Adoption of Project Management Methodology and Challenges Faced: A Comparative Analysis between Government IT Sector and IT Organisations in the Corporate Sector in Kerala

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Abstract

Adoption of a Project Management methodology is highly critical in the success of projects in any domain. It is imperative that a matured project management methodology is significant in the successful implementation of projects. Various Project management methodologies such as PMBOK, Waterfall, PRINCE2, Agile, etc. are followed in different domains including IT. Yet challenges remain and very few projects are able to adopt these methodologies for project success. This paper covers a comparative analysis between corporate IT organisations operating in Kerala and IT organisations owned by Government of Kerala. The paper aims to identify the project management methodology, the level of project management practices, the reasons for project failures and the challenges in the adoption of a Project management framework. The study was conducted among 50 employees of four IT organisations in Government sector and 50 employees of Corporate IT sector in the state of Kerala, India. The focus is to understand the differences in project management practices, specific challenges in adoption of Project Management methodology between Government IT sector and Corporate IT organizations in Kerala. This study aims to enhance in the current practices of project management to create more successful projects in IT domain in Government Sector.

Keywords

Project Management, Information Technology, Project Management Office, Project Management Software, Project Management Tools, e-Governance.

Introduction

The usage of information technologies by Government agencies that have the ability to transform the relationship of Government with citizens, businesses and other functions of Government is referred to as e-Government (infoDev, 2009). e-Governance is the implementation of IT initiatives by Government to enable the delivery of services to citizens and businesses. In India, e-Governance started with the launch of National e-Governance Plan (NeGP) in May 2006, with the Department of Information Technology co-ordinating the entire plan. NeGP comprised of 27 Mission Mode Projects (MMPs) and 8 support components implemented at central, state and local government levels (Suri & Sushil, 2017).

The Digital India is a flagship programme launched by Government of India in 2015 with a vision to transform India into a digitally empowered society and knowledge economy (PWC, 2017). It brings together many existing schemes under the NeGP in a restructured and refocused manner (Department of Electronics and Information Technology, 2015).

E-Governance is viewed as a means to attain good governance, viz transparency, efficiency, quick response, and increased accountability with the adoption of technology. The focus is on use of ICT for streamlined delivery of services to citizens (Suri & Sushil, 2017). e-Governance in simple terms is the implementation of ICT initiatives in Government sector. According to electronic Transaction Aggregation & analysis layer of Government of India, Kerala has reported a count of 95,75,46,532 e-transactions with 135 services offered online in from 1-Jan-2020 until 31-Dec-2020 (Meit Y, 2021).

For e-Governance projects to be successful all the challenges need to be effectively managed and the Critical Success Factors of project management and implementation should be understood.

The main aim of the study is to understand the challenges faced in adoption of a project management methodology in implementation of e-Governance projects. In order to identify the challenges in terms of the Project Management practices and framework in e-Governance sector, a in comparative study with Corporate IT organisations has been done.

Accordingly the following research questions were developed in the context of the state of Kerala.

1. What are the Project management practices adopted in Government IT vs Corporate IT organisations?
2. What are the major challenges with respect to adoption of Project Management methodology in Corporate and Government IT domains?

This analysis will indirectly help to answer these questions.

1) Is adoption of project management methodology dependent in the sector in which the projects are executed?
2) What are the unique challenges with respect to adoption of Project Management methodology in e-Governance sector?

Literature Review

Project Management of IT Initiatives in the Public Sector and Private Sector

Success of the project is a key issue of project management, but project management is very poorly defined when it comes to the concepts and the paths to achieve project success. Establishing effective project management practices is still a challenge to many organisations. Public sector projects are often characterised by uncertainties, complex, political influence and large number of stakeholders. The Project managers in the public sector is faced by team challenges, including inability in linking team performance and reward, compensation linked to longevity, and inability to select team members based on their skills (Santosa & Varajao, 2015).

Management of projects in the public sector is considered to be more complex than private sector with the most challenging area being Stakeholder management. Project Managers and team members working in public sector organisations responsible for management of projects need a different level of training when compared to private sector organisations. Lack of systematic approach to Project Management intra-departmental or inter-departmental, lack of Project Management culture, leads to wastage of resources during execution of projects. The complexities in stakeholder management, procurement management, low product pricings with highly detailed governance structure are distinct characteristics of organisations in the public sector. Transparency in processes is another factor which directs focus into the form and content of the communications. Complexity in communications ensures successful stakeholder management and in turn ensures

project success (Gasik, 2016). The same holds true for, IT organisations working for the Government, involved in the development of IT services for the Government and citizens. Project failures are subjectively defined based on assumptions and interpretations. Most of the times Government IT projects fail due to lack self-awareness of the system and the anticipated risks associated with its implementation (Alami, 2016). The requirement is a 'fuzzy dimensional model for project management' adopting similar and different techniques of project management in Public and private sector (Gasik, 2016).

