

**THE DETERMINANTS OF END-USER
SATISFACTION WITH HRMIS AND ITS
INFLUENCE ON INDIVIDUAL PERFORMANCE
IN GOVERNMENT AGENCIES IN MALAYSIA**

by

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LIST OF ABBREVIATIONS

CFA	Confirmatory Factor Analysis
CMV	Common Method Variance
COG	Cognitive Model
CRM	Customer Relationship Management
CSFs	Critical Success Factors
DOI	Diffusion of Innovation
ECM	Expectation Confirmation Model
ECT	Expectation-Confirmation Theory
EFA	Exploratory Factor Analysis
EG	Electronic Government
e-GP	Electronic Government Procurement
EHRM	Electronic Human Resource Management
ELX	Electronic Labour Exchange
e-procurement	Electronic Procurement
ERP	Enterprise Resource Planning
e-services	Electronic Services
ESK	Embodied Service Knowledge
ESQ	Employee Service Quality
e-Syariah	Electronic Syariah
EUCS	End-User Computing Satisfaction
EUISS	End-User Information System Satisfaction
EUS	End-User Satisfaction
G2B	Government to Business
G2C	Government to Citizens

G2E	Government to Employees
G2G	Government to Government
GOE	Generic Office Environment
HR	Human Resource
HRIS	Human Resource Information Systems
HRM	Human Resource Management
HRMIS	Human Resource Management Information Systems
HRMIS2	Human Resource Management Information Systems 2
HRMS	Human Resource Management System
ICTs	Information and Communication Technologies
IS	Information Systems
IT	Information Technology
MAMPU	Malaysia Administrative Modernization and Management Planning Unit
MSC	Multimedia Super Corridor
PACS	Picture Archiving and Communication Systems
P-E	Person-Environment
PLS	Partial Least Squared
PMS	Project Monitoring System
PSD	Public Service Department
P-T	Person-Technology
R&D	Research and Development
SILA	Training Information System
SMPC	Sub module of Leave Management
SMPT	Sub module of Claim Management
SSO	Shared Services Outfit

TAM	Technology Acceptance Model
TCT	Technology Continuance Theory
UPM	Universiti Putra Malaysia

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**PENENTU KEPUASAN PENGGUNA AKHIR TERHADAP HRMIS DAN
PENGARUH TERHADAP PRESTASI INDIVIDU DI AGENSI KERAJAAN
MALAYSIA**

ABSTRAK

Penyelidikan tentang pengurusan sumber manusia elektronik (PSME) telah memberikan banyak perhatian kepada pengaruh sifat-sifat sistem atau ciri-ciri teknologi terhadap kejayaan pelaksanaan. Disamping itu juga, faktor-faktor lain seperti faktor kontekstual dan perbezaan pengguna telah banyak diberikan perhatian meluas dalam sorotan susastera sistem maklumat. Bagaimanapun, kajian tentang pengaruh psikologi seperti stres terhadap teknologi (teknostres) di agensi kerajaan Malaysia hampir tidak wujud. Oleh itu, kajian ini menilai hubungan langsung antara teknostres, faktor-faktor sokongan organisasi berkaitan sistem maklumat, iaitu sokongan literasi, sokongan teknikal, kemudahan penglibatan teknologi, dan sokongan inovasi, dan kepuasan pengguna akhir terhadap PSME di agensi kerajaan Malaysia. Pelaksanaan PSME di agensi kerajaan Malaysia dikenali sebagai *HRMIS*. Kajian ini juga memfokuskan tentang dua penyebab utama teknostres, iaitu ciri-ciri teknologi dan ciri-ciri pengguna, yang boleh mempengaruhi tahap teknostres terhadap *HRMIS*. Kajian ini seterusnya menyelidik kesan penyederhana efikasi sendiri teknologi dan umur terhadap hubungan antara teknostres, sokongan organisasi berkaitan sistem maklumat, dan kepuasan pengguna akhir. Tesis ini juga menilai kesan kepuasan pengguna akhir terhadap prestasi individu pengguna akhir *HRMIS*. Pada mulanya, temu duga awal telah dijalankan dengan tujuh pakar *HRMIS* di kerajaan negeri Perlis, Kedah, dan Pulau Pinang untuk mengenal pasti anteseden teknostres. Kemudian, sejumlah 990 soal selidik telah diposkan atau dihantar kepada

wakil organisasi yang bersetuju untuk terlibat dalam kajian ini. Dari 990, hanya 623 soal selidik telah dikembalikan. Bagaimanapun, hanya 490 yang digunakan untuk analisis selanjutnya dengan kadar maklum balas sebanyak 49.5%. Seterusnya, *Partial Least Square (PLS)* berasaskan pendekatan *Structural Equation Modeling (SEM)* telah digunakan untuk menganalisis data. Dapatan kajian menunjukkan capaian, kadar perubahan, dan sikap mempunyai hubungan yang signifikan dengan teknostres. Teknostres juga didapati mempunyai hubungan negatif dan signifikan dengan kepuasan pengguna akhir. Bagaimanapun, hanya tiga faktor sokongan organisasi berkaitan sistem maklumat (sokongan literasi, sokongan teknikal, dan kemudahan penglibatan teknologi) mempunyai hubungan signifikan dengan kepuasan pengguna akhir. Dapatan kajian juga menunjukkan kesan penyederhanaan efikasi sendiri teknologi terhadap hubungan antara teknostres dan kepuasan pengguna akhir. Kajian ini akan memberi manfaat kepada pengamal dengan memberikan cadangan bagi pelaksanaan *HRMIS* di agensi kerajaan Malaysia. Secara khususnya, pengurus dapat membangun dan merekabentuk program latihan bagi membantu pengguna akhir dengan aplikasi *HRMIS* yang efektif. Juga, pengurus disarankan melatih pengguna akhir tentang bagaimana untuk mengurus masa mereka sebagai satu strategi untuk menangani keadaan teknostres. Berkenaan sokongan organisasi, pemantauan secara berterusan terhadap dasar dan piawai, dokumentasi, dan penglibatan pengguna akhir ialah kumpulan sokongan penting yang perlu disediakan oleh pasukan *HRMIS* untuk menimbulkan persepsi yang menyenangkan terhadap *HRMIS*. Akhir sekali, implikasi dapatan kajian terhadap teori, limitasi kajian, dan cadangan bagi kajian susulan juga dibincangkan.

