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EMPIRICAL STUDY: LEADERSHIP, ORGANIZATION CULTURE, EMPLOYEE ENGAGEMENT IN INFORMATION TECHNOLOGY CONTINUOUS IMPROVEMENT ADOPTION

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Abstract

Continuous Improvements (CI) is well-known for its significance in driving and facilitating process and products improvements in organizations. For decades, large organizations used

CI to improve and streamline process and workforce. CI thinking and adoption is critical for IT functions to improve aspects such as innovation, team productivity, service reliability, and cost optimization. The role of organization culture, leadership, employee engagement become key for adoption of CI to ensure stability, scalability, and sustainability to business functions through right tools, technologies, and services. There is need for research on the influence of trio on adoption of CI in the context of IT. The trio are interrelated components that play a crucial role in the success and sustainability of any organization. The aim of this study is to evaluate these three factors, its influence on adoption of CI by IT function using a quantitative approach. This study engages IT stakeholders from ITES, global companies which have their global IT development centres in India to ascertain their views. The finding of the study shows organization culture has a strong influence on adoption of CI in IT. This study can provide critical insights to management in streamlining IT practice, design organization mechanisms for better adoption of CI in IT.

Keywords: Continuous Improvements, Information Technology, Organization Culture, Leadership, Employee Engagement

1. Introduction

Continuous improvement (CI) plays an important role in organizations, functions, and teams to rediscover and streamline processes and products to make them more efficient, CI ultimately leads to better quality, speed, and efficiency in daily operation, improves way of working (Nair & Demirbag, 2018). CI contributes to faster delivery, cost reduction, and increased customer satisfaction.

Several industries have improved efficiency, productive, and reduced cost by adopting CI as a practice. Through CI organizations can get rid of non-value add work, waste referred to a “Muda” by making incremental changes to their processes, procedures, and practices. For decades many industries have focused on incremental process and procedural improvements. Business functions such as procurement, supply chain, manufacturing, shop floor, finance, logistics, etc., are implementing CI to be efficient, deliver value to the organization and customers. IT is no exception to CI; it is essential for IT teams to continuously focus on CI as a practice and culture.

Over the past many years there has been multiple studies on continuous improvements, adoption, methodology in various industries. However based on multiple references from past literature it is found that there is still additional research required on key

factors and their influence on adoption of CI by IT. Hence it necessitates a study in the context of IT industry. This study is conducted in Indian cities which are popular for IT services. India is chosen as it is one of the most sought-after IT offshoring destination for companies across the world. According to National Association of Software and Services Companies (NASSCOM), Indian IT services industry is expected to reach market size of US\$300-350 billion by 2025 (Matharoo, 2021).

1.1. Significance and Objective of research:

The objective of this research is to find answer to the following questions:

- (1) Is Leadership important and does it influence the adoption of CI in IT
- (2) Does employee engagement influence the adoption of CI in IT
- (3) Does Organization Culture influence the adoption of CI in IT

This research is significant because many multinational companies (MNC) have their inhouse centres (GIC) or global development centres (GDC) in India. Hence, by studying the India IT sector, it is possible to understand various multinational scenarios and hence it is possible to generalise the outcome to global IT industries. Further, this research can help IT management and leaders to know key factors and design their organizations, teams appropriately to enable effective adoption of CI by IT.

2. Literature Review

LEAN is a process of continuous improvement techniques and activities used in manufacturing or service. Organization looks at increasing value to customer, removing waste and enhancing operations. Lean can be applied to variety of processes and procedures. . Lean six sigma is not just limited to manufacturing operations. It can be applied to development of products and services (Magodi et al., 2022). IT involves products and services, and hence lean principles can be extended to IT, referred as LEAN IT. Lean in IT can be and applied for the development and management of IT products, solutions, and services. Lean methodology can be classified into 3 simple ideas:

