People critical success factors (CSFs) in Information Technology/Information System (IT/IS) implementation

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ABSTRACT

Information technology/Information System (IT/IS) become the vital tools in today's competitive environment, hence it has become the major concern for successfully implementing IT/IS in every organisation. In every organisation, people are the fundamental issue. They have the powerful force that can influence the success and failure of IT/IS implementation. Many literatures have discussed about the critical success factors (CSFs), but none of them highlighting the people issue. Therefore, this research paper presents a review of recent work of CSFs in implementing IT/IS focusing on the people issue only. Various journal articles, conference proceedings, theses and book between years 2001 to 2010 were reviewed to get relatively new findings. Findings revealed twenty (20) factors that frequently cited by researchers. These factors were then grouped into four (4) categories; skills, behaviour, management and mind-set. It is anticipated that, this research will not only create awareness but also assist organisations to understand the CSFs in implementing IT/IS, increasing the chances for successful implementation and served as a guideline for future planning.

Keywords: *critical success factors, IT/IS, people, literature review*

INTRODUCTION

Rapid global development in technology has made information technology/information system (IT/IS) become essential tools in every organisation regardless of their size. Evidence on benefits of IT/IS implementation had been discussed by numerous scholars (Adriaanse, Voordijk, & Dewulf, 2010; Batenburg & Constantiou, 2009). Almost every industry can obtain the benefit of implementing IT/IS which include speed up operation, enhance collaboration, improving information exchange and others (Kivrak, Arslan, & Cagatay, 2010). According to Moh'd Al-adaileh (2009), implementing IT/IS in organisation will give an overall impact on organisational forms and management by increasing their productivity, reducing the product cycle, automation of operational decision and supporting of strategic and tactical decisions. All these benefits have encouraged organisation to invest in the technology as it had become a key resource for organisations, economies, and societies.

Despite the huge advantages of IT/IS, it is surprising to witness the growing number of IT/IS failure over the last four decade. Earlier findings show that IT/IS failure are related to technological or engineering problems (Lyytinen & Hirschheim, 1987; Sauer, 1997), while recent findings indicate users as the major reason for the failure (Davis & Songer, 2008; Hartmanna & Fischer, 2009; Lou & Alshawi, 2009).

People issue has become the critical factor thereby needing full attention from everyone. They are the most important assets in every organisation. Being the ultimate user of the technology, they have strong influence to the success or failure of implementing IT/IS. Research on the people issue can provide an insight to understand

people and their ability to cope with the technology that is going to be use or being used in the organisation (Un & Price, 2007). According to Ruikar, Anumba, & Carrillo (2006), the implementation of IT/IS is also less likely to succeed when people are not ready. Most organisations however, overlooked about this aspect; thus failed to obtain full potential of IT/IS. They forget that technology is supposed to be made for people to assist them to perform their work effectively. More attention should be given for this issue to help the organisation to successfully implement IT/IS.

To date, little research has concentrated on CSFs in IT/IS implementation focusing on people issues. Therefore, to address this shortcoming, this paper will analyse the existing literature to identify CSFs in implementing IT/IS focusing on people issue. The identified factors is believed to give better understanding and clearer picture of the factors that are vital for the successful implementation of IT/IS.

DEFINITION ON CRITICAL SUCCESS FACTORSS (CSF)

The concept of Critical Success Factors (CSFs) originates back in 1960's by D. Ronald Daniel of McKinsey & Company(Carali, 2004). It was then popularized a decade ago by Jack F. Rockart of MIT's Sloan School of Management. As the concept of CSFs has evolved it has been extensively used by every sector to achieve their business mission, objectives or goals. Various definitions of CSFs can be found from literature. Méndez, Pérez, Mendoza, & Ortega (2008), define CSFs as carry out certain activities in the right way to meet intended objectives. While Austin (2002) describes CSFs as critical areas that need to perform so that the organisation can achieve its goals. Gajendran, Brewer, & Chen (2005) also defines CSFs as certain aspects that need special attention in order to achieve business objectives. Basically, CSFs is about those few key elements which will influence the end results in achieving intended objectives.

