“Reasons for the failure of web-based application information technology projects: an empirical study in Malaysia”

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Reasons for the failure of web-based application of information technology projects: an empirical study in Malaysia

Abstract

Every year, organizations lose millions of dollars due to failure of web-based application of information technology (IT) projects. Research shows that companies have difficulties in web-based application IT projects to complete on time or on budget or within the scope and any of these combinations. The purpose of this study is to identify the factors influencing failure of web-based application of IT projects, particularly in the context of Malaysia. The study was conducted on 155 experieced project managers in handling web-based IT projects. The top ten failure factors were identified. The findings of the study reveal that lack of clarity of goals, low teamwork quality, ineffective project management, no reward and recognition system in place and insufficient resources are the core factors for the failure of web-based application of IT projects. The significance of this research lies in the fact that its results will add new knowledge in the project management field by identifying the relative importance of the factors that have an impact on web-based application of IT project failure.

Keywords: web-based applications, critical factors, IT projects, discriminant analysis, binary logistic regression analysis.
JEL Classification: L83.

Introduction

Web-based application of IT (WBAIT) projects form a major part in day-to-day business transactions, have an immense impact on organizational activities, and possibly modify the organization's vision (Kuruppuarachchi, 2001). WBAIT projects are different from other projects because of the unique risks, rapid development requirements, short technology life, rush-to-market demands and the multiple dependencies on many other similar projects (Taylor, 2004). In addition, WBAIT projects were negatively distinguished from other projects because of the difficulty in successfully balancing time, budget and quality requirements (Bennington, 2004). Prior studies have suggested WBAIT project failures could have been avoided by efficient management guidance seeking from technical professionals (Heerkens, 2002). The ultimate goal to avoid project failure is to ensure that the project is on track (scope), on time (schedule) and within the budget (cost) to satisfy the needed customers. Based on Standish Group (2011), projects incur failure, with at least 60% or more of the projects experiencing some form of fault either cancelled or challenged. Most of the earlier studies focused on the critical success factors of general IT projects through illustrating high profile IT companies. The present study is undertaken to study the factors that influence the failure of IT projects particularly web-based applications which are tested, assembled and designed in Malaysia.

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1. Literature review

WBAIT project implementation is a process of great complexity which involves a lot of factors and different conditions. The potential failure factors and the results of the various projects differ substantially from one to another and the factors identified in the literature vary in each and every project. Table 1 illustrates a summary of the related literature and identifies failure factors of web-based application of IT projects. A detailed review of journal articles leads to the identification of 56 possible failure factors which are listed in Table 1 (Appendix).

1.1. Pilot survey. Fifty six identified failure factors emerged from reviewing the related literature were sent via email to forty project managers for their expert comments, who handled web-based IT projects. Thirty questionnaires were completed by the participants and returned, which account for 75% of the response rate. All the respondents were IT project managers who had come across at least one failed IT project. The results of the pilot survey showed that 60% of the respondents used failed web-based application of IT projects to fill in the survey forms, above 50% of respondents were from electronic industry where they managed IT system enhancement in the company. Top ten failure factors were identified from the pilot survey. While the failure of web-based application of IT project was considered as the dependent variable, ten independent variables were the top ten failure factors identified in the pilot survey. Out of these 56 failure factors listed in Table 1, 10 (18%) factors were considered to be the most influencing factors for IT project failures namely; 1) lack of clarity of goals, 2) lack of top management support, 3) lack of perceived usefulness, 4) poor teamwork quality, 5) ineffective project management, 6) no reward and recognition system in place,

7) insufficient resources (funding and personnel), 8) ineffective communication, 9) lack of users' involvement and 10) no system of monitoring and feedback. Thus, based on the pilot study, ten failure factors were identified and used as the independent variables in the study.

1.2. Research methodology. A self-administered questionnaire, printed in English to cover the population effectively, was used in this study. The Likert scale of 1-5 points (1 'strongly disagree' to 5 'strongly agree') was used to measure the independent variables. The questionnaires were sent via email to IT project managers who were working in multinational IT companies. About 400 questionnaires were distributed among the respondents. However, 155 questionnaires were answered which makes a response rate of 39%. The completed questionnaires were used for statistical analysis. There were 96 (62%) male respondents and 59 (38%) female respondents, about 65% of the respondents had overall working experience above 3 years. Most of the respondents were degree holders (78%). About 62.6% of respondents were from IT service provider industry followed by 35.5% from electronic industry. Majority of the respondents had experienced failure in leading small IT projects (49%) which was followed by medium project size (32%) and large project size (19%). The respondents' personal, and organizational profile and project failure reasons are summarized in Table 2 (Appendix). This study comprised of ten independent variables and one dependent variable (i.e. reasons for WBAIT failure projects).