- Customer Value Delivery
- Remove Non-Valued Work
- Continuous Improvement

Continuous Improvements (CI) identify ways to optimize and streamline work, thereby reducing waste in process, procedure, and workflows. CI practice became popular when LEAN, kaizen, agile started picking up popularity in the industry. An organization's history,

heritage can create a set of ingrained behaviours, processes, and structures that may no longer be relevant or effective in a changing environment but are difficult to change (Siggelkow & Rivkin 2005). The downside to these years of history is the accumulation of waste created due to practices, behaviours for a long period of time without much change. Waste can be in the form of accumulated bureaucracy or processes which contribute to longer lead times and inefficiency. The waste or non-value-added work can be generated by non-value adding activities (Magodi et al., 2022). It is assumed that for “change for good” to be successful, encouraging employee participation to continue to improve work and their workplace is essential (Prayuda, 2022). CI is a perpetual means for companies to remain relevant, competitive, cost-effective, and lean. There are many factors that can influence and improve organizations’ CI effectiveness. One such factors that impedes improvement in organizations is resistance to change (Erceg et al., 2018). It’s important to understand various factors such as the above mentioned and their impact on CI through further review of literature to understand how each of the factors influence adoption of change, innovation, or improvements in organizations. This knowledge can aid in application of these factors in context of this research scope.

2.1. Leadership Involvement (LI)

Leadership is hard to clearly define and articulate. What leadership means depends on the context of multiple factors like organization, culture, organization objectives, employee self-awareness etc. However, leadership can be looked at as an aspect of how well a leader manages their staff and leads them towards organization goals. Leadership styles play a significant role in how a team is managed and led to achieve a specific vision or goal. Hence, the leadership styles become critical in an organization’s success. There are different types of leadership styles and each of them has its own positives and negatives. There is enough evidence in the past literature that confirms that leadership commitment is an important factor in the quality improvement. To achieve sustainable CI culture the development of leadership commitment over a period is a key element in a culture of quality improvement, this commitment will develop over time and help achieve a sustainable CI culture (Almaiman & McLaughlin, 2018).

Leadership at the organizational level is important as leaders serve as a role model. Executive involvement can influence the top management and functional heads to participate in CI (Galeazzo et al., 2021). Leadership competence and commitment, especially in managing resource, defining strategies, working methods, and driving teams towards CI, are critical from

a leadership and management perspective (Unzueta et al., 2020). Mohammad et al., in 2020 conducted a quantitative survey with 400 responses which included CI as a variable and established that trust mediates relations between transformation leadership and CI. Leadership behaviours towards CI creates trust in the organization, which will reflect in employee solidarity towards CI (Mohammad et al., 2020). Leaders become enablers in organizations for the teams and supervisors. Strong leaders are needed for teams who can promote, manage, and communicate CI (Unzueta et al., 2020). Leadership focus on building employee empowerment culture motivating the employees and actively engage them in CI activities (Butler et al., 2018). There are many different types of leadership styles, and each of these styles have their own advantages and disadvantages.

Leaders fostering a culture of collaboration in the work- place can have many benefits, including better cooperation, improved problem-solving, and increased innovation. This is not limited to finding solutions to business problems, but better directorial approaches to continue to encourage an environment of change. The thinking of the leader has a greater influence on the organization, creative thinking has a greater influence on visionary leadership (Atthirawong et al., 2021). Leaders have the responsibility to provide the vision, strategy, the required resources, and support. It's not limited to this, they should also engage employees, continuously monitor, and set an example to lead improvements in the teams (Singh et al., 2018). A study by Qi et al. (2019) found that involvement of leaders is essential for successful implementation of CI in IT service management. Literature identifies leadership, leadership styles and their involvement as influencing factors for organizations to achieve their outcomes and defined the success of the team in achieving those outcomes. However, there is limited research in IT context. Hence, the below hypothesis is arrived.

Hypothesis 1 (H1): *Leadership involvement has significant positive impact on adoption of continuous improvements in IT.*

2.2. Employee Engagement (EE)

Employee engagement is an approach which results in right conditions for all the employees in an organization to contribute and bring out best of their skills which is in line with organisation's goals and values. Proper employee engagement contributes to organization success which brings in a sense of wellbeing for both the organization and the employee. from an employee's perspective, employee engagement refers to the establishment of trust, commitment, and a mutually beneficial communication process between the employee and the organization (What is employee engagement, 2022). This mutually beneficial communication

approach increases success to both the employee and the organization contributing to organizational goals, employee success and well-being. For an employee it's about clearly understanding the roles and responsibilities within the organization and contributing towards organization success. From the organization perspective it's about organization's success and the success of the employee. When an employee has a clear understanding of the organization purpose and its objectives, he or she can fulfil them better and take part in the journey of the success of the organization by contributing to it positively. Employee engagement is about being fully involved as a team player focusing clearly on goals and contributing to them through the regular feedback from team and managers. This feedback mechanism supports employees developing new skills that would contribute to once success and organization success.

