be outlined in terms of the research questions. Recommendations for future research will be outlined and a summary of the research will be provided. The purpose of this research was to provide a descriptive profile of a set of female Foreign Domestic Workers (FDWs) that work as household maids, to better understand their interactions with technology. For this purpose, quantitative descriptions of what Information Systems, technologies, and types of data are being accessed by Foreign Domestic Workers as well as how age, language or education affects Foreign Domestic Workers from accessing wanted information.

The goal of this research as stated in Chapter 1, was to formally examine and evaluate the level of accessibility acceptance, and usability of Information Systems available to FDWs. Additionally, this research examines FDWs' access to pertinent information and evaluates the relevance of FDWs' levels of education, English skill proficiency, age, and accessibility, to information system tools such as online Information Systems, help-lines, and cell phones. The original research questions which

were raised in Chapter 1 are discussed below:

Research Question 1. What Information Systems are accessed by FDWs?

Survey questions 3, and 4 addressed this question. Question 3, “When you go online, what website do you visit most often?” was an open ended question requiring the participants to specify which websites they normally visit. As the question was open ended many FDWs entered multiple websites regularly visited. Ninety one FDWs, (77%) of participants, responded that they indeed visited websites. The top three sites visited by this subsection of participants were: 1) Facebook visited by 39 FDWs (54%), 2) Google visited by 36 FDWs (50%), and 3) Yahoo visited by 19 FDWs (26%). The full list of websites visited by FDWs is provided in Appendix H.

If participants did not visit any websites, question 4, “If you do not use any websites, please explain why” asked the participants to provide reasons for their lack of website usage. Forty-three FDWs, (36%) responded to question 4. The top three results for question 4 were: 1) “Not time” as written in by 13 FDWs (30%), 2) “No access to computer” as written in by 10 FDWs (23%), and 3) “Don’t Know How” as written in by nine FDWs (21%). The full list of responses to why FDWs do not visit websites is provided in Appendix I.

Research Question 2. What types of technologies (such as computers, help-lines, Information Systems or cell phones) are used to access available Information Systems?

Survey question 1 asked participants to order a list of seven options by *how* or through what *methods* they accessed information. In a ranking of 1 to 7, number 1 represented the first method FDWs would use to access information. In the same manner, number 7 represented the last method a FDW would use to access information.

To ensure that if the participants accessed information by any other means than the choices listed in question 1, an additional option titled “other” was provided so that they could easily enter a new category if needed. The choices listed (see Appendix C) were possible options that can be used to access information. Both technical and non technical options were provided to better round out the study. The technical options included Information Systems such as, “I call a help-line”, “I go online to a website”, and “I SMS or text someone”. The non-technical options included “I ask someone face-to-face”, “I call a friend”, and “I visit an organization during business hours”.

When the technical options are reviewed independently, the results of the actual accessibility, acceptance, and usability of current Information Systems targeted toward this segment of population result as follows: 1) “I call a help-line”, 2) “I go online to a website”, and 3) “I SMS or text someone”.

Research Question 3. What types of data (such as legal, logistical, medical, entertainment, and so forth) are most requested by FDWs?

Survey question 7, listed 15 types of general topics, worded in question form, which were relevant to FDWs. The participants were asked to rate each topic by a Yes/No/Not Sure key. If participants had indeed asked the given question or a similar question in the last 12 months, they were asked to mark that question with the number 1. If the participants had not asked the given question or a similar question in the last 12 months, they were asked to mark that question with the number 2. Likewise, if the participant was not sure if she had asked the given question or a similar question in the last 12 months, she was asked to mark that question with the number 3.

These set of questions provided clear and quantitative data regarding which

questions FDWs asked most and least often. Survey question 8 was a fill in the blank open-ended question, which asked the participants to add any questions they had asked in the last year that were not already listed in the survey. Although there were six entries for question 8, all were related to a question already listed in the survey. For example, “Is your boss allowed to ask you personal questions?” This question is related to questions about your employer. Second, “How can FDWs protect themselves from abuse?” This question is related to legal rights.

The answers provided by FDWs to question 7 were analyzed and the results are listed in detail Appendix J as well as in the summary shown on Table 13. The results from the top two questions asked by FDWs were both work related. Number one was “What rights do I have as a Foreign Domestic Worker?” and the second “Salary Questions”. These questions are very specific and answers would depend on knowledge and analysis of each FDW’s case by case scenarios. Informing or providing FDWs with an overview of rights, legal regulations, or the average salary typically paid to FDWs will not answer their specific questions. It could be said that FDWs are searching for two way communication avenues to ask specific questions regarding their particular situations.

In comparison, the least frequently asked questions were “Questions about non-government organizations” and “General questions I don’t want to ask my employer or agency”. These results would seem to show a few possibilities. First, that these questions are not asked because they are not highly important or relevant to most FDWs. Second, that these questions are not asked because the information is already available to them.

Table 13

Topics Ranked by Frequency of Requests by Foreign Domestic Workers

Most Often Asked	Often Asked	Generally Asked	Sometimes Asked	Least Often Asked
Legal Rights	Salary Questions	Fun things to do in Singapore	Agency Questions	Questions – Non Employee
Time Days Off	Going Home	About MOM	Transfer Questions	Questions Non Agency
Health and Well being	Classes	Work Pass Status	Embassy Questions	Questions about NGOs

Research Question 4. Does age, language, or education level make a difference in FDWs access to available Information Systems?

Survey questions 1, 2, and 3 in the demographic section (see Appendix C) pertain to participants' age, language proficiency, and education level. These questions were then compared to questions 1 and 2, from the resource and technology section of the survey, which were directly related to access of information. In question 1, each *method* of locating information or gathering data, such as asking someone "Face-to-face", calling a "Help-line", calling a "Friend" or going online to a "Website" was contrasted to the participants' age, education level, and English proficiency. Likewise each *source* of information listed in question 2 such as employment agency, government organization, or national embassy was studied to see if any interesting relationships could be found.

There are significant findings in this research that would attest that age, English language proficiency, and education level do have an impact in the access of Information Systems by FDWs. Data shows that as FDWs age, they feel more

comfortable sending SMSs and texts and consequently the older the FDW the less they depend on the “Face-to-Face” method of acquiring information. Additionally, if FDWs assessed themselves as “Excellent” readers, they were three times more likely to choose SMS as their preferred method to gather information compared to FDWs who self-assessed themselves as “Fair” readers. This data would seem to suggest that proficient English readers feel more comfortable receiving information through SMSs thus using technology.

Research Question 5. Which organizations are most successful at data dissemination directed toward FDWs?

A list of 12 organizations that disseminate data to FDWs (see Appendix C or Figure 12) was presented to each participant through survey questions 15 and 16. Question 15 asked the participants to mark any organizations that they recognized or had *heard about* in the past. Question 16 asked participants to mark any organizations that they had *used* in the past. The results showed that out of the 118 responses, the most recognized organization was MOM (the Ministry of Manpower). MOM is the legal employment governance organization in Singapore. Although 97 FDWs, 82% of participants, did recognize the organization, 21 participants, 18% did not.

These results could be explained in a few ways. First, five FDWs, 4% of participants stated that they had used MOM in question 16 but also stated that they had not heard of MOM in question 15. This would represent a survey entry error made by the participants. Second, it is possible that a small number of FDWs depend solely on the employment agency that hired them and arranged all the documents for them to travel and work in Singapore making it unnecessary for them to personally have any

dealings with MOM directly. Third, it is also possible that although FDWs might have had a slight initial contact with MOM when they first arrived in Singapore, if the FDW does not transfer nor experiences any changes in her work status while in Singapore, no action would be needed to maintain her work pass active. Therefore, the FDWs' lack of recognition or use of MOM services would be natural.

Discussion of the Findings

Based on the data collected, 72 (61%) of surveyed FDWs have access to the Internet. This number is much higher than expected based on personal conversations with NGO representatives and from previously published materials about this segment of the population. An interesting finding is that FDWs do not typically visit Singaporean government organizations, national government organizations, or non-government organizations that have been set up to support them in Singapore.

The results show that FDWs who do access websites tend to visit social media sites for social, entertainment and communication purposes with friends and family, such as Facebook, Google, and Yahoo. These Information Systems have proven to be easily accessible, not requiring an extensive learning curve or extensive training to access, thereby making the system accessible to most users, not solely to experts (Oulasvirta, Petit, Raento, & Tiitta, 2007).