Project Management is a significant component in the delivery of IT services irrespective of the type of organisation delivering the service. There are many factors influencing project management which are covered in various sections of this paper. The main challenges in the implementation of an IT system in an organisation are lack of clearly defined requirements (goals) of the project, business users not involved or no information provided by them, lack of people to implement the project, business and functional requirements that are incomplete or frequently changing and inexperienced project managers (Chmielarza & Zborowoski, 2018). Project Management Office is a layer for establishing control between project management and top management (Santosa & Varajao, 2015). The role of a PMO is to define internal process and institutionalise the process related to projects across the organisation (Szalaya et al., 2017). The top success factors for improving e-Government project management are Stakeholder/ User Engagement, Top Management support, Monitoring and Controlling and Feedback, Clear Project mission, Vision, Goals and objectives, Proper Planning, Competent Project Teams, Effective Communication, Project Compliance, Meeting technical specifications and Matching Standards & regulations, etc (Elshahed & Elkadi, 2019).

For e-Governance in developing countries, defining the success factors for e-government that are customised to the country, alignment between e-government strategies, programmes and projects, interoperability frameworks at a government level, architecture repositories, evaluation frameworks for the project, project development methods at a national level are highly recommended for successful e-governance implementation (Mkude & Wimmer, 2015). Project management challenges identified in e-Governance exist in project planning, managing changes, communication, implementation, poor stakeholder management, poor scope definition, procurement, risk, etc. When it comes to software engineering, challenges include in the development process, quality, technology, data, etc. (Kumar et al., 2019). According to a study done in project management practices in Czech republic, the more accepted methods are traditional methods of project management rather than agile. The traditional approaches to IT systems development result in the project team working through each phase and cannot respond to the true

requirements and hence unaware about the true progress or final outcomes (Mergel, 2016).

The main reasons for project failure are problems with project scope, definition and establishment, unclear expectations of the project outputs, inadequate risk management and insufficient resources (Hodzic & Hruzova, 2018). Adoption of agile in e-Governance involves challenges around Internal Competencies, User participation, stakeholder alignment, drivers in adopting agile, impact of regulation, hierarchical structure, resource management and domain complexity (Simonofski et al., 2018).

Project Management Body of Knowledge (PMBOK) by PMI, PRINCE2, Agile are some of the standard project management methodologies adopted across different sectors world-wide including IT. In India, Project Management Institute (PMI) has partnered with National Institute for Smart Government (NISG) to execute the National e-Governance Programme (NeGP) in 2013 (Standard, 2013). A Task Force was created under the Chairmanship of CEO, NITI Aayog in partnership with PMI for focused result-oriented approach and effective delivery of projects within time and budget for Central/ State Government and Public-Sector Enterprises (PSEs) in India (Ayog, 2019). The Agile IndEA Framework published by Ministry of Electronics & IT, Government of India are built on the key components of Stakeholder Engagement, Value Streams, Portfolio of Services, Minimum Viable Architecture, Building Blocks, Product Roadmap, Epics and User Stories, Templates and Agile Procurement (Ministry of Electronics & Information Technology, 2019). Though these published guidelines and methodologies for project management are available, challenges still exist in the execution of e-Governance projects in India. Project teams find challenges in leveraging these methodologies effectively according to the needs of their projects.

Problem Statement

IT initiatives should be executed in structured manner, so that that they follow a general set of principles, easily replicable and a history of the project and past projects should be available for ready reference at any time. Often the requirements of IT systems may be similar, for example, the general organisation functions such as HR, Fund Management, Delivery of Pensions, Social welfare schemes, Grievances handling, etc. may be similar across departments. These IT systems can be easily replicated, if they are built on open source/ replicable frameworks and the knowledge and the artefacts are easily available across departments and project teams. This leads to the requirement of a common project management framework based on the standard principles of project management, which is

flexible and less cumbersome for the project team to take it through project after project when it comes to implementation of IT initiatives rolled out by the Government.

The primary goal of this study is to understand the difference in the adoption of project management methodology and project management practices with respect to corporate IT sector and Government IT sector.

