Scientific Journal of Impact Factor (SJIF): 5.71

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 6, Issue 01, January -2019

EFFECT OF PEOPLE FACTORS ON EXECUTION PERFORMANCE OF SOFTWARE DEVELOPMENT PROJECTS IN SRI LANKA.

Duimnda Weeraratne[1], Prof. Dr. Md Gapar Md Johar[2],Prof. Dr. Ali Khatibi[3],Dr. S. M. Ferdous Azam[4]

[1]*Management and Science University, Malaysia*
[2]*Management and Science University, Malaysia*
[3]*Management and Science University, Malaysia*
[4]*Management and Science University, Malaysia*

Abstract - *Software Development Industry is one of the key players of the Sri Lankan economy. Hence, the performance of software companies is a very crucial factor for the growth of the country. Since software development activities bear the characteristics of projects, primary management method used by the industry to produce software is project management methodology. However it is evident that the success rate of software projects in the industry is not at a satisfactory level. One of the major causes of higher failure rate is lack of good project management practices. Projects are implemented applying five phased project management lifecycle namely; initiating, planning, executing, monitoring and controlling and closing. A number of critical success factors influence the performance of these phases. This article aims to examine the effect of people factors on execution performance of software development projects in Sri Lanka. Main people factors considered are, project manager experience, team capability, user contribution, and customer contribution. Data was collected from 298 managers using a web based tool. The reliability of the data was analyzed using Cronbach's alpha coefficient. The relationship between variables was measured using Pearson correlation test. Regression analysis was used to ascertain the effect of variables. The results indicate that Team capability is significant predictors of execution performance of software development projects in Sri Lanka.*

Key Words-*Project Management, Execution Performance, Project Manager Experience, Team Member Capability, Customer Involvement, User involvement.*

I. INTRODUCTION

Information Technology has become a part and parcel of our lives today. It is used to manage all types of activities of our lives namely; business, government, nonprofit, personal, domestic etc. The benefits reaped form this new tool mainly depends on the quality and cost of the software that is available for use. Software development efforts are managed as projects as the nature of the software development activities bear characteristics of projects. Hence software development projects draws knowledge and skills from both the disciplines of software development and project management. Project management is a critical success factor of IT industry, since IT industry's all development activities are project based [1]. Reference [2] found that Project management positively affect project time, cost, effort and outcome. When projects are carried out effectively and efficiently, projects are completed successfully achieving both business and project objectives.

Unfortunately Software project failure rate have been very high since its inception. A large and growing body of literature has investigated software project success and failure. Reference [3] found that the majority of software development projects are not completely or well developed and some of them are even cancelled. Reference [4] the Reference[5], Reference [6]identified project management as a very challenging management function since a lot of projects fail in their scope, time and cost objectives. Reference [7] showed that Software project failures are rising up every day. Reference [8] Reference [9] maintain that despite the successful application of software to many areas, software development projects have a reputation for higher failure rate; they are e.g. late, over-budget, or not able to satisfy customers' needs. Greater number of software development project are not successfully completed or cancelled prematurely [10], [11]. Reference [10] indicates that average success rate of a software project from 2011-2015 is 29%.

Reference [12], Reference [13] and Reference [14] found that causes of IT project failure are mainly due to project management and organizational behavior related factors rather than technological factors. Reference[15] maintain that success of software development projects mainly depends on the application of comprehensive project management processes. Hence, success of software development projects depends on proper projects management practices [11]. According to Reference [16], projects should be selected after assessing their alignment with organizational objectives. Successful execution of projects generates short and long term positive impacts on organizational performance. Project success rate can be increased by applying good project management practices [17]; [18]; [19];[20]; [21]; [22]; [23]; [24].Project management provides an organization with powerful tools that enhance the ability to plan, execute and control activities, people and all the involved resources [25].

Software industry is one of the fastest growing industries in Sri Lanka. It is the 5th largest foreign exchange earner and one of the major employment generators for professionals (Sri Lanka Association of Software and Service Companies,[26].The export revenue from the industry has grown rapidly since 2007. In 2007 export earning was $213 million and it has grown to $850 million by 2015. IT-enabled service exports were the fifth largest foreign-exchange earner in2015. By 2022, it is expected that the IT and BPO industry will be the country's primary source of export revenue earner with a sales value of US$5 billion [26].As far as employment generation is concerned, in 2007, industry employed 33702 professionals and in 2013 it rose to 75107. The industry plans to reach a target of 200,000 by 2022. [26]

However, software project failure is a major factor that hinders growth potentials of the industry. Reference [27] reported that Sri Lankan software development companies too experience failures, even though the data is not available on cost of failure. A recent study carried out in Sri Lankan context indicates that 35% of software development projects fail in Sri Lanka. The main causes failure are identified under two categories. Lack of clear goals and objectives, lack of good estimates, and poor risk management are identified as planning related factors. Under project execution related factors, the study identifies lack of leadership, lack of team work and lack of good control mechanism [28].Madhu Fernando, presenting a paper at the [29] on the theme "Maximizing IT Project Performance through Better Governance", stated that 70% of the IT projects in Sri Lanka failed to meet the specified requirements.
Reference [1] in his study on impact of agile project management practices on enhancing the IT project success in Sri Lanka, interviewed top IT consultants and senior manager of leading companies in Sri Lanka, and established the low rate of IT project success in Sri Lanka. This was attributed to the lack of good project management practices in software development activities.
Reference [30], in their study on Key risks in software project management in Sri Lanka have found several critical sources of risks for projects. From this list, those relevant to execution process are; scope creep, existence of unspoken requirements, not allocating sufficient time for requirement gathering, lack of understating of client's requirement by the project team, lack of time contingency, increasing defects, and inability to reach key client reps for critical requirements.

