

# Journal of Business Systems, Governance & Ethics





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# Journal of Business Systems, Governance and Ethics

Vol 2, No 4, 2007

## Contents

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|                        |          |
|------------------------|----------|
| <b>Editorial .....</b> | <b>v</b> |
|------------------------|----------|

*Arthur Tatnall*

|  |          |
|--|----------|
| <b>E-Commerce Adoption in China's Service SMEs:<br/>A Study From Web Usability Perspective .....</b> | <b>1</b> |
|--|----------|

*Mingxuan Wu, Li Zhang, Qiudan Xing, Li Dai and Hongmei Du*

|  |           |
|--|-----------|
| <b>Analysis of Workplace Surveillance in a Quest for an Ethical Stance .....</b> | <b>15</b> |
|--|-----------|

*Saima Ahmed*

|   |           |
|---|-----------|
| <b>A Framework for Developing Effective Technology-Enabled<br/>Distance Education Programs in Management:<br/>A Study of a Video Conference-Based Program in an Indian Perspective ....</b> | <b>27</b> |
|---|-----------|

*Jaydeep Mukherje and Mukti Mishra*

|  |           |
|--|-----------|
| <b>Success Factors Associated With Health Information Systems<br/>Implementation: A Study of an Australian Regional Hospital .....</b> | <b>41</b> |
|--|-----------|

*Carmine Sellitto and Daniel Carbone*

|   |           |
|---|-----------|
| <b>Unequal Outcomes for Women Academics in Australian Universities:<br/>Reflections on Belinda Probert's 'I Just Couldn't Fit In' .....</b> | <b>57</b> |
|---|-----------|

*Chau Jo Vu and James Doughney*





# Editorial

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This fourth number of Volume 2 represents the 8<sup>th</sup> issue of the *Journal of Business Systems, Governance and Ethics* and follows the trend for this new journal to include increasing numbers of articles written by researchers from many countries around the world. This issue has articles by researchers from the Peoples Republic of China, Pakistan, India and Australia. It covers a wide range of topics including e-commerce adoption in China, workplace surveillance in academic institutions in Pakistan, technology-enabled distance management education programs in India, health information systems in Australian hospitals and an article addressing the unequal outcomes for female academics.

The first article, written by Mingxuan Wu, Li Zhang, Qiudan Xing, Li Dai and Hongmei Du addresses the issue of adoption of e-commerce by China's service SMEs. The authors note that although China's economy continues to grow rapidly, some researchers have remarked that China will have to develop its service sector to sustain this growth. Research on electronic commerce adoption in China's service industries is still lacking. This article reviews research that highlights challenges for developing and adopting e-commerce in China's service SMEs that involved a survey of 494 service SME websites in China. It found that most of China's service SMEs are still at the early stage of adopting e-commerce; there is an obvious e-commerce divide between Eastern China and Western China; and there is a positive relation between GDP per person and e-commerce adoption.

In the second article Saima Ahmed discusses the incidence of surveillance in higher learning academic institutions in Pakistan. The article gives an overview of surveillance in a workplace and outlines how the latest technology has made this task more convenient for employers. The article then delves into the privacy issues that arise as a consequence of surveillance, and a review of related ethical theories has been undertaken to find the justification of surveillance practices in the modern workplace. The study aims to show typical methods used, and their extent of this usage in surveillance in an academic institution setting.

In the next article, Jaydeep Mukherje and Mukti Mishra describe a significant un-met need for quality management education for working executives in India. They note that one of the major bottlenecks here has been the inability of potential students to leave their job for a prolonged period of time to attend the on-campus management programs. As effective management education cannot be delivered without a reasonably high degree of student-faculty interaction and, more significantly, student to student interaction, management education for working executives has been located at the premises of business schools in India. With the proliferation of two way Video Conferencing facilities across the country, as well as the advent of Internet technology, however, this limitation can now be overcome.

Carmine Sellitto and Daniel Carbone next investigate the success factors associated with health information systems (HIS) implementation in an Australian regional hospital. They identify five important factors from the literature for the successful implementation of health information systems, including stakeholder engagement, support of management and local champions, understanding HIS imposed change, user training, and impact of government incentives. In one case HIS implementation was considered a failure by the system's users, with all factors except the training issues poorly addressed. The study also reports on practicalities encountered with the system's introduction and documents several new operational factors that were found to be associated with HIS implementation.

In the final article, Chau Jo Vu and James Doughney consider the position of women academics in Australia. They note that women's participation in the academy in Australia has grown rapidly in the past decades but that the position of women academics in Australia is similar to that in other countries where they are still under-represented in senior academic leadership positions. The paper introduces a flow model for analysing staffing changes in organisations that provides insights not usually presented in the literature on gender inequity in academic employment.

Arthur Tatnall  
Editor



# E-Commerce Adoption in China's Service SMEs: A Study From Web Usability Perspective

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## Abstract

*Although China's economy continues to grow rapidly over the last decade, some researchers have been aware that China has had to develop its service sector if China wants to sustain this growth. However, researches on the electronic commerce (e-commerce) adoption in China's service industries are still lacking and are limited so far. In literature review, few works discuss e-commerce adoption by measuring web site usability / web usability.*

*This paper reviews the research on China's small and medium enterprises (SMEs), and highlights the challenges for developing and adopting e-commerce in China's service SMEs. This research surveyed 494 of China's service SME websites, and found that (1) most of China's service SMEs are still at the early stage of adopting e-commerce; (2) there is an obvious e-commerce divide between Eastern China and Western China; (3) there is an existing positive relation between GDP per person and e-commerce adoption. This paper suggests that there is a need to select more sampling cities and make further research for justifying the above findings. Finally, this research concludes that web usability is the core of e-commerce adoption, and recommends the promotion of web usability as an effective strategy in further strategic development for China's service SMEs adopting e-commerce. This research believes that China's service sector adopting e-commerce might promote them up to the global level and stay competitive, which might further benefit the growth of China's economy immensely.*

## Keywords

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*Contact links, e-commerce adoption, GDP, service industry, SMEs, web usability.*

## Introduction

As key contributors to the economic growth and employment in the global economy (DFAIT-MAECI 2004), the majority of

small and medium enterprises (SMEs) have realised that electronic commerce (e-commerce) can fulfil their expectations (NUA 2002). The first reason is that today more than ever before, a small enterprise can use new technologies to respond quickly to change consumer patterns, customize goods and services to meet local demand, manage supply processes and inventories, and monitor production costs and quality control (Bologna 2000). Payne (2003) believes that SMEs would be in a very good position to adapt to new technology, which may be adapted faster in SMEs than larger companies who can be slowed by bureaucracy and stricter staffing hierarchies. The following is that the potential benefits of e-commerce to “level the playing field” will allow SMEs to compete better (Daniel & Myers 2000), which gives SMEs a better chance to compete in their markets (Payne 2003). The last reason is that e-commerce can support SMEs to establish a commercial presence in foreign markets, entry and exit barriers in foreign markets may be barriers to their effective participation (DFAIT-MAECI 2004).

However, in review of e-commerce researches in SMEs, only a small number of studies focused on the adoption and use of e-commerce in SMEs (Grandon & Pearson 2004, cited in Al-Qirim 2006, p.19). The results seemed to be disappointing and bring further gloom to the e-commerce adoption phenomenon in SMEs (Al-Qirim 2006, p.19). Therefore, many researchers warn that SMEs are being laggards in adopting or in using e-commerce more strategically in business (Abell & Lim 1996; Abell & Black, 1997; Adam & Deans, 2000; Deloitte, 2000; Grandon & Pearson, 2004; MOED, 2000a, 2000b; Poon, 2000; Poon & Swatman, 1995, 1997, 1998, 1999a, 1999b; PWHC, 1999; Teo, Tan & Buk, 1998, cited in Al-Qirim 2006, p.19).

Kristian Steenstrup, the research director at Gartner said “E-business will change Asia more than it changes the U.S.” (Rao 2001). Schneider (2007, p.11) supports that the second wave is characterised by its international scope with sellers doing business in many countries and in many languages while the first wave of e-commerce was predominantly a U.S. phenomenon. Therefore, there is an urgent need for understanding SMEs adopting e-commerce in Asian countries, especially in China as the largest country in the world.

A few works have been published, such as Guo & Chen (2005, p.55) find that some smaller China’s companies adopt the Internet earlier than their larger counterparts. However, researches on e-commerce adoption in China’s SMEs adopting are still lacking and are limited so far, especially in service SMEs. This paper focuses on e-commerce adoption in China’s service SMEs from web site usability / web usability perspective.

## **Research Background**

Although China’s economy continues to grow rapidly over the last decade, some researchers have been aware that China has had to develop its service sector if China wants to sustain this growth. According to Spohrer (2005), there are some reasons why service sector is important. First, the economies of most developed countries are dominated by services (70% of the labor, GDP, etc.). Second, even traditional manufacturing companies like GE (70% of services revenue) and IBM (50% of services revenue) need to add high value services to grow their businesses. Third, research indicates that improving productivity – one type of service innovation – often requires technical-business, social-business, and social-demand innovations combined. One more reason is that service industries will be more active in the global marketplace in order to maintain their job and wealth-creation capability in an increasing integrated world (DFAIT-MAECI 2004). However, China’s service sector has to face several challenges in adopting e-commerce.

## **Classification of Service Industry**

China has a different classification of its service sector compared with advanced countries, such as Australia. According to the Australian Bureau of Statistics (ABS 2004), the service industries are divided into the 12 sections including wholesale trade, retail trade, accommodation/cafes/restaurants, transport/storage, communication services, finance/insurance services, property/business services,

government administration/defence, education, health/community services, cultural/recreational services, and personal/ other services.

This research adopts the classification of the Australian Bureau of Statistics to conduct its analysis, and focuses on 10 different sectors in service industry excluding government administration/defence, and education. This would enhance the quality of communication with other researches.

## Definitions of SMEs

There is no single agreed definition of an SME (APEC 2006, p.63). A variety of definitions are applied among Organization for Economic Cooperation and Development (OECD) countries, and employee numbers are not the sole defining criterion, which are generally considered to be non-subsidary, independent firms which employ fewer than a given number of employees (APEC 2006, p.63). Daniel & Myers (2000) believes that a widely accepted definition of SMEs is companies with less than 250 employees. IDC (2004) covers SMEs with 1-499 employees, segmented into 1-4, 5-9, 10-19, 20-49, 50-99, 100-199, 200-499. In 2003, China announced a standard for SMEs. However, it just covers few industries (see Table 1) as follows:

**Table 1:** Definitions of SMEs in China

| Industries                        | Business Size | No. of Employees | Business Sales<br>(Million CNY) |
|-----------------------------------|---------------|------------------|---------------------------------|
| <b>Manufacturing</b>              | Medium        | 300-2000         | 30-300                          |
|                                   | Small         | <300             | <30                             |
| <b>Construction</b>               | Medium        | 600-3000         | 30-300                          |
|                                   | Small         | <600             | <30                             |
| <b>wholesale trade</b>            | Medium        | 100-200          | 30-300                          |
|                                   | Small         | <100             | <30                             |
| <b>Retail trade</b>               | Medium        | 100-500          | 10-150                          |
|                                   | Small         | <100             | <10                             |
| <b>Accommodation/restaurant</b>   | Medium        | 400-800          | 30-150                          |
|                                   | Small         | <400             | <30                             |
| <b>Transport</b>                  | Medium        | 500-3000         | 30-300                          |
|                                   | Small         | <500             | <30                             |
| <b>Post communication service</b> | Medium        | 400-1000         | 30-300                          |
|                                   | Small         | <400             | <30                             |

(Source: Xinhuanet 2003)

## Challenges for E-commerce adoption in China's Service SMEs

Currently, there are at least three challenges for e-commerce adoption in China's service SMEs as follows:

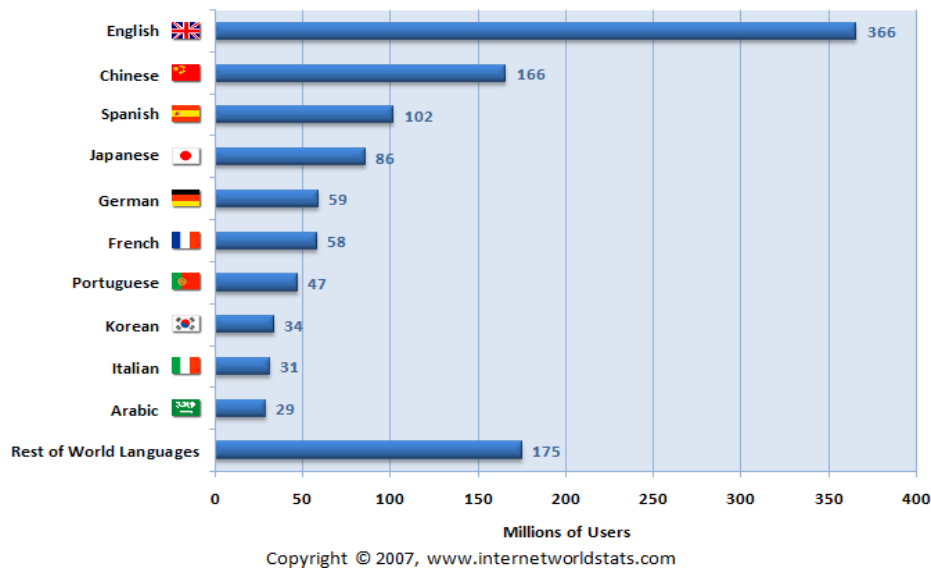
### China's service sector is still the least developed compared with advanced countries

In 2005, China has 3.65 million SMEs and 28 million individual businesses, which accounts for 99.6 % of all industries (China Daily 2005), and up from 98.99% in 2003 (Luo & Guo 2005). However, China's service sector is only 40.3% share of China's GDP in 2005 (Stats 2006). China's service sector is still one of the least developed in the world (Chen 2005, p.13) compared with a service sector share of 71.6% in Australia (ABS 2004) and 79.4% in the US (Chen 2005, p.13).

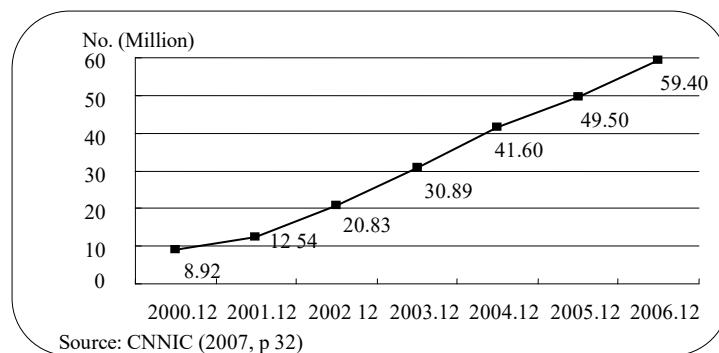
Thus, some researchers are aware that China as "the world's factory" is already being challenged, and must develop its service sector (Chen 2005, p.13), because: (1) being the 'world's factory' has taken its toll on China's environment; (2) China has faced more and more tough hurdles to further expanding its world market share in manufactured goods; (3) manufacturing can no longer create new jobs.

### Internet penetration is the last second among the top ten languages used on the web

On 30 June 2007, the Chinese has been the top second Internet Language used on the web (Internet World Stat 2007) (see Figure 1). In the meantime, the number of computers connected to Internet continues to grow up in China, which is 59.4 million in Dec 2006, and up from 8.92 million in 2000, 12.54 million in 2001, 20.83 million in 2002, 30.89 million in 2003, 41.60 million in 2004, and 49.50 million in 2005 (CNNIC 2007, p.12) (see Figure 2).



**Figure 1:** Top Ten Internet Languages (Source: Internet World Stat 2007)



**Figure 2:** The Number of Computers Connected to Internet in China

However, Internet penetration by language in China is only 12.3%, which is the last second among the top ten languages used on the web, and is just more than Arabic (see Table 2).

**Table 2:** Top Ten Languages Used on the Web (Number of Internet Users by Language)

| TOP TEN LANGUAGES IN THE INTERNET  | % of all Internet Users | Internet Users by Language | Internet Penetration by Language | Internet Growth for Language ( 2000 - 2007 ) | 2007 Estimate World Population for the Language |
|------------------------------------|-------------------------|----------------------------|----------------------------------|--|---|
| <a href="#">English</a>            | 31.7 %                  | 365,893,996                | 17.9 %                           | 157.7 %                                      | 2,042,963,129                                   |
| <a href="#">Chinese</a>            | 31.7 %                  | 166,001,513                | 12.3 %                           | 413.9 %                                      | 1,351,737,925                                   |
| <a href="#">Spanish</a>            | 8.8 %                   | 101,539,204                | 22.9 %                           | 311.4 %                                      | 442,525,601                                     |
| <a href="#">Japanese</a>           | 7.5 %                   | 86,300,000                 | 67.1 %                           | 83.3 %                                       | 128,646,345                                     |
| <a href="#">German</a>             | 5.1 %                   | 58,981,592                 | 61.1 %                           | 112.9 %                                      | 96,488,326                                      |
| <a href="#">French</a>             | 5.1 %                   | 58,456,702                 | 15.1 %                           | 379.2 %                                      | 387,820,873                                     |
| <a href="#">Portuguese</a>         | 4.1 %                   | 47,326,760                 | 20.2 %                           | 524.7 %                                      | 234,099,347                                     |
| <a href="#">Korean</a>             | 3.0 %                   | 34,120,000                 | 45.6 %                           | 79.2 %                                       | 74,811,368                                      |
| <a href="#">Italian</a>            | 2.7 %                   | 31,481,928                 | 52.9 %                           | 138.5 %                                      | 59,546,696                                      |
| <a href="#">Arabic</a>             | 2.5 %                   | 28,782,300                 | 8.5 %                            | 940.5 %                                      | 340,548,157                                     |
| <b>TOP TEN LANGUAGES</b>           | <b>84.8 %</b>           | <b>978,883,995</b>         | <b>19.0 %</b>                    | <b>198.0 %</b>                               | <b>5,159,187,766</b>                            |
| Rest of World Languages            | <b>15.2 %</b>           | <b>175,474,783</b>         | <b>12.4 %</b>                    | <b>440.3 %</b>                               | <b>1,415,478,651</b>                            |
| <a href="#"><b>WORLD TOTAL</b></a> | <b>100.0 %</b>          | <b>1,154,358,778</b>       | <b>17.6 %</b>                    | <b>219.8 %</b>                               | <b>6,574,666,417</b>                            |

(\*) NOTES: (1) Internet Top Ten Languages Usage Stats were updated for June 30, 2007. (2) Internet Penetration is the ratio between the sum of Internet users speaking a language and the total population estimate that speaks that specific language. (3) The most recent Internet usage information comes from data published by [Nielsen/NetRatings](#), [International Telecommunications Union](#), [Computer Industry Almanac](#), and other reliable sources. (4) World population information comes from the [world gazetteer](#) web site. (5) For definitions and navigation help, see the [Site Surfing Guide](#). (6) Stats may be cited, stating the source and establishing an active link back to [Internet World Stats](#). Copyright © 2007, Miniwatts Marketing Group. All rights reserved.

(Source: Internet World Stat 2007)

## Theoretical Framework and Research Methodology

A crucial success factor in e-commerce is the development of an appealing, effective, and efficient web site (Belanger 2006, p.i). This is due to web site becoming a global platform used by individuals, organisations, and governments worldwide (Belanger 2006, p.i), and a powerful medium for worldwide information dissemination and e-commerce (Singh, Dalal, & Spears 2005, p.288), and an important part of a successful e-commerce operation to meet the needs of potential customers (Schneider 2007, p.151). Agarwal & Venkatesh (2002, p.169) highlight to measure the quality of its web presence through a key concept that emerges from human-computer interaction (HCI) research-that of usability. Therefore, web usability is the core of e-commerce development and adoption. In literature review, little works discuss e-commerce adoption by measuring web usability.

## Studying E-Commerce Adoption by Measuring Web Usability

The notion of usability has been defined in a variety of ways by scholars (Nielsen 1994, Karat 1997; Gray & Salzman 1998; Lecerof & Paterno 1998; Lecerof & Paterno 1998; and Nielsen 2000, cited in Agarwal & Venkatesh 2002, p.169). Spool (1998 cited in Sandvig & Bajwa 2004, p.15) and Nielsen (2001 cited in Sandvig & Bajwa 2004, p.15) note that web usability is typical measured by observing web users as they attempt to complete a given set of tasks. Sandvig & Bajwa (2004, p.15) define web usability as the study of how web users interact with web pages and site navigation. Schneider (2007,

p.146) believes that the study of web usability can understand how companies can improve their web presences by making their sites accessible to more people and easier to use, and by making sure that their sites encourage visitors to trust and even develop feelings of loyalty toward the organisation behind the web sites. Currently, more and more companies are realising the importance of web usability testing, and are doing some testing (Schneider 2007, p.150).

In fact, the emergence of usability testing and laboratories has been an indicator of the profound shift in attention to user needs since the early 1980s (Shneiderman 1998, p. 127, cited in Sandvig & Bajwa 2004, p.15). Such as Agarwal & Venkatesh (2002) develop an evaluation procedure for website usability including content, ease of use, promotion, made-for-the-medium, and emotion. As two pioneers of usability testing, Dr. Ben Shneiderman founded the University of Maryland HCI Lab, and Dr. Jakob Nielsen established Alerbox web to analyse the current issues in web usability (Schneider 2007, p.150). These tests are often conducted on new or redesigned web sites to evaluate how well a representative sample of the web sites target population can navigate the site (Sandvig & Bajwa 2004, p.15).

According to Goldsborough (2005, p.40), if a business uses web site to promote or sell its products or services, the life of this business may depend on whether its web site shows up in the first screen or two when people conduct web searches through Google and other search sites. Jansen (2007, P.24) further highlights that sponsored search is an effective method for providing relevant information to web searchers for the e-commerce area.

However, the web site searched by search engines or linked by other web sites is just the initial step for a business adopting e-commerce. Both Goldsborough and Jansen ignore another two critical factors. The first factor is whether web site is effective. Web site is a crucial determinant of whether visitors are likely to return to the site (Klein 1998, cited in Agarwal & Venkatesh 2002, p.168). If it is ineffective, web site might not work out properly. It should be difficult for potential customers to find out business's products and services well. Nielsen (2000, p.11, cited in Agarwal & Venkatesh 2002, p.168) highlights that users experience usability first and pay later on the web. Therefore, it is impossible that web visitors get failed or bad experiences and may come back to these web sites again because they have many options on the web. Another factor is whether contact e-mail address or link provided on the web site is valid. Generally, e-commerce web sites provide the different channels for users easily to contact sales representatives or businesses. Compared with the traditional ways such as post mailing address, telephone number, and fax number, contact e-mail address or link is an effective e-channel provided on the web site which visitors are easy to be made contact with. Song & Zahedi (2005, p.1224) indicate that contact function in e-commerce website design is one of the significant roles of elements related to service. For an example, few firms had e-mail address links on their web sites but they often understaffed the department responsible for answering visitors' e-mail messages so that many site visitors sent e-mail messages that were never answered (Schneider 2007, p.146). If contact link is invalid, therefore, businesses might not be made contact with by visitors easily. For these reasons, this research just address the percentage of usable websites to measure the terms of web usability, which focuses on two critical factors – the effective web sites and valid contact links.