RESEARCH METHODOLOGY

This study reviewed fifty four (54) existing literature on CSFs in IT/IS implementation across industries. The review does not only limit to articles published in peer-reviewed and prestige journals, but also include theses and book. The analysis involved 41 journals, 6 theses, 6 conference proceedings and a book (refer diagram 1). All of the article/theses however, do not solely focus on CFSs in IT/IS relating to people issue. Only findings relating to people issue were extracted from the articles/theses. The search date was limited to year 2001 to 2010 in order to get new findings.
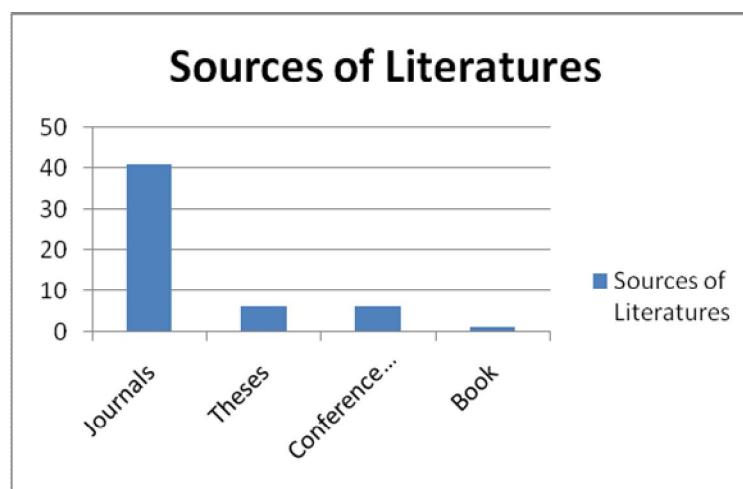
Figure 1: Sources of Literatures
DISCUSSIONS

Literature has identified twenty (20) factors that contribute to the successful implementation of IT/IS. These factors are top management support, communication, user involvement, IT staff roles and responsibility, training/skills, leader/ IT Leader, organisation culture, knowledge/ experience, motivation, awareness, focus and ambition, satisfaction, teamwork/ collaboration, willingness to change, attitude, commitment, management style, employee behaviour towards collaborative environment, trust, interpersonal relationship and personal characteristic. The authors categorised those factors into four (4) categories:

(1) Skill : people's ability to do something that came from knowledge, practice or gift
(2) Behaviour: people's reaction towards its surroundings
(3) Management: the art or practice of managing, usually business
(4) Mind-set: people's habit based on previous experience which has influence on their daily activity
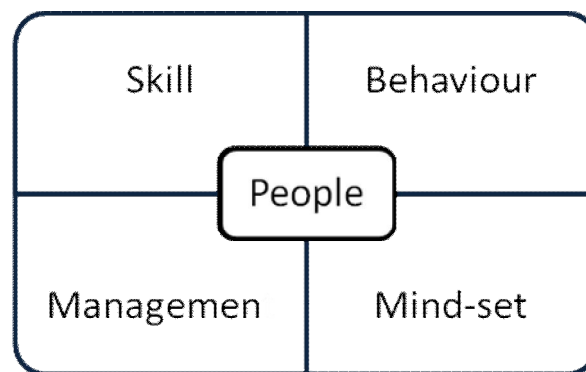

Figure 2: Categories of People Issue

Skill
According to Oxford dictionary, skill can be defined as the ability to do something well. This ability may come from knowledge, practice or even gift. Three (3) CSFs found to be suited with this definition. The factors are training/skills, communication and knowledge/experience (refer table 1). Each CSFs were briefly discuss below.

Table 1: CSFs categorised under skill category

Category	Elements	Authors	No. of Citations
Skill	Training/ skills	Peansupap & Walker (2005), Nahar et al.(2006), Kelegai & Middleton(2004) , Buruncuk & Gülser(2001) , Eadie, Perera, Heaney, & Carlisle(2007) , Habib(2009) , Aggarwal(2010), Stewart, Mohamed, & Marosszeky(2004) , Sabherwal, Jeyaraj, & Chowa (2006)	9
	Communication	Nahar et al.(2006), Havelka (2002), Gajendran, Brewer, & Chen (2005), Habib,(2009), Lind & Culler (2009), Mazri (2005), Wikforss & Löfgren (2007), Hartmanna & Fischer (2009), von Urff Kaufeld, Chari, & Freeme (2009), Chrusciel & Field (2003), Ngai, Law, & Wat (2008), Bhatti (2005), Moohebat, Asemi, & Jazi(2010) , Kronbichler, Ostermann, & Staudinger (2009),	15