Employee engagement is also about employees developing a feeling of being loyal, feeling pride towards their organization. This would enable them to become a positive force in promoting the organisation values both internally and externally. When an employee embraces the organization values of engagement, they are more involved in organizations and self-improvement. Employee engagement is key from an employer point of view as this will help in improving their knowledge and contribute towards commitment to products, processes, and services, there-by being innovative at work. From an organization perspective it's important that the employee deeper commitment is key for higher productivity and active engagement in organization activities. Their actions should reflect organization values and be consistent in exhibiting the values. When the values and commitment is mutually established it would become easy to drive organization towards a growth path which includes CI.

CI is a process that permeates an organization vertically and horizontally. Engagement at different levels and functions within an organization is critical to implementing CI. Empowering people within an organization through engagement initiatives, executive support, and development of self-esteem leads to a better relationship between work and organizational commitment. Jurburg et al., (2009) established that commitment has a positive impact on employee engagement in improvement initiatives.

Employee engagement in organizational activities defines the success of organization. Better employee engagement results in organizations achieving defined goals and objectives. When employees feel comfortable with what they are doing and how they are doing, the commitment towards the job increases as the purpose is clear. Satisfaction of the employees is considered one of the important factors for making changes since dissatisfaction makes

employees not to be committed and no support towards change, they would resist change (Iljins et al., 2015). The intention of the employee to be engaged, attitude towards participation and contribution to change is necessary for CI. The environment for employees to easily participate in CI activities is required to ensure employee can be part of the CI activities. However, there is no direct relation between ease of participation and employee intention to participate. The intention to be part of the CI is positively related to the usefulness of being part of CI (Jurburg et al., 2019). People leaders should establish and enable an environment that supports employee engagement is doing things out of desire or with intentions to help themselves and the organization. Managers should create an environment that supports employees to do everything they want desirously and intentionally (Vu, 2020). Employee engagement is an important factor for installing a culture of continuous improvement in teams. Engaged employees have a higher inclination to be committed by actively participating and providing feedback which contributes to the success of initiatives involving improvements (Lacerda et al., 2020). Hence, past literature shows that employee engagement is key for organization success and to drive outcome, leading to the following hypothesis.

Hypothesis 2 (H2): *Employee engagement in CI activities has significant influence on adoption of continuous improvements in IT.*

2.3. Organization Culture (OC)

Organization culture may have developed from a variety of aspects like beliefs of the founding fathers, their evolution, and experiences over the period and learnings from their experiences. The culture would broadly reflect the beliefs which become the foundation of the organization. Having a healthy culture in an organization would promote the vision of the organization. For an organization to excel its culture needs to be value driven, positive and clear. Continuous improvements and learnings are valued by positive organizational culture. Organization Culture which includes experimentation, innovation and that which motivates trying new things by taking risk contributes to the success of organizations improvements initiatives (Lapina et al., 2015). A company can be a blend of different types of culture and need not be of one or the other type of culture. For implementing lean management there needs to be a preparation phase where every employee in the organization participates. For this to happen employees should have been trained and understand the need for improvements and should be enabled to implement lead practices in their day-to-day jobs (Womack & Jones, 2003).

Benefits of a strong culture include increased trust and cooperation, less conflicts, and more effective decision-making. A strong sense of identification with the firm, an informal control system, and a consensus among employees as to what is crucial are all provided by culture. Employees in firms with clearly defined cultures may also defend their actions at work on the grounds that they are consistent with the culture. More than discussions and resources proper organization culture is required. Certain cultural characteristics are necessary for effective continuous improvements. To develop and encourage continuous improvement in the spirit of organization is a difficulty that many organizations must overcome (Almaiman & McLaughlin, 2018). (Almaiman et al., 2018) established that for an organization to enable CI the organization should have an enabling infrastructure that motivates employees to implement improvements. They also established that leaders should allow employees to participate in continuous improvement activities. Culture of an organization is a key in the implementation of continuous improvement initiatives. Organization culture that fosters employee empowerment, trust and accountability enables employees to adopt new processes and practices. This enables the success of improvement initiatives (Iljins et al., 2015).

Organization culture can be classified into Clan, Advocacy, Hierarchy and Competition cultures. Different organizational cultures can have a significant impact on the success or failure of continuous improvement initiatives. For example, a culture that values collaboration, open communication, and experimentation may be more conducive to continuous improvement compared to a culture that values hierarchy, structure, and adherence to established processes certain aspects of organizational culture, such as employee involvement, learning orientation, and supportive leadership, can be positively associated with continuous improvement. On the other hand, cultural factors such as resistance to change, a focus on short-term results, and a lack of trust and collaboration can be negatively associated with continuous improvement.