The WBAIT project becomes failure if: a) not meeting the project timeline; b) exceed project cost; c) not delivered as per defined scope and d) any combination of (a), (b) and (c).

Dummy 1 (D1) = answer (d) = any combination of (a), (b) and (c).

Dummy 2 (D2) = answer (c) = not delivered as per defined scope.

Dummy 3 (D3) = answer (b) = exceed project cost.

D1, D2, D3 are dummy variables taking value 1 or 0. For example D1 takes 1 when respondents favor answer (d) "any combination of (a), (b) and (c)".

In summary,

D1 = {1 if the respondent favors option (d) "any combination of (a), (b) and (c)".

0 if the respondent does not favor option (d)}

D2 = {1 if the respondent favors option (c) "not delivered as per defined scope".

0 if the respondent does not favor option (c)}

D3 = {1 if the respondent favours option (b) "exceed project cost".

0 if the respondent does not favor option (b)}

The research framework displayed in Figure 1 (Appendix) was constructed using the resource-based view theory (Wernerfelt, 1984).

2. Hypothesis development

In project management, project goals should be clearly defined at the initiation phase and be made clear to all stakeholders. This is important for project team members to be fully committed in achieving the project objectives. Lack of clarity of goals was one of the failure factors identified by Harper (2011), Qassim (2007), Carlos (2005), Al Neimat (2005), Gartner (2004), Coley (2001) and Sosik (2000). Accordingly, this study hypothesizes:

H1: The greater the lack of clarity of goals, the higher the failure rate of web-based application of IT project.

The top management needs to provide timely support to project team members to grow into a high performance zone. The teamwork can create synergies and get problems solved in an effective and efficient way. The top managements' support is important in the early stages of project implementation (Akkermans, 2002). Lack of top management's support is identified as one of the failure factors by Carlos (2005), Winters (2003), Qassim (2007), Al Neimat (2005), OGC (2005), Speight (2007), Krighsman (2008) and Ranjan (2011). Thus, the following hypothesis is developed:

H2: The greater the lack of top management's support, the higher the failure rate of web-based application of IT project.

Perceived usefulness is the degree to which a person believes that his use of a particular system would enhance his job performance (Davis, 1989a). The lack of perceived usefulness was one of the failure factors identified by Harper (2011). If the users do not understand where the system helps them in doing their job, it automatically causes the failure of the IT project implementation. The perceived usefulness may be used to measure how the technology (implementation of IT project) can increase users' job performance (Liang, 2009). It is also a measure of users' acceptance to the new IT system. Users' mental acceptance of an IT system is highly influenced by their attitude toward using the system even before the implementation of the IT system (Nah & Teh, 2006). The Research on Technology Acceptance Model also concludes that perceived usefulness has a strong significant effect on attitude (Davis, 1989b). Thus, the following hypothesis is advanced:

H3: The greater the lack of perceived usefulness, the higher the failure rate of web-based application of IT project.

The teamwork is important for any IT project and without team performance, the project may fail due to dysfunctional, disorganized and stalling during the execution of the project plans. Some previous studies indicated that there is a positive relationship between project teamwork quality and project success (Edara, 2011; Nah, 2003; Brown, 2007; and Xu, 2005). The research highlights that the higher the teamwork quality, the higher the probability of a project team to have success. According to While OGC (2005) and Carlos (2005), teamwork quality is one of the failure factors to IT projects. Hence, the following hypothesis is developed:

H4: The lower the teamwork quality, the higher the failure rate of web-based application of IT project.

Project management is critical to the implementation of IT projects (Nah, 2003). The effective project management has significant impact on the success of IT projects (Zhang, 2003). Garcia-Sanchez and Perez-Bernal (2007) found that project management is the second important factor of IT project implementation. Thus, the following hypothesis is proposed:

H5: The lower the effectiveness of project management, the higher the failure rate of web-based application of IT project.