A large no of Studies have been carried out on software project management practices in other countries. Very limited studies have been carried out on Sri Lankan industry. Further, a majority of studies have investigated factors that influence project out comes. There is limited research that explores relationship between critical success factors and performance of major phases of project lifecycle. Project management life cycle consists of five phases namely; initiating, Planning, Execution, Monitoring and controlling, and Closing [16].Execution and controlling process groups interacts throughout and occur simultaneously. Therefore for the purpose of this study executing and controlling will be considered as a single phase. Furthermore, Highest level of activity occur during execution and controlling phases (50.5%) and these activities occur almost throughout the project management life cycle. Therefore, their influence on project outcome is high [16]. Very limited studies have been done on factors that influence execution performance of projects. This study hopes to bridge the existing literature gap in this area.
The evidence presented in this part reveals that software project failure is a critical problem common to most of the countries. Limited research indicates that Sri Lankan software industry too has similar experience. Main cause of failure is lack of project management. Moreover, it is observed that most of the previous studies have examined the direct relationship between critical success factors and project outcomes.
This paper examines critical success factors that influence execution performance of software development projects in Sri Lankan Software Development Industry. The study reviewed the existing literature on critical success factors for software projects and investigates effect of people related factors on execution performance. Data collected using a web based survey from 298 project managers and project leaders from software development companies in Sri Lanka from Jan 2017 to July 2017. The collected data were analyzed using descriptive statistics, reliability test, correlation and multiple regression methods.

2. LITERATURE REVIEW

2.1..Critical success factors for software development projects

Critical success factors are selected few important areas, successful application of which guarantee project success. Reference [31]; Reference [32]; Reference [33]; Reference [34] Reference [13]; Reference [35].Projects being unique entities, which critical success factors work for a project depends on many factors? Therefore organizations should identify specific critical success factors that work for their projects and concentrate on them [27].Identification of the important factors that causes success in projects and focusing on them at the right time increases the chances for success [36]
Project execution is the process of implementing the project plan and completing the work defined in the plan to deliver project specifications. During this process project plans is subject to updates. The largest amount of the project effort (33%) will be applied on execution 16]. Project monitoring and controlling process too is performed concurrently with execution

phase. Project monitoring can be defined as measuring the progress of the project and comparing the progress information against the plan and taking corrective and preventive actions where necessary. Monitoring and control activities expend17.5% of the project effort [16]. Both execution and monitoring and control activities together expends 50.5% of the project effort. Therefore, critical success factors that influence these phase are worth investigating.
Reference [37]grouped critical success factors under five categories ie; project, leadership, team, environmental and organizational. People related factors that are falling under these five categories are project manager competence, user commitment, technical background of the team, and client involvement. One of the major resource used to build software is people. According to Reference [38],"The key stakeholders involved in software development projects are; senior management, project manager, team members, system architects, users, venders, suppliers, and customers.
Reference [39], in their extensive literature survey identified 26 critical success factors for software project success and they were grouped under people, process and technical categories. Ranking given to some of the critical success factors is used as the criteria for choosing success factors for the study. Execution performance related factors identified by this study with their ranking are; Up-to-date progress reporting -14, Effective monitoring and control- 16, Risk management - 18, Effective change and configuration management -20, Good quality management -23, Effective communication and feedback-7. People related factors identified with their ranking are; Effective project management skills/methodologies (project manager) - 4, User/client involvement- 6, Skilled and sufficient staffs -9.

The evidence presented in this section justifies the demand to examine effect of people factors on execution performance of software development projects. Hence, critical success factors identified for the study are; Project execution performance (Process factors, dependent variable), Level of Experience of project manager, Team capability/Competence, User contribution, and Customer contribution (people factors, independent variables).

2.2 People factors for execution performance (PEP)

As mentioned in the previous section, a large number of stakeholders are involved in all phases of a software development projects. Previous studies have identified four stakeholders as important for software development projects. These stakeholders are Project manager, project team, user and client. The people factors related literature reviewed in this section are; knowledge, skills, experience, contribution and commitment of the identified stakeholders. A study conducted by Reference [40] found that capability of people involved in the project is an essential factor that influences project success. One major reason for failure is people from both customer and supplier's side lack kills to implement best practices.

2.2.1 Project manager experience (PME)

Project manager (PM) is the person appointed by the performing organization to lead the team towards project objective. Projects managers in most of the situations get involved in project activities from initiation through closing [16].Project manager (PM) plays the most vital role on a project. Project manager is responsible for preparing a plan with the team, coordinating execution, monitoring and controlling and closing activities of the project. PM should make sure that these activities are carried out adequately to meet the completion criteria [16].

Reference [41] showed that the role of the project manager is to develop a plan considering stakeholder requirements, defining project activities, creating a an organizational structure, allocating resources, assigning team members to the project, providing leadership and monitoring and controlling the project performance. Reference [42]showed that project manager can control most of the factors that cause project failure.