This is done by comparing various factors related to adoption of project management methodology in both these sectors such as

- Project Characteristics.
- Awareness about Reasons for project failure.
- Existing project management methodology.
- Extent of adoption of project management tools.
- Components required for project management.
- Challenges faced in the implementation of project management framework.
- Awareness about Challenging phases of the project.

Research Methodology

The study focus on the relation between the sector/domain on the adoption of project management methodology and practices. The aim is to find out if the adoption of project management is different between private IT sector and government IT sector. This will help to bring out the level of acceptance of processes in Project Management in e-Governance sector. This will pave way for future studies on interventions in improving the adoption of project management in e-governance sector for improving the delivery of services to citizens.

Independent variable: Sector
Dependent variable: Project Management framework

Conceptual Framework

The study aims at understanding the influence of domain in adoption of project management. The objective is to understand if adoption or acceptance of a project management framework differs between Corporate IT sector and Government IT sector in Kerala. From the literature review done from difference sources regarding project management, implementation of a Project Management framework in a particular domain

depends on several factors, major ones have been identified as Dependent variables in this paper.
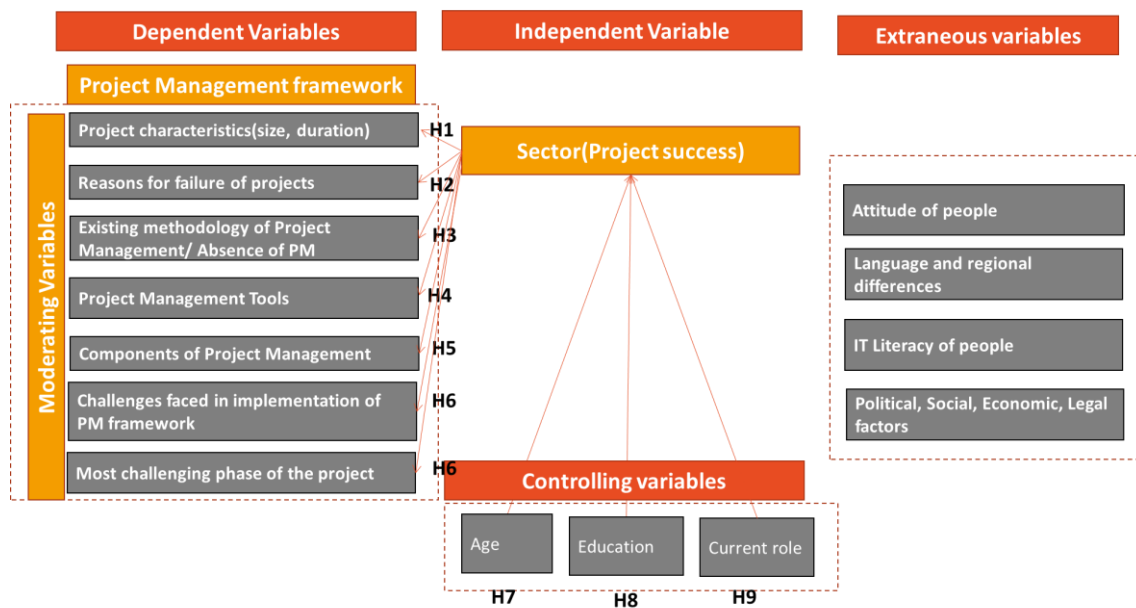

Figure 1 Conceptual Framework

The conceptual framework for the study is as shown in Figure 1.

Based on the Literature review, Dependent variables are further sub divided into moderating variables based on the above factors identified in the conceptual framework.

Table 1 Variables and Sub variables - Challenges in implementation of project management methodology

Variable code	Dependent Variable	Sub-variable	Reference
1	**Project Characteristics**		
1.1		Duration	
1.2		Project Type	
2	**Reasons for project failures**		(Karan, 2017) (Gupta et al., 2019)
2.1		Scope changes	
2.2		Schedule overrun	
2.3		Cost overrun	
2.4		Lack of steering committee meeting for tracking the project progress	
2.5		Absence of process and tools for end to end project management	
2.6		Requirements change over time	
3	**Project management methodologies**		(Thesing et al., 2020), (Karaman & Kurt, 2015)
3.1		SDLC/Water fall	