**THE DETERMINANTS OF END-USER SATISFACTION WITH HRMIS
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ABSTRACT

Research on electronic human resource management (EHRM) has given much attention to the influence of system features or technology characteristics on the implementation success. Other factors, such as contextual and user differences, have also been extensively highlighted in the information system (IS) literature. However, research on the psychological influence, such as stress, on technology (technostress) in Malaysian government agencies is almost non-existent. Therefore, this study examines the direct relationship between technostress, organizational IS-related support factors, namely, literacy support, technical support, technology involvement facilitation, and innovation support, and end-user satisfaction with EHRM in the Malaysian government agencies. The implementation of EHRM in the government agencies of Malaysia is known as human resource management information system (HRMIS). This study also focuses on two key antecedents of technostress, which are technology characteristics and user characteristics postulated to influence the level of technostress in HRMIS. This study further investigates the moderating effect of technology self-efficacy and age on the relationship between technostress, organizational IS-related support, and end-user satisfaction. The thesis also examines the effect of end-user satisfaction on the individual performance of HRMIS end-users. A preliminary interview was conducted among seven HRMIS experts from Perlis, Kedah, and Penang state governments to identify the antecedents of technostress. Then, a total of 990 questionnaires were either mailed or dropped off

to the representatives of the organizations that had agreed to participate in this study. Of 990, only 623 questionnaires were returned. However, only 490 were usable for further data analysis, representing a response rate of 49.5%. The Partial Least Square (PLS) based Structural Equation Modeling (SEM) approach was used to analyze the data. The results showed that accessibility, pace of change, and attitude were significantly related to technostress. Technostress was also found to be negatively and significantly related to end-user satisfaction. However, three factors of organizational IS-related support (literacy support, technical support, and technology facilitation involvement) were significantly related to end-user satisfaction. The results also revealed the moderating effect of technology self-efficacy on the relationship between technostress and end-user satisfaction. This study will benefit human resource practitioners by providing suggestions in implementing HRMIS in government agencies in Malaysia. Specifically, managers can develop and design a training program to help end-users with effective application of HRMIS. Also, managers are recommended to train end-users how to manage their time as a strategy to deal with technostress conditions. On organizational supports, continuous monitoring of HRMIS policies and standards, documentation, and end-user involvement are important sets of support that need to be provided by HRMIS management team to create favorable perceptions towards HRMIS. Finally, the theoretical implications, limitations of the study and directions for future research are also discussed.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The use of information technology (IT) has permeated rapidly in public and private organizations throughout the world (Buntin, Burke, Hoaglin, & Blumenthal, 2011; Gardner, Lepak, & Bartol, 2003; Melville, Kraemer, & Gurbaxani, 2004; Mithas, Tafti, Bardhan, & Goh, 2012; Mithas, Ramasubbu, & Sambamurthy, 2011; Staples & Seddon, 2004). The increasing use of IT in these organizations stems from the belief that it is related to revenue growth, profitability, firm performance (Mithas et al., 2012; Mithas et al., 2011), competitive advantage, cost reductions, customer services (Rawstorne, 2005), and increased productivity (Jain & Kanungo, 2005). As a result, many organizations are investing more than 4.2% of organization's income to develop information system (IS) applications so that their business operations, strategies and tactics can be implemented effectively (Weill, Subramani, & Broadbent, 2002). In human resource management (HRM), it was reported that companies could save up to 75% in human resource operations, and the costs related to them can be recouped within two years (Bell, Lee, & Yeung, 2006). It was also indicated that companies can enhance their overall business productivity and efficiency due to the technology and provide better and faster people services to their workers (Bell et al., 2006).

In Malaysia, the government has been actively investing in IS. As part of its electronic government (EG) projects, the human resource management information system (HRMIS) is introduced. The HRMIS is implemented to provide public sector employees with an integrated system for human resource information management.

According to the then Director of Public Service Department of Malaysia, Tan Sri Dato' Samsudin Osman, HRMIS in the public sector enables human resource management to be managed more systematically as the system encompasses both the operation and the management functions. The system is meant for human resource planning, organizational development, service schemes, retirement and retirement benefits, service matters, career development, and employee relationship management in public sector organizations. All documents on HRMIS, such as corporate information, implementation policies, standard operation of procedures, and customer services can be accessed from the government website at <http://www.eghrmis.gov.my/>. In short, the implementation of the HRMIS project runs in concert with the government's aspiration of using the ICT to change the processes and management of public sector employees in the country so that the vision of transforming Malaysian to become a knowledge-based society and knowledge-based economy materializes (Eia, 2004, p. 6).