Projects that were managed without skilled and experienced project managers are more likely to fail. **Reference** [43]; Reference [44]; Reference [45];Reference[46]have revealed on the importance of team Skills and availability of sufficient Staff for software development project success. A number of studies have reported that good project management skills and use of project management methodologies by projects managers as demanding factors for project success. [43]; [44]; [47]; [48]; 49]; [50]
Reference [10] CHAOS report indicates top 10 success factors for software development projects. One of them is Project management expertise. On the role of the project manager [28]found that Project success can depends on project managers skills, experience and personality.
Evidence presented in this section suggests that project manager's experience is a critical factor for project success.

2.2.2 Team capability and experience (TCE)

A large and growing body of literature has investigated the effect of team member capability and experience on software project success. Number of authors has indicated that team knowledge and skills is a critical success factor for software project success Reference [51]; Reference [17]; Reference [18]; Reference [21]; Reference [52]; Reference [53]; Reference [23].Further , Reference [2] showed that Project team member knowledge, experience and commitment positively affect project time, cost, effort and outcome. Reference [54]maintain that deploying team members with high level of competence and expertise ,and greater motivation, as a critical success factors for projects.

Reference [55] identity that team members with required qualifications and previous experience in similar previous projects are critical success factor for project. Projects that were managed without skilled and experienced team members are more likely to fail. Reference [44]; Reference [44]; Reference [45]; Reference [46]has revealed on importance of team Skills and availability of sufficient Staff for software development project success. This argument is supported by [56], [38], [57]who maintain that team capability is a critical success factor for software projects success.

Reference [40]identified that capability of people assigned to the project as important factor that influences project success. Reference [52]capable team members are critical factor for project success. Reference [58] proposed that team members should possess the required skills and team work competencies in order to run projects successfully. Reference [28]showed similar findings regarding knowledge and experience of the project team. As noted by him, qualifications and the expertise of the project team is an important factor for project success.

Reference [59]; Reference [60]; Reference [61] identified project personnel competency and project mission as micro project success factors. According to Reference [62], Reference [63] some of the team related critical success factors of projects are; team skills and competencies, self motivation, team member experience, coordination and communication among the team.
Together, these studies outline that project team member capability and experience is a critical success factor for software development projects.

2.2.3 Customer and user contribution

Customer and user involvement, their cooperation, and support during the software development projects are very crucial factors for project success. The relationship between user/customer involvement and project success has been widely investigated. User/customer contributes to projects during execution and controlling stages of a projects by way of clarifying and refining requirements, validating deliverables, requesting changes in a timely manner, approving changes initiated by the team, and, participating in reviews.

Reference [55] reported that projects that concentrate on user needs achieve objectives successfully. In the mean time they found that projects that do not pay required attention to user needs are likely to become unsuccessful.

User insolvent and commitment positively affect project time, cost, effort and outcome [2].Customer's persistence and commitment to the project positively affect project time, cost, effort and outcome [2]
Reference [56], Reference [57], Reference [38] in their studies have established that customer involvement as a critical success factor for successful IT projects.
Reference [64] found that strong customer involvement as a critical success factors for project success. Reference [65]; [66] showed that user involvement is an essential factor for successful completion of information system projects.

Reference [44];[67];[45]; [48];[68]; [69];[50]; [5]; [43]; have revealed that customer and user involvement in software development projects with required commitment, contributes to project success a great deal.

The studies presented thus far provide evidence that user and customer involvement are important critical success factors for software development projects success.

2.3 Execution performance (EP)

Literature reviewed in the previous sections of this paper highlighted the importance of effective execution for project success. Execution and monitoring and controlling processes are one of the key stages of project management lifecycle. Sufficient monitoring and controlling mechanism ensure that project objectives are achieved successfully [55].According to the Reference [16], execution is the process of implementing the work defined in the project management plan and affecting changes approved by the change authority. Activities that comes under this process is; completing project deliverables, training and development of team, distributing information, assuring quality, initiating change requests and effecting changes, selecting sellers and contracting with sellers, and managing stakeholders.
Monitoring and controlling project work is the process of measuring performance of the project activities, comparing them against the plan, and taking correcting and preventive action where necessary. The main activities of monitoring and controlling processes are identifying new risks, reassessing existing risks, performance reporting, quality control, monitoring execution of changes, and configuration management [16].

According to ITS Reference [70] managing a project includes implementation of all the activities of the project by the team and the project manager as per the plan. Reporting project status to senior managers is a critical success factor in execution. Meetings with senior executives should be scheduled. Project managers meeting with senior management and sponsor should