The reward systems work as a powerful management tool for attracting, motivating and retaining employees (Mulvey, 2002). It is observed that regardless of whether the reward is non-monetary or monetary, a higher caliber of employees would be attracted toward organizations and possess a desire to stay with a company for longer period when reward and recognition programs were implemented (Abendschein, 2004). Therefore, the following hypothesis is developed:

H6: The greater the lack of reward and recognition system, the higher the failure rate of web-based application of IT project.

Any company needs to ensure there is a sufficient fund allocation for the implementation of new IT project as there are lots of factors related to the new IT system. The management needs to decide the scope of the IT project according to the resources allocation (funding and personnel). The insufficient resources (funding and personnel) with unrealistic scope will lead to the failure of IT project implementation. Krigsman (2008) and Carlos (2005) identified insufficient resources (funding and personnel) as one of the failure factors and therefore, the following hypothesis is developed:

H7: The greater the lack of resources (funding and personnel), the higher the failure rate of web-based application IT project.

The effective communications in the IT projects refer to the extent and frequency of information-shared between management, employees and users. Not only does it refer to sharing of information between the management, but it also refers to communicating with the users and non-users of IT projects in the organization (Jayaraman, 2010). Communication is the driver that keeps everything working properly (Schwalbe, 2000). The ineffective communication was one of the failure factors identified by Krigsman (2008), Speight (2007), Carlos (2005), Al Neimat (2005) and Winters (2003). Accordingly, the following hypothesis is advanced:

H8: The greater the lack of effectiveness of communication, the higher the failure rate of web-based application of IT project.

The users' involvement refers to a psychological state of an individual and is related to the importance of the IT project to the users (Esteves & Pastor, 2000). The users' participation is important in IT projects to gather requirements and users' input which increase the smooth flow of the project implementation in various phases. The lack of users' involvement was one of the failure factors identified by Qassim (2007), Carlos (2005), Al Neimat (2005), OGC (2005), Gartner (2004) and Coley (2001). As such, the following hypothesis is proposed:

H9: The greater the lack of users' involvement, the higher the failure rate of web-based application of IT project.

Monitoring means continuously checking to know whether the projects are running as per scheduled plan and are producing the expected results (Winter, 2001). The poor lack of feedback and monitoring system surface the problem only after the project is implemented. Ranjan (2011), Clarke (1999) and Herzner (1987) have similar conclusions where the feedback and monitoring system are important to the success of IT project while the absence of these factors in project execution gives negative impact to the project. As a result, the following hypothesis is developed:

H10: The greater the lack of monitoring and feedback process, the higher the failure rate of web-based application of IT project.

3. Significant findings and results

The factor and reliability analyses were applied to test the goodness of the data. All the 10 constructs in the questionnaire were intact and retained after factor analysis. The KMO sampling of adequacy

was above 0.81 and the Bartlett's test of sphericity was significant at 0.000. The total variance explained was above 0.73 and the anti-image correlation for each item was greater than 0.5 (Hair, 2006). The result also confirmed that the construct is one-dimensional which means the questions built for each factor measure the particular construct loaded on a single factor. The Cronbach's Alpha was used to estimate the reliability and it was above 0.7 for all the constructs. The results of the descriptive analysis show that the top factor for the failure of IT project is 'no system of monitoring and feedback' with the mean (M) value of 3.98 and standard deviation (S) of 1.00, followed by 'lack of clarity of goals' (M = 3.87, S = 0.77) and 'no/lack of users' involvement' (M = 3.75, S = 0.98). The factor of 'no reward and recognition system in place' seems to have the lowest influence with the mean value of 3.43 and standard deviation of 0.97. Since the off-diagonal elements in the correlation matrix were less than 0.7, no multicollinearity was present among the independent variables.