## Research Methodology

This research adopts the random sampling method to select the samples. The first step is to define the different service sectors. The second step is to select the cities. The third step is to use a random selection procedure to select samples from China's Yellowpage (<http://www.yellowpage.com.cn>) online. However, most of China's service SMEs do not establish web sites. On the other hand, most of businesses do not provide their web site links in China's Yellowpage web site even if they have. Therefore, search engine is used to search business web sites according to the business name selected by the third step. This research chooses the Chinese Baidu ([www.baidu.com](http://www.baidu.com)) as the main search engine.

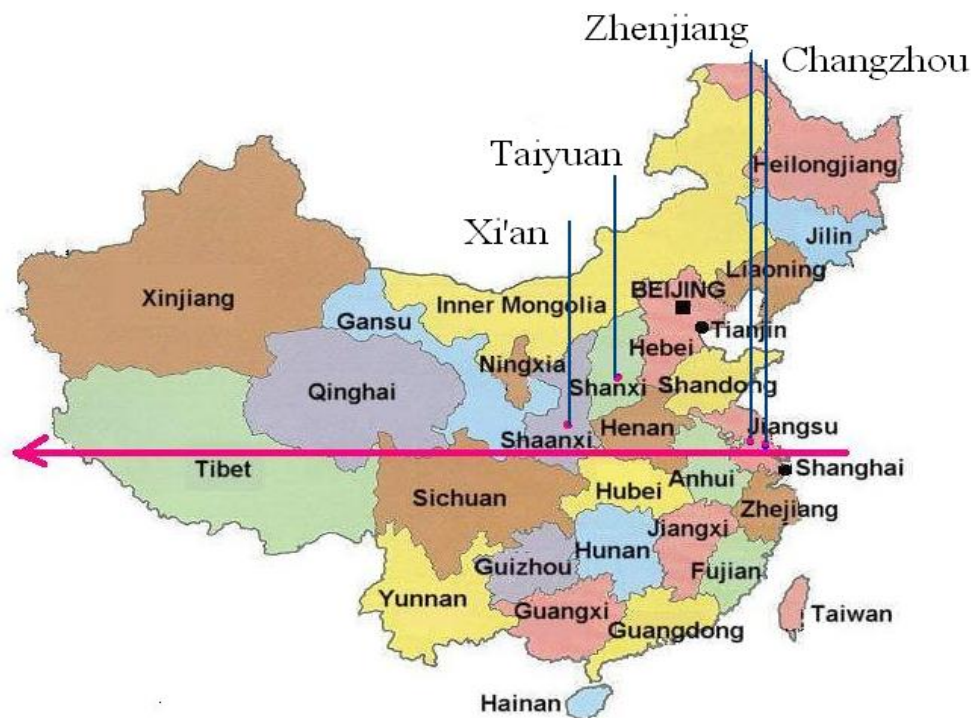
The data was collected from 13 November 2006 to 18 December 2006 during 5 weeks period. All data are recorded in order to analyse and monitor any changes. First is to survey whether all web sites still

work properly on 18 December while they all work well on 13 November. Second is to test whether all contact links listed in the effective web sites are valid.

## Data Analysis and Findings

### Data Analysis

Totally, 494 service SMEs were selected from four sampling cities including Xi'an (162) in Western China, Taiyuan (152) in Middle China, Zhenjiang (123) in Eastern China, and Changzhou (57) in Eastern China (see Figure 4)



**Figure 4:** The Location of Sampling Cities in China's Map

Table 3 shows GDP and GDP per person in sampling cities as follows:

- GDP (130.22 Billion CNY), GDP per Person (37,174 CNY) in Changzhou – a larger city in Eastern China.
- GDP (90.5 Billion CNY), GDP per Person (33,870 CNY) in Zhengjiang – a medium city in Eastern China.
- GDP (89.549 Billion CNY), GDP per Person (26,175 CNY) in Taiyuan – a larger city in Middle China.
- GDP (127.014 Billion CNY), GDP per Person (15,925 CNY) in Xi'an – a larger city in Western China.

**Table 3:** GDP and GDP per Person in Sampling Cities

| City      | Location | Size   | GDP<br>(Billion CNY) | GDP Per Person<br>(CNY) |
|-----------|----------|--------|----------------------|-------------------------|
| Changzhou | Eastern  | Larger | 130.22               | 37,174                  |
| Zhenjiang | Eastern  | Medium | 90.5                 | 33,870                  |
| Taiyuan   | Central  | Larger | 89.549               | 26,175                  |
| Xi'an     | Western  | Larger | 127.014              | 15,925                  |



- Notes: (1) GDP, GDP per Person of the city of Changzhou are provided by Loone (2006).  
(2) GDP, GDP per Person of the city of Zhenjiang are provided by Zhenjiang Government (2006).  
(3) GDP, GDP per Person of the city of Taiyuan are provided by Taiyuan Statistics (2006).  
(4) GDP, GDP per Person of the city of Xi'an are provided by Xi'an Information Centre (2006).

Table 4 shows the effective web sites in sampling cities as follows:

- 85.19% (138 out of 162) of web sites in Xi'an are effective, and 14.81% (24 out of 162) are dead. Here, the dead web sites include "this domain name has expired", "web changed", "website shut down", "invalid hostname", "web site does not work", "domain name changed", "server not found", "directory listing denied", and "no web sites configured at this address".
- 88.16% (134 out of 152) of web sites in Taiyuan are effective, and 11.84% (18 out of 152) are dead.
- 90.24% (111 out of 123) of web sites in Zhenjiang are effective, and 9.76% (12 out of 123) are dead.
- 100% of web sites in Changzhou are effective and work out. None is dead.
- Total 89.07% (440 out of 494) of web sites are effective, and 10.93% (54 out of 494) are dead.

**Table 4:** The Effective Web Sites in Sampling Cities

| City      | Effective Websites |         | Dead Websites |        | Sum<br>no. |
|-----------|--------------------|---------|---------------|--------|------------|
|           | no.                | %       | no.           | %      |            |
| Xi'an     | 138                | 85.19%  | 24            | 14.81% | 162        |
| Taiyuan   | 134                | 88.16%  | 18            | 11.84% | 152        |
| Zhenjiang | 111                | 90.24%  | 12            | 9.76%  | 123        |
| Changzhou | 57                 | 100.00% | 0             | 0.00%  | 57         |
| Total     | 440                | 89.07%  | 54            | 10.93% | 494        |

Table 5 shows web sites with valid contact links and web sites with invalid contact links among 440 effective web sites in four cities as follows:

- 83.33% (115 out of 138) of web sites with contact links among 138 effective web sites in Xi'an are valid, 16.67% (23 out of 138) are invalid.
- 84.33% (113 out of 134) in Taiyuan are valid, and 15.67% (21 out of 134) are invalid.
- 81.08% (90 out of 111) in Zhenjiang are valid, and 18.92% (21 out of 111) are invalid.
- 98.25% (56 out of 57) are valid in Changzhou, and only one (1.75%, 1 out of 57) is invalid.
- Totally, 85.00% (374 out of 440) of contact links among 440 effective web sites are valid, and 15.00% (66 out of 440) are invalid.

**Table 5:** Valid Contact Links among the Effective Web Sites

| City      | Valid Contact Links |        | Invalid Contact Links |        | Sum<br>no. |
|-----------|---------------------|--------|-----------------------|--------|------------|
|           | no.                 | %      | no.                   | %      |            |
| Xi'an     | 115                 | 83.33% | 23                    | 16.67% | 138        |
| Taiyuan   | 113                 | 84.33% | 21                    | 15.67% | 134        |
| Zhenjiang | 90                  | 81.08% | 21                    | 18.92% | 111        |
| Changzhou | 56                  | 98.25% | 1                     | 1.75%  | 57         |
| Total     | 374                 | 85.00% | 66                    | 15.00% | 440        |

Here invalid links include "maildir over quota", "no mailbox here by that name", "server not found", "quota exceed", "mailbox full", "mailbox space not enough", "undelivered Mail Returned to Sender:temporary failure", "domain is over quota", "user mailbox exceeds allowed size", "user is over quota", "mailbox currently unavailable", "invalid User", "unable to relay for", "recipient address rejected: unknown user", "couldn't find any host named XXXX.XXX.cn", "wasn't able to establish an SMTP connection".

Thus, table 6 shows the usable websites in sampling cities as follows:

- 162 service SMEs web sites were surveyed in Xi'an. They includes the usable websites (70.99%, 115 out of 162), websites with invalid contact links (4.20 %, 23 out of 162), and dead web sites (14.81 %, 24 out of 162).
- 152 service SMEs web sites were surveyed in Taiyuan. They includes the usable websites (74.34%, 113 out of 152), web sites with invalid contact links (13.83%, 21 out of 152), and dead web sites (11.84 %, 18 out of 152).

- 123 service SMEs web sites were surveyed in Zhengjiang. They includes the usable websites (73.17%, 90 out 123), web sites with invalid contact links (17.07%, 21 out of 123), and dead web sites (9.76 %, 12 out of 123).
- 57 service SMEs web sites were surveyed in Changzhou. They includes the usable websites (98.25%, 56 out of 57), web sites with invalid contact links (0.75%, 1 out of 57), and none of dead web sites.

**Table 6:** The Usable Websites in Sampling Cities

| City      | Usable Websites |        | Websites with Invalid Links |        | Dead Websites |        | Sum |
|-----------|-----------------|--------|-----------------------------|--------|---------------|--------|-----|
|           | No.             | %      | No.                         | %      | No.           | %      |     |
| Xi'an     | 115             | 70.99% | 23                          | 14.20% | 24            | 14.81% | 162 |
| Taiyuan   | 113             | 74.34% | 21                          | 13.82% | 18            | 11.84% | 152 |
| Zhenjiang | 90              | 73.17% | 21                          | 17.07% | 12            | 9.76%  | 123 |
| Changzhou | 56              | 98.25% | 1                           | 1.75%  | 0             | 0.00%  | 57  |
| Total     | 374             | 75.71% | 66                          | 13.36% | 54            | 10.93% | 494 |

Therefore, the terms of web usability provided in this research is 70.99% (Xi'an), 74.34% (Taiyuan), 73.17% (Zhenjiang), and 98.25% (Changzhou).

## Findings

### Finding 1: Most of China's service SMEs are still at the early stage of adopting e-commerce

This research surveys all IT service providers (ISPs) in Zhengjiang, one of sampling cities, listed in China's Yellowpage online. However, only 20.18% (22 out of 109) of ISPs have established their own web sites including effected web sites (8.35%, 20 out of 109), web site with only one web page (0.92%, 1 out of 109), and dead web site (0.92%, 1 out of 109) (see Table 7).

**Table 7:** ISPs' Web Sites in Zhenjiang- One of Sampling Cities

| Web Sites |        |          |       |      |       |     |        | Non-Web Sites |        | Total |
|-----------|--------|----------|-------|------|-------|-----|--------|---------------|--------|-------|
| Effective |        | Web Page |       | Dead |       | Sum |        |               |        |       |
| no        | %      | no       | %     | no   | %     | no  | %      | no            | %      | no    |
| 20        | 18.35% | 1        | 0.92% | 1    | 0.92% | 22  | 20.18% | 87            | 79.82% | 109   |

Totally, 79.82% (87 out of 109) of ISPs do not have any web sites or even web pages. Therefore, most of ISPs have not established web sites to support their business activities and provided their services through web sites yet. Clearly, other service sectors might be less than ISPs in this term. A China's research also supports this finding that the number of China's businesses connected to the Internet is less than 1.5% of all of businesses (Yu 2005).

Owens (2006, p.24) divides the development of e-commerce in the last decade into three generations, which includes that the first generation efforts to conduct e-commerce preceded the Internet, and in the second generation most businesses progressed in e-commerce to where they could conduct sales transactions electronically, and the third generation of e-commerce that the integration of information technology infrastructure to create an e-business.

According to Owens's standards, therefore, most of China's services SMEs are still at the early stages of adopting e-commerce so far. This finding is similar with Peet, Brindley, & Ritchie' research in Europe (Peet, Brindley, & Ritchie 2002, cited in Al-Qirim 2006, p.19) that SMEs' web sites lack interactivity and are limited to text-based content, and also similar with Al-Qirim's research in New Zealand that SMEs establish web sites primarily to advertise and to promote their business rather than to conduct e-commerce as such (Al-Qirim 2006, p.19).

**Finding 2: There is an obvious e-commerce divide between Western China and Eastern China**

Simon (2004) emphasises that Internet adoption and gains in efficiency and productivity from the Internet have not yet been replicated in the developing world and has led to the coining of the term digital divide. Mandal (2004, p.1) highlights digital divide as the phenomena which is responsible for imbalanced growth of e-commerce among developed and developing countries.

However, this phenomenon also exists within China while this research focuses on the difference between Changzhou and Xi'an in terms of GDP and web usability. This research finds that there is an obvious e-commerce divide between Western China and Eastern China (see Table 7) as follows:.

- There is an only 2.52% difference in GDP between Changzhou (130.22 Billion CNY) and Xi'an. (127.014 Billion CNY)
- There is an obvious gap in the terms of web usability (38.40%) between Changzhou (98.25%) and Xi'an (70.99%).

Also, the evidence from the latest Internet survey in China published on 23 Jan 2007 (CNNIC 2007, p.74) supports this finding that the adoption of Internet in Eastern China is obviously higher than its adoption in Western China. Generally, service SMEs adopting e-commerce in Eastern China is better than Western China.

**Table 7: E-commerce Divide Between Eastern and Western China**

| City       | GDP<br>(Billion CNY) | Web Usability<br>% |
|------------|----------------------|--------------------|
| Changzhou  | 130.22               | 98.25%             |
| Xi'an      | 127.014              | 70.99%             |
| Difference | 2.52%                | 38.40%             |

**Finding 3: There is a positive relation between GDP per person and e-commerce adoption.**

Table 8 shows a positive relation between GDP per person and e-commerce adoption as follows.

- The GDP per person in Changzhou (37,174 CNY) is the highest one. Its web usability (98.25%) is also the highest one.
- The GDP per person in Taiyuan (26,175 CNY) and Zhenjiang (33,870 CNY) are in the middle. Therefore, their web usability (74.34% and 73.17%) are also in the middle.
- The GDP per person in Xi'an (15,925 CNY) is the lowest one. Its web usability (70.99%) is also the lowest one.

**Table 8: GDP per Person & Web Usability**

| City      | GDP Per Person<br>(CNY) | Web Usability<br>% |
|-----------|-------------------------|--------------------|
| Changzhou | 37,174                  | 98.25%             |
| Zhenjiang | 33,870                  | 73.17%             |
| Taiyuan   | 26,175                  | 74.34%             |
| Xi'an     | 15,925                  | 70.99%             |

Clearly, there is a positive relation between GDP per person and web usability (see Figure 5):

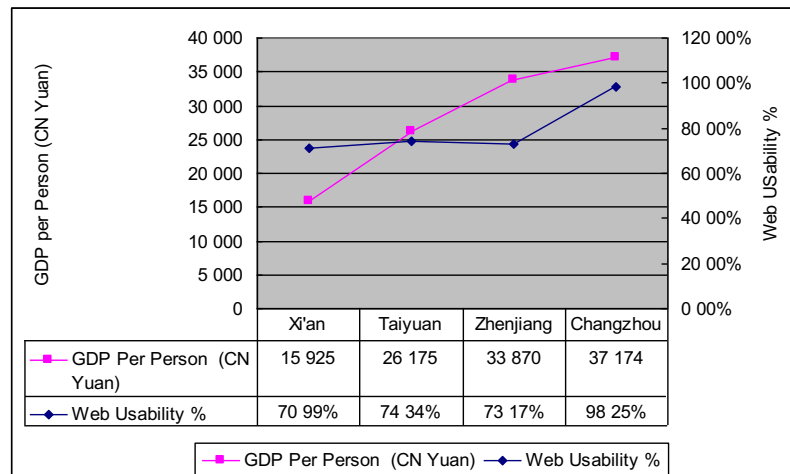


Figure 5: GDP per Person vs. Web Usability

## Limitation and Further Research

The data presented in this paper were from a survey research for understanding the current situation of China's service SMEs adopting e-commerce. However, the questionnaires do not really be relevant to this work. Therefore, details about this survey and research questions do not be provided in this paper. Overall, this research finds that (1) most of China's service SMEs are still at the early stage of adopting e-commerce; (2) there is an obvious e-commerce divide between Eastern China and Western China; (3) there is an existing positive relation between GDP per person and e-commerce adoption.

On the other hand, there are at least other three limitations in this research as (1) the sample size of Changzhou- one of sampling cites is smaller compared with others; (2) the number of sample clusters are smaller (four cities), which is difficult to be conducted by a statistic analysis; (3) just addressing the percentage of usable websites as measurement criteria to evaluate the terms of web usability is too narrow.

In further research, therefore, there is a need to select more sampling cities for justifying the findings presented in this paper. One more thing is that more elaborated works involved in dynamic content need be done, such as in terms of broken URLs, broken pages, broken links, broken anchors, missing titles, missing attributes, old pages, slow pages, orphaned files, download times, and shutdown interval etc.

This paper concludes that web usability is the core of e-commerce adoption, and recommends that the promotion of web usability as an effective strategy in further strategic development for China's service SMEs adopting e-commerce. This research believes that China's service sector adopting e-commerce might promote them up to the global level and stay competitive, which might further benefit the growth of China's economy immensely.

## Endnote

This paper is a continuing work updated and based on an early brief article, which has been presented at 2007 International Symposium on Information Systems & Management (2007 ISM: the Management track of WiCOM2007) (IEEE 2007 ISM), July 25-28 2007, Shanghai, P.R.China.

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# Analysis of Workplace Surveillance in a Quest for an Ethical Stance

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## Abstract

*This article examines the incidence of surveillance in higher learning academic institutions in Pakistan. It gives an overview of surveillance in a workplace and outlines how the latest technology has made the task more convenient for employers. It further delves into the privacy issues that arise as a consequence of surveillance. A review of related ethical theories has been undertaken to fathom the justification of surveillance practices in the modern workplace. In the literature review section, a number of studies that explore impacts of surveillance have been reviewed. The data has been gathered from 60 employees working in 5 different universities (both public and private sector) covering primarily their ethical stance on surveillance practices used. The study would help in figuring out the typical methods used and their extent of usage in order to establish incidence of surveillance in an academic institution setting. Finally, relevant hypothesis are tested with the available data to comprehend employees ethical stance on deployment of surveillance, their perception changes (if any) in case of availability of notices on surveillance etc.*

## Keywords

*Workplace surveillance, higher learning academic institutions, Pakistan, ethical stance*

## Introduction

Institutions and business organizations generally use workplace surveillance as a way of monitoring the activities of their employees. In today's workplace, with the advent of latest technology, there has been an explosion of workplace surveillance. Employers that engage in surveillance practices do so for a variety of reasons such as to increase productivity, to review performances, to provide safe and secure working environment to the employees and also to protect company's vital assets against employees' misuse. Latest technology has now allowed employers to ask more of each employee simply because average productivity level has increased due to technology. It also provides us with a host of ethical challenges as new technology poses new implications for the balance of power in the workplace.

As long as there has been employment, employees have been monitored (Nebeker & Tatum, 1993). The phenomenon of employers spying on their employees is not new. Henry Ford, for example, used to condition wages on workers' good behaviour outside the factory. It is said that he had 150 inspectors in

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his sociological department to keep an eye on workers' hygiene and housekeeping habits.

In Pakistan, the extent of workplace monitoring and techniques deployed for monitoring purposes varies in different organizations. Usually, the incidence of monitoring is higher in the financial services

sector such as banks, insurance, critical governmental agencies and pharmacies as here the employees are expected to be serving in sensitive positions. At the same time, most of the private sector organizations carry on surveillance practices on an occasional basis in the manner of spot checks rather than constantly or on a regular schedule. Furthermore, the distinction between personal and professional lives is getting indistinguishable in a modern workplace, as some employees conduct personal business in the office and professional business at home. It becomes evident that some work must be done at home in order to get accomplished on time, whereas, employees could get faster, cheaper and easier access to the Internet in their offices than their homes. The trend in Pakistan where both partners are working is also increasing gradually which commands additional personal calls from office to settle some family related issues. As no research has been found in Pakistan to address this issue, the present study is an attempt to facilitate research into surveillance and privacy in the workplace. It also aims to provide foundation for new analysis in future.

## **Privacy in the Workplace**

The modern workplace has become the centre of the information society and privacy in the workplace has turned out to be a fundamental business issue of modern times. Joseph Kupfer (1987) defines privacy as “Privacy is the trusting way others treat us, resulting in a conception of ourselves as worth being trusted. In contrast monitoring behaviour and collecting data on us projects the disvaluing of the self in question”.

Ethical issues when associated with privacy generally arise with gathering and disclosing of information and those related to information itself. Letting other people know your personal information is considered a privacy breach. It's a common human nature that people don't like other people knowing things about them immaterial to the fact with what they would actually do with that information.

Employers consider it as their right to manage the workplace, simply because they want to place workers in more suitable positions, they want to make certain productive performance and they also want to ensure fulfilment of positive actions. In order to accomplish all this, they consider it their right to know what their workers are doing in the workplace.

Employees, on the other hand, consider it their right to be treated as self-directed and capable individuals who can make their own decisions. They want to ensure their personal development and valued performance. They want to be treated as empowered individuals free from monitoring. They consider surveillance as their privacy breach.

## **Use of Technology in Workplace Surveillance**

Use of technology for workplace surveillance purposes can be considered as one of the challenges of post modernism. The most modern surveillance tools allow employers to pin down the activities of their employees from web browsing to eavesdropping phone calls, from observing downloaded files to restricting access to various sites. Availability of products such as WebSense, New Access Manager, WebTrack and Internet Watchdog has made all this a lot more convenient. Also available is a truth telling device (from SpyShop.com) that once attached to a telephone could tell whether the individual on the other end of the line is speaking truth or telling a lie, and uses voice stress analysis to determine voice tremors for this purpose (Andrew Alderson, 1997).

Computer surveillance, also known as Employee Internet Management, is among the most popular form of workplace surveillance. This could be in the form of Internet surveillance, in which a special type of software can track of all of employees' activities on internet. Or it can in the form of Desktop surveillance in which the employer's computer by using specific surveillance software intercepts a signal that is given off by the employee's computer. Similarly, organizations use camera surveillance to thwart theft and vandalism. Security and legal personnel use these data to reduce legal responsibility, watch for the release of sensitive information, and curtail losses of company assets.

## **Literature Review**

Surveillance in the workplace has become an important issue facing both individuals and organizations in almost all over industrialized world. The literature review is essentially focused on the phenomenon of workplace surveillance, ethical issues that arise due to surveillance and its impact on the workforce. According to Botan (1996), the term monitoring refers to the collection of information about work regardless of purpose. Whereas surveillance, sometimes has a suspicious connotation associated with it because the information collected in this case has the potential to be used in a negative manner, such as restricting certain behaviours of the target individual/s. Also Nebeker and Tatum (1993) define electronic monitoring as “the use of electronic instruments or devices such as radio, video and computer systems to collect, store, analyse, and report individual or group actions or performance” (p. 509).