		Al-Alawi et al.(2007)	
	Knowledge & experience	Nahar et al.(2006), Kelegai & Middleton (2004), Buruncuk & Gülser (2001), Hussein et al (2007), Eadie et al (2007), Standing et al.(2006), Habib (2009), King (2001), Mazri,(2005), Thong (2001), Tambovcevs (2010), Sabherwal et al.(2006)	12

Training/skills: According to Buruncuk & Gülser(2001), adequate training is important regardless whether the team members have experience or not. This might be due to the difficulties of the system itself, which requires users to possess certain level of skills. Training will also help users to understand how to effectively use the system. Without training and skills, users are unable to utilise the benefit of technology which leads to the failure of IT/IS implementation.

Communication: Communication is very important as it serves the basic functions in managing organisation. It can be described as the interaction process of conveying information, ideas, opinion, instructions, decisions, rules and plans throughout the entire organisation. This factor, however, is usually underestimated and overlooked. The lack of effective communication will lead to the failure of IT/IS implementation as users don't have clear information about their contribution, roles and the achievements(Habib, 2009).

Knowledge/experience: According to Hussein et al (2007), having adequate knowledge in IT/IS is essential as it will give a positive influence to the extent of usage of the technology in organisation. The level of knowledge will influence management's perception of IT/IS, its responsibilities, usefulness and strategic value to the organisation (Kelegai & Middleton, 2004). Besides, this factor also is related to personnel issues especially for the older generation who are not computer literate. These group of people will have difficulties in keeping up with the advancement in IT/IS related issues as they are used to the traditional way of work (Eadie et al., 2007).

Behaviour

Oxford dictionary defines behaviour as the way in which one acts or conducts oneself towards the others. CSFs includes in this category are motivation, employees behaviour towards collaborative environment, interpersonal relationship, commitment, attitude and interest in IT (refer table 2). Each CSFs were briefly discuss below.

Table 2: CSFs categorised under behaviour category

Category	Elements	Authors	No. Of Citations
Behaviour	Motivation	Davis & Songer(2008) , Nahar, Lyytinen, Huda, & Muravyov(2006) , Peansupap & Walker(2005) , Al-Alawi, Al-Marzooqi, & Mohammed (2007)	4
	Employee behaviour towards collaborative environments	Lou & Alshawi(2009), Hedelin & Allwood (2002)	2
	Interpersonal relationship	Park & Abels (2010), Mullen (2005)	2
	Commitment	Peansupap & Walker (2005), Buruncuk & Gülser	7

		(2001), Havelka (2002), Standing et al.(2006), Gajendran et al. (2005), Habib (2009), Aggarwal (2010)	
	Attitude	Davis & Songer (2008), Nahar et al.(2006), King(2001), Abukhzam & Lee (2010), Mazri,(2005), Sabherwal et al.(2006)	6

Motivation: Motivation can be defined as a driving force that leads to achieve objectives. According to Davis & Songer (2008), strong motivation is important as it can overcome many difficulties in using the new technology. Motivation can be improved by understanding organisational cultures, identifying needs and preference as well as rewards (Nahar et al., 2006).

Employee behaviour towards collaborative environments: People are the critical factor that influence the success and failure of IT/IS implementation in collaborative environment of the organisations (Lou & Alshawi, 2009). Their behaviour towards the environment has indirect effect on the way the system is being used. Thus, this factor indirectly determines the success or failure of IT/IS implementation in organisation.

Interpersonal relationship: Interpersonal relationship is believed to have positive impact on the communications patterns which influence the successful implementation IT/IS in organisation. Strong interpersonal relation among users is an advantage as they are willing to put more time and effort to help each other to utilise IT/IS in the organisation (Mullen, 2005).