3.1. Binary logistic regression analysis. The binary logistic regression analysis is used when the dependent variable is dichotomous and the independent variables are of any level of measurements. The binary logistic analysis was applied three times. First one was dummy 1 dependent variable with ten independent variables of lack of clarity of goals, lack of top management support, lack of perceived usefulness, poor teamwork quality, ineffective project management, no reward and recognition system in place, insufficient resources (funding and personnel), ineffective communication, lack of users' involvement and no system of monitoring and feedback. It was then followed by dummy 2 dependent variable with ten independent variables and finally dummy 3 dependent variable with ten independent variables. The results revealed that for dummy 1 dependent variable, Nagelkereke R-square was 0.170, $p < 0.05$ and the overall percentage was 68.4% with correct classification of 43.3%. The Wald Chi-square statistics for this research shows that there are three independent variables that are statistically significant at 5% level namely; 'lack of clarity of goals', 'poor teamwork quality' and 'insufficient resources (funding and personnel)'. For dummy 2 dependent variable Nagelkereke R-square was increased from 0.170 to 0.204. Overall percentage was increased from 68.4% to 75.5% but there was a decrease in the correct percentage which indicates that only 19.0% of the data were classified correctly. Only two independent variables were statistically significant at % level namely; 'poor teamwork quality' and 'ineffective project management'. For dummy 3 dependent variable, the overall percentage was the highest model with 81.9% but this does not indicate any value because the correct classification is 0%. The Nagelkereke R-square value was also the lowest among the 3 models which is only 0.071 and none of the independent variable appeared statistically significant. The Chi-square statistics was not significant for dummy 3 ($p > 0.05$) which meant that the model did not fit well for dummy 3 dependent variable. In sum, an IT project will fail (the reason for failure is with any combination of failed reasons; not meeting project timeline, exceeding project cost and not delivering as per defined scope) if there is a lack of clarity of goals or the resources (funding and personnel) are insufficient or the quality of teamwork for the project is poor. Dummy 2 dependent variable with ten independent variables analysis shows that 'the poor teamwork quality' and 'an ineffective project management' are the reasons for the failure of IT projects because of 'not delivered as per defined scope'. Dummy 3 dependent variable with ten independent variables analysis indicates that IT project failure by exceeding project cost does not really matter as none of the factors is significant. This might be due to the fact that the salary of the project team members are internal cost (sunk cost) and thus not having a great impact on the failure of IT project. Table 3 (Appendix) shows the results of the binary logistic regression analysis models of independent variables on dependent variable.

3.2. Discriminant analysis. The two-group discriminant analysis was used to explore the differences between the two groups of the dependent variables simultaneously (Jayaraman et al., 2011). Table 4 (Appendix) illustrates the results for dummy 1 dependent variable where the Box's M (Sig) is 0.000 ($p < 0.05$). The overall correct classification for dummy 1 was at 62.6%. Wilks' Lambda scores on the discriminant function were between 0.954 and 1.000 for the ten independent variables. Two independent variables were found to be significant at 5% level namely; 'lack of clarity of goals' and 'no reward and recognition system in place'. For dummy 2 dependent variable, the Box's M (Sig) was 0.000 ($p < 0.05$). The overall correct classification for dummy 2 was increased from 62.6% to 65.8%. Wilks' Lambda scores on the discriminant function were between 0.972 and 1.000 for the ten independent variables. Only one independent variable was found to be significant at 5% level, i.e., 'insufficient resources (funding and personnel)'. This independent variable also appeared as the significant variable in dummy 1 dependent variable analysis. For dummy 3 dependent variable, the Box's M (Sig) was 0.018 ($p < 0.05$). The overall correct classification for dummy 3 was the lowest model with 60.6%. Wilks'

Lambda scores on the discriminant function were between 0.986 and 1.000 for the ten independent variables. No independent variable was found to be significant at 5% level. The result coincides with the binary logistic model where both models have no significant variable for dummy 3 dependent variable.

3.3. Comparison between binary logistic analysis and discriminant analysis. Since different models show different results, the tests based on Youden's Index (YI), discriminant power and likelihoods were used to identify which analysis fits the model best. The results show that for dummy 1, binary logistic has higher value compared to binary logistic for Youden's Index, discriminant power (DP) and likelihoods for discriminating analysis. However, for dummy 2, discriminant analysis fits the model better because it has higher value compared to binary logistic. And finally for dummy 3, discriminant analysis fits the data model well because binary logistic is not able to give any conclusion. Therefore, we can conclude that discriminating analysis model fits our dummy 1 and binary logistic fits dummy 2 and dummy 3 (Table 5). Based on this study, lack of clarity of goals, poor teamwork quality, ineffective project management, no reward and recognition system in place and insufficient resources (funding and personnel) are the factors that significantly influence the failure of web-based application IT projects in Malaysia.