Researchers have carried out a number of studies to find out the impact of surveillance on various perspectives surrounding an employee’s behaviour. Also, psychologists often quote the famous maxim that that “behaviour is a function of the person and the environment” by Kurt Lewin (1936). But first, a review of some ethical perspectives regarding privacy in the workplace follows:

## **Workplace Surveillance: the Ethical Perspective**

As latest communication technologies are entering the workplace, so is the need for more detailed laws and regulations to clarify the rights of both the employee and employer (Botan, 1996). From an ethical standpoint researchers are concerned with the attack on employees’ privacy and autonomy that electronic monitoring systems appear to represent (Hartman 2001). It is imperative that privacy issues in workplace should be dealt with some common understanding of ethics. The ethical debate also tries to find answer to the ethical justification on employee’s right to privacy versus the employer’s right to oversee the workplace. Whether employees have a right to privacy? Or is it the employer who has right to manage the workplace? Similarly, employers could now easily seek all kind of personal information on employees with the help of latest technology, but is this justifiable? To answer these and other similar questions one has to look into existing laws and ethical theories.

As new communication technologies are entering the workplace, the need for more specific laws and regulations to clarify the rights of both the employee and employer is getting more crucial (Botan, 1996). Take the case of email monitoring in Europe; for instance, in Germany, German Criminal Code Section 202a protects against access to encrypted e-mails. Employers wishing to monitor e-mails have to gain approval from the Works Council and individual employees. Similarly, France is also very restrictive in allowing employers to monitor e-mails. It is permissible only in cases justified to employee’s task.

If we look at prevailing privacy laws in Pakistan, it becomes evident that constitution of Pakistan provides the basis for fundamental rights and guarantees the protection of life, liberty, body, reputation & property of an individual. Basic freedoms are dealt in articles 15, 16, 17, 18 & 19. This constitution also states about security of person, i.e. “No person shall be deprived of life or liberty save in accordance with law.”

The general law of contract in Pakistan is contained in the Contract Act 1872. The Act defines “contract” as an agreement enforceable by law. This act also defines frustration to occur in case of subsequent circumstances that the parties could not control and thus the agreement cannot be performed. However, it is not comprehensible whether surveillance can be considered to be part of “frustration”.

Hence, it becomes evident that Pakistan’s law does not yet provide an absolute answer to this. “While the law may offer protection in specific areas of our personal lives, it is incomplete - in part a result of the swift advance in technology, one that the law often has hard time capturing” (Steven Winters, 1993). Hence, a review on general ethical theories becomes crucial to get guidance in this case and this would also be helpful in consideration of rights.

Philosopher John Locke has emphasized on protection of our natural rights. Hobbes on the other hand gave a somewhat pessimistic view by saying that human beings are capable of undertaking negative actions; therefore, a strong governmental (in this case organizational) hold is needed to provide security. Integrative Social Contracts Theory gives another relevant ethical viewpoint in this regard. By distinguishing between those values that are similar across cultures (hypernorms) and those that are culturally specific. This theory tries to verify the ethical principles that form the basis for hypernorms. This evidence could be established from international/national laws, religious principles, cultural recognition, and established industry standards. However, Integrated Social Contracts Theory is faced with certain limitations in practice. For example, the case where hypernorm-based employer's rights are debased by the hypernorms based protection of the employees' right or vice versa.

John Rawls, in his theory of distributive economic justice provides another pertinent point of view on ethical acts. Like Hobbes and Locke, Rawls too belongs to the social contract tradition. He defines ethical acts as those that lead to an equitable distribution of goods and services. In his theory, he poses a scenario that prevented people from knowing their status in a society so that they would decide about justice from behind a *veil of ignorance*. Without knowing what role people have to play in society, people would build a cooperative system that is perceptive to the welfare of all stakeholders. Rawls believes that the members of such system would not know whether they are among the employer population of employee population and therefore, actions undertaken in such a system are deemed ethical because of inherent fairness of the system. In short, this theory provides a sensible balance between economic and ethical consequences of privacy protection for both employees and employers.

Few ethical frameworks justify the act of monitoring in terms of its "utility to the organization" or its "consequences". Utilitarianism, however, is a very weak principle for ethical action. The fact that an act does not harm people does not mean it is ethical. Overall organizational goals can also be questioned against which policies are essentially providing utility to workers, for example, social and organizational justice requires that principles of distributive justice, equity, equality of opportunity could be used to evaluate systems for pay setting, recruitment and performance management etc. As far as consequentialism is concerned, justification of employer's monitoring is based on the fact that the prevailing law mostly held employer responsible for the act of employees, with this consequence in mind employers seek more and more information about prospective and current employees to protect themselves from the tort "negligent Hiring" and vicarious liability (Robert Barker et al, 1995).

Laura P. Hartman (2001) suggests an approach based on two core values of integrity and accountability in order to balance interest of both employers and employees. Integrity, she says is consistency in values, and requires defining values and prioritizing them. This can be accomplished by an organization's mission statement. Following this, one may obtain direction from the mission statement. Assuming that monitoring does satisfy the organization's mission statement, the employer must implement monitoring in such a manner that is accountable to those affected by monitoring. Thus, accountability as suggested by Hartman means that the employer must value employees' privacy rights and let them make educated decisions about their dealings.

Only a few other empirical research studies have explored the surveillance from ethical perspective. For example, Greenberg (2002) has explored the influence of an ethics program on employee theft only. Greenberg has explored two related variables i.e. an ethics program and victim of theft. By ethics programs, he meant that the organization had a formal ethics program in place. The conclusions from this study were that employees stole less when they worked at an organization which had an ethics program in place and also stole less when they were told that the money came from individuals rather than the company.

## Justification of Workplace Surveillance

Organizations might justify the use of surveillance in the workplace for various reasons. According to a survey conducted by the American Management Association (2000) the top most reported reasons for deploying surveillance included: acquiring information for performance reviews, guaranteeing legal

compliance, and controlling costs. Other reasons included protection of business information, security, and safety (Daugherty, 1999; Howard, 1998). In countries like United States, American management association has conducted various surveys to find out the prevalence of electronic monitoring and surveillance deployed by business organizations in the country. However, statistics showing incidence of electronic monitoring in Pakistan are almost non-existent.

## **Impact of Surveillance**

This section of the paper reviews a number of academic studies that tackle surveillance from varying points of view i.e., both positive and negative outcomes of surveillance. Latest research shows that if someone questions you too much or takes away too much of your power, it may lead to insecurity, feeling of being overwhelmed and powerless. However, the variables that are considered to respond favourably in the presence of monitoring and surveillance are job performance and productivity. Motowidlo (2003) defines job performance as “the total expected value to the organization of the discrete behavioural episodes that an individual carries out over a standard period of time” (p. 39). In fact, it has become anecdotal that surveillance is the tool deployed by many employers to monitor the performance and productivity of their employees. Related studies from social psychology have measured the impact computer monitoring on job performance (Aiello & Svec, 1993). Using the Social Facilitation Framework (Zajonc 1965), they explained the effects of electronic monitoring on job performance on simple and complex tasks with the hypothesis that the presence of another person increases performance on simple tasks and decreases the same on complex tasks. Aiello and Svec (1993) found a similar effect of computer monitoring. They concluded that if a job involves performing difficult tasks, it is more efficient not to have computer monitoring.

Another area of research interest on surveillance has been the impact of surveillance practices in the presence or absence of an advance notice in the form of organizational policies (Ambrose & Alder, 2000; Bies, 1993). And also their impact on privacy perceptions held by employees. Ambrose and Alder (2000) have incorporated the variable ‘disclosure of monitoring’ in their studies. Bies (1993) states: “if I know in advance that I will be subjected to electronic monitoring or drug testing for example, I can take the necessary measures to be seen in a most favorable light”. Another empirical study has found that employees are more accepting of drug testing programs and other HR practices involving personal information disclosure when advanced notice or agreement for disclosure is provided (Stone & Kotch, 1989). Using a scenario study, Stone and Kotch (1989) found that employees were more accepting of a drug-testing program when advanced notice was provided.

In a field experiment conducted by Gary A. Ballinger (2002), the hypothesis: “Advanced notice of electronic monitoring (compared to post notice) will reduce invasion of privacy perceptions” was tested. The results predicted that post notice of monitoring would lead to significantly higher invasion of privacy perceptions respectively, compared to advance notice conditions. Thus, the hypothesis that advanced notice of electronic surveillance leads to lower invasion of privacy perceptions was fully supported in this experiment.

The conditions of advance notice as a critical component in employee acceptance of monitoring regimes in organizations has found considerable support in related studies (Ambrose & Alder, 2000). This effect is found in studies both within and outside of the performance monitoring arena (Stone & Kotch, 1989, Alge, 2001).

Other researchers have investigated possible effects on the workforce such as stress (Aiello, 1993, Aiello and Kolb, 1995). Experiments conducted by Nebeker and Tatum (1993) to investigate the effects of computer monitoring, under different conditions of standards and rewards, on productivity, work quality, satisfaction and stress did not show any significant negative effects of computer monitoring. Botan & Vorvoreanu, (2000) in their study claim that various discourses and interests interact in organizational settings, shaping the reality of being under electronic surveillance and influencing the extent to which the experience is negative and these issues were found to be absent in some related research conducted in experimental settings. The disciplinary dimension usually

associated with surveillance in the real workplace was also absent. And they also isolated computer monitoring from other forms of surveillance. In a real work setting, there is much more at stake, which can increase the stress and other reported negative effects of electronic surveillance such as authority, control and other disciplinary actions.

The findings by Mason et al. (2002) have revealed that employees in their case studies appeared relatively unconcerned about privacy aspects of 'surveillance-capable technologies' in the workplace. Their case studies suggest that a more complex reality exists in the workplace and that the employees and their supervisors can collaborate to meet the organization's goals, whether this means using the monitoring/surveillance systems or finding ways to challenge them.

Botan & Vorvoreanu (2000) in their investigation on whether monitoring leads to perceptions that work quantity is more important than quality, raised an important limitation of existing research is that it disregards employee voice i.e. surveillance does not usually consider the opinions of those who are surveilled. They also noted that a number of ethical issues related to electronic surveillance, such as perceptions of right and wrong in a real work setting are needed to be explored in detail.

## **Methodology**

Addressing this limitation of existing research on absence of voice of those who are surveilled, the author is conducting this study. The paper would provide the basis for the methodology used to undertake the research which includes primary research using questionnaire to elicit stance of employees and their general perceptions on the incidence of surveillance. Keeping this notion in mind, the author in this study has specifically designed a questionnaire, to find out the viewpoints of those who are exposed to such surveillance technologies. This study will provide not only the statistics on surveillance techniques deployed, but also the employees' ethical stance and general viewpoint on the presence of such technologies in the modern workplace as the author found none of the research that summarizes these aspects in a Pakistani work environment. Also areas for further investigation will be highlighted.

In an attempt to stimulate further study of this topic the present study is limited to organizations in academic sector particularly the universities only. This empirical study essentially deals with finding out the predominant surveillance methods deployed by various degree awarding academic institutions in the city of Lahore, Pakistan. This study as opposed to some previous studies on similar topic is questionnaire based and data is gathered in real work setting. Gathering of employees' views in this manner is justified as personal' views speak about the person's values. A number of other researchers have based their studies on the similar findings from the classic structure of social psychology which states that values influence personality and personality influences the attitudes and that attitudes are directly related to behaviour. (Maloney and Ward, 1973; Kaiser et al., 1999). So similarly, this study aims to seek the views (telling about values) held by university's employees, their general attitude and their ethical stance towards workplace surveillance practices.

## **The Hypothesis**

For the purpose of this research, the author has constructed a few pertinent hypotheses. The first hypothesis would figure out answer to the generic question, whether employees who are exposed to different surveillance techniques consider it ethically justifiable? Or do they believe in their own privacy and autonomy? So hypothesis is will be based on the assumption that employees perceive the presence of surveillance in modern workplace as unethical.

The second hypothesis is based on the assumption that the employees generally hold negative views on surveillance practices. Thirdly, it is hypothesized that the extent of surveillance is higher in private sector universities and institutions as compared to those serving in the public sector.

Another hypothesis is set out to verify the notion that employees regard an advance notice about surveillance in the form of organization's policy, to be more acceptable than a post notice or secret surveillance and later questioning in case misbehaviour is detected.

## The Study

The present study is undertaken to find out the ways in which surveillance-capable technologies are deployed by academic institutions in Pakistan, the purposes for which they are used and the views of the employees affected by them. This study aims to provide foundation for new analysis in future. The first part elicits statistics on the tools used for surveillance purposes. The remaining parts seek to test for the above mentioned hypothesis by analysing the feedback on carefully selected questions by those who are surveilled.

## Data

In April-May 2007, a questionnaire was administered to employees working at various universities in the city of Lahore. Convenience sample was taken from employees working in both public and private sector universities as the exploratory nature of this relaxed the typical demands for representative sampling required in inferential research. A total of 75 questionnaires were administered in 6 universities in the city of Lahore only. Of which 60 responses were achieved giving us a response rate of about 80%.

The questionnaire comprised of 21 questions. The first part of questions elicits information on the different types of tools used for surveillance purpose. The second part asked for incorporation of surveillance related information in the institution's policy handout, how would the employees perceive the presence of surveillance related notices and how would they feel towards presence of secret surveillance method. The third part draws out information on the impact of surveillance, in this section, questions were carefully chosen from literature review findings and were intentionally worded with both positive and negative components in order to elicit a balanced appraisal rather than one focused only on problems or dissatisfaction. With this phrasing we anticipated to obtain a broad reflection on surveillance techniques used and to avoid prompting respondents with words representing the specific attitudes of interest. An open ended question was also included to get a profound insight on respondent's general outlook on workplace surveillance practices. And lastly, one final section on the questionnaire gathered information on respondent's profile and the type of organization he or she is serving for.

## Data Analysis

After collecting data from 60 respondents serving in universities SPSS was used for analysis purposes. The data was tested both for its reliability and validity. Using Runs test, significant reliability was found for most of the key variables. For validity testing, Cronbach alpha value was calculated for the variables used in various tested hypothesis. These values are higher than 0.7. Table 1.0 provides the summary of respondent's profile:

**Table 1:** Summary of Employee's Profile

| <b>Designation</b>                | <b>Percent</b> | <b>Age</b>         | <b>Percent</b> | <b>Education Level</b> | <b>Percent</b> |
|-----------------------------------|----------------|--------------------|----------------|------------------------|----------------|
| <b>Lecturer/TA/RA</b>             | 50             | <b>21-30 years</b> | 45             | <b>Masters</b>         | 61.7           |
| <b>Assistant Prof.</b>            | 15             | <b>31-40</b>       | 30             | <b>PhD</b>             | 8.3            |
| <b>Associate Prof./ Professor</b> | 6.7            | <b>41-50</b>       | 13.3           | <b>Professional</b>    | 15             |
| <b>Other</b>                      | 13.3           | <b>51-60</b>       | 5              | <b>Other</b>           | 8.3            |

In one section of the questionnaire the information was gathered on the incidence of typical techniques deployed for surveillance purposes such as monitoring telephone usage, employee internet monitoring, video surveillance, review of email messages and mechanism for recording employee's work time. Half of the respondent's reported that their organization recorded the use of telephone by the employees.



Presence of video cameras in universities was reported by only 36% of employees. As far as interception of email messages is concerned, 37.3% of respondent's affirmed the existence of mechanisms to intercept emails messages whereas 55.9 % reported that there is no interception of emails and the remaining employers were not aware about the presence or absence of email interception. 60% of employees reported that their internet usage is monitored.

Lastly, employees were asked on the methods deployed by the organization to record their timings. In this case out of 60 responses received, nearly half reported on the absence of any mechanism by the organization to track their timings, 24 reported on time recording using a manual system such as signing the register and only 5 respondents revealed on the presence of an electronic time recording system to record their time. In the next part of the questionnaire, the employees were asked to rate their acceptability level both in case of presence of secret surveillance as well in case when an advance notice on the possible use of surveillance techniques is provided. These responses were measured using a 5 point Likert type scale (1 = Strongly acceptable, 5 = Strongly Unacceptable). Cronbach alpha value in this case was found to be 0.798 and reliability was also significant.

As far as responses to an open ended question or the respondent's personal opinions on the institution of workplace are concerned, only 12 of the respondents fill up this section with their opinions. Four of the responses justified surveillance presence in an organization as it is required for smooth running, to protect resource misuse and to increase performance in an organization. Two of the respondents showed non favourable attitudes to surveillance as their responses vary from "against freedom" to "reduced creativity". Two respondents presented us with mixed feelings, one says that it is acceptable if incorporated to a reasonably and not excessively extent, whereas the other respondent mentioned of better ways to monitor productivity than mere surveillance. The remaining respondents reveal that the incidence of surveillance is normal for a workplace, it is good and that they are not much bothered about its presence.

## Results

One sample t test was used to test for the hypothesis that employees perceive presence of workplace surveillance in universities as an unethical practice. The results in this case were found to be significant as this hypothesis was rejected. The results of t test are shown in table 2.0.

**Table 2: One Sample T Test**

|   | T            | Df        | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference |              |
|---|--------------|-----------|-----------------|-----------------|---|--------------|
|   |              |           |                 |                 | Lower                                     | Upper        |
| <b>Ethical Stance</b>                       | <b>-9.35</b> | <b>54</b> | <b>0.00</b>     | <b>-0.62</b>    | <b>-0.75</b>                              | <b>-0.49</b> |
| General Outlook                             | -11.015      | 56        | 0.00            | -0.68           | -0.81                                     | -0.56        |
| Perspective on surveillance techniques used | -10.178      | 56        | 0.00            | -0.65           | -0.78                                     | -0.52        |

Note: Test value = 2 (For Ethical stance variable value 2 was used for Unethical. Similarly, 2 represent negative viewpoints in case of General Outlook and Perspective).

The data showed that out of 55 respondents who replied to this question 34 claim it as an ethically justified practice and 21 deem it as unethical.

For our second hypothesis concerning that employees generally hold negative views on the incidence of surveillance in an academic institute setting. This was tested by asking employees how they perceive the presence of surveillance as either it provides you with a feeling of being secured or with an intrusive feeling and whether your general outlook towards the deployment of surveillance techniques is positive or negative. The results were again found to be significant as this assumption was rejected at 5% level

of significance. The results for this test are shown in Table 2. Cronbach alpha value for these related variables measured on similar scales is 0.7765.

**Table 3: Independent Samples Test**

|                                      | F      | Sig.  | T      | Df | Sig. (2-tailed) | 95% Confidence Interval of the Difference |          |
|--------------------------------------|--------|-------|--------|----|-----------------|---|----------|
|                                      |        |       |        |    |                 | Lower                                     | Upper    |
| Is Telephone Usage recorded          | 1.399  | 0.242 | -1.653 | 58 | 0.104           | -0.5                                      | 4.74E-02 |
| Video Surveillance Present           | 19.531 | 0     | -2     | 57 | 0.05            | -0.52                                     | 3.83E-04 |
| Computer or Internet usage Monitored | 1.213  | 0.275 | 0.518  | 56 | 0.607           | -0.2                                      | 0.35     |
| Intercepting Emails                  | 0.294  | 0.59  | -0.047 | 57 | 0.963           | -0.34                                     | 0.32     |
| Employee Time is recorded            | 0.824  | 0.368 | 0.2    | 57 | 0.843           | -0.32                                     | 0.4      |

Using Levene's test for equality of variances and T test for equality of means.

Table 3 shows p values for the hypothesis testing the notion that incidence of surveillance is lower in case of public sector universities. Equal incidence was assumed for the null hypothesis. The null hypothesis was fairly supported in case of technologies such as telephone usage recorded, computer or internet monitoring, intercepting of emails and recording of employee's time. However, the results were found to be significant (2 tailed) in case of video surveillance only. This 2 tailed p value was converted into one sided test but the results were yet again significant.

For the hypothesis set out to verify the notion that employees regard an advance notice about surveillance in the form of organization's policy, to be more acceptable and hence ethically justified than presence of secret surveillance technique in a university. Regression using binary logistic analysis was performed to test this. Cox and Snell R square value was compared for both cases. The value of R square in case of an advance notice (Advance Notice: Cox and Snell R Square = 0.369) was higher than the similar value calculated in presence of secret surveillance (Secret Surveillance: Cox and Snell R Square = 0.269). However, these findings were not significant. Table 4 shows the frequency of employee's responses on various Likert scale items.

**Table 4: Comparison of Surveillance Perceptions in Case of Presence vs. Absence of Advance Notices**

| In case of advance notice on Surveillance |           |         | Presence of Secret Surveillance |           |         |
|---|-----------|---------|---------------------------------|-----------|---------|
|   | Frequency | Percent |                                 | Frequency | Percent |
| Strongly acceptable                       | 14        | 23.3    | Strongly Acceptable             | 5         | 8.3     |
| Somewhat acceptable                       | 27        | 45      | Somewhat Acceptable             | 19        | 31.7    |
| Indifferent                               | 13        | 21.7    | Indifferent                     | 21        | 35      |
| Somewhat Unacceptable                     | 3         | 5       | Somewhat unacceptable           | 11        | 18.3    |
| Strongly unacceptable                     | 1         | 1.7     | Strongly against it             | 2         | 3.3     |

## Discussion

From research point of view, surveillance has become an important topic today and its use in modern workplace has also pondered a number of ethical issues. In post modern era, with significant developments in technologies, the task of surveillance has become more convenient and less costly for the employers. This empirical study has been carried out essentially to explore incidence of surveillance and its ethical implications in universities in Pakistan.

In universities setup, the predominant technique used for surveillance was found to be in the form of computer monitoring or employee Internet management as 60% of employees reported its presence. This was followed by recording of telephone usage as this was reported by 50% of employees.

Use of surveillance is generally considered as an invasion of individual privacy. Those who are against its usage perceive it as an unethical practice. Previous research efforts (e.g. Aiello & Kolb, 1995) have led to a widespread belief that employees find surveillance to be invasive. Surprisingly, in case of universities in Pakistan, most of the employees perceive it as ethically justified as the author in this study fails to reject hypothesis perceiving it unethical. The study also revealed that majority of respondents hold positive opinions on the deployment of surveillance. The data showed that 62% of employees believe that surveillance provides them with security while only 33% perceive it as intrusive. Similarly 65% of employees have a positive outlook on surveillance while only 30% presented us with a negative outlook.

Another issue that this research explored was to confirm the previous findings that surveillance is more acceptable and justified in case employees are informed in advance (Ambrose and Alder, Stone and Kotch etc) by the university about their usage. The present study compares the acceptability perceptions of surveillance both in case of presence and absence of such notices. The regression analysis showed R square value to be higher in case the employees are informed in advance than the similar value calculated for that of secret surveillance. However, this could not be considered as significant finding. The summary of results showed that 70% of respondents consider it to be either strongly or somewhat acceptable in case a notice is provided whereas more than 60 % of employees are either indifferent or they perceive secret surveillance as unacceptable. This indifferent attitude is comparable to the findings by Mason et al. (2002) that employees are generally indifferent to presence of surveillance practices.

## Conclusion

In the post modern era, with the advent of some latest technologies it has become possible for organizations to continuously monitor activities of their employees, in ways more intrusive than was possible with conventional ways. And this failure to protect privacy ultimately leads to an inability to protect personal freedom and autonomy on an employees' part. Web browsing, personal use of office e-mail, and/or making personal phone calls all account for spending company's time and resources on non-business related activities. From an ethical standpoint, the researchers had been trying to justify the employee's right to privacy versus the employer's right to control the work tasks. This study summarizes the incidence of surveillance technologies deployed in universities and would help them identify the general perception of employees towards surveillance practices.