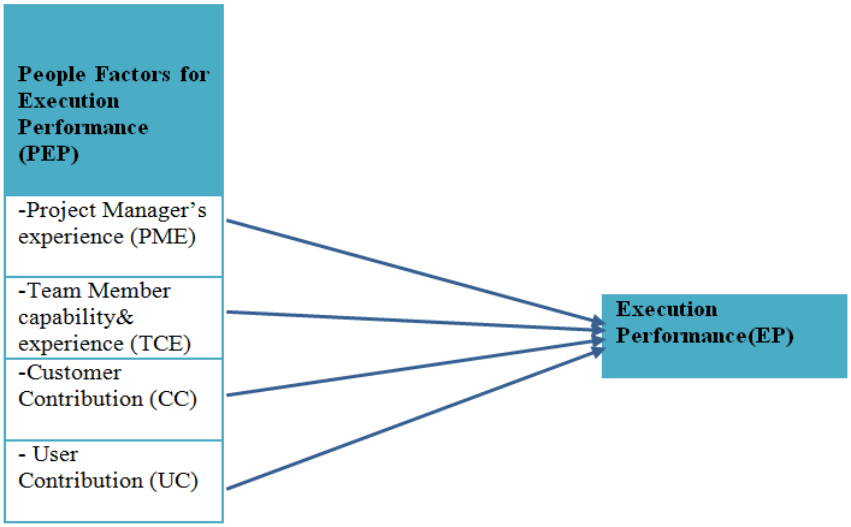
focus on solving issues, verifying deliverables, tracking project milestone progress. Reference [71] found weekly status meetings with client and weekly progress review meetings with the team as effective methods for monitoring and controlling project performance. Many Previous studies have reported that Effective monitoring and control as a critical success factor for software development projects [72]; [68]; [48]; [68]; [73]; [45]; [43]. [74] identifies six critical success factors for project success. Of these six factors following are related to execution and control; use of valid measurements, proper project milestone tracking, having a good change control system, use of good quality control practices,
Configuration management system with processes, activities, tools and methods is used to manage configuration items of the project. [16].Configuration management focuses on specifications of outputs and processes. Configuration management activities are; configuration identification, configuration status accounting, and configuration verification and audit. [16].

Quality assurance and quality control are important activities of project execution and controlling process. Reference [74] identified that use of good quality control mechanism as an important factor of effective execution of a project.
Overall, these literatures highlight the activities of execution process of a software development project and it's importance for project success.

2.4 Theoretical framework

The objective of this study is to examine effect of people factor on project execution performance in Sri Lankan Software development industry. Previous studies done in UK, USA, Australia support positive relationship between people factors, and project outcome. However very limited studies have focused on the effect of people factors on execution performance. Moreover, no study on similar investigations has been done in the Sri Lankan context. Thus, a research framework is designed considering the relationship between main variables(Figure.1). Accordingly, the variables identified in the research framework are: Project manager experience, Team capability and experience, customer contribution and user contribution as independent variables and execution performance as the dependent variable.
The literature reviewed thus far provides evidence that execution consist of completing project deliverables, training and development of team, distributing information, assuring quality, initiating change requests and effecting changes, selecting sellers and contracting with sellers, managing stakeholders, identifying new risks, reassessing existing risks, performance reporting, quality control, monitoring execution of changes, and configuration management .Use of project manger experience for above mentioned execution activities is investigated. As far as team capabilities are concerned, contribution of team knowledge, skill, experience and commitment for execution activities is examined. In respect of customer and user involvement, their level of contribution and commitment towards execution process is examined.

Figure 1 – Theoretical Framework



2.5 The statement of hypotheses

The primary objective of this research study is to identify the impact of people factors on execution performance of software development projects in Sri Lanka. With the view of achieving this objective, following hypothesizes are developed.
H1: There is a positive relationship between the experience of the project manager and execution performance
H2: There is a positive relationship between the team member capability and execution performance
H3: There is a positive relationship between the customer involvement and execution performance
H4: There is a positive relationship between the user involvement and execution performance

3. RESEARCH METHODOLOGY

This section presents research design, population, sample, designing instruments, data gathering procedures and statistical analysis.

3.1 Sample and data collection

Population considered for the study is software development companies actively operating in Sri Lanka. A list of most updated software development companies are not available from any of the institutes and bodies responsible for various aspects of the industry. Information and Communication Technology Agency (Sri Lanka) ICTA has carried out a salary survey on Sri Lankan Software Industry in 2009. It has surveyed 291 companies. Export Development Board(EDB)has carried out a IT export value survey in 2010, and it has surveyed 598 IT companies. All the lists were amalgamated and list of 456 companies were created. Those software companies registered after 2010 were obtained from registrar of companies and final list was prepared. This contained 547 companies and it was decided to verify their existence using web addresses and telephone numbers. Since there were a large number of non-responses, it was decided to send the questionnaire to all the companies in the list.

3.2 Data collection

Both primary and secondary data were used to investigate the relationships. The main data required for the study were related to software development companies, project manager/team leaders, and software development projects. Data was collected between February 2017 to July2017.

Primary data were gathered using a questionnaire form project manages and project leaders of software development companies. The questionnaire was posted on a web based data collection tool and the access link was sent to companies through e-mails. Questionnaire consists of five parts; questions on Project manager experience, team capability and experience, customer involvement, user involvement and execution performance. The first four variables were measured using a Likert five scale models with rating from very high to very low. The scale was structured in the following manner.5 Very high; 4= High 3= Average 2= Low and 1= Very Low. The dependent variable " execution performance" was measured using a Likert five scale models with rating from Strongly disagree, Disagree , Neutral , Agree , Strongly agree, The scale was structured in the following manner.5 Strongly agree; 4= A/*gree 3= Neutral 2= Disagree and 1= Strongly disagree. The questionnaire was sent to 547 companies and 324 responses were received and 26 Questionnaires contained missing data and they were omitted from the data analysis process. Remaining 298 responses were considered for the study.