Social media in this context can be defined as any communication tool that allows the user to have a two-way exchange of information. Regular media on the other hand, only allows one-way communication to its consumers (Maurer & Lutz, 2012). Regular media allows the user to read newspapers or listen to the radio but does not provide a way to immediately respond to the material presented.

Social media however, allows the user to provide feedback on a given topic in multiple ways, from voting on it, asking questions in a safe and often anonymous manner, to sharing content such as opinions, photos, videos or more. This conclusion is supported by the results from survey questions 1 and 2 where FDWs listed their preferred sources and methods of gathering information. This data shows that FDWs by in large, prefer face-to-face communications, possibly so that they can hold a two-way communication. The other preferred information gathering methods by FDWs are shown to be: using the phone to call a friend, or calling a help-line where someone will answer their specific questions. In this case, FDWs are seeking alternatives to gather data or perform tasks, as Beaudry and Pinsonneault (2010) propose, negating many, if not all, the presumed benefits of the Information Systems put in place for their benefit.

A lack of free time seems to be the major impediment to accessing the Internet for FDWs. From the number of participants who stated that they did not access the Internet, 23% of FDWs stated that they had “no access” to computers and another 21% stated that they did “not know how” to use computers, the majority of the responses, 30%, stated that FDWs simply had “no time” or were “too busy with work” to take time out to access the Internet. From this feedback it is possible to discern that although more time could be spent on providing accessibility, measuring acceptance, and educating FDWs to use available Information Systems, the main obstacle to FDWs accessing Information Systems is obtaining enough time to do so. When FDWs were surveyed on how they usually gathered information, the majority, 49%, stated that gathering information face-to-face was their preferred option. The second option with 21% of the responses was asking a friend. Going to a website to gather information was the third

preferred option with 14% of the responses. This feedback supplemented with FDWs' lack of free time, supports Attwell's claim that the access to Information Systems as a dedicated activity that is location-based for most users; as such, accessing Information Systems is not always convenient and not integrated into the user's life (2007). Today, FDWs' interaction with technology is still not integrated in their culture or every day activities.

FDWs responses to questions regarding their age, language, and education level were correlated to the resource and technology questions in the first section of the survey. The data shows interesting findings in that the older FDW population, those ranging from 46 to 55, are more prone to choose "sending and SMS or text" to gather information than the rest of the surveyed FDWs with younger age ranges. What is more interesting is that none of the participants from the youngest age range of 18 to 25 chose SMS as their top method of gathering information. Yet, according to Teófilo, Martini, and Cruz (2009), to truly provide access to the majority of the people in their own environment, the next evolutionary step in data access systems or data delivery systems is mobile technologies.

According to Fang et al., (2011), Worldwide use and ownership of mobile phones according to the authors will continue to increase. The FDWs grouped in the younger age ranges prefer instead, to ask information from a friend or ask someone face-to-face. Additionally, only the FDWs grouped in the middle age ranges, picked visiting a website as their first or second choice. This means that the youngest and oldest FDWs are not seeking information online as their first choice. This data also shows that as FDWs age they feel more comfortable sending SMSs and texts and

consequently the older the FDW is, the less she is to depend on the “Face-to-Face” method of acquiring information.

When analyzing the data in the same manner for question 2, as shown in Figure 9. The results show that the younger FDWs do not ask other “FDWs” for information nor do they usually go to “non-government organizations”. Furthermore, it is interesting to note that participants in the middle age ranges have fewer participants choosing to go to “Government” or “Non government organizations”. As a whole, the most chosen options for information gathering are the employment “Agency” and “Friend”.

The data also shows some interesting results regarding language proficiency. FDWs who said they were “Good” or “Fair” readers for example, rely much more on the employment agencies to obtain information than do “Excellent” self-assessed FDWs. Additionally, FDWs who assessed themselves as “Good” in all three aspects of English proficiency also favored their national embassy as a source of information while those self-assesses as “Excellent” or “Fair” relied less on their national embassy establishments for information. On the other hand the higher the FDWs’ self assessment on reading the higher their use of SMS. This data would seem to suggest that proficient English readers feel more comfortable receiving information through SMSs and that they stay away from calling help-lines where they have to verbally explain themselves.

As mentioned previously, attitude toward technology adoption has been found to play a key role in technology acceptance. One of the core beliefs of this research is that there exists a significant limitation of information accessibility by FDWs. Thought they might indeed access Google and other web 2.0 sites for entertainment purposes. This population is not engaging with other systems that have been developed for them with

information relevant to their work, lives and safety. UTAUT, as presented in Chapter 3 contains four core determinants of user behavior: 1) Performance expectancy, 2) Effort expectancy, 3) Social influence and 4) Facilitating conditions, which must be taken into consideration when developing an Information System.

Limitations of the Study

As noted in Chapter 1, six limitations were outlined which might have impacted the conclusions of the study. Apart from those previously stated it is important to outline additional limitations that were encountered throughout the study. The major limitation was the data collected from FDWs regarding education levels. It was not until later in the study that it was found that many FDWs would report that they attended college even if it was just for the few days training required to become a FDW overseas. In future research, any education questions must be more precise.

Second, it was rather difficult to obtain the participants needed to conduct the study. Although the target number of 100 participants was achieved, a large number of potential FDWs opted not to be part of the study, which increased the length of the survey research portion of the study. Many of the potential participants seemed to have the time to complete the survey but many FDWs mostly Indonesian and from other nationalities did not feel comfortable being approached and spoken to in English much less answering a survey. Even though English was chosen as the language for the survey, since the study was about use of Information Systems in the English language, in the future, translating surveys to other languages might provide more participants from other nationalities, which might in turn provide a broader view into FDW's IT accessibility and usability.

Lastly, there was a limitation on potential participants interest to participate in the study since the researcher was a foreigner. In future research, it might be interesting to recruit and train survey handlers to approach potential subjects. This change might make the potential participants feel more comfortable and more willing to participate.

Implications

This benchmark study has contributed to the Information Systems body-of-knowledge by gathering and analyzing data to better understand FDWs and their interactions with technology as well as to establish if technology disparity as described by Much and Skaksen (2009) is affecting this segment of the population.

This research provides a descriptive profile of FDWs that work as household maids in Singapore. These women share a few characteristics such as receiving very low incomes (see Table 1), holding manual labor positions, and speaking English as their secondary language. Yet they live in Singapore, one of the most sophisticated and technologically advanced countries in the world (ICT Development Index, 2009).

This study analyzed quantitative descriptions of what Information Systems, technologies, and types of data are being accessed by Foreign Domestic Workers as well as how age, language or education affects Foreign Domestic Workers from accessing wanted information.

The results show that most participants, 115 out of the 118 women who completed the survey, own a cell phone. A surprising 37% of the participants, 42 out of 114 responses, own a computer yet only 16 of these women were allowed to use their computer at work. Still, 91 participants stated that they accessed websites such as Facebook, Google, Yahoo, YouTube, and Skype. The data also indicates that only 2

participants visited government sites. One participant said she visits the MOM website, while the other stated that she visits the Filipino Embassy web page. See the complete listing of visited websites in Appendix H. This data would seem to indicate that although FDWs have the ability and skill to use the computer and surf the net they do not usually visit government organizations. This might seem to point back to the social media discussion stated earlier in which each individual prefers a two-way communication versus one-way communication found in regular media.

The study shows that a high percentage of FDWs do access the Internet and have the ability and capability to browse web pages and gather data online. The data seems to demonstrate that ability to use technology is not a barrier to these FDWs. Although the majority of FDWs do not own a computer and access to technology might be improved, FDW are indeed able to use a computer and go to social media sites. Additionally, this data suggests that FDWs are much more computer savvy than previously presumed.

FDWs' self-appraised levels of English proficiency is "Fair" to "Excellent" with only 2 participants stating that their English language proficiency was "Poor". In conclusion, it could be summarized that there are significant findings in this research to attest that age, English language proficiency, and education level do have an impact in the access of Information Systems by FDWs

Finally, access to technology does not seem to be a factor for the majority of the participants since 91 of them (77%) have the ability to access the Internet. What is very interesting is that they access the Internet for social aspects and not for employment, legal or personal rights issues. Therefore, it is imperative that information system from

organizations, agencies and the government provide the same level of ease of use and accessibility as other Information Systems such as Google and web 2.0 offerings which do not require an extensive learning curve or extensive training to access them, thereby making the system accessible to most users, not solely to experts (Oulasvirta, Petit, Raento, & Tiitta, 2007).