Conclusions

The current study is an investigation of the factors that influence the failure of web-based application of IT projects. A large number of studies focused on critical success factors for IT projects; however, many projects still fail. This research was carried out to bridge the existing gap by focusing on the factors that influence the failure of web-based application of IT projects. Thus, the purpose of the present study was to identify the factors influencing failure of web-based application of IT projects, particularly in the context of Malaysia. The survey questionnaire was distributed to IT project managers across Malaysia who had in-depth understanding on the factors influencing the failure of web-based application of IT project. The findings show that five independent variables affect the failure of web-based IT projects namely; 1) lack of clarity of goals, 2) low teamwork quality, 3) ineffective project management, 4) no reward and recognition system in place and 5) insufficient resources (funding and personnel). In this study, lack of clarity of goals is identified as one of the factors for the failure of web-based application of IT project. It reveals that the more unclear the goal, the higher the failure rate of web-based application of IT project. Before starting off a project, the project goal should be clearly defined and communicated to all the stakeholders in order to avoid the project implemented system features which do not meet the project scope (Qassim, 2007). This is important in order for the project team members to be fully committed to achieve the project objectives. Research done by Zwikael (2010) also found out that the goal clarity is the key determinant of project effectiveness. Team members' resources were used at the maximum level because they understand the goal that they need to achieve at the end of the project, therefore it can stir up their action and energize them (Locke, 2002). Locke (2002) also concludes that when the goals are clearly defined at the beginning of the project team formation, the project team members tend to focus their attention and effort directly toward relevant activities that will lead to the success of the project rather than being distracted by extraneous activities that will cause failure to the project. Low teamwork quality is identified as one of the factors for the failure of web-based application of IT project. It reveals that the lower the teamwork quality, the higher the failure rate of web-based application of IT project. This finding is supported by Carlos (2005) and OGC (2005). Building of high-quality team requires a lot of efforts (Adam, 2009), for example goal-orientated involvement fosters greater self-awareness. However, the effectiveness in an organization actually comes hand by hand with appropriate skilled and trained practitioners who will make the right decisions to integrate, implement and transform data and information in order to achieve the project goals. Therefore, the importance of the project team should not be taken slightly in any project.

In this research, ineffective project management has been identified as one of the factors for the failure of web-based application of IT project. This finding is supported by Rajan (2011), Harper (2011), Krigsman (2008), Speight (2007), Qassim (2007), Carlos (2005), Al Neimat (2005), OGC (2005), Gartner (2004), Winters (2003) and Sosik (2000). Zhang's (2003) research indicated that companies should implement effective project management strategy to control the implementation process, avoid the overrun of budget and ensure the implementation is on schedule. In order for the IT project to be managed effectively, Best Practice Project Management framework which covers project schedule, plans, monitoring and feedback, and risk management can be applied in project management (Al-Mudimigh, 2001). The project schedule and plan should be detailed becasue it is linked to the project goal, clear definition of the project objective, the resource planning and tracking of project progress (Shanks, 2000). A realistic project schedule is important to ensure the project would be completed

on time (Zhang, 2003). Some of the projects are given unrealistic project due date without further understanding the requirements and work needed to be done to complete the result. Consequently, the unrealistic project schedule is one of the main reasons for project schedule revision (Kumar, 2003). Furthermore, tight or unrealistic project schedule will exhaust the project team, under the time constraint pressure, the quality of the project might compromise in order to complete the project deadline. This will cause more problems once the project is released to production environment. If the project is not as per user requirements or there are a lot of system bugs, the end user might refuse to use the system. More seriously, the whole implemented IT project might become a white elephant.

In this research, no reward and recognition system in place has been identified as one of the factors for the failure of web-based application IT project. This finding is consistent with Rajan's (2011) research. Reward systems work as a powerful management tool for attracting, motivating and retaining employees (Mulvey, 2002). When project team members are attracted and motivated by the reward once the project is completed, they will not only stay in the project but will also ensure the project is implemented successfully. Regardless of whether the reward is nonmonetary or monetary, a higher caliber of employees would be attracted to such organizations and possess a desire to stay with a company longer when reward and recognition programs are used (Abendschein, 2004).