The work provides evidence concerning the predominant tools used for surveillance purposes and the proportion of their usage in academic setting. Nonetheless, this study suggests that most employees in academic institutions of Pakistan do not perceive surveillance in the workplace as unethical or intrusive. Some respondents were actually found appreciating the surveillance presence by saying that it provides them with a feeling of being secured while at work. It also shows that acceptance of surveillance techniques would be greater if employees are informed in advance in the form of company's policies for the possible use of these devices. These findings further highlight the importance of explicit and well-communicated organizational policies for surveillance techniques communicated to the employers. Generally, the use of these tools seems to be well accepted. The survey findings are encouraging for the development of a more focused instrument helping to understand the consequences surveillance in the workplace.

## Limitations

This research only considers employee perceptions on surveillance regardless of the perceptions of employers. The sampling strategy and sample size of the present study was not a probability sample, as a result, it may be prone to selection bias. These viewpoints might be more representative of faculty members of universities as equal allocation sample size was not used for various levels of employees. The proportions obtained in this study only give an indication to a larger population.

## Future Research

A great deal of research still remains to be done in Pakistani context to better understand the impact of surveillance on the workforce in general and its effect on performance and productivity in particular. A large-scale survey across multiple professions is needed to ascertain the proportions of employees that feel positively or negatively about workplace surveillance in Pakistan and also to seek whether there are difference of opinions among different demographic groups. Replicating this study with a more representative sample from other organizations such as financial institutions would be an important step. The research reported in this paper could also be extended to see if attitudes towards surveillance depend on particular type of surveillance method used. For instance, video surveillance may be preferred for providing high security reasons, whereas email interception may indicate lack of trust on organization's employees. Hopefully, future research will build on these and could also specifically examine negative impacts on workforce in Pakistani work environment.

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# **A Framework for Developing Effective Technology-Enabled Distance Education Programs in Management: A Study of a Video Conference-Based Program in an Indian Perspective**

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## **Abstract**

*A major problem in delivering quality management education to working executives in India has been the inability of the candidates to leave their job for a prolonged period of time to attend the on-campus management programs. With the proliferation of two way Video Conferencing (VC) facilities across the country, as well as the use of Internet technology, this limitations could quite effectively be overcome for both students and management educators.*

## **Keywords**

*India, Video conferencing (VC), management education, online education*

## **Introduction**

There has been a very significant un-met need for quality management education for working executives in India. One of the major bottlenecks has been the inability of the candidates to leave their job for a prolonged period of time to attend the on-campus management programs. From an educator's point of view, effective management education could not be imparted without the possibility of a reasonably high degree of student-faculty interaction and more significantly, student to student interaction (Conaway, Easton and Schimdt 2005). Thus, management education for working executives has been essentially located at business school premises in India.

With the proliferation of two way Video Conferencing (VC) facilities across the country, as well as Internet technology, the above-mentioned limitations for students as well as management educators could be effectively overcome. The focus of the VC technological platform is a powerful user interface that enables a large number of students spatially scattered to have a highly interactive 'one to one' as well as 'one to many' exchange with a centrally located faculty. The system incorporates live broadcast

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in two-way audio and video, it also provides real-time data interactivity to enable the students to watch and interact with the central faculty as well students from other centres, live, on VC facilities. VC technology seems to have potential to play an important role in the proliferation of management education. It is effective in bringing in the teaching competence

available elsewhere in the world right in the classroom as well as aggregate students from large number of geographical locations to a few distributed web centres or virtual classrooms.

Technology-enabled distance management education has the potential to address the needs of the countries which require skilled managerial manpower in large numbers, and where existing educational infrastructure and resources are not available. Also, distance education has become an important strategic issue for business schools in India as well as worldwide, as it overcomes the restrictions of same-time or same-place learning (Dellana, Collins and West 2000). However, it also provides new challenges to understand and then manage the effectiveness of the programs offered through the emerging technology enabled medium.

To effectively harness the emerging technology, some pedagogical adaptations are required for the educators. These include: course delivery, course materials selection and mechanisms to engage students who are interacting in virtual classrooms. The volume of student to professor interaction may become much higher than the traditional class, and may be difficult to handle, restricting class size (Hirschheim 2005). Similarly, certain adjustments in the students learning models are also required. Like any new technology a process of diffusion is expected. A learning curve effect is expected to help (over time) in fully harnessing the benefits of imparting effective management education on the VC platform. The ground rules for effective teaching through this medium would evolve over time, with the experience of the educators, students and evolution of technology etc.

The debate about the effectiveness of the distance learning method of delivering business courses continues, the results of student satisfaction has been mixed (Campbell and Swift 2006). However, for quick proliferation of the technology enabled distance education in management, understanding the challenges faced by the students as well as faculty is a significant first step. The programs, irrespective of the technology platform used, need to deliver value to the student participants so that the subsequent programs succeed. Thus it is important to understand how the value creation takes place in each of the technological platforms. This research explores this important issue with respect to the VC based Distance Learning (DL) programs.

## **Practical Managerial Problems Faced**

Management education is quite an established discipline in India (in existence from 1950's and having more than 1000 AICTE approved institutions as on date); pedagogy is reasonably well developed and has been accepted by the industry in India and abroad. The VC based management education offered in DL mode, is just emerging and is a fast evolving field. It needs to evolve and adapt to the current markets to be able to make an impact which is useful for the industry, academia, students and society.

The fundamental issues which make the VC based executive management educational platform different from the standard classroom format are:

- a. There is time constraint for the course as well as the classes, thus the structure of the program has to be rigidly followed even at class to class level (rather than the overall course level). Time once lost can not be made up easily.
- b. The students are at a distance from the faculty and are clubbed as a group (VC centre wise), hence difficult to build rapport on individual basis, both at the faculty-student and student-student level of interaction.
- c. The student to student interactions within the centre is uninhibited but across centres is limited at best. Students can not necessarily see all other participants at a time, so within student interaction as well as student-faculty interaction need a protocol for smooth operation.
- d. The entire set of student query is unlikely to be addressed within the scheduled class time (due to large class size). Never the less they need to be addressed, and hence the VC mode has to be supplemented in a different (typically) virtual forum. This forum should be comparatively time independent and location neutral in nature, like web based forums, internet, e-mails etc.

- e. The students come from diverse educational as well as professional background and hence there is very large within class discrepancy (in VC mode it tend to persist longer than normal classroom) in the appreciation of the various courses offered in the curriculum. This poses the challenge to the faculty about appropriately pitching the classroom interaction, as well as to manage the outliers subsequently.
- f. Regular assignments and evaluation are associated with logistic complexities.
- g. To ensure that the service level offered by the technology is acceptable for the educational requirements; is an operational challenge.
- h. The students normally do not get to see all the teaching aids together, for example, if the faculty is in the screen, then the board as well as the presentation screen is either out of focus or placed in a smaller window which may not be easy to follow.

Though, the basic aim of education; like meeting the learning objectives of the students, remain unchanged irrespective of the medium and are clear intuitively, but they may require different delivery mechanisms in the VC based DL mode. The delivery effectiveness become difficult to measure objectively as there are some interplay of faculty, course and the technology which necessarily happens in a technology enabled distance education mode. So, it is possible that a particular course is very well designed for the conventional classroom and delivered well by the faculty, would be differently evaluated by the students who have varying of DL.

Formal evaluation of teaching performance by students is now a factor in promotion, tenure, and salary adjustment decision of the faculty (Hooper and Page 86). Also, the effectiveness of the program has significant commercial implications for the institutions offering the course. Thus from the point of view of developing and delivering effective management education through the VC platform, it is important to understand precisely how the learning value is derived by the students. Developing a method to evaluate the effectiveness of distance learning program and faculty effectiveness through the VC mode is the first step.

## Literature Review

The fundamental difference of technology enabled distance education from traditional classroom mode is the physical absence of the instructor, but research findings suggests that it is not an issue for the students as it is considered a constraint and students adjust to it as given. Also, student satisfaction from the courses are also comparable to normal classroom courses (Campbell and Swift 2006).

The key challenges faced in the online distance education has been classified as a set of interdependent issues like content related, delivery related and learning related (Rungtusanatham, Ellram and Siferd 2004). Unique competence is required in the area of course planning, delivery and managing the distributed classroom interaction, and use of appropriate mechanisms of student learning (Davis and Roblyer 2005). These issues give a clue to the basic parameters which could be used to evaluate program effectiveness.

Student evaluation of faculty members should not be compared across disciplines and levels of courses (Whitworth, Price and Randall 2002); however, the students evaluation of the teachers performance are very stable and consistent over time (Tang 1997). However research also indicates that in many cases students evaluation can be statistically reliable and valid (Whitworth et al. 2002). Since a management program is a heterogeneous mix of different disciplines, even though it may not be possible to evaluate the faculty, the program level effectiveness could be measured and evaluation of effectiveness could be possible.

The student performance in the on-line and traditional classroom courses were also found to be same (Dellana et al. 2000), thus the metrics for the program effectiveness, which is measured on commonly used parameters like student learning, the design of the courses, the delivery of the course, academic administration, engaging the students beyond the classroom; could be used. However, online instructors



role requires a paradigm shift in perceptions of instructional time and space, virtual management techniques and engaging students through virtual communication (Davis and Roblyer 2005). It is expected that the measurement of teaching (and for that matter program) effectiveness will be changed dramatically in future (Tang 1997). Thus new measurement techniques may be useful and required.

There are quite a few studies available in the domain of web based distance education as well as on line education. Similarly there is considerable research data available about measurement of the teaching effectiveness, student learning etc. however, there is no specific literature in the area of predominant use of VC medium to deliver a long duration management education. Since online learning is getting integrated into many traditional courses, it is important to move beyond making comparison to face to face classes and move towards understanding the specific nuances of the online class as its own unique environment (Conaway et al. 2005). Since the existing literature is not dealing with the specific distance learning programs on VC, the literature survey is only expected to provide the guiding principles. It would also require significant and specific research work to gather insight as well as theory development for newly emerging and fast evolving education through the VC medium.

## Methodology Adopted

VC-based technology is just emerging in India. Reliance Infocomm Limited is providing the VC technology platform across 120 cities in India (and expanding). Though the technology was primarily designed for corporate need to have multi location – multi party conferencing, it was appropriate for the application in DL also. So far, the platform has been used by only one institute, Xavier Institute of Management, Bhubaneswar, India (XIMB); in providing a long duration (300 hours) management program in India as “Post Graduate Certificate in Business Management” (PGCBM). Some other institutes have also offered a few management development programs through this medium, but none in a large scale as XIMB. The “PGCBM” program of XIMB commenced in October 2005. It had 120 participants from 23 centres across 16 cities in India. Since the student base is all India and XIMB is a reasonably well known management institute, the student base would reflect the overall population. The program has been running successfully and regularly till date. Thus it qualified as a good site to study. Annexure 1 gives a detail of the PGCBM program of XIMB.

Significant insights could be generated by studying this site (Yin 1984), seemed to be the most appropriate for the research as:

- a. It was a unique case as the Indian executive's who opt for management education are typically looking not only the value addition provided by the program, but also brand image and quick payoff's in the job market.
- b. Prior understanding is not available and part of the research is exploratory in nature.
- c. Rich context dependent understanding would help in improving the understanding the issues associated in delivering effective executive management education by harnessing the VC technology.

## Stages of the study

The case study was expected to have two parts. First stage was the exploratory study, called the Exploratory Study, where the objective of the researcher was to understand the different criteria on which the students measured the program effectiveness. Once the first stage was over, in the second stage; a scale was developed to measure how the students processed the different criteria in forming their opinion about the VC based management program effectiveness.

## Details of the study

- a. **Choice of techniques:** The topic of research was essentially exploratory in nature; the search for appropriate parameters (to evaluate the program effectiveness) required developing a

common understanding of the student's evaluation criteria. It required deep insights on the learning process of the students, and an initial qualitative research seemed more appropriate to narrow down the criteria on which the program, the courses, and the faculty effectiveness could be subsequently measured quantitatively. Face to face contact with the PGCBM students was expected to facilitate the process.

- b. The students of PGCBM program of XIMB were to attend a mandatory 60 hour, spread over one week of On Campus Stay (OCS) as an integral component of the program (refer Annexure 1). Thus the physical presence of the student in the OCS presented the researcher with the opportunity to interact with the students on a face to face basis and conduct the case study research effectively.

Since any course means different things to different participants, there was a very high probability of existence of multiple perspectives about the topic of program evaluation among the students. Gaining information about the shared understanding based on interaction among the participants was critical to the research. Thus, Focus Group Discussion (FGD) was chosen as the primary methodology in developing the evaluation parameters (Malhotra 2004). A small variation to the methodology was attempted by asking the respondent to fill up a their own set of evaluation parameters in an open ended questionnaire, making the finding more amenable to content analysis as well as quantitative analysis, thereby offering a slightly more objectivity than a standard FGD could offer. All the FGD's were video recorded as well as notes were taken by the researcher. Also the study was done in phased manner, with each stage building on the work accomplished in the previous stage.

### Operational details

The total PGCBM batch size was 120, and most of them were expected to be able to attend the OCS in either of the two batches (with a gap of three days in between), henceforth referred to as OCS1 and OCS2 respectively. The batches were formed randomly and thus expected to be equivalent in nature. The batches were also not likely to interact about their experience with each other in detail, thus they could be treated as equivalent for the research purposes.

For making the FGD groups, the students appearing for the OCS1 were selected at random and split into equivalent groups of 10 members each. Each of the groups reflected the heterogeneity which the entire class contained in terms of the student profile (location, educational background, job profile, work experience etc.). Two such groups were used in each stage of the research where focus group discussions were required.

**Stage1.** Development of the *initial dimensions* on which the VC based course needed to be measured was developed theoretically as well as using the experience of the researcher and the faculty who had the experience of teaching in the VC platform. The FGD protocol is attached in Annexure 2. FGD of students (2 FGD having 10 participants each) were conducted to develop a master set of criteria which were considered relevant by them for evaluating the VC based courses.

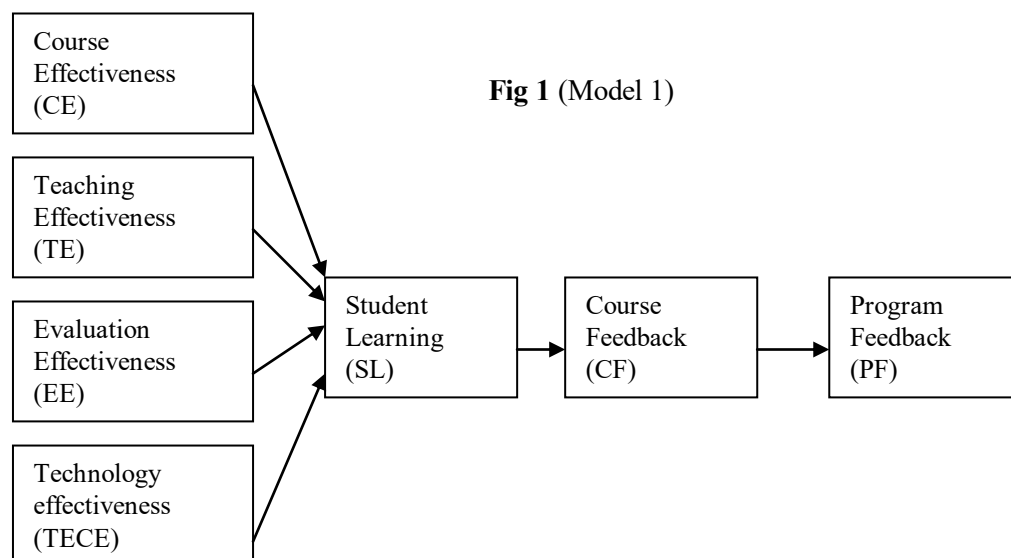
**Stage2.** The FGD's in Stage 1 were analyzed, collated and a master list of criteria for evaluation of courses offered in VC mode was developed. A second phase of FGD's of students (2 FGDs of 8 participants each) was conducted to develop the relevant mapping of the criteria to the different developed dimensions. Thus the first level of evaluation criteria for the overall program and the sub criteria was developed. Based on the analysis of the FDG's in Stage1 and Stage 2, twenty-five (25) different criteria were found relevant and are given in Annexure 3. The criteria were analyzed by researchers and classified under the following heads: Learning Value, Course Design, Course Delivery, Course Administration and Interest Generation. The tabulation details are given in Annexure 4, and the final parameters decided, in Annexure 5.

The faculty members with teaching experience of at least 3 number 3 credit courses and had not taught in the VC mode (though aware of the medium and its challenges) were asked to validate the result of the step 3. Their suggestions were incorporated. The items of the scale so far developed were then suitably adjusted to convert them into statements as required by Likert scale. Thus the initial completed scale

was developed, given in Annexure 6. This was administered to the students attending OCS1. The reliability of the measures was not up to acceptable mark and hence was further modified using the existing literature (Stapleton and Murkison 2001; Rungtusanatham et al. 2004; Davis and Roblyer 2005). Thus the validity was incorporated in the scale by the help of existing literature on validated scales as well as expert opinion of faculty. Constructs were redefined as: Course Effectiveness, Teaching Effectiveness, Evaluation Effectiveness, Technology Effectiveness, Student Learning, Course Feedback and Program Feedback. The details are given in Annexure 6. The scale was formatted to a questionnaire form (Annexure 7) and administered to the students of OCS2. The questionnaire was filled up by 54 participating students for six different faculty members who had conducted at least 8 hours of classes in the VC for them (and not had any normal classroom interaction). In all 42 (sets of 6) completed responses were collected. The Cronbach's alpha reliability figures were satisfactory and complete information is given in Annexure 8.

## Development of Theoretical Constructs for Student Evaluation of a VC-Based management Program Based on the Exploratory Study

The seven different parameters were the ones clearly identified as the basic parameters which were used by the students to evaluate the usefulness of the course. The researcher hypothesized that out of these, four parameters; Course Effectiveness (CE), Teaching Effectiveness (TE), Evaluation Effectiveness (EE) and Technology Effectiveness (TECE) lead to Student Learning (SL) from the course. The assumption being, the objective of attending the program for the student was to enhance their learning. The student learning was thus expected to impact their assessment of the individual course or the Course Feedback (CF). Since, the entire program was essentially aggregation of many courses, the student's evaluation of the program, or the Program Feedback (PF) would depend on the course feedbacks. The following was the schematic representation of the construct (Fig 1):



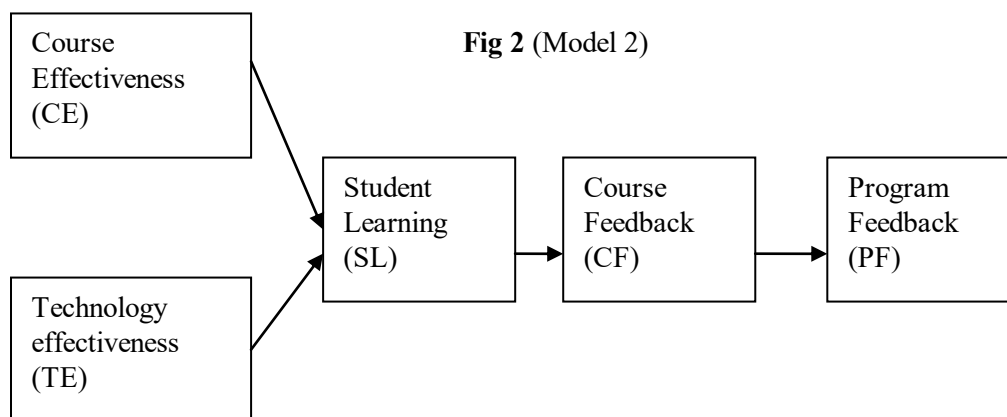
## Testing the Theoretically Developed Framework of Student Evaluation of VC-Based Management Education

The variables in the construct were measured by taking the average of at least four separate questions (as per the scale developed, and given in annexure7). It was appropriate to employ the model fitting technique to understand the student's evaluation process and underlying evaluation construct. AMOS software to analyse using structural equation modelling was chosen (Malhotra 2004) as: (i) Variables were interdependent in nature (ii) More than one variable could determine another variables (iii)

Technique calculated all the figures simultaneously (iv) Built in tolerance for errors in measurement of the variables.

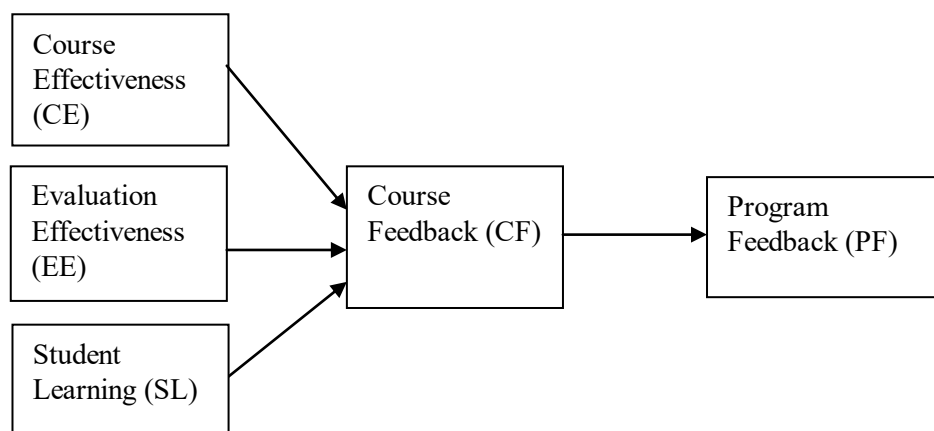
Step1: The theoretically developed model (Model 1) was tested for fit with the data. The Discrepancy figures per degree of freedom, The Adjusted Goodness of Fit Index (AGFI), Tucker Lewis Index (TLI) and the RMSEA were the measures used to evaluate the model fit. The fit measures were not reflecting a good fit of the Model 1, to the data collected (Annexure 9). The effect of TECE and TE on SL, were found to be insignificant. Thus it was concluded that the theoretically developed model did not fit the data well, and required to be modified.

Step2: Based on the results, Model 1 was modified. Since in Model1, TECE and TE did not make significant impact on the SL, they were dropped in the revised model. The revised model was named “Model 2” (which was essentially Model1 sans the TE and TECE). There was a considerable improvement in the fitness measures, yet they were not up to the acceptable level.



Step3: Since each of the variables in Model 2 was significant, there was no possibility of dropping any of the variables. There was a need to re-conceptualize the framework. Literature (Karstebsson and Vedder 1974), and discussion with experienced faculty suggested that, the student learning may be based on their own interest in the subject, self motivation, relevance to their own work etc. Thus student learning could be an independent variable in the framework and not dependent on any other variable(s). Thus the Model2 was modified significantly to convert student learning as an independent variable, keeping the rest same. Fit measures were calculated for Model 3. The fit measures are given in the Annexure 9. The fit measures were found to meet the acceptance criteria put for the all the measures, and thus the model was accepted, which is given in Figure3.

**Figure 3 (Model 3)**



Step 4: Alternate frameworks to improve the fit were tried out but they were not found to improve upon the results derived from the Model 3. Thus they are not reported.