Recommendations

Based on the study implications mentioned above, the following list of five recommendations for future research is outlined:

1. Additional research is necessary to gather data from the large number of FDWs who do not have a day off and cannot be approached at malls or organizations that support them. Collecting more data from this pool of FDWs would improve the generalizability of the study. It is possible that employment agencies could be used to reach FDWs who have been placed.

2. Conducting the same study in other countries such as Hong Kong, Thailand, or Indonesia would provide data to verify if the high access to technology and use of the Internet in Singapore is similar to other countries, or if this relationship is solely based on Singapore's advanced telecommunications infrastructure. Singapore provides free wireless in many areas and research in countries with less infrastructure advancements might not result in the same level of use and access from their FDWs. Additionally, a study could be conducted in countries like Dubai who have similar technology infrastructures to Singapore to compare FDWs' access and use of technology.

3. Integrating questions to do a deeper analysis of how FDWs access the computers they currently use to go on-line. Data regarding computers FDWs are using,

location of these computers, and time these computers are being used, could provide additional insight of FDWs' use, acceptance, and access of technology.

4. Integrating questions into the survey to do a deeper analysis of what activities FDWs spend their time on while online. Gathering data regarding the reasons why FDWs visit Facebook, Google, and Yahoo and possibly why FDWs do not visit websites like MOM and other organizational web pages that were set up to support them would be useful to better understand FDW behavior towards technology.

5. Acceptance research on why some sites are used and others are not. This research would validate FDWs' interest in social media, and how social media could be adopted by government organizations.

Summary of the Dissertation

The discipline of Information Systems interlaces all activities concerned with the processing, storing, distribution, and use of information and data. As the amounts of information and data increase, technology advances to help organizations and society at large, manage the data being created and shared. The process of managing information is a constant cycle that requires innovation, education, and transformation. Information Systems and Information Technology industries take up the challenge and move along the cycle with dizzying speed. Yet, those who are not part of the Information Technology industry, the unskilled workers, manual laborers, or disenfranchised populations have a real possibility of being left behind.

As technology improves and transforms at vast rates, unskilled workers are unlikely to be able to catch up with it. Technology neglect is defined in this paper, by the author, as a situation where as technology evolves; it fails to provide a specific

segment of population with effective tools or the proper means to take advantage of such technology.

Technology is not only a major facilitator in the creation of wealth through the reduction of costs of production, manufacturing, development, delivery, and distribution activities associated with global business processes, but it is also being integrated into our everyday lives to support our daily endeavors (Igun, 2011). Yet, unskilled populations, who do not have access to technology, are often deprived of the opportunities and benefits that Information Technology can provide, furthermore, they are being left behind in terms of technology and skills aptitude proficiency (Munch & Skaksen, 2009).

While some Information Systems research has been done as it relates to the less educated manual labor segment of the population by organizations such as the Human Rights Watch or by international labor offices, this data can only be classified as anecdotal evidence rather than data gathered through a formal research study. To establish a benchmark in this area of Information Systems research and to formalize the gathering of baseline data, a formal study was conducted to examine and quantify the Information System technologies that have been established for Foreign Domestic Workers (FDWs) working in Singapore.

These workers meet several distinct qualifications: they have chosen to take a job as domestic maids, which does not require a high education or English proficiency level, they earn very low wages, but they have the advantage of living and working in Singapore, where infrastructure, technology and communications top ICT's charts and tables as one of the most advanced countries in the world.

This research examines and evaluates the level of accessibility, acceptance, and usability of Information Systems available to FDWs by providing a descriptive profile of this particular population. Quantitative descriptions of what Information Systems, technologies, and types of data are being accessed by Foreign Domestic Workers as well as how age, language, or education affects Foreign Domestic Workers from accessing wanted information was gathered to better understand this segment of the population and their interactions with technology.

Additionally, this research looks at FDWs' access to pertinent information and evaluates if FDWs' levels of education, English skill proficiency, age, and accessibility to information system tools such as computers, and cell phones, through the use of help-lines and web sites are relevant. Finally, an analysis of gathered responses was used to better understand the information technology accessibility challenges facing FDWs.

The following five research questions were raised to frame the study. A short summary of findings is provided below.

1. What Information Systems are accessed by FDWs?
 - Ninety-one out of 118 FDWs, 77% of participants, visited websites. Many participants provided multiple entries. The top three sites visited by this subsection of participants were: 1) Facebook visited by 39 FDWs (54%), 2) Google visited by 36 FDWs (50%), and 3) Yahoo visited by 19 FDWs (26%). The full list of websites visited by FDWs is provided in Appendix H.
2. What types of technologies (such as computers, help-lines, Information Systems or cell phones) are used to access available Information Systems?

- Table 14 shows the summary of technologies used to access available Information Systems by FDWs. As expected most FDWs own a cell phone. An Unexpected finding was that a rather high number of FDWs, 37%, own a computer as well. Additionally, a very high number, 77% of FDWs have access to websites.

Table 14

Types of Technologies Used to Access available Information Systems by Foreign Domestic Workers

Technology	Frequency	Percentage
Own Cell Phones	113	96%
Access SMS or Text	22	19%
Access Help-Lines	11	9%
Own Computers	42	37%
Access Websites	91	77%

3. What types of data (such as legal, logistical, medical, entertainment, and so forth) are most requested by FDWs?
 - Figure 17 shows the summary of the topics most often requested by FDWs.
4. Does age, language, or education level make a difference in FDWs access to available Information Systems?
 - There are significant findings in this research that would attest that age, English language proficiency, and education level do have an impact in the access of Information Systems by FDWs. Data shows that as FDWs age, they feel more comfortable sending SMSs and texts and consequently the older the FDW the less they depend on the “Face-to-Face” method of acquiring information. Additionally, if FDWs assessed themselves as

“Excellent” readers, they were three times more likely to choose SMS as their preferred method to gather information compared to FDWs who self-assessed themselves as “Fair” readers. This data would seem to suggest that

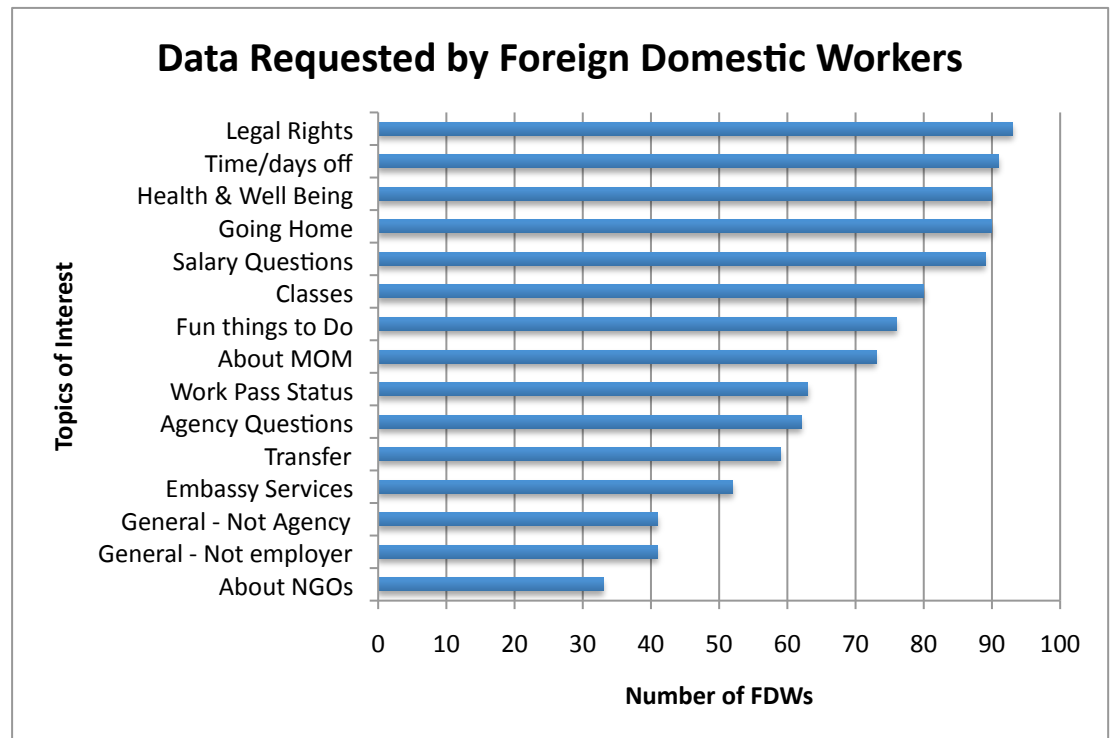


Figure 17. Types of Requested Data Prioritized by Foreign Domestic Workers

proficient English readers feel more comfortable receiving information through SMSs thus using technology.