1.1.1 Electronic Government (EG)

Governments across the world realize the need to improve the quality of services they offer to citizens and businesses (Bhuiyan, 2011). The implementation of an electronic government (EG) can be seen as a platform for that purpose. In fact, in today's environment, an EG is widely accepted as a tool to modernize and improve the government functions (Foley & Alfonso, 2009).

There are many definitions of EG offered by different authors and scholars from different perspectives. For instance, Gartner (2000, as cited in Fang, 2002) explained that EG allows internal and external relationships, such as service delivery, community involvement, and governance to be transformed as a result of the

integration of technology, the Internet, and new media. Gartner added that through the most innovative ICT technologies, particularly, web-based Internet applications, EG has enabled governments around the world to offer better access to information and services to the people and business sectors, enhance the quality of the services, and grant more opportunities to the public to take part in democratic institutions and processes. In the same vein, World Bank (as cited by Oteniya, Janowski, & Ojo, 2007) refers EG as the use of information technologies by government organizations for the purpose of transforming relations between them and the citizens, businesses, and other government agencies.

As stated by Accenture (2005), many countries in the world, such as Germany, Norway, United States, Canada, and the United Kingdom, have started to launch multi-year programs by using web technology to create more efficient, effective, and citizen-centered governments. The Kingdom of Saudi Arabia, as the biggest country in the Middle East, has also initiated the transition process to EG (Alshehri, Drew, & Alfarraj, 2012). Alshehri et al. found that most of the Saudi government ministries have their own websites. E-government also appears to be installed in many parts of the world, such as in Yemen (Ali & Zhao, 2012), Egypt (Gebba & Zakaria, 2012), Pakistan (Rehman, Esichaikul, & Kamal, 2012), Spain (Pérez-Castillo, Guzmán, Piattini, & Places, 2012), Malaysia (Wan Mohd Saman & Haider, 2012), Indonesia (Rokhman, 2011), Romania, and South Korea (Porumbescu, Vrabie, & Ahn, 2012). A survey conducted by the United Nations in 2008 reported that EG is growing as 189 countries were online in 2008 compared to 179 in 2005 (Mishra & Mishra, 2011). The survey also stated that in 1995, there were only 142 government websites as compared to 2,617 in 1998. By 2010, more

than 30,000 government-managed websites were installed either in developed or developing countries (Halpern, Rozaidi, & Ki, 2012).

As EG is actively being implemented throughout the world, researchers are keen to investigate issues related to it. Previous studies have looked at such issues as the advantages, opportunities, obstacles, challenges, and success factors (Alshehri et al., 2012; Bhuiyan, 2011; Ebrahim & Irani, 2005; Gebba & Zakaria, 2012; Helbig, Gil-García, & Ferro, 2005; Ndou, 2004), assessment and solutions (Ali & Zhao, 2012), benefits (Bertot, Jaeger, & McClure, 2008; Gorla, 2009), and adoption of EG (Porumbescu et al., 2012). With regards to the advantages, EG is said to reduce costs, increase revenues, increase productivity, enhance decentralization, improve decision making (Gil-Garcia & Helbig, 2006), and provide technology-enabled user services (Bertot et al., 2008). Ndou (2004, p. 8) listed seven advantages: (1) cost reduction and efficiency gains, (2) quality of service delivery to businesses and customers, (3) transparency, anticorruption, and accountability, (4) increased capacity of government, (5) network and community creation, (6) improvement in the quality of decision-making, and (7) promotion of the use of ICT in other sectors of the society. Gorla (2009) reported the economic benefits and social benefits from the implementation of EG in 15 rural projects in India. The economic benefits include employment of rural youth, better prices for farmers' products, and reduction in loss. Acquisition of farmers' knowledge, improved health, education, finance, and insurance are some of the social benefits associated with the EG implementation. In a similar vein, Rokhman (2011) categorized the advantages of EG into three groups: (1) transforming services - government services will be more convenient, more responsive, more accessible, and more cost effective, and people with disabilities can access the services easily and citizens will get a quick and good response to their

queries, (2) renewing local democracy - councils will be more accountable, more open, more inclusive, and able to lead the communities, while EG provides a platform for debates among citizen, engagement with their local services and councils, and assessment of their political representative, and (3) promoting local economy vitality - employability of citizens will increase by having a modern communication infrastructure, a skilled workforce, and an active promotion of electronic business.

However, many barriers and challenges follow the implementation and adoption of EG. Alshehri et al. (2012) identified some them from their survey conducted on 460 Saudi citizens including information technology (IT) employees in various public sectors. The barriers to implementing EG were related to the technological infrastructure, users' inability and lack of knowledge in using the computer and technology, security and privacy issues, lack of users' trust and confidence, among others. Of the barriers, deficiency of technical support from the government website's support team is identified as the most important barrier to EG implementation. They concluded that organizations must provide a professional team to handle all issues and problems faced by the public and employees. Furthermore, high-quality technical support must be placed to provide efficient and effective services. Gebba and Zakaria (2012) analyzed and summarized the challenges faced by Arab countries in the EG development and implementation. One of the challenges is the lack of awareness of e-government services on the part of the citizens and public organizations' employees.