## Implications of the Study

- a. The scale to measure the program effectiveness of the VC based DL programs could be used as a reliable tool for future use.
- b. The teaching effectiveness did not emerge as important criteria for the student's evaluation of the program effectiveness, while course effectiveness and evaluation effectiveness did. It is possible that a very well designed course and evaluation system may be offered by different faculty members quite effectively without significantly altering the student satisfaction. Thus, teaching in this medium could be developed more in a process based manner rather than faculty skills. More structured delivery with average faculty skills may be adequate. Thus the finding supports the "design-team driven model" approach to course content design and program design in the medium (Rungtusanatham et al. 2004).
- c. It is possible to scale up the program quite conveniently. For the success of the program, the critical aspects are the program design, evaluation process and student motivation to learn as compared to teaching effectiveness and technology. Thus a well developed course by an expert(s) with very clear evaluation parameters may be quickly disseminated to a large number of faculty (through a train the trainer program) to conduct the classes effectively. So the faculty constraints could be effectively overcome and the program could be expanded.
- d. Technology Effectiveness did not come across as important parameter to students, possibly the technology was new, and the student expectation were not much out of the same. The limitations of the technology were possibly well understood and internalized by the students or novelty of the new technology also could possibly have suppressed its differentiating impact on the program. It could be like a hygiene factor, it is not a motivator. However, if it is not of acceptable standard then it could possibly act as an irritant. Overall, it is possible that the medium makes the technology such a given parameter that it doesn't remain a differentiator. The implication is that, focusing on the course design, evaluation process and admission criteria for students are equally important (if not more) as constant endeavor to improve technologically in the medium and offer superior interaction.
- e. The student learning did not come as a dependent variable, instead as an independent variable. The implication is that student learning may depend on factors which are beyond the factors studied in the research, for example, it could be the individual student's interest in the subject, ability to grasp concepts, readiness to do self learning etc. Thus the feedback of the program may depend largely on the student's interest in learning rather than the program per se. Thus the student's motivation to join and learn from the program was of vital importance. As a corollary, the screening of the students in the admission process would assume critical importance.

## Limitations of the Study and Scope for Further Research

- a. The study was conducted only on one program (as there was no other site at the time of the research) further studies are required to confirm the findings.
- b. The students were the early adopters of this mode of learning, as they were the first group of students who adopted the technology. Thus the students group studied might not reflect the entire population and more significantly the future student population.
- c. The program studied in this research, itself is in the development stage and hence is undergoing a lot of pedagogical experimentation, which might have biased the responses and thereby the conclusions. Hence the study conducted with the students of the subsequent batches might be useful and more dependable.
- d. The framework of student evaluation of management program, developed by this research could also be tested with student undergoing the classroom programs and their criteria for program effectiveness could also be compared.

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## Annexure 1 (Details about the PGCBM program of XIMB)

**XAVIER INSTITUTE OF MANAGEMENT, BHUBANESWAR**

**POST GRADUATE CERTIFICATE PROGRAM IN BUSINESS MANAGEMENT (PGCBM)**

### ADMISSION PROCEDURE

**Eligibility:** The minimum requirement for admission to the Program is A three-year Bachelor's degree (or equivalent) in any discipline recognized by the Association of Indian Universities as eligible for Post-Graduate studies in Management and with at least two years work experience

**XIMB PGCBM Prospectus & Application:** The cost of the PGCBM Prospectus is Rs 800. The applicants can obtain the PGCBM Prospectus from the nearest Reliance Webworld in person or from the XIMB office counter in person by cash payment. Each PGCBM prospectus carries a unique User ID and Password for each student which would be used to access the XIMB PGCBM website for online student registration. The student would use the User ID and Password to fill up the online application form at the XIMB Website ([www.ximb.ac.in](http://www.ximb.ac.in)). Once registered, the student would have access to the XIMB web where relevant information regarding admissions would be posted from time to time.

**Selection Process:** After review of the candidate profiles, XIMB would intimate the short-listed candidates regarding the venue and time for their interview. The interviews would be held through Video Conferencing from certain identified Reliance Webworlds. The final selection will be based on the candidate's performance in the Personal interview (which factors in the past academic record and relevant work experience). The selected candidates will be informed by mail by September 20, 2005.

**Admission:** Candidates who are selected for admission to the Post-Graduate Program must indicate their acceptance of the admission offer and all related conditions by paying the first instalment of fees as detailed in the letter of admission before the date stipulated therein. The classes would begin by the end of October 2005. At this time, the students will be given a Manual of Policies and Regulations which will be binding on them.

### ACADEMIC SYSTEM - PGCBM

**Program Design:** The Program consists of 12 courses, namely:

- |                                       |   |
|---------------------------------------|---|
| 1 Cost & Management Accounting        | 2 Basic Economics for Managers                |
| 3 Organizational Behaviour            | 4 Quantitative methods for Business Decisions |
| 5 Financial Management                | 6 Human Resource Management                   |
| 7 Production & Operations Management  | 8 Marketing Management                        |
| 9 Information Technology for Managers | 10 Ethical & Legal Environment of Business    |
| 11 Strategic Issues in Management     | 12 Emerging Business Paradigms                |

**Academic Calendar:** The entire program consists of one year duration, having 240 hours of live video conferencing and 60 hours of rigorous on-campus classes at XIMB, spread over one week duration.

**Certification:** The institute awards the Post Graduate Certificate Program in Business Management to students who have successfully completed the entire course work and have successfully completed all academic requirements as mentioned in the Manual of Policies. The Manual of Policies would be provided to those students who are admitted to the program.

### ON CAMPUS STAY at XIMB

The PGCBM program includes a seven-day on-campus stay at XIMB. During this one-week, the students would be exposed to 60 hours of rigorous real-time classroom interaction by the renowned XIMB faculty. A number of skill development programs, which require intense group activities, The students would have access to world-class facilities of XIMB.

## Annexure 2 (PGCBM Focus group discussion brief – FGD protocol)

PGCBM program offered by XIMB is the first ever video conferencing based course to be offered in the country. Catering to a diverse mix of time starved and location bound students; the program seems to have started off well and has a bright future. Powered by the state of the art technology, the program is demanding for both faculty and student, in terms of acquaintance with the system itself.

Given our experience in the past couple of months, certain issues have emerged which need to be addressed in a common platform:

- 1 The students of this program consist of a heterogeneous mixture coming from different locations and various backgrounds. This has made **program design and delivery** a difficult task.
- 2 Time and distance being the binding constraints, have added to the complexity of the programs in terms of **administration and evaluation**.
- 3 The application of videoconferencing technology to the education industry is new. This calls for an adaptation in the **teaching methodology** or development of a new methodology altogether.
- 4 In order to optimise the take away for both student and faculty, the **technology needs to be harnessed** fully. At the same time, **caution** needs to be exercised towards the **inherent biases** that the technology brings in.

Improvement is a continuous process driven by awareness of environment. Given the vivid experience that each one of us has had till now, it is essential for us to sit back and take note of what has transpired. This focus group discussion is an attempt to get an insight to the subtler issues involved in the PGCBM program.

Participants are encouraged to feel free in expressing their views. The output of this discussion shall be used purely for research purpose and the development of the PGCBM program. Constructive feedback and critical reasoning shall be appreciated. We shall try to keep our discussion focused on to the following points:

- 1 The expectations of the students from: Course, Faculty, Technology
- 2 What are the key ingredients of the program package that can not be compromised with?
- 3 What are the features that add value to such a program?
- 4 Any new features that you would like to have in the program?
- 5 What are the basic skills that students of such a program look for in a faculty?
- 6 What are the features that need to be incorporated to
  - a Keep the students engaged in the class?
  - b Keep the students engaged outside the class?
- 7 Any drawbacks of the technology that has been noticed? What could be the possible changes required in the technology front to suit to the needs of the student?
- 8 Any other difficulty faced during the program?

(Participants are supposed to list down the criteria on which a PGCBM faculty should be evaluated. A minimum of 10 criteria are required. They need to be in order of importance. The most important one has to be written first. Rough work will be allowed.)

**Annexure 3** ( The list of the 25 parameters which were found relevant in FGD 1 & 2)

| Serial No | Item   |
|-----------|--|
| 1         | Ability of the faculty to clear the fundamentals of the subject                            |
| 2         | Clarity of concepts explained in the course  |
| 3         | Ability of the faculty to complete the planned session in time                             |
| 4         | The relevance of the course in your work life  |
| 5         | Ability of the faculty to motivate the students to participate in the A S discussion forum |
| 6         | Ability of the faculty in making the course relevant to the students                       |
| 7         | Ability of the faculty to motivate the students to engage in self learning                 |
| 8         | Ability of the technology to enable the students to engage in self learning                |
| 9         | The adequateness of the course materials distributed by the faculty                        |
| 10        | Practical orientation of the course  |
| 11        | The appropriateness of VC technology in delivering the particular course                   |
| 12        | Regularity of evaluation   |
| 13        | Transparency of evaluation   |
| 14        | Value addition achieved by the students attending the course                               |
| 15        | Adhering to predetermined structure of the program   |
| 16        | Pre class preparation of faculty   |
| 17        | Faculty responsiveness in the A S  |
| 18        | Use of different evaluation parameters for testing the learning of the students            |
| 19        | Examination which evaluates the application of concepts by the students                    |
| 20        | Ability of the faculty in making the classes interesting to students                       |
| 21        | Ability of the faculty to utilize the technology effectively                               |
| 22        | Course administration by faculty   |
| 23        | Ability of the faculty to make the class interactive                                       |
| 24        | Ability of the faculty in engaging students in the class                                   |
| 25        | Ability of the faculty in developing appropriate assignments                               |

**Annexure 4** (Tabulation of the clubbing of criteria by participants of FGD3 & 4)

| S.No | Item   | Learning Value | Course Design | Course Delivery | Course Admin. | Interest Generation |
|------|--|----------------|---------------|-----------------|---------------|---------------------|
| 1    | Ability of the faculty to clear the fundamentals of the subject                            | 8              | 0             | 3               | 0             | 3                   |
| 2    | Clarity of concepts explained in the course  | 5              | 5             | 0               | 0             | 3                   |
| 3    | Ability of the faculty to complete the planned session in time                             | 0              | 5             | 5               | 2             | 3                   |
| 4    | The relevance of the course in your work life  | 6              | 2             | 0               | 0             | 6                   |
| 5    | Ability of the faculty to motivate the students to participate in the A S discussion forum | 4              | 4             | 3               | 0             | 2                   |
| 6    | Ability of the faculty in making the course relevant to the students                       | 2              | 6             | 3               | 0             | 3                   |
| 7    | Ability of the faculty to motivate the students to engage in self learning                 | 1              | 4             | 5               | 2             | 3                   |
| 8    | Ability of the technology to enable the students to engage in self learning                | 1              | 6             | 3               | 2             | 2                   |
| 9    | The adequateness of the course materials distributed by the faculty                        | 0              | 9             | 4               | 1             | 1                   |
| 10   | Practical orientation of the course  | 3              | 5             | 2               | 1             | 1                   |
| 11   | The appropriateness of VC technology in delivering the particular course                   | 0              | 1             | 6               | 4             | 2                   |
| 12   | Regularity of evaluation   | 2              | 1             | 2               | 3             | 1                   |
| 13   | Transparency of evaluation   | 1              | 3             | 1               | 6             | 1                   |
| 14   | Value addition achieved by the students attending the course                               | 5              | 0             | 4               | 1             | 2                   |
| 15   | Adhering to predetermined structure of program   | 0              | 4             | 2               | 6             | 1                   |
| 16   | Pre class preparation of faculty   | 0              | 0             | 7               | 3             | 2                   |
| 17   | Faculty responsiveness in the A S  | 0              | 1             | 1               | 2             | 7                   |
| 18   | Use of different evaluation parameters for testing the learning of the students            | 2              | 1             | 2               | 8             | 0                   |
| 19   | Examination which evaluates the application of concepts by the students                    | 5              | 0             | 0               | 7             | 3                   |
| 20   | Ability of the faculty in making the classes interesting to students                       | 1              | 0             | 1               | 1             | 9                   |
| 21   | Ability of the faculty to utilize the technology effectively                               | 0              | 0             | 4               | 4             | 4                   |
| 22   | Course administration by faculty   | 1              | 1             | 1               | 6             | 4                   |
| 23   | Ability of faculty to make the class interactive   | 0              | 1             | 1               | 1             | 10                  |
| 24   | Ability of faculty in engaging students in class   | 0              | 1             | 1               | 1             | 10                  |
| 25   | Ability of the faculty in developing appropriate assignments                               | 3              | 1             | 1               | 2             | 8                   |



**Annexure 5** (Parameters for evaluation of program as per exploratory study)

|   |
|---|
| <b>Learning Value</b>   |
| Ability of the faculty to clear the fundamentals of the subject                 |
| Clarity of concepts explained in the course                                     |
| Value addition achieved by the students attending the course                    |
| <b>Course Design</b>  |
| Ability of the faculty in making the course relevant to the students            |
| Ability of the technology to enable the students to engage in self learning     |
| The adequateness of the course materials distributed by the faculty             |
| Practical orientation of the course   |
| <b>Course Delivery</b>  |
| Ability of the faculty to complete the planned session in time                  |
| Ability of the faculty to motivate the students to engage in self learning      |
| The appropriateness of VC technology in delivering the particular course        |
| Pre class preparation of faculty  |
| <b>Course Admin.</b>  |
| Regularity of evaluation  |
| Transparency of evaluation  |
| Adhering to predetermined structure of the program                              |
| Use of different evaluation parameters for testing the learning of the students |
| Examination which evaluates the application of concepts by the students         |
| Course administration by faculty  |
| <b>Interest Generation</b>  |
| Faculty responsiveness in the A S   |
| Ability of the faculty to make the class interactive                            |
| Ability of the faculty in engaging students in the class                        |
| Ability of the faculty in developing appropriate assignments                    |
| Ability of the faculty in making the classes interesting to students            |

**Annexure 6** (Measurement scale Used for the research)

| S. No | Course effectiveness   |
|-------|--|
| 1     | The subject matter was relevant & useful                                   |
| 2     | The course was interesting and stimulating                                 |
| 3     | The course was intellectually challenging                                  |
| 4     | The workload was consistent with the value of the course                   |
|       | <b>Teaching effectiveness</b>  |
| 5     | The instructor was able to present the concepts clearly                    |
| 6     | The instructor could answer the student queries satisfactorily             |
| 7     | The instructor had healthy respect for students                            |
| 8     | The instructor was prepared for the classes                                |
| 9     | Overall the instructor was one of the best have ever had                   |
|       | <b>Evaluation effectiveness</b>  |
| 10    | The exams were fair  |
| 11    | The projects and assignment were beneficial                                |
| 12    | The quizzes and exams were able to check the understanding of the students |
| 13    | The quizzes conducted were relevant  |
| 14    | The evaluation was consistent and fair                                     |
|       | <b>Technology effectiveness</b>  |
| 15    | The technology was creatively used in the course                           |
| 16    | The A S was effectively used during the course to help in learning         |
| 17    | The technology helped enhance the overall learning experience              |
| 18    | The content presentation in VC platform was satisfactory                   |
| 19    | The course web in A S was well organized                                   |
|       | <b>Student learning from course</b>  |
| 20    | was able to derive value from the course                                   |
| 21    | New ideas and applications were learnt                                     |
| 22    | am enthused to learn more about the subject                                |
| 23    | The coverage of the course was adequate given the time constraint          |
|       | <b>Course feedback</b>   |
| 24    | Overall the course was useful  |
| 25    | would recommend the course to others                                       |
| 26    | Compared to other courses this course was one of the best                  |
| 27    | The course was able to add value to me                                     |
| 28    | This course is an important component of the overall program               |
|       | <b>Program feedback</b>  |
| 29    | am satisfied with the program  |
| 30    | would recommend the program to others                                      |
| 31    | The program as a whole is adding value to me                               |
| 32    | My objective of joining the program are being met                          |

**Annexure 7 (Questionnaire Used for the study)**

Evaluate the abovementioned course taken by the particular faculty with respect to the following statements in a scale, strongly agree, agree, neither agree or disagree, disagree and strongly disagree.

**“Course Feedback for PGCBM” - QMBD (A) By Prof. G.K. NAYAK**

| S.no | Statement  |
|------|--|
| 1    | Assignments given were relevant to the course                                  |
| 2    | Concepts were clearly explained in the course                                  |
| 3    | Faculty was adequately prepared for the class                                  |
| 4    | The course motivated me to engage in self learning                             |
| 5    | The course design induced me to participate in the A S discussion forum        |
| 6    | Faculty made the classes interactive   |
| 7    | The course materials given were adequate                                       |
| 8    | The course adhered to the predetermined structure of the program               |
| 9    | The evaluation method adopted was transparent                                  |
| 10   | The course had the desired practical orientation                               |
| 11   | The planned class coverage were completed in time                              |
| 12   | Examinations evaluated the application of concepts                             |
| 13   | Faculty was successful in clearly explaining the fundamentals of the subject   |
| 14   | Faculty took care of my individual learning needs                              |
| 15   | Expected value addition was achieved by me from the course                     |
| 16   | The delivery style helped in making the course relevant to my work life        |
| 17   | The technology was effectively used to help me in self-learning in the subject |
| 18   | Feedback given by the faculty was timely                                       |
| 19   | Faculty responsiveness in the A S was adequate                                 |
| 20   | My learning was regularly evaluated  |
| 21   | VC technology is suitable for delivering the course                            |
| 22   | The classes were interesting to me   |
| 23   | The course is useful in my work life   |
| 24   | Technology was utilized effectively in the conduct of the course               |
| 25   | My learning achieved was tested in various ways during the evaluation          |

**Annexure 8 (Reliability test results of the different parameters measured)**

| Parameter                   | No of Cases | No of tem | Alpha Scores |
|-----------------------------|-------------|-----------|--------------|
| Course Effectiveness        | 281         | 4         | 0.8732       |
| Teaching Effectiveness      | 282         | 5         | 0.8933       |
| Evaluation Effectiveness    | 261         | 5         | 0.907        |
| Technological Effectiveness | 282         | 5         | 0.8986       |
| Student Learning            | 282         | 4         | 0.8414       |
| Course Feedback             | 282         | 5         | 0.9245       |
| Program Feedback            | 282         | 4         | 0.872        |

**Annexure 9 (Model Fit Data – Summary)**

|                | Discrepancy | Degrees of Freedom | Discrepancy / d. of f. | Adjusted GFI | TL I        | RMSEA       |
|----------------|-------------|--------------------|------------------------|--------------|-------------|-------------|
| Model 1        | 62.47       | 9                  | 6.94                   | 0.69         | 0.86        | 0.2         |
| Model 2        | 30.07       | 5                  | 6.01                   | 0.77         | 0.91        | 0.19        |
| <b>Model 3</b> | <b>4.39</b> | <b>3</b>           | <b>1.46</b>            | <b>0.94</b>  | <b>0.99</b> | <b>0.06</b> |



# Success Factors Associated With Health Information Systems Implementation: A Study of an Australian Regional Hospital

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## Abstract

*This paper identifies five factors from the literature that are important for the successful implementation of health information systems (HIS). The HIS factors identified include stakeholder engagement, the support of management and local champions, understanding HIS imposed change, user training and the impact of government incentives. The paper further explored the introduction of a commonly used HIS (Medical Director®) in a regional Australian hospital and used the implementation factors as a guide for reporting stakeholder perceptions of the system. The implementation of the HIS in view of the systems users was a failure with all factors except the training issues poorly addressed. The study also reports the practicalities encountered with the system's introduction and documents several new operational factors that were found to be associated with HIS implementation. Overall, the factors provided a sound criterion on which to judge the implementation performance (success or otherwise) of the HIS. The factors identified have the potential to be used as a guide by others who are engaged with information systems in the health area.*

## Keywords

Health information systems, regional hospitals, systems implementation

## Introduction

Enormous investment has gone into computerised health information systems (HIS) worldwide, with the operation and up-keep of such systems in the clinical environment assumed to compose a notable component of a hospital's running costs. Given the importance of HIS, the perceived benefit of adopting these types of systems tends to be underreported. In one of the few published works on health care systems evaluation, a high proportion of HIS implementations are considered to have failed with questionable outcomes (Littlejohns, Wyatt and Garvican 2003). The effective use of computer systems in health care can potentially help save lives that may otherwise be lost. They are able to improve delivery of medicines; lower the cost of public health and improve business efficiency (Health Management Technology 2001).

Health expenditure by the Australian Federal government in 2004 was A\$72.2 billion and corresponded to 9.5% of GDP – some A\$23 billion was dedicated to hospital expenditure (Australian Institute of Health and Welfare 2004). Furthermore, this figure has doubled over the last four decades with Australia spending a similar proportion of its GDP on health as Canada and France; more than Japan, New Zealand and the United Kingdom, but less than the USA. Indeed, Hillman (1999) indicates that as many as

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14,000 preventable deaths may occur each year in Australian hospitals – a figure that may be underestimated due to the voluntary reporting system in place (Noble 2003). Dearne (2003) refers to the significant number of patients that die due to medical errors each year in the US – errors that potentially can be reduced with the introduction of health information technology. Arguably, the ability to reduce these errors and mishaps from a medical management perspective is central in efforts to improve health quality, resulting in lower health care costs (Barach and Small 2000). Furthermore, it has also been established that manual administering systems have accounted for one in three adverse reactions to prescription drugs where a patient with a known allergy has been overlooked by medical staff (Bates, Cullen, Laird, Petersen, Small, Servi and al 1995).

This paper identifies important (critical success) factors that need to be considered for successful HIS implementation. Furthermore, the implementation of a HIS in a regional Australian hospital setting was investigated from this success factor perspective as a means of establishing the suitability of these factors.

## **Health Information Systems and Success Factors**

The identification of critical success factors in organisations when first proposed allowed organisations to quickly identify those things that must go right for them to succeed and indeed, thrive to achieve competitive performance (Rockart 1979). Since Rockart's initial proposal that critical success factors were an important management tool, the concept of success factors has received significant attention as a methodology with which to examine the implementation of information systems (IS).

Moreover, the identification and application of success factors with respect of IS implementation can also be industry specific – whereby a set of governing success factors are shaped and peculiar to the organisation's operating environment. Indeed, within the realms of information systems/technology adoption there is a basic three-stage concept that tends to underpin user acceptance – an initial reaction to the use of the system; this initial reaction is followed by intention to use the system that leads to the actual use of that system (Venkatesh, Morris, Davis and Davis 2003). Given the fundamental concept associated with information systems adoption/acceptance, this study rather than examining the broad literature on general IS adoption, draws specifically from the HIS related literature to identify the pertinent health factors. Arguably, within the health care area the introduction of health information systems has tended to lag behind other high profile areas such as financial services, banking and manufacturing. Moreover, the health care sector has its own operation forces that tend to be directed by government policy, medical work practices, professional training and duties as well as regulatory controls (Davidson and Chiasson 2005) – all issues that can be viewed as influencing the selection of factors when implementing a HIS.

The general impact of introducing information systems in an organization could be viewed as a technical matter removed from organisational dynamics – simply an implementation process where there is a rollout of technology. There is however, substantial agreement that the success of information systems tends to be determined by organisational factors (Aarts, Doorewaard and Berg 2004) – which in a health care situation have been strongly associated with involving users in the implementation process as well as having management support for the project (Fish and Turner 1999). Within the health sphere it could be argued that the commensurate medical benefits – both patient-centric and from an organisational perspective – justify the potentially disruptive nature of introducing information systems. However, the desirable introduction of new technology by health care organisations can be greatly assisted by considering key implementation success factors that are particular to the health care environment.