5. Which specific activities in data dissemination directed toward FDWs are perceived as effective?
 - When the data regarding organizations recognition versus FDWs’ use of the same organizations is analyzed. There does not seem to be any distinguishable differences. Yet, non-governmental organizations with the most variety in available classes and the best locations accessible through public transportation seem to have the highest recognition and use from the

list of organizations. Still the most recognized and used organization is MOM, the Ministry of Manpower, which provides all FDWs with a work permit to work legally in Singapore.

A formal research survey methodology using a seven-page paper and pencil in-person survey was chosen to identify, organize, and evaluate data gathered from FDWs. The survey provided in Appendix C, was divided into three sections: 1) an information gathering section, 2) a resource/technology section and, 3) a demographic section. In the first section, respondents were asked to answer closed and open-ended questions regarding the types of information they seek and additional questions regarding where they usually gather data in a day-to-day basis.

This section provides the benchmark for the type of information that is most requested by this population and resulted in a ranked list of the most used Information Systems by FDWs. The second section gathered data regarding respondents' use and access to technology. Ranking scaling questions were written to formulate which technologies including computer, cell phone, or help-lines were more frequently used to access information. This section also provided feedback regarding accessibility to technology. The third section focused on demographic questions such as age, highest completed school grade level, and self-assessed levels of spoken, written, and reading English proficiency.

The intended population for the requirements phase of the research were FDWs working in Singapore. As there is no available database, adequate information, or listing of FDWs' contact information, a random sampling study of this time is not possible but a 118 participant sample of the population was used to gather data through non-

probability convenience sampling. The research took place at three different locations within Singapore, at different times of day and during different days of the week, to maximize the pool of participants. Additionally, there is no known data to support that the sample used within the 253 square mile city state would have different behaviors and need different information than would members from a random sample from the same population.

The mall intercept method pioneered in the early 1980s and used extensively today, was used to gather participants' data. A mall intercept is a face-to-face interviewing method akin to the door-to-door research method in that the researcher may pinpoint a location or population whom to research. By using the mall intercept method, participants were approached in public places and asked to voluntarily participate in this research.

Based on the data collected, 61% of surveyed FDWs have access to the Internet. This percentage is much higher than expected after reviewing previously published materials about this segment of population. An interesting finding is that when FDWs do go on-line they do not normally visit government organizations nor any other non-government organizations that have been set up to support them in Singapore or their home country. The results show that FDWs who do access websites tend to visit social media sites such as Facebook, Google, and Yahoo, for communication and entertainment purposes with friends and family.

Social media in this context can be defined as any communication tool that allows the user to have a two-way exchange of information. Regular media on the other hand, only allows one-way communication to its users. Regular media allows the user

to read or listen to information but does not provide a way to immediately respond to the material, such as reading newspapers or listening to the news. Social media however, allows the user to provide feedback on a given topic in multiple ways, from voting on it, asking questions in a safe and often anonymous manner, to sharing content such as opinions, photos, videos, or more (Maurer & Lutz, 2012).

Lack of free time seems to be the major impediment to accessing the Internet for FDWs. From the number of participants who stated that they did not access the Internet, 23% of FDWs stated that they had “no access” to computers and another 21% stated that they did “not know how” to use computers, the majority of the responses, 30%, stated that FDWs simply had “no time” or were “too busy with work” to take time out to access the Internet. From this feedback, it can be seen that although more time could be spent on providing access and education to these workers their main obstacle to accessing Information Systems is obtaining free time to do so.

When FDWs were surveyed on how they usually gathered information, the majority with 49%, stated that gathering information face-to-face was the preferred option. The second option with 21% of the responses was asking a friend. Going to a website to gather information was the third preferred option with 14% of responses. This feedback could be interpreted to demonstrate that the FDWs’ interaction with technology is still not integrated in their culture or everyday activities.

When the main four issues (Availability, Design, Quality, and User Acceptance) with accessing Information Systems by the manual labor segment of the population stated in Chapter 1 are revisited; it can be concluded that FDWs do have availability of technology as shown in the study results. Yet, these women are not visiting websites

designed for their use, such as government portals providing information and services. The study shows that the current Information Systems developed for this segment of the population may not be providing the Design, Quality of information, nor the User Acceptance needed to make these tools successful as compared to social media sites which are being visited by FDWs. It could be said that social media is making an impact on how and when FDWs spend their time with technology. FDWs are looking for two-way communications, which will be more relevant to their individual situations.

In conclusion, why are the indigent not leveraging technology to a higher degree? It could be argued with the data from this research that the answer is because culturally and socially FDWs as part of the indigent population need the perception of human touch in their interactions with technology and are not willing to spend time or effort with technology that cannot be customized for their needs. The future of Information Systems might be better geared to provide less general content and more customized services to their users.

Appendix A

Survey Introduction Letter

February 2012

Data Accessibility Research



Today we are conducting a formal research on data accessibility by foreign domestic workers in Singapore. The survey is very brief and will only take 15 to 20 minutes to fill out.

Instructions for completing the survey can be found on the form itself. Please read and answer all questions to the best of your ability.

When you return the survey, if fully completed you will receive an appreciation gift.

Please be assured that all information you provide will not be linked to you in any way. As you will notice your name, address, phone number or other identifying information will not appear on the survey.

This research will aid in completing my dissertation to obtain an Information Systems Doctoral Degree at the Nova Southeastern University located in Florida, USA. The Institutional Review Board (IRB) a global institution that promotes scientifically and ethically sound research has approved this study.

Do not hesitate to call me at +65 9232-2300 if you have any questions or if you would like a copy of the final report when the research is completed.

Your participation represents a valuable contribution to research and I thank you again for your cooperation.

Sincerely yours,
Sandra Boesch
Ph.D. Candidate - Nova Southeastern University
<http://scis.nova.edu>



Appendix B

Pilot Survey

Data Accessibility Survey for Foreign Domestic Workers

Gathering information

1. When you need information or have a question **HOW** do you find the answer?
(Please **rank** 1 to 7 in order of use 1 being the first place you go for information and 7 being last place you would go to get information)
 - a. _____ I ask someone face-to-face
 - b. _____ I call a help-line
 - c. _____ I call friend
 - d. _____ I go online to a website
 - e. _____ I visit an organization during business hours
 - f. _____ I SMS or text someone
 - g. _____ Other – please explain _____

2. **WHERE** do you go to ask questions about job status, help or services?
(Please **rank** 1 to 6 in order of use. 1 being used most often, 6 being used least often)
 - a. _____ I ask a friend or family member
 - b. _____ I ask another Foreign Domestic Worker (FDW) or Helper
 - c. _____ I ask my agency
 - d. _____ I ask a Government organization like MOM
 - e. _____ I ask My embassy
 - f. _____ I ask a non-governmental organization like TWC2 that supports me
 - g. _____ Other – please explain _____

3. When you go online, what website do you visit most often? _____

4. If you do not use any websites – please explain why _____

5. When you need work related information, which organization(s) do you visit in person? Feel free to pick from the lists from questions 4 or 5 – or add one if not listed.

6. If you do not visit any organizations in person – please explain why _____

Data Accessibility Survey for Foreign Domestic Workers

7. Information you receive can have different characteristics such as correct but confusing - or correct but not detailed enough to be useful.

For each source of information listed on the left (friend, family member etc) please mark with an X all the words that you think apply to the data they provided the last time you asked a question.