Based on the Literature review it is understood that Organization culture be it one type or other, mixed type has can have an impact on the people, teams, and the culture they embrace to operate which would drive continuous improvement initiatives to be a successful practice. This has given rise to the following hypothesis

Hypothesis 3 (H3): *Organization Culture fostering encouragement and motivation has significant influence on adoption of continuous improvements in IT.*

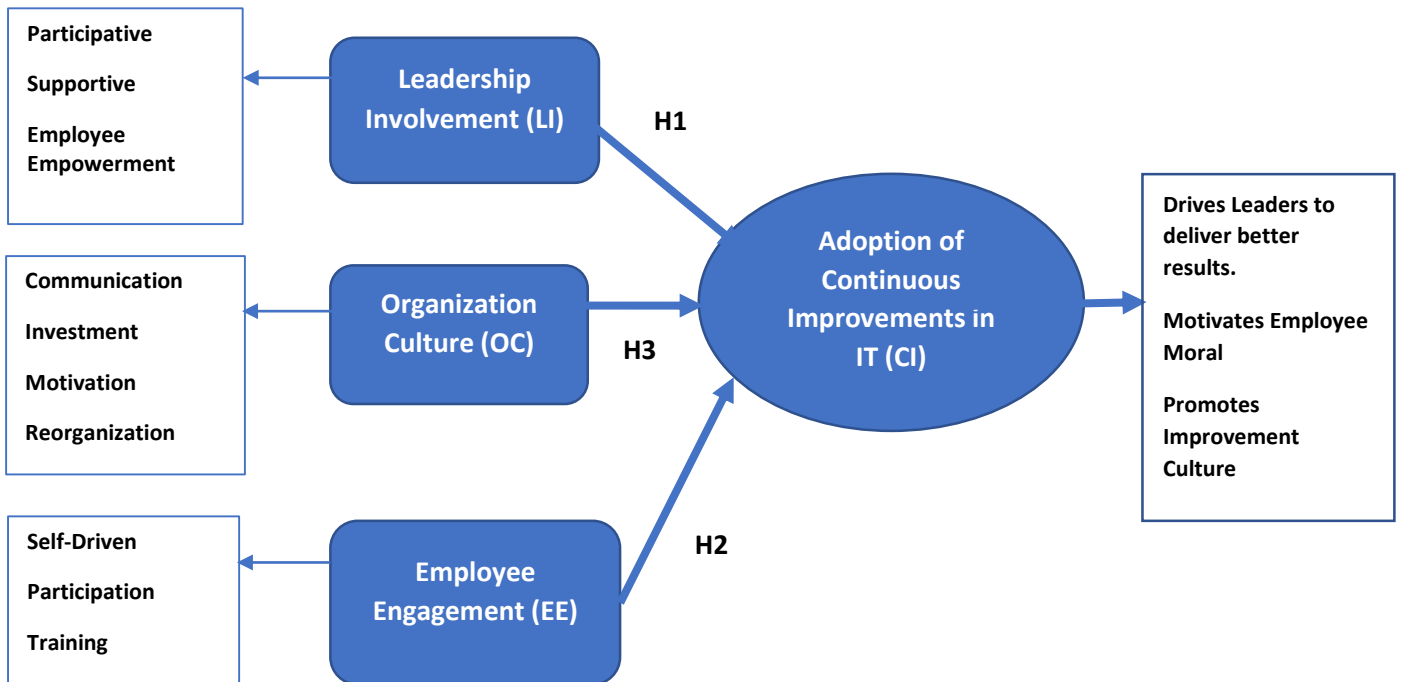
3. Research Methodology

The strategy that was employed was a quantitative study designing questions for the factors to be researched. The questions were designed considering and referencing pre-existing measurement tools like was referenced for organization culture questions. The questions were designed by referencing Utrecht Employee Engagement Scale (UWES), leadership scale (ILS) discussed by (Aarons et.al, 2014) and (OCAI) for organization culture discussed by (Cameron & Quinn, 2006) to test the hypothesis on a 5-point Likert scale with 1 being strongly agree and 5 being strongly disagreed to establish the relationship on the dependent variables along with their statistical significance. The survey questioner consisting of 4 sections, 1st section focused on demographics like age, gender, education level, role in organization. The 2nd section focused on questions to measure employee engagement, 3rd section on organizational culture, 4th section on leadership involvement. The final sections focused on questions related to the continuous improvement's outcomes. The questioner was circulated online through WhatsApp with a google forms link to more than 250 participants. Valid responses were received from 70 respondents with a response rate of approximately 25 – 30%. The survey data collected is well distributed that enables establishment of research objective. To do this the data collected was analysed statistically using ADANCO 2.3.2 tool. In the following sections we will discuss the data and analyse data collected to establish hypothesis and objectives.