Commitment: Commitment from organisation and users are crucial to successfully implement IT/IS. Users' commitment is important as they have to devote themselves to use the technology, while organisational commitment referring to the top managers to support end-users to use IT/IS. Havelka (2002), in his research has proved that high level of commitment gives positive influence on IT/IS success. Peansupap & Walker (2005) identified that the basic requirement to successfully implement IT/IS is to have full commitment from users and organisation. Numerous examples of failures due to the lack of commitment had been discussed by many researchers over the years (Aggarwal, 2010; Habib, 2009; V. Peansupap & D. H. T. Walker, 2005).

Attitude: Attitude plays an important part in life and in an organisation for the successful IT/IS implementation. Having staff with positive attitude would help the organisation to strive as they do maintain positive thinking towards everything. The implementation of new system would be easier as they are looking forward for the benefit of the new technology. Empirical studies have recognised positive attitude towards IT/IS a necessary condition for their successful implementation (Davis & Songer, 2008; Nahar et al., 2006).

Management

According to Oxford dictionary, management is defined as the process of dealing or controlling organisation or people. Seven (7) CSFs were identified to suit this category. There are top management support, leadership/IT leader, user involvement, teamwork/collaboration, focus and vision, IT staff roles and responsibilities and management style (refer table 3). Each CSFs were briefly discuss below.

Table 3: CSFs categorise under Management category

Category	Elements	Authors	No. of Citations
Management	Top management support	Nahar et al.(2006), Kelegai & Middleton (2004), (Buruncuk & Gülser (2001), Hussein, Abdul Karim, Mohamed, & Ahlan(2007) , Eadie et al.(2007), Standing, Guilfoyle, Lin, & Love(2006) , Habib (2009), King (2001), Lind & Culler(2009) , Aggarwal (2010), Lou & Alshawi (2009), Chrusciel & Field (2003), Moh'd Al-adaileh (2009), Young & Jordan (2008), Doom, Milis, Poelmans (2010), Stewart et al. (2004), Sabherwal et al.(2006)	17
	Leadership/ IT Leader	Standing et al.(2006), Aggarwal (2010), Gottschalk & Karlsen (2005), von Urff Kaufeld (2009), Doom et al (2010), Stewart et al.(2004)	6
	User involvement	Buruncuk & Gülser (2001), Havelka (2002), Habib (2009), Lind & Culler (2009), Thong(2001), Sabherwal et al (2006)	6
	Team work/ Collaboration	Mazri (2005), Utley (2001), Ngai et al.(2008), Hwang & Xu (2007), Bhatti (2005), Kronbichler et al.(2009)	6
	Focus & vision	von Urff Kaufeld et al (2009)	1
	IT staff roles and responsibility	Jiang, Klein, & Pick (2003), Martinsons & Cheung (2001), Salleh (2007)	3
	Management style	Hussein et al.(2007), Standing et al.(2006), Jamshidian & Rahnama (2004)	3

Top management support: Approvals, willingness of the top management to be involved in the system implementation and to allocate certain amount of resources are the key to the successful IT/IS implementation. Most of the studies agree the crucial role played by the top management to successfully implement IT/IS in organisation (Aggarwal, 2010; Doom et al., 2010). This shows that this factor is widely accepted as a compulsory element for IT/IS implementation.

Leadership/ IT leader: Leadership is one of the factors that contributes to the success of IT/IS implementation as it deals with issue of how to achieve collaboration and unity in an organisation. Having a good leader will directly or indirectly promote higher levels of staffs/users self-efficacy and empowerment (Vachara Peansupap & Derek H.T. Walker, 2005; Walumbwa, Lawler, Avolio, Wang, & Shi, 2005). This will encourage effective use of the system and eventually lead to its success.

User Involvement: Havelka (2002) defines user involvement as participation of actual users of the application in the development process. Their involvement is important as it requires users to use their skills, experience and knowledge to successfully implement IT/IS. It also gives them the authority to make decision, ability to control their work, and taking responsibility (Evans & Lindsay, 2002), thus develop the sense of ownership. The strong feeling of ownership may increase user's commitment and lead to positive impact to successfully implement IT/IS (Havelka, 2002). As the end user of the system, involving them will increase their satisfaction and acceptance towards the implementation of the technology.