Source of information	Information was Correct	Information was Incorrect	Information was Clear	Information was Confusing	Information was Useful	Information was Not Useful
EXAMPLE Friend	X			X		X
Friend						
Family Member						
Agency						
My Embassy						
Government Organization						
Non – Gov. Organization						

8. From the following list, please circle all Helper related organizations that you have **heard about** in the past.
- | | | |
|---------------------------------|----------------------------|----------------------------|
| a. AWARE | e. Legal Aid Bureau | i. TAFEP – Fair Employment |
| b. Your National Embassy Office | f. MOM | j. TWC2 |
| c. FAST | g. National Pregnancy | k. UNIFEM Singapore |
| d. HOME | h. Samaritans of Singapore | l. Other _____ |
9. From the following list, please circle any Helper related organizations that you have **used** in the past.
- | | | |
|---------------------------------|----------------------------|----------------------------|
| a. AWARE | e. Legal Aid Bureau | i. TWC2 |
| b. Your National Embassy Office | f. MOM | j. TAFEP – Fair Employment |
| c. FAST | g. National Pregnancy | k. UNIFEM Singapore |
| d. HOME | h. Samaritans of Singapore | l. Other _____ |

Data Accessibility Survey for Foreign Domestic Workers

10. Do you have access to a computer with Internet service? (Mark all that apply)

- a. Yes, I can use my employer's computer with Internet access.
- b. Yes, I have my own computer with Internet access.
- c. Yes, I can go somewhere to access a computer with Internet access.
- d. Yes, my friend lends me access to his/her computer with Internet access.
- e. Yes, other _____
- f. No, I am not allowed to use my employer's computer with Internet access.
- g. No, I do not have access to a computer with Internet access.
- h. No, other _____

11. Please look at the questions below and answer for each one if you have asked this question in the last year.

Number 1. **YES** I have asked the question in the last year.

Number 2. I am **Not Sure** if I have asked this question in the last year.

Number 3. No, I have **NOT** asked the question in the last year.

	YES 1	Not Sure 2	NO 3
a. How do I transfer from my current employer?	1	2	3
b. What services are available from my Embassy?	1	2	3
c. What classes are available for me in Singapore?	1	2	3
d. What is my work pass status?	1	2	3
e. What rights do I have as a Foreign Domestic Worker?	1	2	3
f. Salary questions	1	2	3
g. General questions I don't want to ask my employer	1	2	3
h. General questions I don't want to ask my agency	1	2	3
i. Questions about my agency	1	2	3
j. Questions about non-government organizations	1	2	3
k. Questions about Ministry of Man Power (MOM)	1	2	3

Data Accessibility Survey for Foreign Domestic Workers

	YES 1	Not Sure 2	NO 3
l. Questions about going home	1	2	3
m. Questions about health and well being	1	2	3
n. Questions about fun things to do in Singapore	1	2	3
o. Questions about time/days off	1	2	3

12. Are there any questions you ask that are NOT on the list above? Please write them out here.

13. Do you have access to a cell phone? (Mark all that apply)

- a. Yes, I can use my employer's cell phone.
- b. Yes, I own a cell phone and can use it when I want.
- c. Yes, my friend lends me his/her cell phone.
- d. Yes, I own a cell phone but I cannot use it while working.
- e. No, I do not own a cell phone.
- f. No, I am not allowed to use my employer's cell phone.

14. What is your skill in texting SMS messages?

- a. Beginner – I am just learning to use SMS text messaging.
- b. Intermediate – I am comfortable sending and receiving SMS text messages.
- c. Expert – I am very good at sending and receiving SMS text messages.

15. How often do you send or read SMS text messages?

- a. More than 10 times a day
- b. 1 to 10 times a day
- c. 1 to 10 times a week
- d. 5 or less times per month
- e. None, I do not text
- f. Other – please state _____

Personal Information

1. What is your age?

- a. 18-25
- b. 26-35
- c. 36-45
- d. 46-55
- e. 55-66
- f. 66+

Data Accessibility Survey for Foreign Domestic Workers

2. What is the highest level of education you have completed?
- | | |
|---|---|
| a. <input type="checkbox"/> Primary (1-6) | d. <input type="checkbox"/> Vocational Training |
| b. <input type="checkbox"/> Secondary (7-9) | e. <input type="checkbox"/> College Degree |
| c. <input type="checkbox"/> High School (10-12) | |
3. How do you rate your English knowledge? Please circle the appropriate answer.
- | | | | |
|--|------|------|--------|
| a. How well do you <u>speak</u> English? | Well | Fair | Poorly |
| b. How well do you <u>read</u> English? | Well | Fair | Poorly |
| c. How well do you <u>write</u> English? | Well | Fair | Poorly |
4. What nationality are you?
- | | |
|--|---|
| a. <input type="checkbox"/> Filipino | f. <input type="checkbox"/> Malay |
| b. <input type="checkbox"/> Indonesian | g. <input type="checkbox"/> Bangladeshi |
| c. <input type="checkbox"/> Chinese | h. <input type="checkbox"/> Thai |
| d. <input type="checkbox"/> Indian | i. <input type="checkbox"/> Other, please state _____ |
| e. <input type="checkbox"/> Sri Lankan | |
5. What nationality is your current employer?
- | | |
|--|---|
| a. <input type="checkbox"/> American | f. <input type="checkbox"/> Indonesian |
| b. <input type="checkbox"/> Australian | g. <input type="checkbox"/> Malay |
| c. <input type="checkbox"/> Chinese | h. <input type="checkbox"/> Singaporean |
| d. <input type="checkbox"/> English | i. <input type="checkbox"/> Mixed Nationality _____ |
| e. <input type="checkbox"/> Indian | j. <input type="checkbox"/> Other _____ |
6. How often do you have days off?
- | |
|---|
| a. <input type="checkbox"/> I have every Sunday off. |
| b. <input type="checkbox"/> I have 2 or more Sundays off each month. |
| c. <input type="checkbox"/> I have 1 Sunday off each month. |
| d. <input type="checkbox"/> I have 1 Sunday off every two months or less. |
| e. <input type="checkbox"/> I have no days off. |
| f. <input type="checkbox"/> Other – please state _____ |
7. Please provide area where you live such as: Orchard, Ang Mo Kio, Jurong, etc.:
- _____

Appendix C

Study Research Survey

Data Accessibility Survey for Foreign Domestic Workers

Gathering information

1. When you need information or have a question **HOW** do you find the answer?

(Please **order** the following options from 1 to 7. Number 1 being the first place you go for information and Number 7 being last place you would go to get information)

- a. _____ I ask someone face-to-face
- b. _____ I call a help-line
- c. _____ I call a friend
- d. _____ I go online to a website
- e. _____ I visit an organization during business hours
- f. _____ I SMS or text someone
- g. _____ Other – please explain how _____

2. **WHERE** do you go to ask questions about job status, help or services?

(Please **order** the following options from 1 to 7. 1 being used most often, 7 being used least often)

- a. _____ I ask a friend
- b. _____ I ask another Foreign Domestic Worker (FDW) or Helper
- c. _____ I ask my agency
- d. _____ I ask a Government organization
- e. _____ I ask My embassy
- f. _____ I ask a Non-Government Organization that supports me
- g. _____ Other – please explain where _____

3. When you go online, what website do you visit most often?

4. If you do not use any websites – please explain why

5. When you need work related information, which organization(s) do you visit in person? Feel free to pick from the list in questions 15 or 16 – Or add one if not listed.

6. If you do not visit any organizations in person – please explain why

Data Accessibility Survey for Foreign Domestic Workers

7. Please look at the questions below and answer for each one if you have asked this question in the last year.

- Number 1. **YES** I have asked the question in the last year.
- Number 2. No, I have **NOT** asked the question in the last year.
- Number 3. I am **Not Sure** if I have asked the question.

Have I asked this question?	YES 1	NO 2	Not Sure 3
a. How do I transfer from my current employer?	1	2	3
b. What services are available from my Embassy?	1	2	3
c. What classes are available for me in Singapore?	1	2	3
d. What is my work pass status?	1	2	3
e. What rights do I have as a Foreign Domestic Worker?	1	2	3
f. Salary questions	1	2	3
g. General questions I don't want to ask my employer	1	2	3
h. General questions I don't want to ask my agency	1	2	3
i. Questions about my agency	1	2	3
j. Questions about non-government organizations	1	2	3
k. Questions about Ministry of Man Power (MOM)	1	2	3
l. Questions about going home	1	2	3
m. Questions about health and well being	1	2	3
n. Questions about fun things to do in Singapore	1	2	3
o. Questions about time/days off	1	2	3

8. Are there any questions you ask that are NOT on the list above? Please write them out here.

Data Accessibility Survey for Foreign Domestic Workers

For each line below please circle the number 1, 2, 3, or 4 as it applies to the information you received from them.