3.1. Conceptual Model

The findings from literature review led to establishing the conceptual model as shown in Figure 1. The relation between the independent variables on dependent variable which is adoption of continuous improvements by IT is tested to establish answers to the research questions.

Figure 1: Research Model



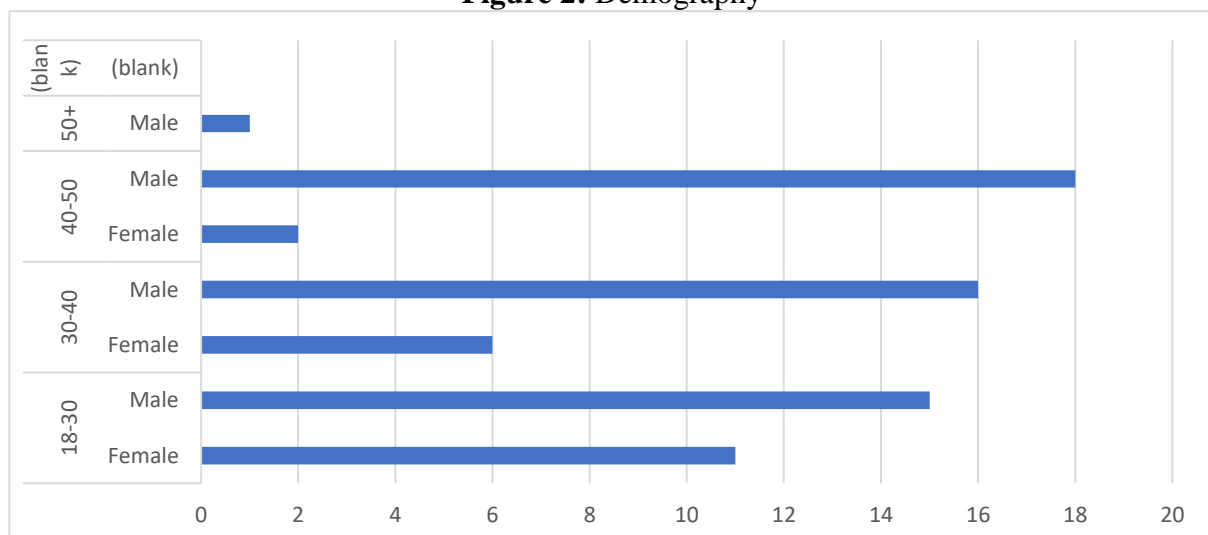
(Source: Author's Own Illustration)