## **Aspects Of HIS Implementation**

The benefit of introducing a HIS assumes a smooth transition from the traditional systems requirements analysis through to implementation. However, there is substantial evidence that suggests successful

implementation of medical and health information systems is determined by various organisational factors (Aarts et al. 2004). Lorenzi (2004) indicates that when implementing information systems in general medical practice there are non-technical issues that need to be addressed – issues that include identifying the requirements necessary for HIS expansion, poor understanding and communication with both computer systems vendors and health care staff and a lack of investment in user training. The published literature on health systems implementation has also identified important success factors that include stakeholder participation (Bowditch and Buono 2001; Sittig 2001; Souther 2001; Wolf 2001; Frabotta 2002; Weiner, Savitz, Bernard and Pucci 2004); the understanding and management of change (Coiera 1999; Sittig 2001; Heckley 2004; Kotter 1995); support from management and the influence of local information systems champions (Ash 1997; Pare and Elam 1998; Weiner et al. 2004); the importance of user training (Blignaut, McDonald and Tolmie 2001; Ammenwerth, Mansmann, Iller and Eichstädter 2003; Weiner et al. 2004); and government support and/or policy influence (Benson 2002; Heckley 2004; Cochrane 2005). Thus, from the literature it is possible to identify and categorise the pertinent and relevant success factors necessary for successful health systems implementation – success factors that tend to be associated with stakeholder participation, understanding change, management support and local champions, user training and government influence.

### **Stakeholder participation**

The need to include clinical personnel (both doctors and nurses) in the decision-making process when implementing computers is well supported by the HIS literature (Bowditch and Buono 2001; Frabotta 2002). A recent study (Weiner et al. 2004) examined the implementation of HIS across a number of hospitals and found that regardless of the size, organisational structure or management styles (top-down/bottom-up) in all projects recognised clinicians as playing a pivotal role in systems adoption. Furthermore, the study concluded that clinical personnel provided input into the design of IT systems as well as leadership in project implementation. Various other studies also allude to the involvement of the health user as an important success factor when implementing HIS. Sittig (2001) re-iterates that users must clearly see the need for any new HIS if they are to support the challenges posed by accompanying change; other authors (Souther 2001; Wolf 2001) reinforce the importance of user buy-in if a project is to succeed.

### **Understanding HIS induced change**

General research of information systems adoption indicates that there must be an awareness of the significant changes that occur during the stages of adoption, and that change-related problems can have potentially devastating consequences (Kotter 1995). Coiera (1999) considers organisational culture as an important factor when innovations are introduced, suggesting that steady incremental change is a better approach than disruptive and radical methods. Indeed, changing a clinician's behaviour in the medical workplace is acknowledged to be a perplexing and challenging issue when it comes to IT adoption (Heckley 2004). Sittig (2001) alludes to the positive perceptions of key and organisational leadership as an important change-management factor that need to be considered in HIS implementation. Sittig (2001) also notes that studies that examined the implementation of clinical information systems generally conclude that successful systems adoption must match the organization in relation to a variety issues that are:

- Technical – does the new system work on the currently installed hardware?
- Social – does the system provide all the features and functions required to replace the current elaborately designed formal and informal communication networks?
- Organisational – does the system support the mission of the organization?

Hence, in an endeavour to facilitate the successful introduction of HIS, health care organisations need to consider and understand the importance that organisational change with need to be addressed as part of an implementation strategy.

## Management support and local champions

Pare and Elam (1998) reported that senior management must be able to understand and address the challenges associated with the introduction of IT systems in a clinical health setting – a factor that appears to allow the organisation to capitalise on opportunities for quality improvement and cost reductions. Weiner et al in their study of hospitals found that:

*“Perhaps the most striking finding....indicated that senior managers rarely provided adoption leadership in terms of either championing the system or motivating the adoption decision process by identifying IT needs through strategic planning or goal setting.”*

(Weiner et al. 2004 p. 58)

Weiner and colleagues further report that it was the ‘enterprising clinicians’ that identified the health-related IT needs and opportunities before persuading senior managers to make the adoption decisions. Within the functional areas of systems implementation, there appears to be an important role for the supporters of new innovations. These local champions must actively and enthusiastically promote the system, build support and overcome resistance amongst the composite user groups, with the aim of ensuring that the system is actually installed and used (Ash 1997).

## User training

The introduction of HIS tends to also impact on the immediate and future training requirements of an organisation. Weiner et al (2004) indicate that extensive training tends to be generally required due to the low IT-based skill levels of doctors and other clinical staff. Training may encompassing simple tasks such as how to use new and basic system hardware (such as mouse actions and functions), or may require familiarisation with knowledge intensive HIS applications. A recent two year study into the adoption of information systems by nursing staff identified that an important success factor that influenced the acceptance of a newly implemented documentation system was associated with the existing self-confidence nursing staff had when using computers (Ammenwerth et al. 2003). Arguably, HIS training instils a perceived sense of confidence in clinical staff. Furthermore, it needs to be acknowledged that at least six months of user interaction and HIS operation may be required before increased staff productivity is evident – allowing for a more tangible evaluation (rather than immediate perceived successes) of the technology’s introduction (Blignaut et al. 2001).

## Government influence

It has been reported that general medical clinicians tend to use computers in their consulting rooms, whereas the hospital doctor is reluctant or does not have the incentive (Benson 2002). Benson further explains that large differences in computerisation between general practitioners and hospital doctors are found in countries where general practitioners play a gatekeeper role in controlling access to secondary health care. Historically, medical clinicians in general practice worked with government agencies to remove impediments to the uptake and successful use of computers. Doctors had major incentives when running their practices – practices that depict characteristics often associated with small business – to utilise computerisation to reduce business overheads. Within the larger healthcare organisation the clinicians have ostensibly been one step removed from HIS implementation. In this type of environment, computing has been generally treated as a management overhead with doctors given no realistic incentives to become involved (Benson 2002). Moreover, the issue of appropriate funding by government is certainly the key to many past and present projects (Cochrane 2005) with Benson (2002) indicating that government leadership and economic incentive are crucial to future HIS implementation – this in an environment where it is believed that clinicians tend to respond to financial incentives (Heckley 2004). Indeed, there needs to be a general recognition that Government has a leadership role to provide appropriate incentives and funding to adopt new HIS.

Five success factors were thus identified from the HIS implementation literature. Each factor has an affiliated set of practices that health care organisations would do well to address to improve the likelihood of successful systems operation and acceptance. These factors and the identified practices are summarised in Table 1. Of these success factors, organisations such as hospitals can have a clear influence on four of the success factors. The only factor they have little control over (other than lobbying) is *government influence*.

**Table 1:** Identified HIS implementation factors and practices

| <b>Implementation Success Factor</b>   | <b>Organisational HIS Implementation Practices</b>   |
|--|--|
| Stakeholder participation              | <p>Inclusion and recognition of clinical personnel in the HIS decision-making process.</p> <p>Recognise the important role of clinical personnel in project leadership and their contribution to HIS design.</p> <p>Identification of user-related systems requirements associated with new HIS.</p>   |
| Understanding Change                   | <p>Have an overt understanding that significant impacts can occur with HIS implementation and that steady incremental change is a better approach than disruptive and radical approaches.</p> <p>Recognise that the clinician's working behaviour as a perplexing issue (possibly unique personal/occupational attributes compared to other professionals)</p> <p>Canvas the views of key and organisational leadership on the HIS project.</p> <p>Identify and match organisational technical, social and organisation domains to the proposed HIS.</p>           |
| Management support and local champions | <p>Recognising the adoption leadership role of senior management in:</p> <ul style="list-style-type: none"> <li>• motivating the decision-making process</li> <li>• identifying HIS needs through strategic planning or goal setting</li> </ul> <p>Identify and encourage enterprising clinicians (HIS champions) that understand IT needs to persuade senior managers to adopt HIS.</p> <p>Identify and recognise the enthusiastic role that supporters of new innovations (the local champions) have as alleviators of potential resistance to HIS adoption.</p> |
| User training                          | <p>Identify and plan for the immediate and future organisational training requirements.</p> <p>Understand that clinical staff training requirements can be wide ranging, starting from a low skill base through to extensive HIS instruction.</p> <p>Recognise the value of existing computing skills that allow staff to be self-confidence when using computers.</p> <p>Allow an appropriate time period before user success and HIS productivity improvements are evaluated.</p>  |
| Government Influence                   | <p>Recognition that Government has a role to provide appropriate incentives and funding to adopt new HIS.</p> <p>Address and alleviate the perception that HIS is a management (non-clinical) overhead in larger health care organisations by involving clinicians in HIS.</p>   |



## **Research Design and Methodology**

This study emerged from discussions between the authors (researchers at Victoria University) and a Division of General Practice (which have been set up throughout Australia to support local GPs and their staff to continuously improve the quality of general practice and the health of the local community) in the State of Victoria. An indication was given by the Division that suggested that there was a need to automate the recording of clinical information in the Accident and Emergency (A&E) department of a small rural hospital that was in the boundaries of the Division. Thus, the university and Division jointly funded the introduction of the HIS (described later in the paper) as a scoping study for the introduction of such systems on a wider scale. After assisting with the funding of the initial system, the university did not participate in its implementation, or its usage, at all. The university subsequently funded a research assistant to conduct the interviews described below.

Although the research project could be loosely described as action research (as the initial joint funding of the project did obviously influence the outcomes of then project), the non-participation of the university in anything to do with implementation means that it is probably more accurate to describe the research approach as that of a case study (Williamson 2002).

### **The HIS – Medical Director®**

The HIS in this study was Medical Director® (MD). MD is a clinical software package used by some 85% of general medical clinicians in Australia. As such, the application assists some 16,000 doctors to record and dispense some 90 million prescriptions to patients (Health Communication Network 2004). In general terms, MD functionality provides the clinician with a powerful application that records data, manages patient appointments, handles third party pathology/radiology reports, facilitates billing and allows professional letter writing. Indeed, the broad and successful adoption of MD in general medical practice has been associated with a set of well-understood computer requirements that have been identified as providing significant clinical support for the Australian doctor (Tomlins R and Power P 1998; RACGP Health Informatics Task Group 1999; Richards, Bolton, Veale and Quinlan 1999; Benson 2002). MD was designed for use via the general practitioner desktop, however, in the few studies that examined the adoption of MD in a hospital environment the software evaluation has been undertaken to address clinical outcomes rather than from a systems implementation perspective. For example, a study that examined the adoption of MD by a regional hospital used computerised prescribing as a basis for developing the fundamental evaluation factors in gauging the success of the software (Newby, Fryer and Henry 2003). Arguably, the small hospital setting should be amenable to the implementation of MD allowing for the commensurate set of benefits that are enjoyed by the broader group of general medical practitioners (GMP).

### **The HIS focus – Accident and Emergency (A&E) Department**

The study examined the introduction of a common and well-known clinical patient management system, Medical Director (MD), into the hospital setting. The doctors that were associated with the A&E department were (as a general rule) visiting medical officers to the hospital. They also had external medical practices and thus a relatively high familiarity with using the MD software.

The A&E department was identified as potentially gaining significant benefits from the introduction of this HIS where it was envisioned that the system would alleviate the errors associated with clinical note taking and patient data collection. It was also felt that the system would improve access to patient information from various locations within the hospital area as well reducing some of the onerous paper work that was currently prevalent in the department.

The introduction of the system was intended to function within the existing operational protocol common to the A&E area in an endeavour to minimise patient impact and procedural change. The procedural aspects of the A&E area involved:

- Patients first presenting at A&E and being attended to by nursing staff for admission (first data collection point).
- Whilst the patient waits to be attended by a doctor, various medical tests and clinical observations are recorded (a second series of data collection episodes).
- Finally, the treating medical practitioner sees the patient, dealing with clinical issues and management (third data collection point).

## The study

A concerted effort was made to gain the user's perspective with respect to the introduction of MD in the A&E area. The primary data collection for the study was drawn from interviews undertaken with those involved in the implementation and use of the new software system. Individual and group interviews, as well as relevant implementation documents were utilised as part of the data collection process. Interviews can be a significant primary tool to gauge an in depth understanding of aspects of the system being studied and typically form a major part of the data collection for case studies (Williamson 2002). In terms of interview structure and guidance, the identified set of success factors were used to form and shape responses from interviewees. All interviews were recorded and then transcribed. Transcriptions were then manually analysed for common and/or emergent themes that related to the HIS success factors. One research assistant was used to conduct interviews and examine data resources in an endeavour to minimise data collection and interpretation anomalies. The research was of an exploratory nature and called for careful sifting and examination of data – a process that does not easily allow data to be automated and computerised – hence, manual data analysis was used in preference to using qualitative data analysis software. Typically, as data was gathered from various sources the researcher was able to identify similarities and differences from the information obtained. Data was collected from three types of users affiliated with the introduction of the system. The characteristic of data sources used in the study are summarised in Table 2.

**Table 2:** Data Sources – 3 types of users

| <b>Data Sources (Interviewees)</b>   | <b>Description</b>   |
|--------------------------------------|--|
| General Medical Practitioners (GMPs) | The doctors (n=8) that agreed to participate in the study had all a relatively short, but informative interview to gauge their perceptions of the HIS.   |
| Nursing Staff                        | Nurses that participated in the study were organised in two small groups (n=8) that allowed their collective perceptions of the new system to be recorded.   |
| Implementation support officer       | The local division of general medical practice supported the project by training nurses and GPs in systems use, documentation, specialised information system support to develop the project. The implementation officer was also one of the authors of the paper and was able provide relevant perceptions associated with the adoption of the HIS. |

For the purpose of this study MD is the HIS that was implemented in a small hospital setting. Indeed, the terms HIS and MD tend to be utilised interchangeably throughout this article when discussing the study. Furthermore, the study uses the identified HIS success factors and important organisational implementation practices to direct the researchers in their data collection activities. Hence, the general research question that guided the study involved capturing the various stakeholder perceptions with respect to the introduction of the HIS. Results are reported as selective summaries of HIS users' perceptions under the different success factor categories. Summaries have also been structured and inter-dispersed with participant quotations to reflect typical user views.

## Results and Discussion

User perceptions associated with the introduction of MD were gathered and reported across the areas identified as being important for successful HIS implementation – stakeholder participation, management support and local champions, understanding HIS imposed change, user training and the impact of government incentives. In the A&E setting the important users of the system were the GMPs and nursing staff – an aspect of the study that is reflected by the significant contribution these two groups make in reporting outcomes associated with the MD implementation process.

### Stakeholder participation

It is important to engage prospective stakeholders in the preliminary HIS decision-making process to identify systems requirements. Furthermore, in the early stage of systems development it is common practice to recognise the clinical and administrative role users have and allow them to make a contribution to the design of the system. The GMPs, nursing staff and the implementation officer were identified as the important stakeholders that provided insight associated with this factor.

### General Medical Practitioners

There was a perceptions amongst all but one GMP that they were never included in the decision making process associated with the implementation of the MD software. Indeed, one comment encapsulates the non-inclusion of GMPs appropriately:

*“....it was presented to the doctors that it was going to be a pilot scheme for the study of computers in an A&E environment....”*

One of the GMPs interviewed did consider that they had been included in the decision-making process – this GMP, a ‘champion’ for the introduction of the system initially, was identified as having a particular enthusiasm for the use of computers in medical practice and healthcare in general. This doctor had made a concerted effort in engaging the requirement aspects of the initial consultation process associated with MD’s introduction.

In terms of recognising the clinical role of GMPs when it came to influencing the design of MD, the general consensus was that no appropriate degree of consultation occurred. A pertinent comment from one GMP that tends to collectively summarise the perceptions of many was that:

*“Medical Director is used by many GPs in the network. However, there was no recognition of our administrative role.”*

User requirements, when introducing an information system are one of the most important aspects associated with successful implementation. There was general agreement amongst the GMPs that they were not part of the identification process when it came to the introduction of MD. Generally, the responses appear to confirm the practice of exclusion rather than inclusion of GMP in the user requirements process. Consider some of short but terse responses from GMPs:

*“No, we were not included in anything.”*

*“Were we just told that it was coming and that it will be MD – nobody asked us about it.”*

Some clinical or administrative user roles were reflected in the design of data entry templates that aimed to enhance and streamline data capture – however, according to one GMP this led to a limited use of the medical director program. One GMP suggested that if they had been approached before the system was implemented that some design and operational issues that directly reflected clinical administration facets of the system could have improved system use and indeed, acceptance. For example, it was pointed out that there was a clinical impracticality associated with running MD from where it was positioned because records were physically distant from the patient. Another clinician suggested that the system should have been laptop-based allowing portability from one clinical treatment area to another.

## Nursing Staff

Two groups of nursing staff (N=4) were interviewed over a period of time after the introduction of MD. With respect to being involved in the initial decision-making process all generally felt that there had been little or no inclusion of their group in the adoption of the new system. Indeed, nursing staff reported similar sentiments with GMPs in that they felt excluded from the early formative decision-making process with various summary comments reflecting nursing staff perceptions on the issue:

*“...we were told this is what we are doing and this is what it is.”*

*“the program (MD) was up and running when we were introduced to it...”*

All nurses perceived data-entry as one of the potential hindrances in using the system. Hence, a series of patient data capture templates with appropriate selection options were pre-configured to minimise typing. Nursing staff were also identified as the primary users of the system who would enter initial and on-going patient data. Some clinical/administrative features associated with nursing roles were addressed in the initial systems design stage and primarily involved the customisation of data input screens, user access and templates. From this perspective, nurses played an important role in the design of data capture templates through their active engagement in the design process. Nurses generally indicate:

*“Our clinical role was recognised, yes we were asked what we wanted on the screen.”*

Although, nursing staff were involved in data capture design, they did not appear to have been a source for other design aspects of the system that had a clinical or administrative focus. Post implementation interviews with nursing staff also identified design and operational issues that the desktop installation of MD in the A&E area was inappropriate in that it forced staff to have their backs to the patient when operating the system.

The early engagement of nurses identified that for each staff member to have their own system logon would be unworkable and time consuming. It was also recognised that in an A&E work environment that patient contact and treatment was a team based effort by a collective group of GMPs and nurses. Consequently, initial MD design alterations accommodated a common logon for staff to access the system.

## Implementation support officer

The information management support officer of the Division had a major role in user training, software optimisation, template creation and user-manual documentation. In effect the support officer was ostensibly viewed as an implementation resource after the decision to adopt MD was made. In what appears a peculiar system implementation strategy, the support officer reported that he appeared to be *out of the loop* when it came to systems associated meetings – something that led him to question his own role in the entire project. Furthermore, the support officer indicates by not being included in meetings where MD-related decisions occurred impacted on his support role:

*“..I experienced confrontation particularly with GMPs and nurses who resisted being imposed upon...when it came to the initial and on-going operation of the system.”*

The support officer was the human interface between the instigators of the system – who saw value in its introduction – and the users who were told that it was going to be introduced. He felt that a simple process of relevant consultation (with all stakeholders) was missing and would have made his job a lot easier.

## Summary of Stakeholder engagement

The important stakeholders (GMP and nursing staff) were not included in the decision-making process to adopt the new MD application. The support officer – a significant member of the system team was left out of the loop when it came to making decisions about the on-going activities of MD. With respect

to recognising the role of GMP and nursing staff contributing to aspects of the proposed system, only nursing staff reported that they were adequately consulted in the development of the system. The manner that stakeholders were engaged in this project is contrary to the reported literature that suggests that there is an important link between stakeholder inclusion and participation in health systems adoption and eventual success.

Furthermore, an important operational and practical design issue that was not initially considered was overlooked – that a desktop-based application was not appropriate in an A&E setting that had high patient throughput as well as a one-patient to many-staff interaction ratio. As identified by staff a mobile laptop device would have enhanced the practical usefulness of the MD software.

### ***Understanding Change***

An initial briefing process associated with the introduction of MD clearly articulated the systems aims and also explained the intended workflow changes in moving from a manual data collection environment to a computerised one. All stakeholders were asked their views on the introduction of MD and how the system had affected their workflow. The perceived work changes after the systems' implementation were generally negative amongst the GMP and nursing staff. One GMP identified that duplication commonly occurred because patient data was manually recorded and then at a later stage entered into the MD system. Another GMP summarises the practicalities of using the new system:

*“...it was more difficult because we doubled up with some paperwork – firstly when with the patient, and then entering the information into the computer at the station....”*

Also reported were certain inflexibilities in the system associated with the customisation of MD for the hospital scenario:

*“.. using the system was worse because we could not access a particular patient's history in the way a general practitioner normally does...”*

The important issue associated with altering data template design was to streamline data capture – pre-configured formats were to reduce and minimise typing. However, the customisation of the basic MD system for the hospital environment appears to have led to an inadvertent loss of familiarity that GMPs may have had with the application. The premise associated with introducing MD was that it was perceived as an appropriate system to use in the A&E environment because of the previous experience GMPs had in using the application – they used commercial application of MD in their surgery every day when not at the hospital. Paradoxically, the alterations to MD through data-entry customisation had the unexpected consequence of reducing various aspects of application's functionality for this important group of users.

The introduction of MD affected nursing staff workflow. It was expected that a variation in recording patient information from a manual process to electronic one would impact on the nursing work environment, however all nurses identified that the practicalities of the workplace physical environment were an important workflow constraint. Nurse's indicated that:

*“....you have sometimes in access of five people waiting to be seen...whilst the computer can only be used by one person at a time.”*

*“...the location of the computer was not an issue for me... it was just that you couldn't enter patient information in real time.”*

*“...the system was much harder (labour intensive) and took longer to enter patient information.”*

Arguably this series of comments reflects the practicality of working in a high turn-over health care section of the hospital where nurses tend to numerous patients and record multiple sets of clinical information. Such a scenario ideally requires multiple sets of computer workstations allowing maximum opportunities for, and flexibility in, patient data entry. Indeed, the introduction of the new system

appears to have identified an ergonomic type factor that is associated with understanding the impact of health systems related workplace changes.

In terms of traditional information systems cutover from the existing manual system to MD no extra resources were provided in the form of general clerical staff to assist nursing and medical staff in the transition phase. All nurses suggest that from their experiences a designated person or group of administration staff should have been made available to enter patient data and records.

### **Summary of understanding change issues**

An import factor associated with successful HIS implementation is the acknowledgement that any new system will have an impact on personnel through actual or perceived work-place changes. All clinical stakeholders reported a poor understanding of the aims of introducing the new systems and the subsequent impact on their own working practices. Indeed, the documented pre-implementation briefings to staff explaining the goals of introducing the system appeared to have been forgotten or poorly conveyed to staff. MD appears to have impacted on nurses and doctors forcing them to not only record patient data manual, but then line up to use the computer to re-record electronically patient information. Furthermore, increasing resources in the form of clerical staff to assist with electronic data capture were critically overlooked in the initial transition phase to MD – an issue that impacted understanding the change management issues in this project.

#### ***Management Support and Local Champions***

The likelihood of an HIS project succeeding is greatly enhanced if there is management support through active and visible actions. Moreover, all projects tend to have individuals that champion the cause of adopting a new system taking either formal or informal leadership roles at various functional levels of implementation.