9. The information I usually receive from my **friend** is:

- | | | | |
|-----------------------|------------------|---------------------|------------|
| a. Absolutely Correct | Somewhat Correct | Somewhat Incorrect | Incorrect |
| 1 | 2 | 3 | 4 |
| b. Absolutely Clear | Somewhat Clear | Somewhat Confusing | Confusing |
| 1 | 2 | 3 | 4 |
| c. Absolutely Useful | Somewhat Useful | Somewhat Not Useful | Not Useful |
| 1 | 2 | 3 | 4 |

10. The information I usually receive from an **employer** is:

- | | | | |
|-----------------------|------------------|---------------------|------------|
| d. Absolutely Correct | Somewhat Correct | Somewhat Incorrect | Incorrect |
| 1 | 2 | 3 | 4 |
| e. Absolutely Clear | Somewhat Clear | Somewhat Confusing | Confusing |
| 1 | 2 | 3 | 4 |
| f. Absolutely Useful | Somewhat Useful | Somewhat Not Useful | Not Useful |
| 1 | 2 | 3 | 4 |

11. The information I usually receive from my **agency** is:

- | | | | |
|-----------------------|------------------|---------------------|------------|
| a. Absolutely Correct | Somewhat Correct | Somewhat Incorrect | Incorrect |
| 1 | 2 | 3 | 4 |
| b. Absolutely Clear | Somewhat Clear | Somewhat Confusing | Confusing |
| 1 | 2 | 3 | 4 |
| c. Absolutely Useful | Somewhat Useful | Somewhat Not Useful | Not Useful |
| 1 | 2 | 3 | 4 |

12. The information I usually receive from my **Embassy** is:

- | | | | |
|-----------------------|------------------|---------------------|------------|
| a. Absolutely Correct | Somewhat Correct | Somewhat Incorrect | Incorrect |
| 1 | 2 | 3 | 4 |
| b. Absolutely Clear | Somewhat Clear | Somewhat Confusing | Confusing |
| 1 | 2 | 3 | 4 |
| c. Absolutely Useful | Somewhat Useful | Somewhat Not Useful | Not Useful |
| 1 | 2 | 3 | 4 |

Data Accessibility Survey for Foreign Domestic Workers

Continuation - For **each** line below please circle the number 1, 2, 3, or 4 as it applies to the information you received from them.

13. The information I usually receive from **Government organization** is:

- | | | | |
|-----------------------------------|------------------------------|---------------------------------|------------------------|
| a. Absolutely Correct
1 | Somewhat Correct
2 | Somewhat Incorrect
3 | Incorrect
4 |
| b. Absolutely Clear
1 | Somewhat Clear
2 | Somewhat Confusing
3 | Confusing
4 |
| c. Absolutely Useful
1 | Somewhat Useful
2 | Somewhat Not Useful
3 | Not Useful
4 |

14. The information I usually receive from **Non-Gov Organizations (NGOs)** is:

- | | | | |
|-----------------------------------|------------------------------|---------------------------------|------------------------|
| a. Absolutely Correct
1 | Somewhat Correct
2 | Somewhat Incorrect
3 | Incorrect
4 |
| b. Absolutely Clear
1 | Somewhat Clear
2 | Somewhat Confusing
3 | Confusing
4 |
| c. Absolutely Useful
1 | Somewhat Useful
2 | Somewhat Not Useful
3 | Not Useful
4 |

15. From the following list, please circle all Helper/FDW related organizations that you have **heard about** in the past.

- | | | |
|---------------------------------|-------------------------------|----------------------------|
| a. AWARE | f. Legal Aid Bureau | i. Samaritans of Singapore |
| b. Bayanihan Center | g. Ministry of Manpower (MOM) | j. TAFEP – Fair Employment |
| c. Your National Embassy Office | h. National Pregnancy | k. TWC2 |
| d. FAST | | l. UNIFEM |
| e. HOME | | m. Other _____ |

16. From the following list, please circle any Helper/FDW related organizations that you have **used** in the past.

- | | | |
|---------------------------------|-------------------------------|----------------------------|
| a. AWARE | f. Legal Aid Bureau | i. Samaritans of Singapore |
| b. Bayanihan Center | g. Ministry of Manpower (MOM) | j. TWC2 |
| c. Your National Embassy Office | h. National Pregnancy | k. TAFEP – Fair Employment |
| d. FAST | | l. UNIFEM |
| e. HOME | | m. Other _____ |

Data Accessibility Survey for Foreign Domestic Workers

17. Do you have access to a computer with Internet service? (Mark all that apply)
- Yes, I can use my employer's computer with Internet access.
 - Yes, I have my own computer with Internet access.
 - Yes, I can go somewhere to access a computer with Internet access.
 - Yes, my friend lends me access to his/her computer with Internet access.
 - Yes, I own a computer but I cannot use it while working.
 - No, I am not allowed to use my employer's computer with Internet access.
 - No, I do not have access to a computer with Internet access.
18. What is your skill in texting SMS messages?
- Beginner – I am just learning to use SMS text messaging.
 - Intermediate – I am comfortable sending & receiving SMS text messages.
 - Expert – I am very good at sending and receiving SMS text messages.
19. Do you have access to a cell phone? (Mark all that apply)
- Yes, I can use my employer's cell phone.
 - Yes, I have my own cell phone.
 - Yes, I can go somewhere to access a cell phone
 - Yes, my friend lends me his/her cell phone.
 - Yes, I own a cell phone but I cannot use it while working.
 - No, I am not allowed to use my employer's cell phone.
 - No, I do not own a cell phone.
20. How often do you send or read SMS text messages?
- | | |
|---|---|
| a. <input type="checkbox"/> More than 10 times a day | e. <input type="checkbox"/> None, I do not text |
| b. <input type="checkbox"/> 1 to 10 times a day | f. <input type="checkbox"/> Other – please state
_____ |
| c. <input type="checkbox"/> 1 to 10 times a week | |
| d. <input type="checkbox"/> 5 or less times per month | |

***Almost done – now to some personal information questions.
Please know that your name will not be asked and the research is completely
ANONYMOUS.
Please be as accurate as possible.**

Data Accessibility Survey for Foreign Domestic Workers

Personal Information

1. What is your age range?

a. ____ 18-25	d. ____ 46-55
b. ____ 26-35	e. ____ 55-66
c. ____ 36-45	f. ____ 66+

2. What is the highest level of education you have completed?

a. ____ Primary (1-6)	d. ____ Vocational Training
b. ____ Secondary (7-9)	e. ____ College Degree
c. ____ High School (10-12)	

3. How do you rate your English knowledge? Please circle the appropriate answer.

a. How well do you <u>spea</u> k English?	Excellent Good Fair Poor
b. How well do you <u>rea</u> d English?	Excellent Good Fair Poor
c. How well do you <u>wri</u> te English?	Excellent Good Fair Poor

4. What nationality are you?

a. ____ Filipino	f. ____ Malay
b. ____ Indonesian	g. ____ Bangladeshi
c. ____ Chinese	h. ____ Thai
d. ____ Indian	i. ____ Other, please state
e. ____ Sri Lankan	

5. What nationality is your current employer?

a. ____ American	h. ____ Singaporean
b. ____ Australian	i. ____ Mixed Nationality. If so which?
c. ____ Chinese	1. _____
d. ____ English	2. _____
e. ____ Indian	
f. ____ Indonesian	j. ____ Other _____
g. ____ Malay	

Data Accessibility Survey for Foreign Domestic Workers

6. How often do you have days off?
- a. ___ I have every Sunday off.
 - b. ___ I have 2 or more Sundays off each month.
 - c. ___ I have 1 Sunday off each month.
 - d. ___ I have 1 Sunday off every two months or less.
 - e. ___ I have no days off.
 - f. ___ Other – please state _____
7. Please provide area where you live such as: Orchard, Ang Mo Kio, Jurong, etc.:
-

Thank you!!!

If you answered **EVERY** question
Please ask for your GIFT!

Appendix D

April 26, 2012

H.O.M.E.
1 Sophia Road, #04-02/03
Singapore 228149

Dear Bridget,

Thank you very much for the cooperation extended to me while doing human research for my dissertation research at the ISS Campus.

Jacyntha and Gill were invaluable in offering class time for me to ask volunteers to participate in answering the survey.

Once the dissertation is approved I would be happy to share the results of the study.

Thanks again,

Sincerely yours,

Sandra Boesch
Doctoral Student
Graduate School of Computer and Information Sciences
Nova Southeastern University

Appendix E

April 26, 2012

BAYANIHAN CENTRE
43 Pasir Panjang Road
Singapore 118503

To all:

Thank you very much for the cooperation extended to me while doing human research for my dissertation research at the center.

Once the dissertation is approved I would be happy to share the results of the study.