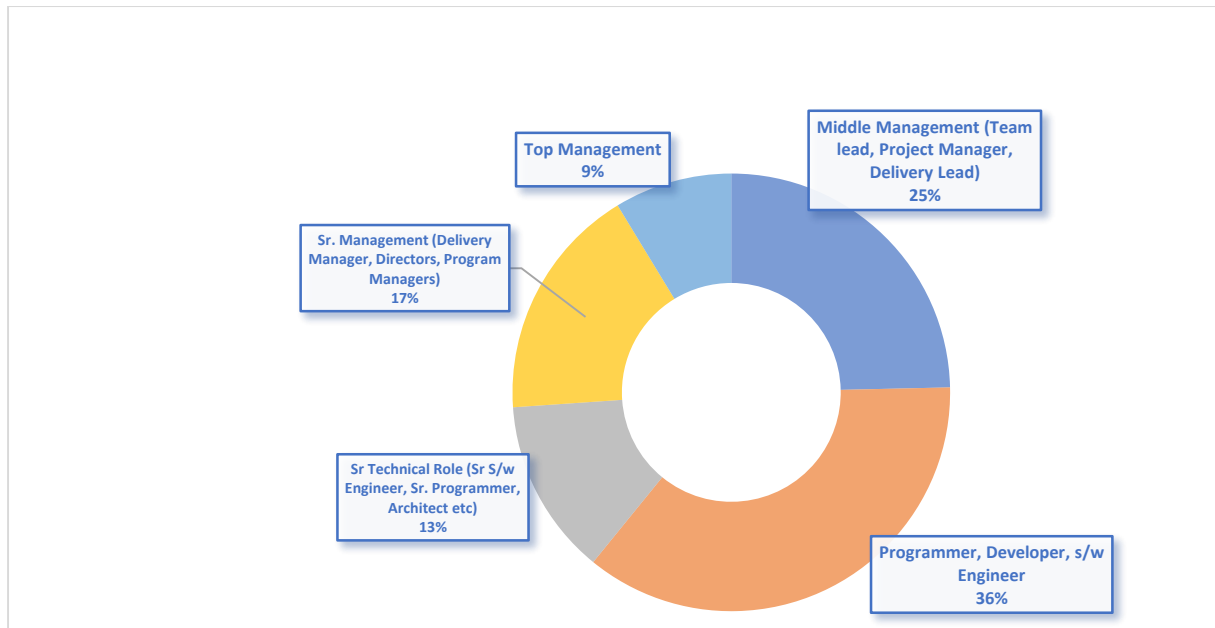
3.2. Data Analysis and Results

Data is collected from employees of ITES, IT industry in India through an online survey using Google Forms. The survey was sent to more than 200 participants.

Valid response received from 70 respondents. Summary of the demography of the respondents is shown in Figure 2. The population was well covered, and the distribution considered to be good to undertake the data analysis.

Figure 2: Demography





(Source: Authors' Own Illustration)

3.3. Reliability & Validity

Jöreskog's rho (ρ_c) values above 0.8 is considered good and above 0.9 is excellent (Jöreskog & Sörbom, 2006). The minimum satisfactory threshold of Cronbach's alpha (α) is 0.6, with values above 0.7 being preferred (Burgess & Steenkamp, 2006), (Cronbach, 1951). Considering the above norms, and with AVE figures ranging from 0.6093 to 0.7084 as shown in Figure 3 indicates the presence of reliability and validity within the model. Diagonal values (AVEs) were greater than the non-diagonal values as represented for each construct (Fornell-Larcker Criterion)

Figure 3: Reliability & Validity

Construct	Dijkstra-Henseler's rho (ρ_A)	Jöreskog's rho (ρ_c)	Cronbach's alpha(α)	(AVE)
EE	0.9024	0.8831	0.8284	0.6553
OC	0.7964	0.8617	0.7875	0.6093
LS	0.7938	0.8791	0.7929	0.7084
CI	0.7936	0.8663	0.7689	0.6843

(Source: Authors' Own Illustration using ADANCO)

3.4. Loading, Cross Loading & VIF

Figure 4 shows indicator loading, cross loading and variance inflation factor for all 14 determinants of the measurement model. It can be observed that all 14 determinants carry a loading greater than 0.7; therefore, it ensures validity of the model. It can be observed that the cross-loadings of the determinants are denoted in bold and are higher than the cross-

loadings on all other constructs in the model. This confirms the clear building of the constructs and the validity of the instrument without any cross-loading. The Variance inflation factor (VIF) values for all constructs are less than 2.93. Therefore, confirms that model is free from multicollinearity.

Figure 4: Loading, Cross-Loading & VIF

Loading					Cross Loading				
Indicator	EE	OC	LS	CI	Indicator	EE	OC	LS	CI
EE1	0.8865				EE1	0.8865	0.5953	0.5963	0.4923
EE2	0.8464				EE2	0.8464	0.5526	0.5346	0.3704
EE3	0.7783				EE3	0.7783	0.6127	0.7460	0.2570
EE4	0.7165				EE4	0.7165	0.4380	0.4521	0.2461
OC1		0.7299			OC1	0.4747	0.7299	0.5133	0.3958
OC2		0.8063			OC2	0.6360	0.8063	0.7028	0.4184
OC3		0.7990			OC3	0.5461	0.7990	0.4922	0.3649
OC4		0.7849			OC4	0.4707	0.7849	0.5365	0.5159
LS1			0.8455		LS1	0.6002	0.6394	0.8455	0.4271
LS2			0.8828		LS2	0.6078	0.5986	0.8828	0.4321
LS3			0.7944		LS3	0.5722	0.5812	0.7944	0.4190
CI1				0.8005	CI1	0.3580	0.3805	0.3425	0.8005
CI2				0.7819	CI2	0.3189	0.5403	0.2929	0.7819
CI3				0.8948	CI3	0.4295	0.4538	0.5820	0.8948