Team work/ Collaboration: Team work/collaboration has a powerful influence in gaining the users acceptance towards the introduction of the new system in the

organisation (Utley, 2001). Research carried out by Hwang & Xu(2007), Bhatti (2005) and Kronbichler et al.(2009), identifies that teamwork as one of the factors that influence the system success. This factor however, does not have a direct impact on the successful IT/IS implementation but affecting the way it is used and benefits obtained from its usage (Hwang & Xu, 2007).

Focus & vision: A clear focus and vision of the organisation and leader is very important as they are responsible to guide the employee towards certain achievement. Everyone in the organisation need to have the same focus and ambition as this features required directing their major attention towards achieving successful IT/IS implementation in their organisation (von Urff Kaufeld et al., 2009).

IT Staff Roles and Responsibilities: IT staffs are responsible either to plan, develop or maintain the IT/IS in the organisation. Their roles and responsibility are critical as it contributes towards the successful implementation of IT/IS. Salleh (2007) and Jiang (2003) in their studies found that IT staff roles and responsibilities are positively related to the successful implementation of IT/IS.

Management style: Management can be described as the process of getting activities completed effectively and efficiently through people to achieve desired goals. This factor is important as it will influence, coordinate and direct people's activity towards achieving organisation objectives (Hussein et al., 2007)

Mind-set

According to Oxford dictionary, mind-set refers to the establishment of a set of attitude held by someone or based on previous experience. Five (5) CSFs identified to be in this category. They are willingness to change, organisational culture, awareness, trust and satisfaction (refer table 4). Each CSFs were briefly discuss below.

Table 4: CSFs categorised under mind-set category

Category	Elements	Authors	No. of Citations
Mind-set	Willingness to change	Peansupap & Walker (2005), Davis & Songer (2008), Havelka (2002), Chrusciel & Field,(2003)	4
	Organizational culture	Eadie et al.(2007), Habib (2009), Yeganeh (2000), Indeje & Zheng (2010), Gallivan & Srite (2005), Xiao & Dasgupta (2005), Poku (2003), Twati (2008)	8
	Awareness	Stewart et al.(2004)	1
	Trust	Al-Alawi et al. (2007), Aberer & Despotovic (2001), Li, Valacich, & Hess (2004)	3
	Satisfaction	Attar & Sweis (2010), Adam Mahmood, Burn, Gemoets, & Jacquez (2000), Colman (2007), Sabherwal et al.(2006)	4

Willingness to change: According to Peansupap & Walker (2005), one of the factors that contributes to the failure of IT/IS system is unwillingness to change, as it involves changes of users behaviour to handle new system. Users usually refuse to change as they are already comfortable with the current work practice. Davis & Songer (2008), identified that, individual with a higher level in the organisation however are willing to change as they have the authority to adjust the changes to suit their requirements.

Organisational culture: Understanding the organisational culture is very important as it will give positive or negative effects on staff and workplace. The characteristic of

organisational culture such as information sharing, team working, trust, fairness, enthusiasm have a high positive influence with the successful IT/IS implementation (Habib, 2009). Failure to understand organisational culture will result disappointment to reap many of the perceived benefits of IT/IS.

Awareness: Awareness is one of the most important qualities which is necessary in implementing anything including technology. Stewart et al.(2004), in their research identified that low level of awareness or exposure to IT/IS is one of the factors that inhibit the successful implementation of IT/IS in organisation.

Trust: Trust between co-workers, trust on the system and trust to the management are essential attributes which is believed to have a strong effect to successfully implement IT/IS. The existence of trust is required among the users in order to respond openly and share their thoughts and perceptions which lead to the successful implementation of IT/IS (Al-Alawi et al., 2007).

Satisfaction: Employees are the valuable assets of the organisation as their satisfaction leads to the success or failure of the organisations (Attar & Sweis, 2010). According to Colman (2007), the level of user satisfaction has mainly been accepted as the sign for a successful system. Their satisfaction will encourage them to work efficiently thus lead to quality performance which leads to increased profit.