The United States General Accounting Office (2001, as cited by Mishra & Mishra, 2011) also highlights the challenges in implementing EG, particularly in terms of commitment of executive leadership, e-government business cases, citizen

focus, personal privacy, security controls, electronic records, technical infrastructure, human capital, and service to the public. Ebrahim and Irani (2005) summarized the barriers of EG in the United Kingdom into five main factors: IT infrastructure, security and privacy, IT skills, organizational, and operational costs. They concluded that adequate resources, support from the management, sufficient infrastructure, capable IT staff, and effective IT training and support are necessary for successful EG implementation. The challenges and barriers to EG implementation are also raised elsewhere (e.g., Bhuiyan, 2011; Weerakkody, Baire, & Choudrie, 2006).

In addition to discussing the challenges and barriers, researchers also focused on the success factors of EG implementation (e.g., Chen & Chen, 2009; Hossan, Habib, & Kuschu, 2006; Vaidya, Sajeew, & Callender, 2006). Vaidya et al. (2006) conducted a literature survey and categorized the critical success factors (CSFs) of EG implementation into two groups: human and technology factors. Human factors consist of supplier adoption, business case and project management, end-user acceptance and training, and support from top management. On the other hand, technology factors consist of authentication, and system integration and security. Hossan et al. (2006) found that the overall vision and strategy, internal political desire, strong change management, the dominance of politics/self-interest, effective project management, adequate technological infrastructure, and competencies among the officials involved were deemed to be success factors. Chen and Chen (2009) in China revealed that internal organization and management, external technical environment, coordination and supportive ability of information center, and quality of the product were related to EG success.

In 1996, the Malaysian government launched the Multimedia Super Corridor (MSC) towards achieving *Wawasan 2020*. Seven flagship application projects were

introduced to stimulate the development of information and communication technology (ICT) in Malaysia. One of the projects is EG. This project is closely monitored by the Malaysia Administrative Modernization and Management Planning Unit (MAMPU) of the Prime Minister's Department (Bakar, 2008). Other projects are a multi-purpose card, telehealth, smart school, R&D cluster, e-business, and technopreneur development, e-government IT standards, and Shared Services Outfit (SSO). These projects are meant to enhance national competitiveness, export growth and value of jobs, reduce the digital divide and accelerate the MSC growth as the regional hub and test bed (Ahmad & Mohsin, 2006). In line with the EG implementation, policies and regulations have been enacted to support the projects. Among them are the Digital Signature Act 1997, Computer Crimes Act 1997, Telemedicine Act 1997, Communications and Multimedia Act 1998, Copyright Amendment Act 1997, and Personal Data Protection 2004 (Zulhuda, 2012)

The implementation of EG in Malaysia aims to improve the operations of internal government regarding widespread service delivery to the people efficiently and effectively (Maniam, Awang, & Murali, 2009). Also, it is expected to improve the facility, accessibility, and interaction quality between the public and businesses, and enhance the information and process flow in the government sectors so that the development, coordination, and enforcement of the national policies run smoothly (Reddick, 2004).

Seven pilot projects were launched along with the declaration of the EG policy, primarily the Multimedia Super Corridor (MSC) applications. They are Electronic Services (e-Services), Electronic Procurement (e-Procurement), Generic Office Environment (GOE), Human Resource Management Information System (HRMIS), Project Monitoring System (PMS), Electronic Labour Exchange (ELX),

and Electronic Syariah (e-Syariah). Also, there are a few online services (for example, e-Tanah, e-Consent, e-Filing, and Training Information System [SILA]) developed by the relevant agencies to enhance the quality of public service delivery. Some of the projects are currently in progress.

At the initial stage, all projects were implemented in selected government organizations, known as the lead implementing agencies. These initial projects are delineated below:

i. e-procurement

Initially, e-procurement was implemented at the Treasury Department (Procurement Unit, Ministry of Finance). The aim of this project is to re-engineer, automate, and transform the current procurement system. Under this project, *e-perolehan* was introduced to perform procurement exercises online. It can be accessed at www.eperolehan.com.my. The implementation of *e-perolehan* is beneficial to suppliers and the government. For example, the project enables suppliers to advertise and sell their goods and services to the government through the Internet. Advertisements include the price, process orders and deliveries. In this project, payment is done through the Internet. For suppliers, increased transparency and faster and accurate services are some of the benefits gained from the system, particularly with regard to payment through electronic fund transfers (Karim & Khalid, 2003). For the government, the system reduces cost as the procurement services are now shortened and centralized. In sum, as the whole procurement system starting from the submission of a tender/contract to tender approval and payment is open, the transparency and accountability are enhanced with the implementation of the e-procurement system.

ii. e-services

The main purpose of e-services is to provide one-stop service window where multiple electronic delivery channels can easily be accessed by public at each of the delivery channel (Siddiquee, 2005). E-services were initially implemented at the Road Transport Department of Malaysia. The project allows citizens to get information about traffic summons, driver's license, and utility payments, such as telephone and electricity bills. Information is available on *Rilek* services, which can be accessed through kiosk machines or at www.rilek.com.my. They can also make payment to the Road Transport Department or the police by credit card. This means that the public do not need to do their transactions at agency branches and utility offices because they can now have access to many delivery channels around the clock (Karim & Khalid, 2003).