In this research, insufficient resources (funding and personnel) have strong positive significant effect on IT web-based project failure (any combination of exceeding budget, exceeding schedule, and not within the scope; not meeting scope). This finding is in convergence with studies by Krigsman (2008) and Carlos (2005). Financial capacity is a crucial factor that might influence the successful implementation of an IT project. This is because financial resource allocation to an IT project is a key factor for the company to make an appropriate decision on make-or-buy decision, scope of the project, training, purchasing of hardware and other related costs. Normally organizations fear that implementation of IT project could require additional financial resources to hire consultants or hire headcount with required skills. Training of people to utilize the new IT system also requires additional financial resources from the company (Pius, 2006). Thus, company needs to ensure there is sufficient funding allocation for the implementation of a new IT project as a lot of factors are related to the new IT system. Management needs to decide the scope of the IT project according to the resources' allocation (funding and personnel). Insufficient resources (funding and personnel) with unrealistic scope will lead to the failure of IT project implementation. Krigsman (Carlos, 2005) also mentioned that some of the companies were trying to make it cheap. Organizations want all the features in the IT system but they do not want to invest the time and money. According to Krigsman, many projects get completed using this strategy but most of the projects run over budget, delayed, missed out many features and had many various quality or process issues due to the quick and dirty approach. The project managers, team members and other stakeholders of web-based application of IT project can spend more time and resources focusing on these contributing factors in order to implement the project successfully. As a result, the improved project outcomes will deliver more value to the business due to the increase in the customers' satisfaction level which later generates a higher return on investments for web-based application of IT project.

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Appendix

Table 1. Possible reasons for the failure of the web-based application of IT projects

No	Factors	Authors													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Deviation from timetable/ budget														√
2	Lack of technical knowledge			√											
3	Lack of leadership			√											√
4	Ignoring project warning signs						√								
5	Enterprise management of budget resources						√								
6	Inadequate testing Processes						√								
7	Competing priorities						√								
8	Lack of prioritization and project portfolio management						√								
9	Lack of organizational support						√						√		
10	Business politics						√						√		
11	Provides universal templates and documentation						√						√		
12	Insufficient resources (funding and personnel)			√			√								
13	Poorly defined roles and responsibilities					√	√								
14	Poor control against target					√									
15	Number of organizational units involved					√									
16	Misunderstanding of scope/objective requirements					√									
17	Staff turnover					√									
18	Change is senior management ownership					√									
19	Inadequate skills and mean					√		√							√
20	Manager fail to plan and manage change									√					
21	Manager fail to plan and manage scope									√					
22	Lack of perceived usefulness		√												
23	No change control process		√	√		√	√					√		√	
24	Business reasons for project failure		√												
25	Business strategy superseded		√												
26	Failure of parent company to deliver		√												
27	Higher cost of capital		√												
28	Estimates for cost and schedule are erroneous		√				√						√		
29	Inappropriate disaster recovery		√												
30	Misuse of financial resources		√												
31	Lack of clarity of goals		√			√	√	√			√			√	√
32	Take over of client firm		√												
33	Too big a project portfolio		√												
34	Bad decisions						√		√						

Table 1 (cont.). Possible reasons for the failure of the web-based application of IT projects

No	Factors	Authors													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
35	Lack of critical success factors measurement								√						
36	Lack of users' involvement					√	√	√	√		√			√	
37	Poor teamwork quality						√		√						
38	Poor vendor management			√		√			√						
39	Governance issues within the contract		√		√										
40	Unrealistic timeframes and tasks				√	√	√	√						√	
41	Deficiencies in organizational change management				√						√				
42	Ineffective communication			√	√		√	√					√		
43	Overruns of schedule and cost		√		√		√								
44	Incomplete requirements & specifications				√		√				√		√	√	
45	New or radically business process/task				√	√									
46	Stakeholder conflict				√	√	√								
47	Employment of new technology				√	√									
48	Copy-and-paste deployment														
49	Failure to set and manage expectations	√		√	√	√	√						√		
50	Poor risk management	√			√		√								
51	Lack of top management support	√		√	√	√	√	√	√				√		
52	No Infrastructural support to teams working on projects	√													
53	No feedback and monitoring process was available	√													
54	No reward & recognition system in place	√													
55	Ineffective project management	√	√	√	√	√	√	√	√		√		√		√
56	Lack of effective methodologies	√				√									

Source: [1]Ranjan (2011), [2]Harper (2011), [3]Krigsman (2008), [4]Speight (2007), [5]Qassim (2007), [6]Carlos (2005), [7]Al Neimat (2005), [8]OGC (2005), [9]Schriver (2004), [10]Gartner (2004), [11]Hinge (2003), [12]Winters (2003), [13]Coley (2001), [14]Soski (2000).