3.3 Analysis and results

Software Package for Social Science (SPSS) version 21 was used to analyze thedata. Statistical techniques used were descriptive statistics, reliability test, correlation and multiple regression analysis. The questionnaire was pilot tested with a sample of 35candidates.Further,the validity of the questionnaire was confirmed by experts in this field of project management. The reliability of the data was analyzed using Cronbach's alpha coefficient (Table 1).The relationship between variables were measured using Pearson correlation test (Table 2).Regression analysis was used to ascertain effect of variable(Table 3).

3.4 Reliability analysis

In the process of reliability analysis, firstly the internal consistency of the scale that were used were determined. Cronbach's alpha analysis technique was applied using SPSS 21 version to measure reliability of the questionnaire. According to Reference [75]Conbach'sAlphs value less than 0.6 is consider as poor and more than 7 is acceptable for the study. Table 1 presents the cornbach's alpha values for three variables; Project Manager experience for execution(.898),Team knowledge and experience for planning (.851),Execution performance(.884).

Table 01 Cronbach alpha of questionnaire's Dimensions

Dimensions	Cronbach's alpha
PME	.898
TCE	.851
EP	.884

3.5 Descriptive statistics and correlation

Mean score and standard deviation was determined for 298 cases examined for four independent variables and the dependent variable examined for the study. The output of the descriptive statistics is as shown in Table 2.The mean score for all the variables were recorded above 3.0. PM experience recorded the highest (3.98). The execution performance recorded 3.47 and

team knowledge and experience 3.61. Mean score for user involvement is 3.0 and customer involvement is 3.25.This results further indicates that execution performance (dependent variable) of the software companies are at average level and the independent variables; PM experience, team knowledge and experience, user involvement and customer involvement are at average level. However, user involvement in execution is seen to be low compared to other three variables. The standard deviation for four independent variables recorded as follows; PM experience.61, team knowledge and experience.60, customer involvement .93, showing significantly small variability. However, user involvement recorded 1.06 demonstrating comparatively a larger variation in the data set for this variables. The execution performance recorded .65 standard deviation demonstrating small variability in the data set.

The correlation analysis results are; CC.318, UC.234, PME.349, TCE. 463. which proved the existence of correlation between dependent and independent variables.

Table 02 Descriptive Statistics and Correlation

Variable	Mean	SD	EP	PME	TCE	CC	UC
EP	3.47	.65	1				
PME	3.98	.61	.349**	1			
TCE	3.61	.60	.463**	.351**	1		
CC	3.25	.93	.318**	.342**	.240**	1	
UC	3.00	1.06	.234**	.155**	.102	.437**	1

**. Correlation is significant at the 0.01 level (2-tailed).

3.6 Hypotheses testing

Multiple regression technique was used to test H1, H2, H3, and H4. The test examines if EP depends on PME,TCE ,CC ,and UC. Using the regression techniques EP was tested as the dependent variable and the PF as the independent variable. The results are presented in the table 3.

Table 3 Results of Regression Analysis

Independent Variable	B	S.E β	t-value	Sig.	Tolerance	VIF
(Constant)	.752	.086	2.247	.026		
Role of Experience of PM for Execution	.016	.014	.212	.832	.748	1.336
Team knowledge and Experience for Execution	.172	.616	2.350	.020	.704	1.420
Customer Involvement in Execution	.020	.027	.403	.687	.766	1.305
User Involvement in Execution	.004	-.007	-.106	.916	.764	1.310
r2=0.362 Adjusted R2=0. 332		F=12.087		Sig. F=0.000[b]		

As per the results presented in table 3 (EP) depends on PF(PE,TC,CC,UC). According to(Chinna&Yuen,2015) the R square value ranges from 0 to 1 in social sciences and the desired minimum R squared value is 0.15. The R –squared value being 0.362, 36% of the variation in Execution performance is explained by the people factors. A large F- Value, followed by a small P-value, implies good fit in a regression model.(china & Yuen,2015). The P-value of the analysis is less than 0.000, which suggests that at least one of the four variables: PME,TCC,UC,CC can be sued to model PP. The equation is:

EP=.752+.016(PME)+.172(TCE)+.020(CC)+ - .004(UC).

Thus, for every unit increase in PME, EP is expected to increase by.016units provided other two variables remain unchanged. As far as other variables are concerned; for every unit increase in TCE,EP is expected to increase by 0.172,provided other variables remain unchanged. For every unit increase in CC; EP is expected to increase by .020 provided other variables remain unchanged and for every unit increase by UC, EP is expected to increase by .004 provided other variables remain unchanged.

Table 4 - Results of Hypotheses

Hypotheses	Results
H1a: There is a positive relationship between the experience of the project manager and planning performance	Not Supported
H1b: There is a positive relationship between the team member capability and planning performance	Supported
H1c: There is a positive relationship between the customer involvement and planning performance	Not supported
H1d: There is a positive relationship between the user involvement and planning performance	Not supported

P-values of TCE are less than 0.05. Thus, TEC is significant predictors of EP. Based on the standardized Beta coefficients; the effect of PME is (0.016), TCEis (.172) ,UC is (.004), and CC is (.020). Hence, the effects of TCE on EP are comparatively higher than other three variables. PME, UC and CC is having a comparatively lower effect on EP.
VIF values in respect of all four independent variables were recorded below 5 denying multi collinearity problems.