iii. e-syariah

E-syariah was implemented to enhance the quality of services of Syariah courts. Through e-syariah, judges can access past cases faster than before. Moreover, it enables the public to get information regarding the Syariah legal system and courses. The public can also access archived cases. E-syariah consists of Syariah Court Case Management System, Office Automation Systems, E-Syariah Portal, Syarie Lawyers Registration Systems, and Library Management Systems (Masrek, 2009, p. 13). Initially e-syariah was implemented at the Islamic Justice Department at the Prime Minister's Office. Now, e-syariah is implemented at all syariah courts in Malaysia (Masrek, 2009).

iv. Human Resource Management Information System (HRMIS)

HRMIS was initially implemented at the Public Service Department (PSD) of Malaysia. The project allows public sector employees to accomplish their daily human resource functions effectively and efficiently in an integrated environment with the use of the IS applications. All states, statutory bodies, and local authority can refer to the standardized human resource processes to get the relevant services. As mentioned by PSD (2010), HRMIS has 15 core modules to cover the entire process of public sector human resource management as mentioned in Table 1.2. The core modules are personal record management, competency assessment, career management, performance management, resourcing, strategy formulation and review, development, employee communications and behavioral management, remuneration, benefit and rewards, establishment data, separation, knowledge base, web publishing, government directory, and executive information system. By using HRMIS, government employees can apply certain activities through online services such as online leave application, online performance appraisal, and online training application.

v. Generic Office Environment (GOE)

GOE was anchored by the Prime Minister's Office. The initiative allows government agencies to collaborate more effectively with each other through better communication and interaction and sharing of information.

vi. Project Monitoring System (PMS)

PMS project was also anchored by the Prime Minister's Office. At the early stage, it was implemented at the Implementation Coordination Unit at the Prime

Minister's Office. The initiative is useful in checking the progress of the implementation of development projects, integrating operational and managerial functions and knowledge repository throughout various government agencies and statutory bodies. GOE also enables government employees to exchange ideas in information management and communication services.

vii. Electronic Labour Exchange (ELX)

ELX was mainly implemented to enhance the mobilization of human resources. The project supports the process of matching between job seekers and job vacancies. In addition, government agencies, business sector, and citizens can access labor market information from this system. Through ELX, job seekers and employers will communicate on the same platform. ELX is implemented by the Ministry of Human Resources.

In Malaysia, the implementation of EG has garnered much research interest (e.g., Abdul Talib & Sulaiman, 2005; Maniam, Murali & Magiswary, 2009; Lean, Zailani, Ramayah, & Fernando, 2009; Salamat, Hassan, & Muhammad, 2011; Wan Mohd Isa, Suhami, Safie, & Semsudin, 2011). Various issues have been examined, such as the overall success of EG (Omar, Mohamad, Yusof, Desa, & Sahib, 2006), e-procurement (Aman & Kasimin, 2007), work performance of employees of electronic government agencies (Salmiah, 2004), and usability and accessibility of the EG website (Abdul Latif & Masrek, 2010; Wan Mohd Isa et al., 2011).

Talip and Narayan (2012) proposed a framework for EG implementation in Malaysia. They underlined four elements to improve EG initiatives: collaboration, cultural diversity, information and technology, and control. Wan Mohd Saman and Haider (2012) conducted a study on e-syariah and revealed that records management

was the crucial factor in the judicial system. Good records management and transparent information system can reduce the misuse of power or corruption, postponement of cases, and delayed decision. In a different study, Abdul Talib and Sulaiman (2005) evaluated the federal government websites in Malaysia and found problems with online payment service, languages, chat room, quick response, and design. Maniam et al. (2009) identified budgetary framework, collaboration and integration among agency, country' competitiveness, digital divide, grassroots level service, legislative and regulatory barriers, lag in technological change, standardization and consistency, service delivery system, various customer community expectation, and work culture as the barriers and challenges of the EG implementation in Malaysia.

Among the EG projects in Malaysia, the implementation of HRMIS or EHRM is considered an important IS application for users in the public sector. Studying the impact of HRMIS, in particular, may be beneficial in improving the effectiveness of HRMIS. What is more important, investigating the users' satisfaction with HRMIS is crucial as the system is deemed to be the main tool for improving the performance of the public sector delivery system. Furthermore, continual improvement of the HRMIS is a key to ensure that the application remains relevant in the public sector human resource management and impactful on the nation development.

1.1.2 Electronic Human Resource Management (EHRM)

The application of technology in human resource functions is known as electronic human resource management (EHRM). EHRM has been widely used since the 1990s when electronic commerce started dominating the business world (Alwis,

2010). EHRM is often used interchangeably with human resource information system (HRIS), human resource management system (HRMS), and virtual human resource. A review of the literature shows various definitions of EHRM. For example, Voermans and Veldhoven (2007) defined EHRM as a system that provides administrative support for human resource activities and processes in organizations by using the Internet. Rue et al. (2004) noted that the full use of web technology-based channels and technology could be used to implement HRM strategies, policies, and practices in organizations. EHRM is also referred to as an application of IT for both networking and supporting, at least, two by individual or collective actors in their shared performing of HRM activities (Strohmeier, 2007). Bondarouk and Ruel (2009) noted that there is no consensus reached on the definition of EHRM due to the rapid evolution of EHRM. However, they offered a new EHRM definition that strikes a chord with many scholars, To them, EHRM can be considered “an umbrella term covering all possible integration mechanisms and contents between HRM and technologies aiming at creating value within and across organizations for targeted employees and management” (p. 507). The present study uses the definition provided by Bondarouk and Ruel (2009) as it links the HRM, technology, employees, and management as a whole.