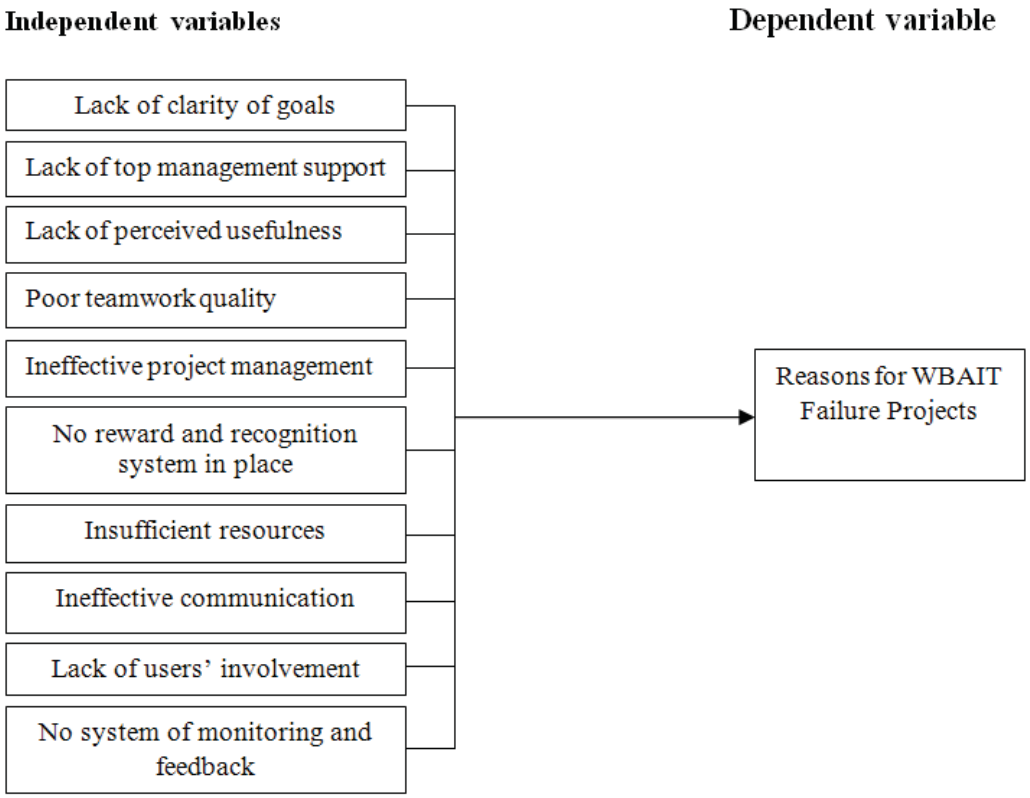

Fig. 1. Research framework

Table 2. Profile of the respondents and reasons for project failure

Demographic factors		No. of respondents	%
Gender	Female	59	38.1
	Male	96	61.9
Age	< 30 years	15	9.7
	30-39 years	91	58.7
	40-49 years	38	24.5
	50-59 years	11	7.1
PMP	Yes	40	25.8
	No	115	74.2
Education	Diploma	6	3.9
	Degree	121	78.1
	Master	27	17.4
	Ph.D.	1	0.6
Experience	< 3 years	55	35.5
	4-6 years	51	32.9
	7-9 years	11	7.1
	> 10 years	38	24.5
Industry	Electric	3	1.9
	Electronic	55	35.5
	IT service provider	97	62.6
Project size	Small	76	49.0
	Medium	50	32.3
	Large	29	18.7
Reasons for Project failure	Time	25	16.1
	Cost	28	18.1
	Scope	42	27.1
	Combination of the above	60	38.7

