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Determining Critical Success Factors for Predicting Process Improvement Implementation Success of IT Projects A Case Study of Telecom Industry

M. SYED, A. AHSAN*

Centre of Advance Studies in Engineering, Islamabad Pakistan

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Abstract: Now a day's telecom industry is facing real problem of improving IT processes. PI projects are widely used to overcome these challenges but unfortunately these projects do not have long lasting success results. In this tech savvy era, IT projects are crucial for survival in Telecom industry. Therefore, there is a need for reengineering of PI projects and identification of the critical success factors which are inattentive. The present study was conducted to fill this gap and robust the existing process of implementation of PI in IT projects. Field survey was conducted using 5 likert scale questionnaire, based on extracted critical success factors. In order to collect the data, Purposive sampling was used along Delphi technique. 6 out of 10 experts responded in each subsequent round. Data was analyzed in SPSS. Statistical analysis showed the consensus of experts on 10 CSF's which played an important role for the successful implementation of PI in IT projects. Implementation of these results was only specifiedto telecom industry which is a limitation of this study. Results of this research can be used for increasing the chances of success of PI implementation in IT projects prior to their initiation.

Keywords: Process improvement (PI), critical success factors (CFS), IT projects.

1. INTRODUCTION

Telecom industry is one of the largest developing sectors and responsible for advanced progress of Pakistan's economy. Approximately 100 Million cellular users and 1.36 Million employers are directly or indirectly connected with telecom sector. The telecom sector is composite, widely regulated and quickly progressing to meet the standards of global markets and initiatives. The fast growing pace of the telecom density resulting in the enormous pull of clientss, has enticed a number of telecom service providers from all around the globe to compete for their share in the market. The need for the telecom service providers to be more flexible, innovative and adaptive is more established and eminent than ever before (Bergenti, *et al.*, n.d.). Constantly improving the processes especially in the IT sector for minimum losses and wastages is the dire need of the Telco's to sustain the imposed competitive environment (Fleischmann, *et al.*, 2013). From the last 25 years, different approaches and procedure used to apply for process improvement (PI) but the desired results were not accurately given (Holland and Kumar, 1995).Process improvement (PI) is a continuous improvement activity without radical changes as there are in Reengineering (Elzinga, *et al.*, 1995).It is also shown that a single PI attempt in the IT projects may present its effects on some of the financial figures, but the impact of such PI initiatives are not long-term (Altinkemer, *et al.*, 1998). PI cannot be undertaken successfully if the process activities are not clearly defined (Elzinga *et al.*, 1995). (TQM) (Whitten, *et al.*, 2004), Activity-Based Costing (ABC) (O'Guin, 1991) and Six Sigma (Gordon 2002) is one of the most comprehensive approach used at that time for improvement process in IT projects.

Although the structure of these approaches were based on accounting, economic and principles or assumptions of engineering but it only works for some cases. But it has been recognized that a complete, concise, systematic, structured, step by step approach addressing all the success factors critical to PI project success is missing (Hammer, *et al.*, 1994), (Trkman, 2010). Organizations stake holders, understanding of the process, performance measurement, process improvement road map, supporting organizational structure, PI toolbox are identified as the critical success factors by BjØrn Anderson (Andersen, 2007).The critical success factors obtained through literature review are listed as : Strategic alignment, Level of IT investment, Performance measurement, Level of employee specialization, Standardization of processes, Informatization, Training and empowerment, Automation, Organizational change, Appointment of process owners, Implementation of proposed change, Use of a continuous Improvement system (Trkman, 2010).

The role of IT projects in any industry is well understood in this modern era and needs no explanation or certification. Highly adaptive and state of the art IT projects are pragmatic to success of a Telco in this highly competitive telecom industry. Thus a lot of attention is paid when it comes to continuously improving the IT projects.

*Dean Foundation University, Rawalpindi, Pakistan

2. METHODOLOGY

Delphi technique has been chosen to filter out and prioritize the factors that are most relevant for the success of PI in IT Projects. Delphi is used "to explore or expose underlying assumptions or information leading to differing judgments; and to seek out information which may generate a consensus on the part of the respondent group;" *et al.,* 2000). Theoretically Delphi can be iterated continuously until consensus is achieved. However, numerous studies have pointed out that three iterations are sufficient enough for the collection of meaningful information (Hsu and Sandford, 2007). So, the author decided this to be a 3 round Delphi application.