The implementation of EHRM in organizations is to ensure the smooth operation of HRM practices, strategies, and policies. Many studies have shown the benefits of EHRM to HR functions, employees, and organizations as a whole. For example, Noe, Hollenbeck, Gerhart, and Wright (2008, p. 47) highlighted that the following benefits of the implementation of EHRM:

- The development of virtual teams with members who are geographically dispersed to work together using video, e-mail, and the Internet.

- Online posting of job openings.
- Online learning for employees anywhere, anytime.
- Online simulations, including tests, videos, and e-mail that can measure job candidates' ability to deal with the real-life business challenge.
- Salary review and bonus information and information about benefits plan.

Shilpa and Gopal (2011) emphasized that EHRM facilitates better management of activities that could help the organization to develop its competitive edge, especially in the activities of thinking, idea generation, and customer service delivery. They also argued that EHRM can eliminate unnecessary processes, offer correct and timely HR information, and automate the time-consuming and error-prone HR paper trail. In the views of Hussain et al. (2007) and Martinsons (1994), EHRM enables human resource (HR) specialists and HR managers to better manage the complexity of managing human resources, support the decision makers by providing fast quality information, facilitate participation in internal consultancy activities, and facilitate the adaptability of organizations to the environmental changes. Furthermore, EHRM allows organizations to enhance their HRM strategic paradigm, decrease costs and increase efficiency, enhance services to their clients, and facilitate management and employees (Alwis, 2010; Lepak & Snell, 1998; Ruel et al., 2007; Stone & Dulebohn, 2013). Kashive (2011) summarized the benefits of EHRM, indicated by various researchers as shown in Table 1.1.

Table 1.1 Benefits of HRIS

Authors	Benefits
Kovach, Cathcart, and Charles (1999)	Reduce time spent on the administrative process.
Kovach et al. (1999)	Provide decision support applications that help HR and non-HR managers, as well as employees, make better decisions.
Targowski and Deshpande (2001)	Positively affect traditional HR processes such as recruitment, selection and training and development.
Enshur, Nielson, and Grant-Vallone (2002)	Used for different purposes within particular HR functions – recruitment and selection, performance evaluation, compensation and benefits, training and development, health and safety, employee relations and legal issues, retention and work-life balance.
Kovach, Hughes, Fagan, and Maggitti (2002)	Share information across the functional area of an organization for the strategic decision-making process.
Lengnick-Hall and Moritz (2003)	Reduce process and administrative costs, speed up transaction processing, reduce information errors, and improve the tracking and control of human resource actions.
Othman and Teh (2003)	Create an IT-based workplace.
Chapman and Webster (2003)	A vital aspect of many personnel related decisions such as collecting job information, recruitment, employee selection, training, and performance management.
Ngai and Wat (2006)	Improve corporate communication, recruitment, selection, training, employee opinion survey, compensation, payroll services and employee verification as well as general information.
Hussain et al. (2007)	For senior HR professionals, strategic use of EHRM is increasingly the norm, irrespective of company size and this had led to the HR profession providing a value add for the company

Source: Kashive (2011)

Despite the benefits, organizations should also be aware of some unintended consequences of using the system in optimizing the full potential of EHRM. For instance, EHRM focuses primarily on efficiency and cost attainment and does not enhance the effectiveness of human resource processes (e.g., performance appraisal processes). As a result, EHRM may have an adverse impact on protected groups (e.g., older job applicants) and can potentially invade personal privacy (Stone & Dulebohn, 2013)

1.1.3 Human Resource Management Information System (HRMIS)

As one of the EG projects in Malaysia, the human resource management information system (HRMIS) was initiated to provide a single platform for public sector employees to accomplish HRM activities efficiently and effectively in an integrated environment. HRMIS refers to an integrated technology-enabled human resource management information system incorporating global best practices in human resource management (Public Service Department, 2010). Generally, the HRMIS is implemented to centralize HR database to give better access to government agencies to strategic and consolidated HR information so that the planning and management of human capital can be enhanced.

The development and the implementation of HRMIS, involved two phases. In Phase 1, the HRMIS core applications were developed, implemented, and piloted at 10 government agencies at various federal, state, and local levels. The ten pilot agencies were Public Service Department (PSD), Kuala Lumpur City Hall (DBKL), the Ministry of Health, Department of Chief Minister of Sarawak, Department of Irrigation and Drainage (DID), Perbadanan Kemajuan Negeri Selangor (PKNS), Majlis Amanah Rakyat (MARA), Chief Executive of the Management Information

System (SMPKE), Unit Administrative Modernization and Management Planning (MAMPU), and the Department of Veterinary Services (DVS) (Public Service Department, 2010). In Phase 2, the HRMIS was applied to the remaining government agencies across the country that was not part of the pilot phase (Public Service Department, 2010). However, in March 2012 the government decided to redevelop and upgrade the HRMIS. The redevelopment process of HRMIS was planned to be implemented in two phases. Phase 1 started in March 2012 and was completed in June 2012. The second phase began in June 2012 and was expected to complete in August 2014. As stated in the service circular,¹ the main reason for doing so was because the majority of the HRMIS users were not satisfied with the applications. Another survey was carried out after the upgrading was made by the PSD and MAMPU. Again, almost 50 percent of the HRMIS users were still not satisfied with the system², particularly with the characteristics of HRMIS, such as accessibility. Currently, the second phase is under way in which the application of HRMIS is being gradually implemented to the rest of the government agencies with the value-added enhancement incorporated gradually.