Table 3. Summary of the results of binary logistic regression models

Variables	Dummy 1 (IV on DV)			Dummy 2 (IV on DV)			Dummy 3 (IV on DV		
	Exp(β)	Wald	*p*-value	Exp(β)	Wald	*p*-value	Exp(β)	Wald	*p*-value
Lack of clarity of goals	2.282	5.251	0.022*	0.754	0.552	0.457	0.836	0.249	0.618
Lack of top management support	0.703	1.183	0.277	1.030	0.007	0.934	1.354	0.631	0.427
Lack of perceived usefulness	0.704	2.163	0.141	1.242	0.776	0.378	0.756	1.008	0.315
Poor teamwork quality	0.353	6.307	0.012*	3.221	6.353	0.012*	0.640	1.126	0.289
Ineffective project management	1.166	0.189	0.663	0.374	5.481	0.019*	1.577	0.993	0.319
No reward and recognition system in place	1.278	1.091	0.296	0.826	0.566	0.452	0.689	1.525	0.217
Insufficient resources (funding and personnel)	2.355	5.747	0.017*	0.565	2.570	0.109	1.203	0.224	0.636
Ineffective communication	1.679	3.085	0.079	0.992	0.001	0.981	1.062	0.025	0.873
Lack of users' involvement	0.607	2.179	0.140	1.362	0.643	0.423	0.964	0.008	0.929
No system of monitoring and feedback	1.258	0.668	0.414	1.851	3.263	0.071	0.727	0.775	0.379
Step	$\chi^2 = 20.800$, $p < 0.05$			$\chi^2 = 23.539$, $p < 0.05$			$\chi^2 = 6.884$, $p > 0.05$		
Block	$\chi^2 = 20.800$, $p < 0.05$			$\chi^2 = 23.539$, $p < 0.05$			$\chi^2 = 6.884$, $p > 0.05$		
Model	$\chi^2 = 20.800$, $p < 0.05$			$\chi^2 = 23.539$, $p < 0.05$			$\chi^2 = 6.884$, $p > 0.05$		
Homser & lemeshow test	$\chi^2 = 7.584$, $p > 0.05$			$\chi^2 = 15.915$, $p > 0.05$			$\chi^2 = 10.135$, $p > 0.05$		
Nagelkereke *R*-square	0.170			0.204			0.071		
Overall percentage of correct classification	68.4%			75.5%			-		

Note: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table 4. Summary of the results of discriminant analysis

Variables	Dummy 1 (IV on DV)		Dummy 2 (IV on DV)		Dummy 3 (IV on DV)	
	Wilks' Lambda	*F*-value	Wilks' Lambda	*F*-value	Wilks' Lambda	*F*-value
Lack of clarity of goals	0.969	0.027*	1.000	0.977	0.993	0.311
Lack of top management support	0.979	0.071	0.995	0.392	1.000	0.978

Table 4 (cont.). Summary of the results of discriminant analysis

Variables	Dummy 1 (IV on DV)		Dummy 2 (IV on DV)		Dummy 3 (IV on DV)	
	Wilks' Lambda	*F*-value	Wilks' Lambda	*F*-value	Wilks' Lambda	*F*-value
Lack of perceived usefulness	1.000	0.951	1.000	0.905	0.993	0.298
Poor teamwork quality	0.999	0.694	0.987	0.157	0.986	0.144
Ineffective project management	0.990	0.205	0.997	0.465	0.997	0.513
No reward and recognition system in place	0.969	0.029*	0.991	0.236	0.988	0.172
Insufficient resources (funding and personnel)	0.954	0.007**	0.972	0.038*	1.000	0.785
Ineffective communication	0.984	0.118	0.998	0.609	0.996	0.415
Lack of users' involvement	0.998	0.553	0.994	0.349	0.992	0.282
No system of monitoring and feedback	0.994	0.320	0.978	0.068	0.989	0.197
Box's M (Sig)	0.000, $p < 0.05$		0.000, $p < 0.05$		0.018, $p < 0.05$	
Correct classification	62.6%		65.8%		60.6%	

Note: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table 5. Power comparison between discriminant analysis and binary logistic regression analysis

Model	n = 155											
	Dummy 1				Dummy 2				Dummy 3			
	YI	Likelihoods		DP	YI	Likelihoods		DP	YI	Likelihoods		DP
		p+	*p*-			*p*+	*p*-			*p*+	*p*-	
Discriminant analysis	0.27	1.67	0.56	0.26	0.28	1.87	0.59	0.27	0.19	1.48	0.70	0.18
Binary logistic regression	0.28	2.74	0.67	0.34	0.16	5.38	0.84	0.45	0.00	0.00	1.00	0.00