Variance inflation factors (VIF)				
Indicator	EE	OC	LS	CI
EE1	1.9436			
EE2	1.9839			
EE3	1.7927			
EE4	1.5107			
OC1		1.4557		
OC2		1.7922		
OC3		1.8013		
OC4		1.4625		
LS1			1.8512	
LS2			2.0990	
LS3			1.4705	
CI1				1.6416
CI2				1.4390
CI3				1.9167

(Source: Authors' Own Illustration using ADANCO)

3.5. Data Analysis and Discussion

For this study structural equation model is used to establish the answers for research questions. SEM and coefficient of determination: In the SEM Figure 5 constructs are represented by the ovals, and arrows represent paths. A linear relationship is assumed to exist between the constructs. The size and significance of the path relationships are important elements in empirical research. ADANCO 2.3.2 develops a recursive structural model, and it

is assumed that all residuals are uncorrelated and there is no causal loop. The structural equation model in Figure 5 was developed to test the hypothesis. Figure 5 indicates that the determinants are either strong or moderate with values ranging from 0.716 to 0.887.

Figure 5: Structural Equation Model



(Source: Authors' Own Illustration, Generated by ADANCO)

3.6. Direct Effects Inference

T-tests play a critical role in determining whether significant relationships exist between the various constructs in the model (Hair, Ringle, & Sarstedt, 2011). In this study, two-tailed tests were evaluated and measured at 10%, 5% and 1% significance levels. Significance levels are measured using t-values and p values, as depicted in Figure 6. For unknown population data, a bootstrapping method was used for modelling, as documented by Efron (1987). Figure 7 shows the research model in which all path coefficients are summarized.

Figure 6: Significance of t & p Values

Significance	t-values	Decision
p>0.10	t<1.65	Not significant
0.10>p>0.05	1.65<t<1.96	Moderate
0.05>p>0.01	1.96<t<2.59	Significant
p<0.01	t>2.59	Very significant

(Source: Efron 1987)

Figure 7: Direct Effects Results

Effect of Adoption of CI by IT	Original Coefficient	Standard bootstrap results			Supported
		t-value	p-value(2-sided)	p-value(1-sided)	
H2: Employee Engagement	0.0592	0.3269	0.7437	0.3719	Not significant - Rejected
H3: Organization Culture	0.3697	2.08	0.0376	0.0188	Significant - Accepted
H1: Leadership Involvement	0.1982	0.8469	0.3971	0.1986	Not Significant - Rejected

(Source: Authors' Own Illustration, based on output generated by ADANCO)

The results summarized below indicate the outcome of the data analysis and the results for each hypothesis tested.

H1: Leadership involvement has significant positive impact on adoption of continuous improvements in IT is rejected as the $\beta=0.19$ with $t\text{-value} < 1.65$ and $p\text{-value} > 0.10$

H2: Employee engagement in CI activities has significant influence on adoption of continuous improvements in IT is also rejected as $\beta=0.05$ with $t\text{-value} < 1.65$

H3: Organization Culture fostering encouragement and motivation has significant influence on adoption of continuous improvements in IT is accepted with $\beta=0.36$ as the $t\text{-value} > 1.96$.

4. Conclusion and Future Research

This pilot study developed a coalition between theory and practice by drawing on academic and practitioner literature in continuous improvements in IT by collaborating with past literature and feedback from industry, and assessment of research artefacts. This research had three objectives pertaining to the three independent variables: employee engagement (EE), organization culture (OC) and leadership (LS). The influence of each variable was tested on the adoption of continuous improvements in information technology services (IT) for continuous improvements (CI), which was the dependent variable. Organization culture was empirically found to have the strongest impact on adoption of CI within IT. Employees engagement and leadership was found to have an insignificant impact on adoption of continuous improvements in IT. Based on the pilot study it is established that organization culture is key to drive continuous improvements. Organizations should focus on building a culture of CI which will enable them to reap the benefits of CI. This indicates that future

researchers should study if leadership, employee engagement has any indirect effects with mediating variables, an angle which was not part of this study to understand significance of adoption of CI in IT. The limitation of this study is that it doesn't look at other factors like rewards, training etc., and how that influences the adoption of CI by IT.

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