CONCLUSION

Perceive benefits of IT/IS in organisation become the main issue in today's business environment. This phenomenon has led to the adoption of the technology in most organisations. Ironically, the desired outcome is not achievable. Many factors that contribute to the failure have been identified and recently, researchers discovered that people issue are the key to the failure. This paper attempts to review the literature on CSF in implementing IT/IS focusing on people issue. It identifies the most cited CSFs based on literature and illustrates their significant to successfully implement IT/IS.

Factors relating to people issues that are fundamental to the successful IT/IS implementation had been identified as: top management support, knowledge/experience, commitment, training/skills, communication, user participation, attitude, motivation, leadership/ IT leader, willingness to change, management style and organisational culture.

Among the listed factors, most researchers identify top management support as the main factor contributing to the successful implementation of IT/IS. Top management are responsible to provide the organisation with enough financial support and resources which include man power and equipment prior to IT/IS implementation. Their responsibility does not end there as they also involve in changing the policy and work procedure, as well as to monitor and to give feedback in order to have a smooth implementation of the technology. In particular, top management needs to actively show their support by expressing their determination and appreciation through concrete actions. According to Dong (2008), top management support is important throughout the entire IT/IS implementation process. Evidence shows that inadequate support from top management lead to the IT/IS implementation failures (Aggarwal, 2010; Doom et al., 2010).

Undoubtedly, communication is necessary to successfully implement IT/IS. Excellent level of communication is required to create understanding among users, for interaction and information sharing as well as to communicate with the entire organisation. Inadequate level of communication will make it impossible for the organisation to

successfully implement IT/IS. Supporting evidence from research by Moohebat et al. (2010) and Habib (2009), has confirmed the importance of this factor.

Knowledge and experience is another critical factor to successfully implement IT/IS. Adequate knowledge and experience of top management, IT leader and user will contribute towards the effective use of the system in the organisation. Insufficient knowledge will lead to the lack of enthusiasm which will become the barrier in adopting the technology. Findings by Thong (2001) revealed that lack of knowledge and experience has caused failure to use the system. Similar results found by Tambovcevs (2010) and Eadie et al (2007), which verified the important of this factor.

Researches also have pointed out the importance of training/skills to successfully implement IT/IS since a decade ago. This factor is frequently cited by authors because it will help users to understand and to be comfortable with the system thus ensuring their acceptance to use the system. It is also a way of educating users hence helping them to use the system effectively. Many failures of IT/IS implementation reported are due to the lack of training/skills (Tambovcevs, 2010)

Results presented in this paper cannot claim to be comprehensive, but it does provide an in-depth review of people CSFs for IT/IS implementation. People CSFs identified in this study will act as a basis that comprise all potential people CSFs associated with IT/IS implementation across industries. The comprehensive set of CSFs derived from this paper will become helpful for the organisations who implement IT/IS to identify possible difficulty and enable them to avoid the potential risks. It is expected that findings from this research will not only create awareness but also assist organisations to understand the CSFs in implementing IT/IS, increasing the chances for successful implementation and served as a guideline for future planning.

Table 5: Summary on CSFs on People Issue

Category	Characteristic	Elements
Skill	people's ability to do something that came from knowledge, practice or gift	Training/ skills
		Communication
		Knowledge & experience
Behaviour	people's reaction towards its surroundings	Motivation
		Employee behaviour towards collaborative environments
		Interpersonal relationship
		Commitment
		Attitude
Management	the art or practice of managing, usually business	Top management support
		Leadership/ IT Leader
		User involvement
		Team work/ Collaboration
		Focus & vision
		IT staff roles and responsibility
		Management style
Mind-set	people's habit based on previous experience which has influence on their daily activity	Willingness to change
		Organizational culture
		Awareness
		Trust
		Satisfaction

FUTURE RESEARCH

Finding from this research only identifies the CSFs relating to people issue in implementing IT/IS. To date, there is no research on aforesaid study was carried out in construction industry. It is important to identify CSFs relating to people issue in implementing IT/IS in construction industry due to the nature of the industry itself, which involve many parties from numerous disciplines. Therefore, interview with construction organisations will be carried out to confirm the existence of the CSFs identified from the literature. Findings from the research will be able to give a better and clearer understanding of CSFs to benefit the construction industry in the quest of successfully implementing IT/IS.

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