4. DISCUSSION AND IMPLICATIONS

Very little was found in the literature on the inquiry of effect of people factors on Execution performance in software development projects. The present study was designed to determine the effect of people factor on Execution performance of Sri Lankan Software development industry. As mentioned in the literature review, People factors considered are; PM experience, team knowledge and experience, customer contribution and user contribution which are positively related with project outcomes. What is surprising is that only team knowledge and experience is found to be positively related with Execution performance in Sri Lanak. It is found that other variables considered; PM experience, user involvement and customer involvementare not related to Execution performance. The results of this study will now be compared to the findings of previous work.This supportive finding related to team knowledge and experience is in agreement with many previous studies. Reference [51];[17]; [18]; [21]; [52]; [53]; [23], [28]: [76]found that team knowledge and skills is a critical success factor for project success.
It was hypothesized that Experience is positively related to execution performance of software projects. Large no of studies have proved effective project management skills and use of project management methodologies by projects managers as critical success factors for projects. Reference [29]concluded that project success depends on PM experience and personality. Project manager can improve in these areas by having access to education and training programs and by earning good working experience in projects [43]; [44]; [47]; [48]; [49] [50].It is somewhat surprising that the findings of this study do not support previous research on PM experience for project success. It was also explained in the previous section that PMs level of experience is at above average level. However, a possible explanation for this result is lack of PM involvement and contribution in execution activities. This laps is more likely to happen in the areas of monitoring and controlling.
In contrast to earlier findings, user and customer contribution does not show a positive relationship with execution performance. Many previous studies that supported this relationship are; [44]; [67]; [45];;[48]; [68]; [69];[77] ;[5]; [43].
A possible explanation for these results may be the lack of adequate commitment of the client and customer representatives towards the execution activities of the project. The general nor of the industry is that software development companies are ultimately held responsible for building the product as per the customer requirements, and customer and user accountability for such results are not formally negotiated. Due to these reasons customer and user do not take much interest to extend the required support for the execution activities of the project.
The present results are significant in at least three respects. Firstly, the companies should focus on team capability when recruiting them to organizations, which is generally a factor given priority in recruitment and selection. Further, organizations should create an conducive environment that facilitates PMs to contribute to execution activities whenever required. Secondly, software development companies should take necessary steps to include customer and user involvement related activities as contractual obligation in the initial contract signed with the customer so that expected support and contribution can be guaranteed. Thirdly, the researchers in Sri Lanka can use the conceptual model in Fig 1, to examine the behavior of these variables in other project driven industries like construction, engineering etc.

5. CONCLUSIONS

The main goal of the current study was to determine effect of people factor on execution performance of software development projects in Sri Lanka. In view of this, relationship between PM experience, team knowledge and experience, user involvement and customer involvement with execution performance were investigated. This study has shown that team knowledge and experience is positively related to planning performance conforming to findings of previous studies. Therefore they continue to be focus areas in planning in Sri Lanka. One of the more significant findings to emerge from this study is that other variables considered; PM knowledge and experience, customer and user involvement is not supporting execution performance. This finding is conflicting with previous studies and needed to be further investigated as to why this kind of behavior happens in Sri Lankan Software Industry.

ACKNOWLEDGEMENTS

The author of this research article wishes to thank his supervisors Prof. Dr. Ali Khatibi, Prof. Prof. Dato' Dr. MdGapar MdJohar, Dr. S. M. Ferdous Azam, and Dr Ganga Sajeewani Karunathilaka, for their expert advice, guidance and consistent support.