Thanks again,

Sincerely yours,

Sandra Boesch
Doctoral Student
Graduate School of Computer and Information Sciences
Nova Southeastern University

Appendix F

Organizations Visited in Person by Foreign Domestic Workers

Organizations	Frequency	Percentage
MOM	25	45%
HOME	19	35%
Employment Agency	16	29%
National Embassy	12	22%
Bayanihan Center	3	5%
Samaritans of Singapore	2	4%
FAST	1	2%
FOWS	1	2%
TAFEP	1	2%
YES	1	2%

**Note 66 participants provided 88 responses*

Appendix G

Organization Details From Survey Questions 15 and 16

Organization	About	Objective
AWARE	Association of Women for Action and Research	AWARE provides support services provides crisis counselling, assistance in dealing with the authorities, and legal advice to women in need
Bayanihan Center	Philippine Bayanihan Society (Singapore)	Promotes skills upgrading among Filipino workers and aims to enhance socio-cultural ties between Filipinos and Singaporeans
Your National Embassy Office	Represents Home Country as a Government Entity in Singapore	Provides services to Nationals in foreign countries
FAST	Foreign Domestic Worker Association for Skills Training	Charity which aims to promote skill training for foreign domestic workers.
HOME	Humanitarian Organization for Migration Economics	Respond to the special needs of migrant communities.
Legal Aid Bureau	Government department under the Ministry of Labor and Welfare.	To provide quality legal aid and advice to persons of limited means.
Ministry of Manpower (MOM)	Government Department under the Ministry of Labor	Provides all FDWs with a work pass to legally work in Singapore.
National Pregnancy	Government Helpline under Ministry of Community Development	Counseling for pregnancy-related problems and intervention in pregnancy crisis situations
Samaritans of Singapore	A non-profit and non-religious organisation	Provides 24-hour confidential emotional support to people in crisis, thinking of suicide or affected by suicide.
TAFEP – Fair Employment	The Tripartite Guidelines on Fair Employment Practices	Implementing fair and merit-based employment practices
TCW2	Transient Workers Count Too	Advocate a more enlightened policy framework for migrant labor in Singapore through ground research and engagement with policy makers and employers
UNIFEM	National Committee of the United Nations Development Fund for Women	Provide funds and support for: Economic Empowerment, Governance and Leadership and Conflict Area Programmes.
Other: Church		
ACMI	Archdiocesan Commission for the Pastoral Care of Migrants and Itinerant People	Give migrants a sense of belonging and security through acts of compassion such as befriending, hospital visits, providing food and shelter, skills training, legal aid, information and referrals.

Appendix H

Websites Visited by Foreign Domestic Workers

Websites Visited by Foreign Domestic Workers in Singapore

Organization	Frequency	Percentage*
Facebook	39	71%
Google	36	65%
Yahoo	19	35%
Internet	4	7%
YouTube	3	5%
Skype	2	4%
Embassy	2	4%
JobStreet	2	4%
Ministry of Manpower (MOM)	1	2%
H.O.M.E.	1	2%
Singapore Taekwondo Federation (STF)	1	2%

Note. 66 Foreign Domestic Workers provided feedback on the websites they visit.

Appendix I

Reasons WHY Foreign Domestic Workers do not Visit Websites

Foreign Domestic Responses as to Why They Do Not Visit Websites

Reason	Frequency	Percentage*
Busy/ No Time	13	30%
No Access to Computer	10	23%
Don't Know How	9	21%
Not Allowed	5	12%
Read Newspapers Instead	2	5%
Information no accurate	1	2%
Rather call someone	1	2%
Don't Use Computer	1	2%
Not Important	1	2%

Note. 43 Foreign Domestic Workers responded to why they do not go online.

*Percentage calculated out of 43 results.

Appendix J

Detailed Results to Survey Question Number 7

Have I asked this Question?	Total Responses	YES	NO	Not Sure
1. How do I transfer from my current employer?	113	59	37	20
2. What services are available from my Embassy?	116	52	30	31
3. What classes are available for me in Singapore?	113	80	22	14
4. What is my work pass status?	114	63	33	18
5. What rights do I have as a Foreign Domestic Worker?	115	93	11	11
6. Salary questions	116	89	17	10
7. General questions I don't want to ask my employer	116	41	54	21
8. General questions I don't want to ask my agency	115	41	50	24
9. Questions about my agency	114	62	31	21
10. Questions about non-government organizations	115	33	45	37
11. Questions about Ministry of Man Power (MOM)	115	73	27	15
12. Questions about going home	118	90	18	10
13. Questions about health and well being	115	90	14	11
14. Questions about fun things to do in Singapore	116	76	27	13
15. Questions about time/days off	117	91	21	5

References

- Al-Ghailani, H., & Moor, W. (2009). Technology transfer to developing countries. *International Journal of Technology Management*, 10(8), 687-703.
- Andersson, A. E., & Beckmann, M. J. (2009). *Economics of knowledge: Theory, models and measurements*. Northampton, MA: Edward Elgar Publishing.
- Attwell, G. (2007). Personal learning Environments - the future of eLearning? *eLearning Papers*. 2(1), 1-18. Retrieved September 30, 2011, from <http://www.elearningeuropa.info/files/media/media11561.pdf>
- Bagozzi, R. P. (2007). The legacy of the technology acceptance model and a proposal for a paradigm shift. *Journal of the Association for Information Systems*, 8, 244-254.
- Bartel, A. P., Ichniowski, C., Shaw, K. L., & Correa, R. (2009). The Valve-Making Industry in the United States and United Kingdom. In R.B. Freeman, & K. L. Shaw (Eds.), *International differences in the business practices and productivity of firms: International differences in the adoption and impact of new information technologies and new hr practices*. Chicago, IL: University of Chicago Press for NBER.
- Beaudry, A., & Pinsonneault, A. (2010). The other side of acceptance: Studying the direct and indirect effects of emotions on information technology use. *MIS Quarterly*, 34(4), 689-710.
- Boesch, S. C. (2012). Residence Location Map of Foreign Domestic Worker Survey Participants. Google Maps. Retrieved May 2, 2012, (<http://maps.google.com.sg/maps?hl=en&tab=cl>)
- Burton-Jones, A., & Hubona, G. (2005). Individual differences and usage behaviour: Revisiting a technology acceptance model assumption. *ACM SIGMIS Database*, 36(2), 58-77.
- Chan, C. W. (2010). The economic effect of education in an information technology–Penetrating economy evidence from Hong Kong. *Educational Researcher*, 39(50), 401-405.
- Chidamber, S. R., & Kon, H. B. (2009). A research retrospective of innovation inception and success: The technology-push, demand-pull question. *International Journal of Technology Management*, 9(1), 94-112.

- Constable, N. (1997). *Maid to order in Hong Kong – Stories of Filipina Workers*. Cornell University Press.
- Curtis, L., Edwards, C., Fraser, K., Gudelsky, S., Holmquist, J., & Thornton, K. (2010). Adoption of social media for public relations by non-profit organizations. *Public Relations Review*, 36(1), 90-92.
- Dennis, W. (2006, November). Singapore to have national wi-fi. *Engineering & Technology*, 1(8), 26-27. Retrieved September 30, 2011, from http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=4114109
- Department of Statistics Singapore. (2011). Official Statistics Portal. Retrieved September 30, 2011, from <http://www.singstat.gov.sg/>
- Eckhardt, A., Laumer, S., & Weitzel, T. (2009). Who influences whom? Analyzing workplace referents' social influence on IT adoption and non-adoption. *Journal of Information Technology*, 24(1), 11–24.
- Fang, X., Benamati, J., & Lederer, A. (2011). Coping with rapid information technology change in different national cultures. *European Journal of Information Systems*, 20, 560-573.
- Freeman, C. (2011). Technology, inequality and economic growth. *Innovation and Development*, 1(1), 11-24.
- Freidman, T. (2011, August 13). A theory of everything (sort of). *The New York Times*. Retrieved September 30, 2011, from http://www.nytimes.com/2011/08/14/opinion/sunday/Friedman-a-theory-of-everyting-sort-of.html?_r=1
- Friedman, B., Kahn, P. H., & Borning, A. (2006). Human-computer interaction and management Information Systems: Applications. *Advances in Management Information Systems*, 6, 348-372.
- Gilbert, M., Masucci, M., Homko, C., & Bove, A. (2008). Theorizing the digital divide: Information and communication technology use frameworks among poor women using a telemedicine system. *Geoforum*, 39(2), 912-925.
- Gregor, P., & Dickinson, A. (2007). Cognitive difficulties and access to information systems: An interaction design perspective. *Universal Access in the Information Society*, 5(4), 393-400.
- Groves, R., Fowler, F., Couper, M., Lepkowski, J., & Singer, E. (2009). *Survey methodology*. Hoboken, New Jersey: John Wiley & Sons, Inc.