For Delphi techniques individuals with adequate knowledge of the topic under study are used as subjects, and their opinions are requested to reach a consensus. (McKenna, 1994) defines these subjects as a panel of informed individuals called 'experts'. For this study the purposive sampling technique was used under which 'Experts' chosen were Process In-charge who have the experience of undertaking PI projects for more than six years in the telecom industry of Pakistan. As the studies indicate that the sample size may vary from 4 to 3000 (Thangaratinam and Redman, 2005). The author selected 10 experts from the telecom industry. Out of these only 6 responded in the first round and then these experts responded in each of the subsequent rounds. Thus a panel of 6 experts was selected for the application of the Delphi technique.

3. RESULTS AND DISSCUSION

After the collection of responses from experts through 2 rounds of Delphi technique, following results were obtained;

1.1 Round 1:

A structured questionnaire with an exhaustive list of 25 Critical success factors extracted from the literature was presented in round 1. The experts were asked for their opinion on whether they considered these factors to be critical for the success of PIin IT Projects. The results collected from experts were then analyzed. (Hsu and Sandford 2007) explained the agreement among 80-70% of the experts on a factor should be considered as the selection criterion. However, this research has considered 80% agreement amongst the experts as the selection criterion. Out of 25 Critical success factors, 10 with more than 80% agreement were then filtered; since more than 80% of the experts considered these factors to be critical enough for the completion of the PI in IT projects. The factors are as following:

- CSF 1 Organizations stake holders and leadership
- CSF 3 Performance measurement
- CSF 7 Experienced process manager
- CSF 8 Linkage to organization strategy
- CSF 9 People change management
- CSF 12 Realizing Value
- CSF 16 Appointment of process owners
- CSF 21 Communication
- CSF 24 Resources allocation
- CSF 25 Clients focus

The factors over which more than 80% of the experts had agreed upon being the most critical factors for success were then passed on to Round 2 for further iterations.

1.2 Round 2:

For Round 2 a structured questionnaire is prepared containing the selected 25 CSFs presented on a likert scale. The experts had to rank the scale of significance of these factors from 1 to 5.5 ranked for the agreement on factor being most critical to success and 1 ranked for the factor to be least critical for the success of PI projects. All of the 6experts responded with complete questionnaires as shown in **(Table 1).** The mean and SD of responses showed the descriptive statistics while the minimum and maximum values of each factor showed the assenters of respondents. The range showed the level of consensus of experts along each factor obtained in round 2. The result indicates that these 10 critical success factors considered being necessary for the success of PI in IT projects which have been obtained in round 1. These factors were further analyzed through SPSS.8 variables were proved at 0.71 reliability after excluding People Change Management and Client Focus.

4. CONCLUSION

After analyzing the data it was concluded that every improvement project is unique in terms of its situation, impact and results. It requires a model robust enough to generate results from given variables and dynamic environment. The previous models do not have complete, concise, systematic, structured, step by step approach. So, the telecom industry is facing problem due to absence of robust model behind PI projects. PI in IT projects should contain the considerations which can assess the success chances of such projects before there initiation, and give the project actors proper visibility and control over the factors critical to success of the PI projects in IT. Without them the these cannot fulfill the improvement requirements effectively and their results will not be accurate enough.

Table 1. Responses of respondent during round 2

Respondents	Organization stake holders and leadership	Performance measurement	PM experienced process manager	Linkage to organization strategy	People change management	Realizing Value	Appointment of process owners	Communi-cation	Resources allocation	Customer focus
Expert 1	5	4	4	4	5	4	4	5	5	5
Expert 2	5	5	5	5	4	5	5	4	4	5
Expert 3	4	4	4	4	5	4	4	4	4	4
Expert 4	4	3	5	5	5	4	4	5	4	5
Expert 5	5	5	5	5	4	5	5	4	4	3
Expert 6	4	4	4	5	3	4	4	4	4	4
Mean	4.5	4.1	4.5	4.6	4.3	4.3	4.3	4.3	4.1	4.3
SD	0.54	0.75	0.54	0.51	0.51	0.81	0.51	0.51	0.40	0.81
Min	4	3	4	4	3	4	4	4	4	3
Max	5	5	5	5	5	5	5	5	5	5
Range	4-5	3-6	4-5	4-5	3-5	4-5	4-5	4-5	4-5	3-5

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