All documents on HRMIS, such as corporate information, implementation policies, standard operation of procedures, and customer services can be accessed from <http://www.eghrmis.gov.my/>. The implementation of HRMIS is fully monitored by the Public Service Department (PSD) of Malaysia as the lead agency. According to MAMPU (2003, as cited by McPherson & Ramli, 2004, p. 709), the objectives of HRMIS are as follows:

¹ <http://www.eghrmis.gov.my>

² The result of the survey can be accessed here:

<http://www.eghrmis.gov.my/index.php/home/makluman-semasa/item/353-sesi-dialog-hrmis-2012.html>

- For effective staffing and rightsizing of the civil service through better availability of HRM information;
- For automating the HRM operational processes which are currently done manually;
- For providing up-to-date consolidated HRM information for effective HRM planning among agencies;
- For better communication, horizontal integration, and more streamlined processes through establishing a richer collaborative system environment among the agencies so as to provide a single window access to HRM transactions that cut across agencies;
- For improving paper-less HRM capabilities among agencies, such as electronic distribution of human resource policy manuals and circulars electronically; and
- For providing an open and flexible system to fulfill and improve the information needs of operational and managerial processes at different levels of agencies.

Also, the benefits of HRMIS implementation in the Malaysia's government agencies are as follows (www.eghrmis.gov.my):

- Automation would enable human resource manager to devote more time for analysis, planning and identifying improvement opportunities.
- Human resource activities would be facilitated in terms of ease and speed with the availability of real-time and on-line information.

- The streamlined human resource procedures and policies and the integrated human resource information would ensure consistency in performing certain processes and ease of use of the system by all agencies.
- Integrated human resource information would facilitate the sharing of information which is accurate and timely. It would also improve communication among agencies.
- Employee productivity, motivation, and satisfaction would be enhanced with the availability of better equipment and computers, reduction of repetitive work and automation of work processes.

Furthermore, the HRMIS project involves redefining 27 current human resource functions to 10 integrated and coherent human resource functions as illustrated in Table 1.2.

Table 1.2 Redefinition of human resource functions in HRMIS

Current HR functions	HRMIS
<ul style="list-style-type: none"> • Manpower planning • Organizational development • Scheme of service • Remuneration & benefits • Service matters • Training • Career development • Employee relations 	Strategy formulation & review
<ul style="list-style-type: none"> • Manpower planning • Recruitment • Placement • Promotion 	Resourcing
<ul style="list-style-type: none"> • Confirmation • Salary management 	Performance management
<ul style="list-style-type: none"> • Career guidance 	Career management

• Promotion	
• Examination	Competency assessment
• Training	Development
• Asset declaration	Personal record management
• Employee relations	Employee communications & behavioral management
• Counseling	
• Disciplinary	
• Confirmation	Remuneration, benefits & reward management
• Loan processing	
• Medical administration	
• Claims processing	
• Leave processing	
• Salary management	
• Payroll processing	
• Separation	

Source: PSD (2010)

As mentioned in the previous section, HRMIS has 15 core modules that outline all the human resource functions in the public sector in Malaysia (refer to Table 1.2). Due to the wide scope of HRMIS implementation involving the human resource management processes -- from the entry stage of an employee right up to the retirement stage, the types of services in government agencies, salary schemes and so on -- the development of HRMIS was carried out in stages. Until now, the expansion of HRMIS modules to other agencies is still in progress. In some agencies, some of the modules to execute their human resource processes are already implemented as other modules are awaiting enhancement.

With HRMIS, applications, such as leave application and yearly appraisal, can be submitted and processed electronically where the personnel service book has been converted into an electronic form. In this way, the HRMIS provides a

systematic and integrated consolidation of information for all HR activities including pension benefits (Abdul Karim, 1997).

As the government is the key player in the national development, investigating the effectiveness of IS and HRMIS, in particular, to the delivery of public sector services is paramount.

1.2 Problem Statement

By and large, the use of IT in HRM can be referred to as electronic human resource management (EHRM) or human resource information systems (HRIS). These two terms are widely used in many IS studies related to HRM even though there are debates whether EHRM and HRIS are two different concepts (Rue, Bondarouk, & Looise, 2004) or similar concepts. However, Ruel, Magalhaes, and Chiemeke (2011) claimed that the terms, such as EHRM, web-based HRM, and information technology (IT)-based HRM, are considered spin-off developments of HRIS. Hence, many tend to use the terms interchangeably. However, according to Bondarouk and Ruel (2009, p. 507), EHRM can be viewed as an overarching concept that talks about the possible integration of HRM and technologies with the purpose of helping employees and management accomplish their job performance within and across organizations. Notably, the rapid development of technology especially the Internet does not only impact human resource functions but has led the way people define the phenomenon. As stated by Stone and Dulebohn (2013), HRIS becomes known as EHRM because organizations have enabled human resource transactions through the Internet. The current use of EHRM is also evident when many researchers use the term especially in the IS and HRM fields (Gupta & Saxena, 2010, 2011; Hoch & Dulebohn, 2013; Mahdavi & Maleki, 2015; Marler & Fisher, 2013;

Troshani, Jerram, & Hill, 2011; Winkler, König, & Kleinmann, 2013; Yrontis, Thrassou, & Zin, 2010; Yusliza & Ramayah, 2011; Yusliza, Ramayah, & Haslindar, 2011; Yusoff, Ramayah & Othman, 2015; Zafar, Shaukat, & Norazuwa, 2010).