The general perceptions of GMPs and nursing staff with respect to management support involvement were negative. Staff reported that there was very little form of leadership or support demonstrated by management either before or during the introduction of MD. Representative comments include:

*“...there was no leadership and there was never a leader on the ground.”*

*“...It was a miss-mash and the collective wisdom was very small.”*

*“...I was certainly motivated to give it a go, but again there was not enough provision of support and leadership to make it work.”*

The individuals that were important in championing the virtues and acceptance of the MD system were identified in this study but did not appear to impact on the project's success. One champion was the implementation support officer that also undertook the training of staff using the system. However, no matter how much the support officer espoused the benefits of MD, he was viewed as an external third party provider and as such, an outsider to the A&E working environment. Another local champion was one of the GMPs that had a high proficiency and experience in using computers in the medical workplace. The role this GMP had was one of:

*“...promoting that MD had been implemented and was now available... I tried to generally motivate and encourage the use of the system amongst staff...”*

From a nursing perspective the A&D the senior and deputy nurses championed the value of the system and provided tacit support through attendance of training sessions and the encouragement of nursing staff to also use the system. However, in terms of designated nursing personnel as either leaders or the go-to person, no nurses filled this role appropriately due to the restrictions associated with the rotating shift and part-time nature of nursing work conditions.

## Summary of management support and local champions

Management was non-existent in the implementation of the new MD software. Indeed, the only notable involvement in the project was the approval of the initial pilot study to be run within the A&E section of the hospital. There appeared to be a perception by medical staff that because they had previous practical experience with the system that no management support was needed – just implement MD and the application would function in a similar manner that the doctors were familiar with. Arguably, the few but important local HIS champions appeared to be transient in the way they interacted with the system and the other hospital staff. For example, the implementation support officer who was the person involved in staff training staff had strong MD champion features, however, was viewed as external to the A&E working environment and not part of the collaborative medical team. The one champion GMP in providing motivation and encouragement in using the system was highly valuable, but restricted to the times that this person visited patients within the A&E workspace – significant championing gaps tended to result when the GMP was not present. Nursing staff all worked rotational shifts, identifying a practical limitation to having nurses as formal champions of the project. Indeed, it may be valid to suggest that information systems champions within this medical workplace needed to be overly present and representative of the work cohort in order to champion the practical and effective value of the system.

### User Training

Training issues associated with the introduction of MD were examined and the general perceptions of staff were that they had been given instruction before the introduction of the system and also during the system's use. Indeed, this appears to be one of the factors that was well recognised as having the potential to result in the failure of the project if not addressed appropriately.

Training tended to be mainly focussed on nursing staff and was undertaken by the implementation support officer who identified that many nurses were working from a low skill base. However, there appears to have been an informal approach to staff attending training with some nurses identifying operational issues that hindered training effectiveness and which were associated with the practical work environment. Some of the views of nursing staff on this issue were:

*“... we had time before we started using it when were able to “play”...but its not until you start using something that you really run into all the problem issues...”*

*“... all part-time and full time nurses were given training to play. Initially we had set times and also ad-hoc occasions when there was spare time...”*

*“... if it was quiet you could go and practice, however it was hard to find the time...”*

The reference to being able to play with the system captured in aspects of staff comments relating to training arguably reflects an informal approach to consolidating staff MD training. Moreover, there was a perception amongst nursing staff that by playing with the new system was a non-threatening approach to enhance nursing computer skills – an approach that appears to support the informal approach to finding time to engage in system training.

There was no indication from staff that training was mandatory and that sufficient resources were provided to alleviate workload stresses so as to allow them to consolidate their understanding of the system through these play episodes. Moreover, it was noted that not all nurse staff were at the same computer skill level and that numerous nursing staff could not be reached for training due to their odd hours of work – again suggesting that training was based on an informal approach with limited or no resources provided to overcome these practical issues.

The GMPs, having previous exposure to using MD were assumed to have a solid body of understanding and practical experience in being able to use the system. Furthermore, it was recognised from early feedback sessions that “most of the doctors at the hospital were computer literate and did not view the system as a threat...”. As such, the GMPs were given a demonstration of the newer customised aspects

of MD with the expectation that they would easily be able to operate hospital's variant to the one they commonly used in their private practices.

### Summary of user training

The nurses received most of the training, however it was clear that there were operational variables that appeared to stifle the effectiveness of training – operational issues such as lack of time to play with the system, variable working hours that hindered training attendance and no allocation of extra resources to support the nurse's training sessions. GMPs, who had a history of being familiar and experienced with the general concept of using MD, were expected to use a customised version of the application with minimal training.

Instruction and training associated with MD adoption was recognised by the project's facilitators as an important issue. However, even though initially acknowledged as a significant factor there appears to have been an informal and limited approach to staff training. Much of the informal and ad-hoc approach to user training appears to be related to pre-existing operational issues which in the case of nursing staff primarily related to shift-work that precluded effective training attendance. With respect to the GMPs, a fundamental assumption of pre-existing knowledge in using MD reduced the training focus on these users and may have been an incorrect assumption.

### Government influence

There was no direct Government involvement, participation in, or facilitation of the implementation of MD. The implementation of MD stemmed from initiatives to introduce an electronic system to enhance access to patient information within the hospital and as such, Government involvement and influence was an absent factor. Governments can enhance systems adoption by providing appropriate incentives and funding to adopt health information systems in general. Furthermore, the involvement of Government can alleviate the perception that information systems are a management domain (non-clinical) and directly engage the support of the diverse number of medical personnel in the respective area that the system is to be implemented. As was mentioned earlier, this was the one factor that could effectively not be influenced (in the short term at least) in relation to the introduction of MD.

Given that government participation in the project was absent, the study sought the views from nurses and GMPs on the role that government may have had in the implementation of such a project. The general consensus amongst the staff was that the role of Government was to provide the fundamental resources that would allow the implementation of health information systems so as to significantly enhance access to timely and complete patient information. Arguably, such electronic information flows and data improvements would allow general enhancements in clinical care, perceptions that were reflected in a high proportion of staff responses:

*"... the government has a great opportunity to purchase a single system for hospitals however there must be interoperability between all stakeholders to make viable..... it seems to me that it is an opportunity being wasted."*

*"...they could have a unique national system for hospitals that would be a benchmark to which all GP practice software could communicate/integrate into so we could all share information."*

*"...the whole system would benefit greatly if hospitals had electronic records because at the moment most of the records are entered manually by nurses with varying degree of success."*

In retrospect, the implementation of the hospital's MD system invariably required formal support from Government in providing tacit guidance and direction as well as extra resources to alleviate some of the operational issues encountered with staff training.



## Conclusions

The paper identified five health information systems implementation factors from the relevant healthcare literature that medical-based organisations need to consider in order to increase the likelihood of succeeding when introducing an information system. The five success factors included, stakeholder participation, the understanding of system imposed change on the organisational personnel, the importance of management support and local champions, user training and the impact of government support in providing incentives to use new health systems. Arguably, the identification of these factors provides a pertinent implementation framework by which to judge the success of a health information systems project. The paper further explored the introduction of the commonly used Medical Director® application in the A&E department of a regional hospital using the factors as a guide for capturing stakeholder perceptions. The implementation of MD was a failure with all factors except the training issues ignored. Indeed, even the implementation practices associated with user training were approached in an informal and limited manner.

In general, the study identified several additional implementation factors that could be said to affect the successful introduction of a HIS. These factors appear to be associated with common aspects of a hospital workplace and reflected operational aspects of the A&E department. One of the additional factors identified was associated with nursing shift-work and the presence of part-time staff that made it difficult to formalise effective training sessions. The irregular hours of work issue also dilute the impact of the local information systems motivators leading to championing gaps when these individuals were away from the area where the system was being used. Indeed, from the previous literature, the HIS champions tend to be assumed to be an ever-present constant accompanying the introduction of a HIS – something that appears to be an exception in the health environment encountered in this study. Arguably, in the healthcare sphere there is an increased likelihood that identified information system champions may have transient or reduced value if not overly present to encourage and motivate others to use the system.

Another operational factor identified in the study relates to the physical practicalities of the patient-clinician interaction that does not appear to have been considered in MD's usability design – as opposed to software design. The historical widespread use of Medical Director® in the doctor's surgery is as a stand-alone desktop application operated in a doctor-to-computer (1-to-1) manner. Hence, the common use of the application is in a face-to-face situation across the doctor's desk and in a relatively ordered time frame – a scenario that is significantly different to that encountered in the A&E environment that commonly has many different staff tending to a number of different patients in different locations. Thus, the variability in working locations impeded the system from being used in the traditional standalone fashion, resulting in staff at times having their backs to a patient when using the system and/or a time delay in an endeavour to wait to use the system. Furthermore, the disparate location of patients encountered in the A&E led to a high degree of staff movement and was an impediment to efficient MD use – where various staff alluded to the system's utility being more suited to a wireless-mobile platform. Arguably, mobile devices such as a laptop or PDA may have been appropriate to accommodate the high degree of staff movement that occurred in the A&E area.

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# Unequal Outcomes for Women Academics in Australian Universities: Reflections on Belinda Probert's 'I Just Couldn't Fit In'

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## Abstract

*The position of women academics in Australia is similar to that in other countries, where women are still under-represented in senior academic leadership positions. Why does progress seem to be so slow? This article hopes to contribute critically to the challenge entailed by Belinda Probert's (2005) work, "I just couldn't fit in": Gender and unequal outcomes in academic careers". It considers her conclusions in the light of the 1992-2005 data from one of Australia's newer universities, Victoria University in Melbourne. The paper also introduces a flow (or transition) model for analysing staffing changes in organisations that provides insights not usually presented in the literature on gender inequity in academic employment. The paper proposes a holistic explanation for persistent gender inequity, combining structural barriers in appointments with the unequal responsibilities women have for care.*

## Keywords

*Women, academics, gender, higher education, Probert*

## Introduction

Women's participation in the academy in Australia has grown rapidly in the past decades. Staff profiles published by the Commonwealth Department of Education, Science and Training (DEST) and the Australian Vice-Chancellors' Committee (AVCC) show that, between 1996 and 2004, the number of female academics grew by 5 per cent to about 14,750. In the same period, the number of male academics decreased by 5 per cent to about 22,500. However, in the academic hierarchy, 67 per cent of female academics are at the two lowest levels, lecturer A and B. In contrast, 45 per cent of male academics are at these levels. Only 11 per cent of female academics are at the most senior levels (D and

E), whereas 28 per cent of male academics are at these levels.<sup>1</sup>

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Traditionally explanations of women's under-representation point to discrimination and bias in promotion and appointment and to the work-family concerns common to women workers generally. However, Belinda Probert, in a significant article, "I just couldn't fit in": Gender and unequal outcomes in academic

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<sup>1</sup> Australia has a five-level academic scale prescribed by the Minimum Standards for Academic Levels (MSALs). The MSALs comprise part of global employment terms and conditions agreed upon by Australia's 40 or so universities and the National Tertiary Education Union (NTEU), which represents academics and many non-academic university employees. The levels and their designations are: A (tutor and senior tutor), B (lecturer), C (senior lecturer), D (associate professor or reader) and E (professor).

careers' (2005), has challenged researchers to generate better explanations.

The article derives from two comprehensive projects in Australia, and Probert's message is blunt:

*... research into gender inequity in academic employment, in the UK and Australia at least, has been insufficiently willing to expose many of the most commonly accepted assertions to rigorous scrutiny, and that this has prevented us from properly understanding the remarkable persistence of unequal outcomes for men and women in terms of pay and status. I want to suggest that most of the factors that are widely used to explain the fact that women remain concentrated in the lower levels of the academic hierarchy are not supported by credible evidence. Many of these factors have had some real historical basis, but to remain focused on them is to ignore the substantial gender equity reforms that have been introduced in public sector employment over the last 20 years and their substantial impact. (2005, pp. 50-1)*

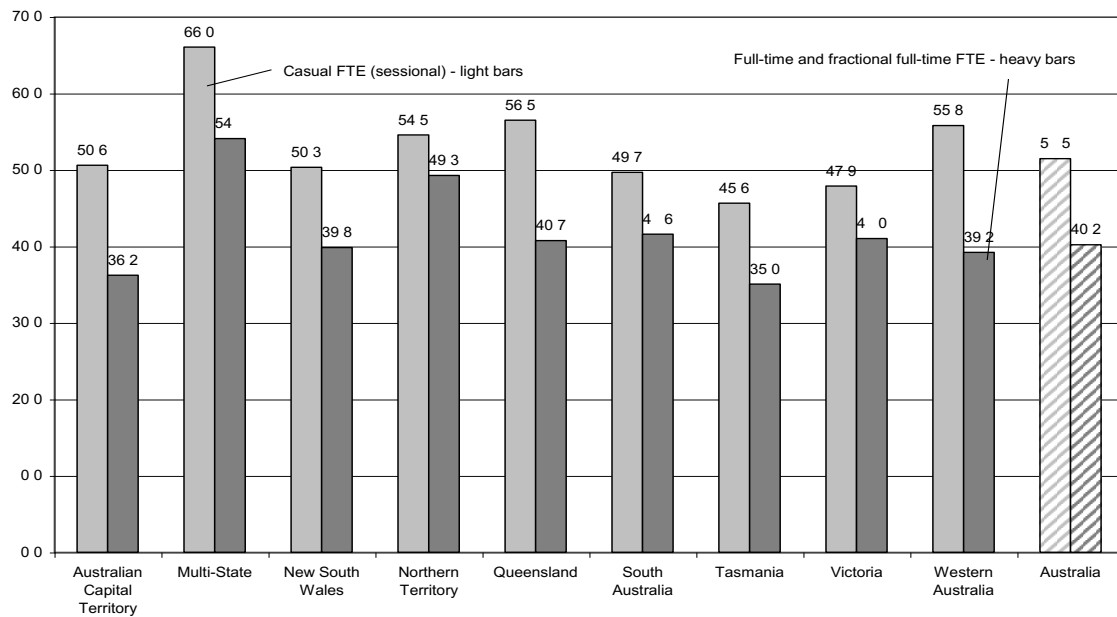
The first aim of our paper is to continue the discussion of how best women academics can achieve equality in universities. Secondly, we hope to contribute critically to the challenge entailed by Probert's work. We will do so by considering her conclusions in the light of the 1992-2005 data from one of Australia's former colleges of advanced education that became a university in 1992, Victoria University of Technology in Melbourne. Thirdly, we will introduce a flow (or transition) model for analysing staffing changes in organisations that provides insights not usually presented in the literature on gender inequity in academic employment. We will simplify the analysis by focusing on one problem only, namely the pathway to the professoriate for women at Victoria University. This is also the main problem that Probert considers (2005, p. 70).

## Probert's Criticisms of Prevailing Explanations

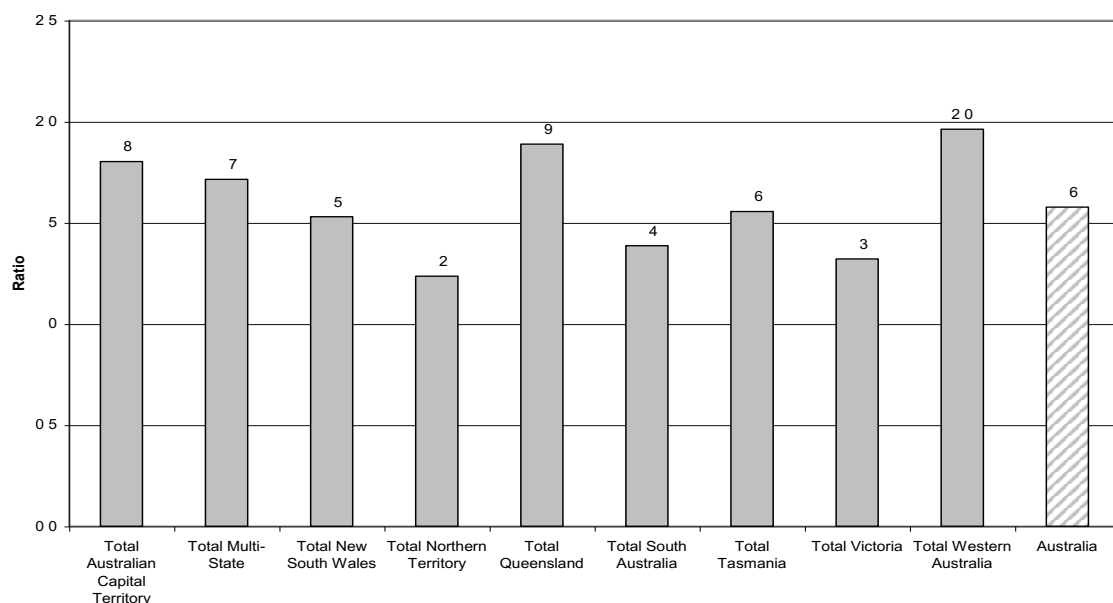
In this section we will outline briefly Probert's (2005) criticisms of existing explanations of gender inequity in academic careers. We will focus only on her main criticisms of the dominant framework, which argues unequal outcomes result 'from the unequal treatment at work of men and women in terms of any or all of the following: appointment levels, workloads, promotions, access to mentoring and other factors that contribute to career progression' (2005, p. 51). We will not labour points upon which there is little disagreement. For example, women academics spend more time than do their male colleagues on teaching compared with research and on student welfare and pastoral care (2005, pp. 57, 59, 60). Neither emphasis aids promotion. In the next section we will compare results from the data sources for her article – a national survey in 1998 and survey/interview research at the University of New South Wales in Sydney in 2002 – with our analysis of Victoria University institutional data.

Probert first questions whether women are disproportionately represented within casual employment (2005, p. 53). Here some additional data might help. Chart 1 gives the most recent available ratios of female casual academics (on an equivalent full-time basis) to the total of all casual academics in Australia. It confirms that women are not over-represented among casual academics. However, to say (correctly) that it is 'the under-representation of women in continuing employment that makes their numbers in sessional employment seem excessive' (2005, p. 53) is also to say (correctly) that the proportion of women employed casually is higher than that of men. That is, women academics are more likely to be sessionals. Chart 2 shows by state average the relative rates of casual employment of women and men, which is a way of representing the likelihood of being employed casually. The point is not merely semantic.

Source: DEST 2004 Staff statistics collection

**Chart 1:** Female academic casual 2003 and continuing staff 2004 ratios (FTE) by State, Australia (%)

Source: DEST 2004 Staff statistics collection

**Chart 2:** Ratio of FTE female academic casual proportion to FTE male academic casual proportion 2003-4 by State, Australia

Probert's second criticism is more substantial. Noting that differences in level between male and female academics are the main cause of the 'gender salary gap',<sup>2</sup> she takes up the important concern of promotion. The article also considers starting levels because these, together with promotion, 'allowed us to test the way that men and women navigate the academic career path, shedding light on how different levels are achieved' (2005, p. 55). Probert's tables 2 and 3 'show that one obvious cause of gender

<sup>2</sup> The results derive from regression modelling (2005, p. 54). Less important independent variables were length of academic career and level of qualification. The former accounts for levels within levels: for most part incremental advancement within levels A to D occurs annually (see Probert 2005, p. 56). The latter has an effect on starting level, which in turn would influence remuneration. It seems to us that the most important problem here is to try to explain gender differences in level.

stratification is that men begin their academic careers at higher levels than women'. Moreover the data on starting qualification 'show that there is good evidence to support the conclusion' that 'men are better qualified at the time of their first appointment' (2005, p. 55). In particular a greater proportion of men held PhDs.

The Australian data in table 1, showing the proportion of academics holding research or coursework doctorates by State in 2004, support to this conclusion. These are not starting qualification percentages, but they are a reasonable proxy. Probert notes 'that among those who begin their career without a Ph.D., women are also less likely to go on and complete one than men' (2005, p. 56). A greater proportion of Australia's male academics do have doctorates. This fact will help to explain some average differences in levels between women and men. However, we doubt its efficacy in helping to explain the very small proportions of women in the Australian professoriate (academic levels D and E). According to DEST (2005) almost 62 per cent of male academics have doctorates, while 28.9 per cent are at levels D and E (a ratio of 2.1 to one). Almost 46 per cent of women academics have doctorates, while 11.2 per cent are at levels D and E (a ratio of 4.1 to one).

Source: DEST 2004 Staff statistics collection

| <i>State</i>                        | <i>Males</i> | <i>Females</i> | <i>Persons</i> |
|-------------------------------------|--------------|----------------|----------------|
| <b>Australian Capital Territory</b> | 76.5         | 61.3           | 71.6           |
| <i>Multi-State</i>                  | 52.2         | 32.0           | 41.1           |
| <i>New South Wales</i>              | 61.4         | 47.7           | 56.2           |
| <i>Northern Territory</i>           | 32.1         | 15.0           | 23.5           |
| <i>Queensland</i>                   | 65.8         | 52.1           | 60.6           |
| <i>South Australia</i>              | 64.2         | 45.8           | 56.8           |
| <i>Tasmania</i>                     | 64.2         | 48.5           | 58.5           |
| <i>Victoria</i>                     | 58.3         | 40.7           | 50.8           |
| <i>Western Australia</i>            | 57.0         | 42.9           | 51.5           |
| <i>Australia</i>                    | 61.8         | 45.8           | 55.5           |

**Table 1:** Full-time and fractional full-time academics with Doctorates by State (% of gender)

Probert's arguments regarding promotion are stronger. 'It is widely believed among Australian female academics that they do less well than men in the promotions process and that this reflects either direct discrimination or systemic/indirect discrimination (Burton, 1997; Currie and Thiele, 2001).' Similar views exist in the UK. 'Others argue that promotion panels are likely to undervalue teaching compared to research and that this will also discriminate against women, who are assumed to invest more in teaching than research (Acker and Feuerverger, 1996).' Rather:

*... in our UNSW study women are more likely to be successful than men when they apply for promotion, while in the national study the success rate for men and women was very similar. And this is so despite the fact that women do indeed tend to place greater weight on teaching and less on research when compared to men's applications ... The data from our research suggest that the explicit recognition of teaching quality in the work of academic staff, and changes to promotion criteria, have been successful in eliminating research bias in promotions outcomes in many universities, and there is no evidence of gender bias in promotions outcomes. There is, however, evidence that women are less likely to apply for promotion than men — or that men approach their careers more 'aggressively' than women. At UNSW 63 per cent of men have applied for promotion, compared to 53 per cent of women. Moreover, of the staff who do apply for promotion, men do so with greater 'intensity', applying for promotion more often than women. (1995, pp. 57-8)*

The available Victoria University data on promotions and applications are perhaps even more dramatic in reinforcing the conclusion that women tend to be more successful when they apply for promotion. The problem is that women academics do not apply for promotion in proportion to their numbers. Table 2 provides the relevant data. To see the latter point, compare the workforce percentages (column 1) at the next lower level – the ‘promotable’ cohort – with the application percentages (column 3). To see the former point, compare the application percentages (column 3) with the successful-application percentages (column 4). Note also that actual promotion percentages across all levels equates to the percentages of female and male academics (columns 1 and 2, last row).