REFERENCES

[1] Nagasinghe S.D, "impact of agile proemct management practices on enhancing the IT project success in srilnaka" 8th International Conference on Business Management, Sri Lanaka (2011).
[2] Chatzoglou, P.D., Theriou, N.G., Dimitriadis, E. and Aggelides, V. "Software project management and planning: the case of the Greek IT sector", Int. J. Applied Systemic Studies, Vol. x, No. x, pp.305–316. (2007)
[3] Fernandes, G.; Ward, S.; Araújo, M. Identifying useful project management practices: A mixed methodology approach. // International Journal of Information Systems and Project Management. 1, 4(2013), pp. 5-21.
[4] DAI, C. X.; WELLS, W. G.An exploration of project management office features and their relationship to project performance, *International Journal of Project Management*, v. 22, p. 523-532, 2004.
[5] Standish Group International. Chaos Summary 2009: 10 Laws of CHAOS. Technical Report. (2009).
[6]Diana White, Joyce Fortune found that project outcome consists of some desireable side effects namely, increased business /sales opportunites, new understanding dnknwoldge gained by the team etc. 2002
[7]Emam, K. E., Koru, A. G. "A Replicated Survey of IT Software Project" (2008)
[8]Cerpa, N., Verner, J.M. 2009. "Why Did Your Project Fail?".Communications of the ACM. 52 (12), 130-134.
[9]Glass, R.L. (2006), The Standish report: does it really describe a software crisis?, *Communications of the ACM.* 49 (8), 15-16.
[10]Standish Group. Projects success rate.SG. 2015. URL: http://www.standishgroup.com/quarterly_reports/pdf_copy/q1_2007_sample.pdf. (10.03.2011.).
[11]Fernandes, G.; Ward, S.; Araújo, M. Identifying useful project management practices: A mixed methodology approach. // International Journal of Information Systems and Project Management. 1, 4(2013), pp. 5-21
[12]Fox, T. L.; Spence, J. W. Project Management, the effect of decision style on the use of project management tool: an empirical laboratory study. // SIMIS database. 36, 2(2005), pp. 28-42.
[13]Hartman, F., Ashrafl, R. Project Management in the Information Systems and Information (2002),
[14]Thamhain, H. J., Linkages of Project Environment to Performance: Lessons for Team Leadership. International Journal of Project Management, 22(7), 533–544, 2004.
[15] Cheng, C. C.; Law, C. H.; Yang, S. C. Managing ERP Implementation Failure: a project management perspective. // IEEE Transactions on Engineering Management. 56, 1 pp. 185-186. (2009),
[16]PMI (2017). *A Guide to the Project Management Body of Knowledge*: PMBOKR Guide, 6th Ed.: Project Management Institute.
[17]Ross, J. W. "Surprising Facts about Implementing ERP," IT Professional, 1, 65-68. (1999).
[18]Holland, C. R. & Light, B.. "A Critical Success Factors Model for ERP Implementation," Software, IEEE, 16, 30-36. (1999)
[19]Rosario, J. G. "On the Leading Edge: Critical Success Factors in ERP Implementation Projects" Business World, 17, 15-29. (2000).
[20]Murray, M. & Coffin, G. "A Case Study Analysis of Factors for Success in ERP System Implementations," Proceedings of the Seventh Americas Conference on Information Systems, 1012-1018. (2001).
[21]Sumner, M. "Critical Success Factors in Enterprise Wide Information Management Systems Projects," Proceedings of the 1999 ACM SIGCPR Conference on Computer Personnel Research, ACM, 297-303. (1999).
[22]PMI. "A Guide to the Project Management Body of Knowledge: PMBOKR Guide, 4th Ed" Project Management Institute (2004)
[23]Dezdar, S.&Ainin, S. "Examining Successful ERP Projects in Middle-East and South-East Asia," American Journal of Scientific Research, 13-25. (2012).
[24]Nah, F. F. H., Islam, Z. & Tan, M.."Empirical Assessment of Factors Influencing Success of Enterprise Resource Planning Implementations," Journal of Database Management (JDM), 18, 26-50. (2007)
[25]Meredith, J. R.; Mantel, S. J. "Project Management" a Managerial Approach. John Wiley and Sons, New York, 2005.
[26] Price Waterhous Corporation, SLASSCOM Strategey document, 2016
[27]Perera & Amaratunga, "sri lanka journal of business economics" volume3, 2010,pp-32-48 2012,
[28]FonsekaT. Sri Lankan Journal of Management,*Volume 14, No. 4 & Volume 15, No. 1(2011)*
[29] Madhu Fernando, ISACA annual conference, 2008
[30]Jayasena and Jayathilake, "Identifying Key Risks in Software Project Management In Sri Lanka" 5th International Conference on Business Management Sri Lanka. 2008
[31]Reel, J., S. "Critical Success Factors in Software Projects" IEEE Software, May-June 1999, 18-23 (1999)
[32]Nah, F., Lau, J., Kuang J., "Critical factors for successful implementation of enterprise systems" ,Business Process Management Journal, 2001, 7(3), 285-296 (2001)