The implementation of EHRM is expected to give enormous benefits regarding increased efficiency and performance of a company management and, in particular, HRM (Hussain, Wallace, & Cornelius, 2007). It is also to help organizations deal with the present issues and challenges of human resources management. Even though it was reported that organizations are increasingly investing a huge amount of money in implementing the EHRM (Weill et al., 2002), the investments do not always lead to better organizational outcomes as anticipated because users may not be satisfied with the system (Dastgir & Mortezaie, 2012). According to some scholars, user satisfaction with the IS crucial for IS success in organizations (Gudigantala, Song, & Jones, 2011; Ives, Olson, & Baroudi, 1983; Sabherwal, Teyaraj, & Chowa, 2006). Hence, many organizations have invested a huge budget in the implementation stage (Dastgir & Mortezaie, 2012) to make sure that the end-users utilize the system fully to ensure that the investment made is worth the effort.

Even though studies on user satisfaction with IS are plentiful, very few have investigated end-user satisfaction with HRMIS, especially in the context of Malaysia. As mentioned earlier, the Public Service Department (PSD), on behalf of the Malaysian government, initiated HRMIS to improve its human resource management processes and functions in an integrated environment for effective human capital planning and management. However, its implementation has never been without problems. In the early stage of HRMIS implementation, most of the complaints received by the PSD were about the system features or characteristics. Specifically,

HRMIS users took issue with the failure or delays in attending or responding to their needs. Besides, they reported that the system was not user-friendly, produced unreliable data, and difficult to use (MAMPU, 2011). These conditions may lead to unsuccessful system implementation, particularly in decreasing users' satisfaction with HRMIS. As part of the solution, PSD recently upgraded that system architecture to enhance data quality and accessibility³⁴. Also, PSD emphasized the need for sustaining HRMIS by providing business supports and change management⁵. It also indicated that users' attitude remains one of the key obstacles in HRMIS utilization. Since users are the key players in effective HRMIS implementation, it is crucial that their point of view be taken into account in improving the system so that it remains relevant and can help PSD in its human resource planning and management.

HRMIS is essential for human resource planning and management because such activities require accurate, reliable, and timely data. As in some instances, users need to enter or update their personal data into the HRMIS; it is, therefore, crucial that the system they are using is user-friendly to facilitate proper data entry and processing. So, if the HRMIS usage becomes complicated, users' satisfaction and willingness to use the system may be affected. When users refuse to update information, data are not reliable and accurate. Notably, inaccuracies in data have a significant impact on the human resource planning and succession planning, budgets, and other systems (Foreign Affairs, Trade and Development Canada, 2006). Consequently, operational inefficiencies due to poor quality data in human resource applications can lead to brand damage and customer satisfaction, and worst – revenues (Fairchild, 2016). The PSD of Malaysia also noted that the reliability and

³<http://www.eghrmis.gov.my/docs/pdf/terkini/mesyuarat2016/jkphrmis-bil2/Kertas1-Status-Pembangunan-HRMIS-Baharu.pdf>

⁴ <http://www.eghrmis.gov.my/docs/pdf/terkini/mesyuarat2015/kertas3.pdf>

⁵<http://www.eghrmis.gov.my/docs/pdf/terkini/mesyuarat2015/pemandu/Kertas1-Halatuju-HRMIS-Masa-Hadapan.pdf>

accuracy of data were the key problems in executing career planning modules⁶. Therefore, studying user satisfaction with HRMIS is justified.

Dissatisfaction with the system may stem from various factors, such as technical, situational or behavioural, and social or organizational (Aladwani, 2003; Au, Ngai, & Cheng, 2002; Jiang, Klein, & Saunders, 2010; MAMPU, 2011; McPherson & Ramli, 2004; Mohd Azman, 2011; Noraswati, 2011; Norshita, Halimah, & Tengku Mohammad, 2010). Au and Ngai (2008) reported that most systems failed to meet the objectives, not because of the lack of technical skills of the developers but because the psychological and organizational issues were not addressed properly when the systems were being developed and implemented. Bondarouk (2011) also stressed that people are the most important element in the implementation of IT in organizations. Therefore, their perceptions of the system and its use may be interpreted as an appropriated representation of the system success.

To date, many researchers and practitioners have shown interest in the influence of technostress in influencing job outcomes (Ayyagari, Grover, & Purvis, 2011; Bradshaw & Zelano, 2013; Hayashi, 2011; Lee, Jin, & Choi, 2012; Nguyen, Trawinski, & Jung, 2011; Salanova, Llorens, & Cifre, 2012; Sami & Pangannaiah, 2006; Tarafdar, Pullins, & Ragu-Nathan, 2011; Tarafdar, Pullins, & Ragu-Nathan, 2014; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007; Tarafdar, Tu, & Ragu-Nathan, 2011; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2011; Tu, Wang, & Shu, 2005; Ungku Norulkamar, Salmiah, & Wan Khairuzzaman, 2009; Wang & Shu, 2008; Wang, Shu, & Tu, 2008). However, studies on the influence of technostress on end-user satisfaction with certain computer systems applications, such as HRMIS in Malaysia, are few especially in the IS literature, with the exception of a study conducted by McPherson and Ramli (2004), who showed that HRMIS users in the

⁶ <http://www.eghrmis.gov.my/docs/pdf/terkini/mesyuarat2015/kertas3.pdf>