Sources: VU CURF (2006), VU EOWA Compliance Reports (1996-2005), Golding (1997)

\* VU EOWA Compliance Reports for 1997 and 2000 were incomplete. Golding (1997) has comprehensive data for 1992-6.

|                   | 1   |             | 2  |             | 3   |             | 4   |             |
|-------------------|---|-------------|--|-------------|---|-------------|---|-------------|
|                   | <i>Per cent of FTE &amp; fractional FTE academic workforce by level (average 1992-2005)</i> |             | <i>Per cent of promotions to level (average 1992-2005)</i> |             | <i>Per cent of total applications for promotion to level (average 1992-2004*)</i> |             | <i>Per cent of applications successful, i.e. promoted to level (average 1992-2004*)</i> |             |
|                   | <i>Female</i>   | <i>Male</i> | <i>Female</i>  | <i>Male</i> | <i>Female</i>   | <i>Male</i> | <i>Female</i>   | <i>Male</i> |
| <b>Level A</b>    | <b>53.0</b>   | <b>47.0</b> | n.a.   | n.a.        | n.a.  | n.a.        | n.a.  | n.a.        |
| <b>Level B</b>    | <b>42.0</b>   | <b>58.0</b> | 50.0   | 50.0        | 46.8  | 53.2        | 90.9  | 72.0        |
| <i>Level C</i>    | 30.0  | 70.0        | 36.0   | 64.0        | 28.7  | 71.3        | 64.5  | 57.7        |
| <i>Level D</i>    | 22.0  | 78.0        | 24.0   | 76.0        | 18.1  | 81.9        | 43.5  | 42.3        |
| <i>Level E</i>    | 16.0  | 84.0        | 17.0   | 83.0        | 17.0  | 83.0        | 62.5  | 48.7        |
| <i>All levels</i> | 36.0  | 64.0        | 36.0   | 64.0        | 26.5  | 73.5        | 65.1  | 53.2        |

**Table 2:** Promotions and applications for promotion at Victoria University 1992-2005 (%)

The three final sections of “‘I just couldn’t fit in’: Gender and unequal outcomes in academic careers” (Probert 2005, pp. 64-70) offer an alternative emphasis to explain for unequal outcomes. We use the words ‘alternative emphasis’ rather than ‘alternative explanation’ to recognise that the dominant explanation also generally includes the cause of gender inequity on which Probert concentrates. Where Probert differs is that she excises standard institutional causes such as casualisation, promotion, appointments and workloads (2005, p. 70) and focuses almost exclusively on the work-family relationship. She says bluntly:

*The absence of many women above Level C in the career structure would appear to be linked to the way households organize the division between paid and unpaid work rather than to discrimination against women in the workplace. (2005, p. 65)*

*Hitherto researchers have looked in the wrong places (at least in part). They should ‘rather, to focus more specifically on the impact of the household on men’s and women’s working lives’ (2005, p. 70).*

Here Probert is on firm and familiar ground. She presents convincing quantitative and qualitative data to show, for example, that work-family relationships also explain why a smaller percentage of women than men have PhDs. Simply 62.1 per cent of the women who had children that were part of the UNSW and national studies cited a lack of time as the reason for not having a PhD. This was almost double the percentage of men with children who cited this reason. This in turn reflected the fact that women academics – just like their sisters elsewhere – overwhelmingly were responsible for the care of children. Conversely, while ‘almost all the partners of female academics were in full-time employment (91.7 per cent of national study)’, only ‘57.2 per cent of male academics had partners in full-time employment’. Moreover ‘almost a quarter of female academic staff also have caring responsibilities for aged parents –



22.3 per cent of these academic staff have caring responsibilities for aged parents, compared to 13.8 per cent of men' (2005, p. 63).

*One of the reasons men have greater human capital in terms of experience is related to these childcare issues. Of academic staff with children at UNSW, 88.1 per cent of women report that their caring responsibilities had an effect on their career plans, compared to 51 per cent of men. Interestingly, almost half of these women indicated they had had to cut back their hours of work or stop work, compared to only 18 per cent who said that they had made a personal choice to stay at home. Of the men who reported that caring had an impact on their careers, just over 40 per cent also described this as requiring them to cut back on their work. (2005, p. 67)*

Time constraints associated with women's disproportionate responsibility for care also helped to explain 'gendered patterns of research output ... [W]omen with older children explicitly acknowledged that research was the only thing that could be put off when the combination of teaching, administration, children and research created overload' (2005, p. 68).

Probert is careful to stress that to 'accept the importance of the household as the critical sphere in which mothers' ability to develop their careers is negotiated is not to reject the significance of workplace initiatives and policy (Probert et al., 2000b)'. Paid maternity leave, access to part-time jobs, transparent workload allocations and 'promotions criteria within a "meritocratic" framework appear to have had a significant impact in reducing gender discrimination'. It is just that Probert directs her central argument elsewhere, namely that such 'measures, on their own, are unlikely to ensure any substantial increase in the proportion of women reaching senior academic positions' (2005, p. 70). On that point we can only agree.

## The Data and Experience at Victoria University, Melbourne

In this section we will discuss Probert's (2005) conclusions in terms of the 1992-2005 data from Victoria University in Melbourne. To make this task easier we will introduce a flow (or transition) model for analysing staffing changes in organisations. This will offer insights that literature on gender inequity does not often consider. Our focus will be on the pathway to the professoriate (academics levels D and E) for women. The database we will use is a confidentialised<sup>3</sup> unit record file (CURF) of full-time and fractional full-time university academic staff according to their current duties (level) on 31 March of each of the 14 years from 1992 to 2005.

The flow model is a straightforward accounting model of workforce transitions from 1992 to 2005. In symbols we can represent it as:

$$F_n = F_0 + A + PT - PF - D - CB$$

The symbol  $F_0$  stands for the average of the level totals over the number of chosen years ( $n$ ). This is the average start-of-year figure for the level. To this we add average appointments per year to the level ( $A$ ) and promotions to the level ( $PT$ ). We subtract average promotions from the level ( $PF$ ), departures from the University ( $D$ ) and career breaks ( $CB$ ). The symbol  $F_n$  is the result of the calculation, and it represents the end-of-year average based on trends in appointments, promotions, departures and career breaks.

Note that 'appointments' here means the appointment of a person from outside the university. Promotions means an increase in level, either through the University's merit-based personal promotions policies or through appointment to a position, which may have involved competitive selection open either to existing staff members or to existing staff and external applicants. Note also that we use the term 'net' for promotions to indicate that sometimes falls in level occur (e.g. when staff members have been acting in a higher position). Similarly people will take and return from career breaks over time, and

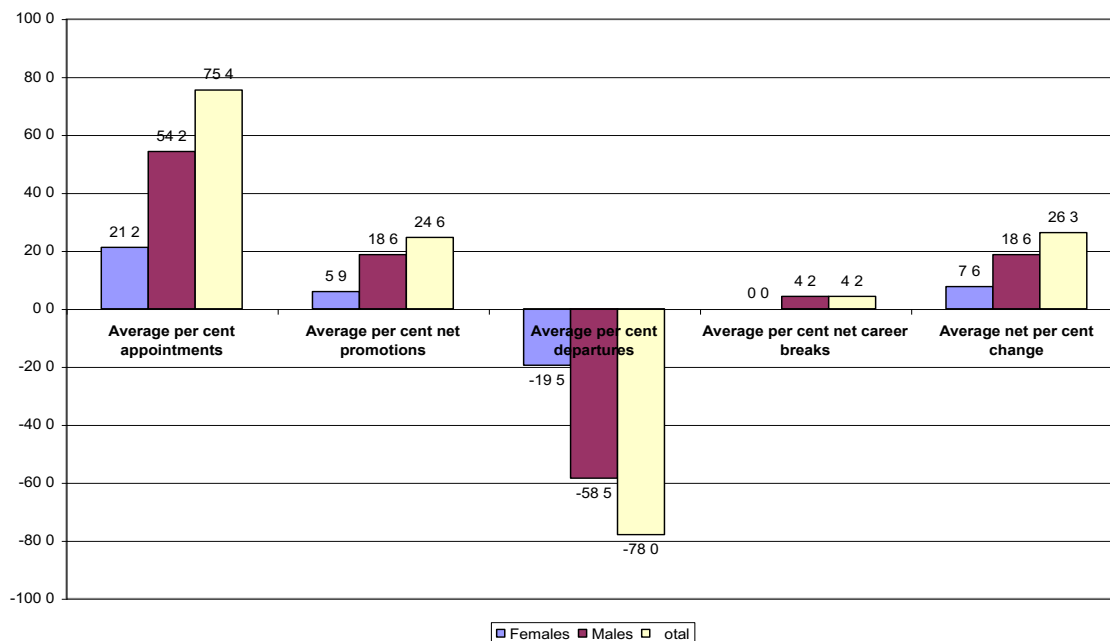
<sup>3</sup> An awful term meaning 'made confidential'. We use it because the Australian Bureau of Statistics uses it for its 'CURF' products.

hence we use the term ‘net’ here as well. Using average data also allow us to smooth annual fluctuations and consider stylised projections.

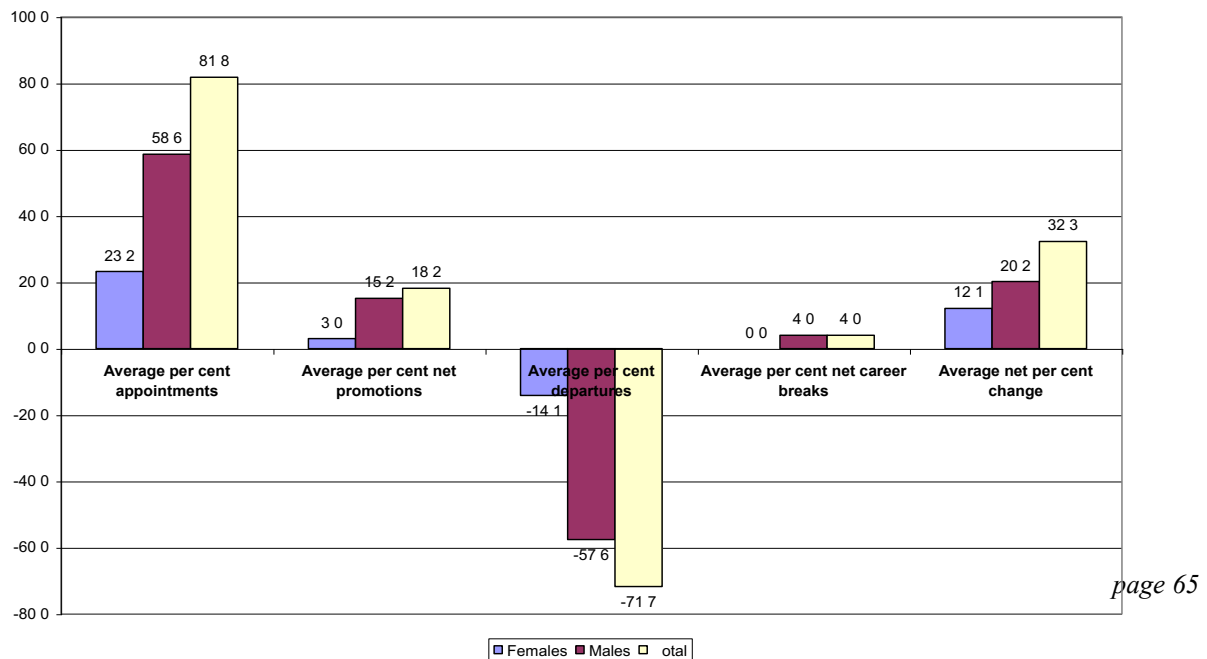
Charts 3 and 4 and table 3 summarise the model as applied at Victoria University, a newer university in Melbourne. Chart 3 is for level E, while chart 4 is for the professoriate as a whole (levels D and E taken together). Table 3 is comprehensive. Following these is chart 5, which summarises the data in terms of percentages of the average increase in numbers of level E women and levels D and E women. For the sake of brevity we will concentrate on the most recent years, namely the 2000 to 2005 average annual workforce transitions.

The university’s senior-level academic workforce has experienced considerable turnover, especially at level E. For level E as a whole turnover now happens every 5.3 years (women 5.1 years). For the professoriate as a whole the time is on average 7.2 years (women 5.7 years). A small role is indicated for career breaks. However, the most important observation from charts 3 and 4 and table 3 is that appointments dominate promotions for the professoriate as a whole, especially at level E. For level D alone promotions are more important, but level D has fewer people than does level E.

Sources: VU CURF (2006)



**Chart 3:** Average per cent of increase in level E (professor) total by gender 2000-5



**Chart 4:** Average per cent of increase in levels D & E (professoriate) total by gender 2000-5

Sources: VU CURF (2006)

|   | Level D |       |       | Level E |       |       | Levels D&E |       |       |
|---|---------|-------|-------|---------|-------|-------|------------|-------|-------|
|   | Females | Males | Total | Females | Males | Total | Females    | Males | Total |
| <i>Averages 2000-2005 per cent of level total</i> |         |       |       |         |       |       |            |       |       |
| <i>Start of year</i>                              | 22.5    | 77.8  | 100.4 | 15.7    | 75.8  | 91.5  | 18.6       | 76.7  | 95.3  |
| <i>Plus (+) appointments</i>                      | 0.7     | 2.1   | 2.8   | 6.1     | 15.4  | 21.5  | 3.8        | 9.7   | 13.4  |
| <i>Plus (+) net promotions to level</i>           | 2.5     | 7.7   | 10.2  | 0.8     | 4.0   | 4.8   | 1.1        | 3.6   | 4.7   |
| <i>Less (-) net promotions from level</i>         | 1.1     | 5.3   | 6.3   | 0.0     | 0.0   | 0.0   | 0.0        | 0.3   | 0.3   |
| <i>Less (-) departures</i>                        | 3.2     | 4.2   | 7.4   | 3.7     | 15.1  | 18.8  | 3.5        | 10.4  | 13.9  |
| <i>Less (-) net career breaks</i>                 | 0.0     | -0.4  | -0.4  | 0.0     | -1.1  | -1.1  | 0.0        | -0.8  | -0.8  |
| <i>End of year</i>                                | 21.5    | 78.5  | 100.0 | 18.9    | 81.1  | 100.0 | 20.0       | 80.0  | 100.0 |

**Table 3:** Average annual workforce transition 1992-2005, 2000-5 per cent of level

Now the reason we have concentrated on *change* above is that it makes us consider a stylised 'mode of entry' to senior academic positions in this university. Mode of entry is the key first-order concept, we believe. Researchers can only fully explain women's under-representation if we first know how universities fill level D and E positions. Table 4 summarises the data by converting the data to percentages of the increase in level E and levels D and E *before* deducting departures and net career breaks. This is because we are focussing on *entry*. Note also that we have created a net promotions row by subtracting promotions 'to' from promotions 'from'.

Sources: VU CURF (2006)

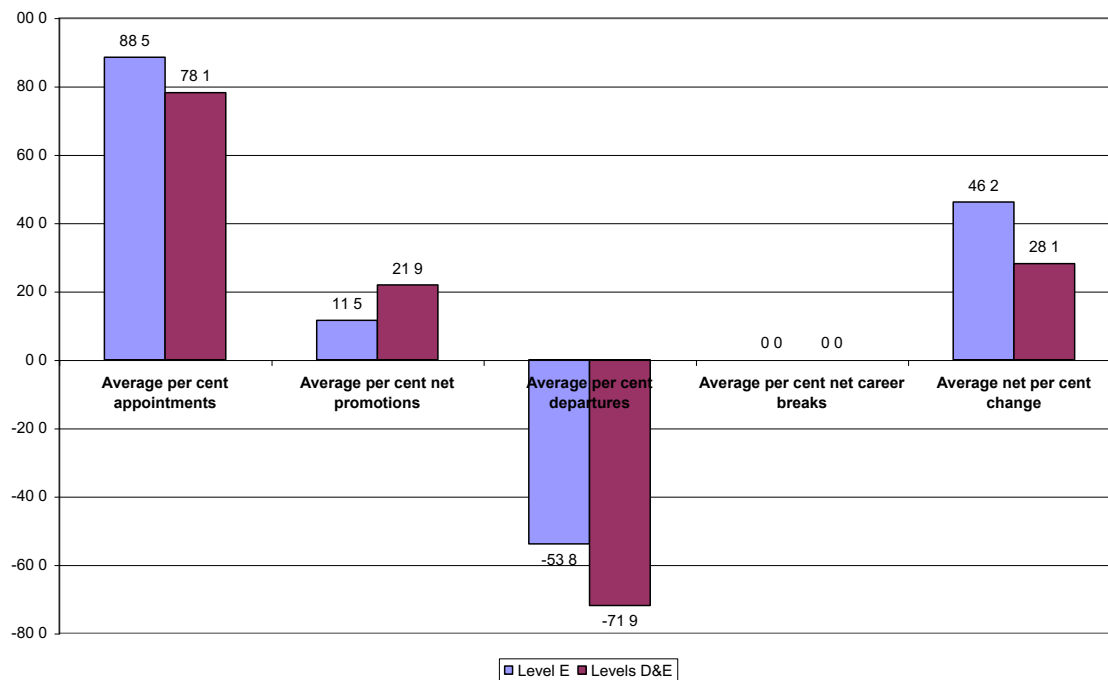
| <i>Per cent of increase in level total</i> | <i>Level E</i> |              |              | <i>Levels D&amp;E</i> |              |              |
|--|----------------|--------------|--------------|-----------------------|--------------|--------------|
|  | <i>Females</i> | <i>Males</i> | <i>Total</i> | <i>Females</i>        | <i>Males</i> | <i>Total</i> |
| <i>Average per cent appointments</i>       | 23.2           | 58.6         | 81.8         | 21.2                  | 54.2         | 75.4         |
| <i>Average per cent net promotions</i>     | 3.0            | 15.2         | 18.2         | 5.9                   | 18.6         | 24.6         |
| <i>Increase</i>                            | 26.3           | 73.7         | 100.0        | 27.1                  | 72.9         | 100.0        |
| <i>Average per cent departures</i>         | -14.1          | -57.6        | -71.7        | -19.5                 | -58.5        | -78.0        |
| <i>Average per cent net career breaks</i>  | 0.0            | 4.0          | 4.0          | 0.0                   | 4.2          | 4.2          |
| <i>Average net per cent change</i>         | 12.1           | 20.2         | 32.3         | 7.6                   | 18.6         | 26.3         |

**Table 4:** Average per cent of increase in level total by gender 2000-5

The message conveyed to staff at this university by these summary tables and charts is not positive. The message conveyed to female staff aspiring to become academic leaders by progressing to the professoriate is *prima facie* disheartening. The narrative goes something like this for all staff members. The mode of entry into level E (i.e. becoming a professor) is overwhelmingly by appointment from outside the university. The 2000-5 average percentage split between external appointment and promotion is about 82:18. Prospects of promotion to the professoriate as a whole (i.e. levels D and E together) are better because external appointment to level D is less favoured. Nonetheless, for 2000-5, the split between external appointment and promotion is about 75:25 per cent for the professoriate overall.

The scenario is even bleaker for the University's women who might aspire to academic leadership. On average between 2000 and 2005 only 3 per cent of professors were women who entered by promotion, while 23.2 did so by appointment from outside the University. For levels D and E together the respective percentages were 5.9 per cent for promotions versus 21.2 per cent for appointments. Though the proportions of women at level E (26.3 per cent) and in the professoriate as a whole (27.1 per cent) increased, they did so by the University privileging external appointment over promotion.

Chart 5 demonstrates this starkly. On average for the years 2000-5 the percentage split between appointments and promotions of women to level E was about 89:11. For the professoriate as a whole (levels D and E) the average split over these years was about 78:22. The corresponding splits for men were about 80:20 for level E and 74:26 for the professoriate as a whole. The prospects for men within the University, too, are inauspicious, but they are a little less inauspicious than the prospects facing aspiring women academics. Alas there is not an especially productive internal promotions pipeline on which to focus. Rather we need to explain the dynamics of external appointment.



Source: VU CURF (2006)

**Chart 5:** Average per cent of increase in levels E (professor) and D& E (professoriate) female total 2000-5

On this question of focus – i.e. where researchers should be looking – we depart from Probert. We do not think that ‘lack of representation of women at levels D and E (the professoriate) cannot be ... directly discriminatory practices in appointments, promotions or workloads’ (2005, p. 70). Yes, we must also focus ‘on the impact of the household on men’s and women’s working lives’ (ibid.). Yes, our data confirm that promotions do correspond to gender-proportions in applications or, indeed, are relatively better for women, who tend to hold back until they are more confident of being successful. Yes, there is no evidence of gender discrimination in workload allocation<sup>4</sup>. Our disagreement is about the mode of entry via external appointment.

First, Probert’s article does not pay sufficient attention to external appointment. She focuses more on promotion and starting level in academia. The latter is a different issue to external appointment to the professoriate. Secondly, the differences in ‘human capital’ suggested by male academics’ higher level of PhD attainment is not as relevant to appointment to the professoriate. Possession of a PhD surely influences starting levels in general, but at professorial level there are vastly more men and women with PhDs than there are positions. Of course, it is possible that newer universities will rely more on external appointment to the professoriate, and we offer this caveat. We note, however, that Probert’s conclusions are general and should therefore be able to apply at newer universities (of which there are many).

Secondly, we are not confident that discrimination does not operate at the level of appointment to the professoriate. Note that appointment is not like promotion because it does not assess individual merit as such. It seeks the ‘best person for the job’ or some similar outcome. Proportions of male and female applicants are not as relevant a consideration as they are with promotions. In fact they are relevant in promotions because we would expect equal merit among men and women in the applicant pool (with due regard for women’s ‘confidence’, as we noted above). The problem for women arises in competitive selection when the final step occurs: nominating the ‘best person for the job’. Doubtless selection panels observe procedural fairness and sex-discrimination requirements. However, these *prima facie* protections rarely control (i.e. compensate) for women’s unequal histories and the subtleties of power.

<sup>4</sup> This is not to say that factors such as access to ‘research active’ status and an emphasis on teaching do not affect women’s workloads negatively. It is just to say that managements do not apply given workloads models in a directly discriminatory fashion.

They become insensitive to gender inequality and discrimination in the social distribution of the responsibility for care precisely when sensitivity is most needed.

## Conclusion

We will conclude by offering our thoughts on why an emphasis on external appointment to the professoriate works against women academics and external women applicants for professorial positions. Our reasoning will combine the structural problem of external selection with 'the impact of the household on men's and women's working lives' (Probert 2005, p. 70).

While many women are capable of functioning in the professoriate – and desire to take on this academic leadership role – they confront the barrier selection: choosing the 'best person for the job'. Right at the time that panels make the crucial selection decision men's 'EO' activates: that is, the tyranny of *experience* and *occupancy*. Men tend to have this form of 'human capital' by virtue of incumbency, and incumbency is hard to shift. It is hard to shift for the underlying reason that women also are disproportionately constrained by the care responsibilities that most men do not have. The absence of equal responsibility for care allows men to accumulate experience through occupancy of jobs. It allows men to rise in levels and increments and to achieve higher rates of pay. For couple families, this reinforces men's role as primary breadwinner. Men thus accumulate more experience: experience nourished by occupancy.

Consequently a self-reinforcing causal mechanism operates. It offers a holistic explanation. Male numerical dominance through occupancy creates an academic culture and norms of experience in which masculine competitiveness and long hours of work can survive. These norms of academic experience do not favour women, especially women who have care responsibilities. The culture survives because men tend to be freed from most of the responsibility for care. The corollary of this is that many women pull back ('I just couldn't fit in') and become less forthright in pursuing their ambitions. That is, women's preferences adapt to the unfavourable circumstances in which they find themselves (Leahy & Doughney 2006a, 2006b; Doughney & Leahy 2005; Doughney 2007). This in turn reinforces the cycle of disadvantage.

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