[33]Young R., Jordan, E., Top management support: Mantra or necessity, International Journal of Project Management, 2008, 26, 713-725 (2008)
[34]Zwilkael, O., "Top management involvement in project management" Exclusive support practices for different project scenarios, International Journal of Managing Projects In Business, 2008, 1(3), 387-403 (2008)
[35]Standish Group, "The Chaos Report" Standish Group International, Inc. (1995),
[36]Savolainen P., Ahonen, J.J., Richardson, I. Software development project success and failure from the supplier's perspective: A systematic literature review, International Journal of Project Management 30, 458–469 (2012).
[37]IRJA HYVÄRI2006 (2006), the Project Management Institute, *Project Management Journal* , Vol. 37, No. 4, 31–41, ISSN 8756–9728/03
[38]Sudhakar, G.P. "A model of critical success factors for software projects" Journal of Enterprise Information Management, 2012. 25(6): p. 537-558.
[39] Mohd Hairul Nizam Nasir1* and Shamsul Sahibuddin2 "Critical success factors for software projects" A comparative study *Scientific Research and Essays* Vol. 6(10), pp. 2174-2186, 18 May, 2011 (2011)
[40]The Royal Academy of Engineering , The Challenges of Complex IT Projects (2004)
[41]James E. Tomayko, Harvey K. Hallman, "Software Project Management" (1989)
[42]Keider, S.P. "Why Projects Fail," Datamation (20:12), 1974, pp. 53-55.
[44]Kappelman LA, Mckeeman R, Zhang L. "Early Warning Signs of IT Project Failure" The Dominant Dozen. Inform. Syst. Manage., 23(4): 31-36. (2006).
[45]Baccarini D, Salm G, Love PED. Management of Risks in Information Technology Projects.Ind.Manag. Data Syst., 104(4): 286-295. (2004)
[46]Milis K, Mercken R. "Success Factors Regarding the Implementations of ICT Investment Projects". I. J. Prod. Econ., 80(1): 105-117. (2002)
[47]Perkins TK . Knowledge: The Core Problem of Project Failure. CrossTalk, The J. Def. Software Eng., 19(6): 13-15.
[48]Humphrey WS. "Why Big Software Project Fail" The 12 Key Questions. CrossTalk, J. Def. Software Eng., 18(3): 25-29 (2005)
[49]Charette RN. Why Software Fails. IEEE Spectrum., 42(9): 42-49. Chow, T., Cao, D-B., A Survey Study of Critical Success Factors in Agile Software Projects, (2005) The Journal of Systems and Software, 81, 961–971, 2008.
[50] Standing C, Guilfoyle G, Lin C, Love PED"The Attribution of Success and Failure in IT Projects". Ind. Manag. Data Syst., 106(8):1148-1165. (2006).
[51]Shanks, G. G., Parr, A. N., Hu, B., Corbitt, B. J., Thanasankit, T. &Seddon, P. (2000). "Differences in Critical Success Factors in ERP Systems Implementation in Australia and China: A Cultural Analysis," Proceedings of the 8th European Conference on Information Systems, Citeseer, 537-544.
[52]Jiang, J. J., Klein, G. &Balloun, J. "Ranking of System Implementation Success Factors" Project Management Journal, 27, 49-53. (1996)
[53]226 Alghathbar, K. "Practical ERP Implementation in Government Organization," International Conference on E-Learning, E-Business, Enterprise Information Systems, and E-Government, 343-349. (2008).
[54]Chow, T., Cao, D-B., A Survey Study of Critical Success Factors in Agile Software Projects, *The Journal of Systems and Software*, 81, 961–971, 2008.
[55]Fortune, J. and D. White, Framing of project critical success factors by a systems model. International Journal of Project Management, 2006.24(1): p. 53-65.
[56]Fan, D. Analysis of critical success factors in IT project management. In Industrial and Information Systems (IIS), 2010 2nd International
[57]Poon, P. and C. Wagner, Critical success factors revisited: success and failure cases of information systems for senior executives. Decision Support Systems, 2001. 30(4): p. 393-418
[58]Mcleod, G., & Smith, D. "Managing Information Technology Projects" Cambridge: Course Technology 1996.
[59]Adel M. Aladwani,"IT project uncertainty, planning and success: An empirical investigation from Kuwait", Information Technology & People, Vol. 15 Iss: 3 pp. 210 – (2002)
[60]Pinto JK, Slevin DP. Project success: definition and measurement techniques. Project Manage. J., 19 (3): 31-35. (1989)
[61]Zwikael O, Globerson S "Benchmarking of project planning and in selected industries" Benchmarking: Int. J., 13 (6): 688-700 (2006).
[62]Carmel E. and Sawyer, S. "Packaged software development teams: what makes them different ?", Information Technology & People, Vol. 11 No. 1, pp. 7-19. (1998)
[63]Curtis, B., Krasner, H. and Iscoe, N. "A field study of the software design process for large systems", Communications of the ACM, Vol. 31 No. 11, pp. 1268-287. (1988),
[64] Lam, S., Cheung, R., Wong, S. & Chan, E. (2013). A survey study of critical success factors in information system project management. W C Fang, Y C Shiue, C C Chen. 1-12. China: NETs2013.

[65]Chen, & Klein, (2002), Reducing user-related risks during and prior to system development, International Journal of Project Management, Volume 20, Issue 7, October 2002, Pages 507-515
[66]Dvir, D., Raz, T., &Shenhar, A J. An empirical analysis of the relationship between project planning and project success. *International Journal of Project Management* 21:89-95. 2003.
[67]OGC Best Practice. "Common Causes of Project Failure" Office of Government of Commerce. .(2005).
[68]Mahaney RC, Lederer AL. "Information System Project Management" An Agency Theory Interpretation. J. Syst. Software., 68(1): 1-9. (2003).
[69]Leveson NG. "The Role of Software in Spacecraft Accidents" J. Spacecraft Rockets., 41(4): 564-575. (2004).
[70] ITS Project Management Group, (2012), ITS Project Management Methodology, *Information Technology Services Project Management Group* , Version 2.1 , University of California, Santa Cruz
[71]Jalil and A. Hanif, Improving management of outsourced software projects in Pakistan , in proceedings of the 2nd IEEE International Conference on Computer Science and Information Technology, pages 524-528, 2009
[72]Schmidt R, Lyytinen K, Keil M, Cule P. "Identifying Software Project Risks" An International Delphi Study. J. Manage. Inform. Syst., 17(4): 5-36 (2001)
[73]Oz E, Sosik JJ. "A Leadership and Communication Theory and Exploratory Study" Why Information Systems Projects are Abandoned:. J. Comput. Inform. Syst., 41(1): 66-77. (2000)
[74]Capers Jones, Software Project Management Practices: Failure Versus Success ©,CROSSTALK The Journal of Defense Software Engineering(2004)
[75]Sekaran, U., &Bougie, R. (2012).*Research Methods for Business*.New Delhi: Sareen Printing Press.
[76]SEI Curriculum Module SEI-CM-21-1.0,Software Engineering Institute Issue on Quality and Productivity. G. M. Gershon, ed. IBM Systems J. 24, 2 (1985).