- Gulati, S. (2008). Technology-enhanced learning in developing nations: A review. *The international review of research in open and distance learning*, 9(1). Retrieved September 30, 2011, from <http://www.irrodl.org/index.php/irrodl/article/view/477/1012>
- Goh, A. (2006). Evolution of industrial policy-making in support of innovation: The case of Singapore. *International Journal of Innovation and Learning*, 3(1), 110-125.
- Haverila, M. (2011). Cell phone feature preferences and gender differences among college students. *International Journal of Mobile Communications*, 9(4), 401-419.
- Hing, J. T., Sevcik, K. W., & Oh, P. Y. (2009, October 15). Improving unmanned aerial vehicle pilot training and operation for flying in cluttered environments. *IEEE/RSJ International Conference on Intelligent Robots and Systems* (5641-5646). St. Louis, MO. Retrieved September 30, 2011, from http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=5354080
- Human Rights Watch. (2011). World Report 2011. Retrieved September, 29, 2011, from <http://www.hrw.org/world-report-2011>
- ICT Development Index. (2009). Measuring the Information Society. Retrieved September 30, 2011, from <http://www.itu.int/ITU-D/ict/publications/idi/2009/index.html>
- iDA Singapore. (2011, December). Statistics on Telecom Services for 2006 (Jul- Dec). Retrieved April 1, 2011, from http://www.ida.gov.sg/Annual%20Report/2010/subpages/infocomm_stats/telecommunications.html
- iDA Singapore. (2009, December). Statistics on Telecom Services for 2009 (Jul- Dec). Retrieved September 20, 2011, <http://www.ida.gov.sg/Publications/20070618184449.aspx>
- Igun, S. E. (2011). Bridging of digital divide in Africa. *International Journal of Information and Communication Technology Education*, 7(1), 11-20.
- Jackson, M., C. (2011). The multi-methodology debate: a response to Harwood. *Journal of the Operational Research Society*, 62, 811–813.
- Joseph, M., & Andrew, T. (2007). Convergence opportunities and factors influencing the use of Internet and telephony by rural women in South Africa and India towards empowerment. *IFIP International Federation for Information Processing*, 241, 1-20. Retrieved September 30, 2011, from

- <http://www.springerlink.com/content/13p24x38727105q4/export-citation/>
Kendall, K. E., Kendall, J. E., & Kah, M. M. O. (2006). Formulating information and communication technology (ICT) policy through discourse: How Internet discussions shape policies on ICTs for developing countries. *Journal of Information Technology for Development*, 12(1), 25-43.
- Koivimäki, T., Ristola, A., & Kesti, M. (2008). The perceptions towards mobile services: An empirical analysis of the role of use facilitators. *Personal & Ubiquitous Computing* 12(1), 67–75.
- Lee, J. S. (2008). Technology education for women by D. I. Y. Technology in closing gender gap. *Proceedings of the Chi 2008 Conference on Human Factors in Computing Systems* (3447-3452). Florence, Italy.
- Lee, K. C., Lee, S., & Kang, I. (2005, December). KMPI: Measuring knowledge management performance. *Information & Management*, 42(8), 469-482.
- Lee, T. (2005). Internet control and auto-regulation in Singapore. *Surveillance & Society*, 3(1), 74-95.
- Leifler, O. (2008). Combining technical and human-centered strategies for decision support in command and control: The ComPlan approach. *Proceedings of the 5th International ISCRAM Conference*. Washington, DC.
- Lu, J., L. (2011). Relations of feminization of agriculture and women's occupational health – The case of women farmers in the Philippines. *Journal of international woman studies*, 12(4), 108-118.
- Luarn, P., & Lin, H. (2005, November). Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, 21(6), 873-891.
- Ludford, P. J., Frankowski, D., Reily, K., Wilms, K., & Terveen, L. (2006, April). Because I carry my cell phone anyway: Functional location-based reminder applications. *Proceedings of the SIGCHI conference on Human Factors in computing systems* (889-898). Montréal, Québec.
- Maurer, C., Lutz, V., (2012). Strategic Implications for Overcoming Communication Gaps in Tourism Caused by Digital Divide. *Information Technology & Tourism*, 13(3), 205-214.
- Ministry of Man Power. (2011). Work Permit (Foreign Domestic Workers). Retrieved September 30, 2011, from <http://www.mom.gov.sg/foreign-manpower/passes-visas/work-permit-fdw/before-you-apply/Pages/default.aspx>
- Munch, J. R., & Skaksen, J. R. (April, 2009). Specialization, outsourcing and wages.

Review of World Economics, 145(1), 57-73.

- Oulasvirta, A., Petit, R., Raento, M., & Tiitta, S. (2007). Interpreting and acting on mobile awareness cues. *Human-Computer Interaction*, 22(1), 97-135.
- Peters, O. (2009, February). A social cognitive perspective on mobile communication technology use and adoption. *Social Science Computer Review* 27(1), 76-95.
- Prusak, L. (2010). Where did knowledge management come from? *IBM Systems Journal*, 40(4), 1002-1007.
- Rice, R., & Hancock, L. (2005). The mall intercept: A social norms marketing research tool. *The Report on Social Norms*, 4(7), 4-7.
- Saghir, J. (2005). Energy and poverty: Myths, links and poverty issues. *Energy Working Notes No 4 .Technical Report*. Washington, DC: World Bank.
- Sales, A., & Fournier, M. (2007). *Knowledge, communication and creativity*. Thousand Oaks, Ca: SAGE Publications.
- Saris, W. E., & Gallhofer, I. N. (2007). *Design, evaluation, and analysis of questionnaires for survey research*. Hoboken, NJ: Wiley.
- Sharp, J. H. (2007). Development, extension, and application: A review of the technology acceptance model. *Information Systems Education Journal*, 5(9), 1-11.
- Teófilo, M., Martini, A., & Cruz, P. (2009). Ulmo: A system to enable mobile applications personalization by binary SMS. 2009 *Fourth International Multi-Conference on Computing in the Global Information Technology*. *Oxford Journals, Social Sciences. Public Opinion Quarterly*, 70(5), 646-675.
- Torimiro, D. O., Kolawole, O. D., & Okorie, V. O. (2007). In-school farm youth and ICT usage: A gender analysis of Nigeria's Yoruba communities. *Journal of Youth Studies*, 10(2), 143-154.
- Trauth, E., Quesenberry, J., & Yeo, B. (2008). Environmental influences on gender in the IT workforce. *ACM SIGMIS*, 39(1), 8-32.
- United Nations, Department of Economic and Social Affairs. (2009). *International Migration Report 2009: A Global Assessment*. Retrieved November 5, 2011, from: <http://esa.un.org/migprofiles/>
- United Nations Statistics Division. (2010). *The World's Women 2010: Trends and statistics*. Retrieved September, 29, 2011, from:

<http://unstats.un.org/unsd/demographic/products/Worldswomen/WW2010pub.htm>

- Vanderheiden, G. C. (2010). Building national public infrastructures on our way to global inclusive infrastructure. *Proceedings of the 2010 International Cross Disciplinary Conference on Web Accessibility (W4A)* (page). Raleigh, North Carolina ACM. New York, NY, USA. Retrieved September 30, 2011, from <http://dl.acm.org/citation.cfm?id=1806014>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.
- Verhoeven, J., Heerwegh, D., & De Wit, K. (2010). Information and communication technologies in the life of university freshmen: An analysis of change. *Computers & Education*, 55(1), 53-66.
- Wajcman, J. (2010). Domestic Technology: Labour-saving or enslaving? *Technology and Values: Essential Readings* (274-288). West Sussex, United kingdom: Blackwell publishing.
- World Economic Forum. (2011, April). The Global Information Technology Report 2010-2011 - Transformation 2.0. Retrieved September 30, 2011, from <http://www.weforum.org/reports/global-information-technology-report-2010-2011-0>
- Wu, C. S., Cheng, F. F., Yen, D. C., & Huang, Y. W. (2011). User acceptance of wireless technology in organizations: A comparison of alternative models. *Computer Standards & Interfaces*, 33(1), 50-58.
- Zhang, Y., Wu, J., & Ai, H. (2009). The technology gap and the limit of imitation: An inspection of the strategy of exchanging market for technology. *Journal of Chinese Economic and Business Studies*, 7(4), 447-455.