3.2		PMBOK/PRINCE2	
3.3		Agile/ Scrum	
3.4		Others	
4		**Extent of usage of project management tools**	(Kostalova et al., 2015)
4.1		All processes and templates are defined and adopted for project management	
4.2		Defined but not all templates and process are used	
4.3		PM tools are defined but not used	
4.4		PM Tools not used	
5		**Components required for effective project management**	(Radujkovica et al., 2017), (Monteiroa et al., 2016)
5.1		PM methodology	
5.2		PM tools and templates	
5.3		Project Management Office	
5.4		Project Management Software	
5.5		End to end project management	
6		**Challenges faced in the implementation of project management framework**	(Salamah & Alnaji, 2014) (Karan, 2017)
6.1		Changing technology	
6.2		Delay in adoption of new practices/ processes	
6.3		Lack of technical skills within the organization	
6.4		Lack of PM skills	
6.5		Lack of end- to end project management	
6.6		Lack of Compliance to requirements	
6.7		No proper Management Information System (reporting)	
6.8		Lack of project Governance framework	
6.9		Lack of leadership support for Project Management	
6.10		Lack of reference material about similar projects	
6.11		Legislative / legal decisions	
6.12		Lack of support from the sponsoring department	
7		**Most challenging phase of project**	(Karaman & Kurt, 2015)
7.1		Initiate	
7.2		Plan	
7.3		Execute	
7.4		Monitor & Control	
7.5		Close	

The variables such as Age, Education and Current role are identified as controlling variables. Attitude of people, language and regional differences, IT literacy of people and other PESTEL factors are considered as Extraneous variables in this study.

Data Collection

Data was collected in the form of a survey questionnaire among 100 professionals from Private IT sector and Government IT sector in Kerala. 50 participants each were selected from each sector among whom the survey questionnaire was circulated. Likert scale was used to collect nominal data. Age, Education, Current role were the demographic information asked. The main aim of this study was to understand if the sector of the participant has a relationship on the adoption of project management framework in that sector. Descriptive Survey method was used as the data collection tool.

Data Analysis

Data analysis was done using SPSS software version 26. The sample consisted of 50 participants each from Government IT sector and Corporate IT sector. Sampling chosen was purposive sampling due to lesser number of IT professionals in Government sector in Kerala.

Frequency distribution was done for demographic information collected from the participants. The demographic details are as given below.

Table 2 Demographic Information

Age	Percentage	Education	Percentage	Current role	Percentage
Less than 25	2	Graduate	9	Programme Director/ HOD	13
26-35	26	Graduate with Technical Qualification	29	Project Manager	38
36-45	66	Master's degree	26	Team member	30
46 and above	6	Master's degree with Technical education	36	Other roles	19
Total	100	Total	100	Total	100

Findings

Reliability and Normality of Data

The normality test showed p value was observed to be less than 0.05 for all variables, and hence the null hypothesis stating that data is normally distributed is rejected. Data was found to be not normally distributed which indicates that non-parametric test needs to be conducted. The overall reliability of the scale is 0.904 using Cronbach Alpha method and was found to be acceptable (Salkind, 2010).

Testing the Independence for of Project Management Factors between Government IT Sector and Corporate IT Sector using Fisher's Exact Test of Independence

To test the independence of Project Management variables across Government and Private sector, Fischer exact Test was used (Sauro & Lewis, 2012). The strength of the association was represented by Coefficient Cramer's V wherever a relationship was indicated.

Table 3 Fischer Exact Test of independence

Sl No	Main Variable	Sub variable	Null Hypothesis	p	Decision	Cramer's V	Strength of Association
1.1	**Project Characteristics**	**Duration**	A. H01: There is no association between the duration of the project and the sector in which the project is implemented.	0.121	Accept null hypothesis		
1.2		**Project Value**	A. H02: There is no association between the value of the project and the sector in which the project is implemented.	0.047	Reject null hypothesis	0.304	Moderate
2.1		**Scope changes**	B.H01: There is no association between the 'Scope changes as a reason for the project failure' and the sector in which the project is implemented.	0.009	Reject null hypothesis	0.330	Moderate
2.2		**Schedule overrun**	B.H02: There is no association between the 'Schedule overrun as a reason for the project failure' and the sector in which the project is implemented.	0.508	Accept null hypothesis		
2.3		**Cost overrun**	B.H03: There is no association between the' Cost overrun' as a reason for the project failure and the sector in which the project is implemented.	0.383	Accept null hypothesis		
2.4	**Reasons for project failures**	**Lack of steering committee meeting for tracking the project progress**	B.H04: There is no association between the 'Lack of steering committee meeting for tracking the project progress' as a reason for the project failure and the sector in which the project is implemented.	0.755	Accept null hypothesis		
2.5		**Absence of process and tools for end to end project management**	B.H05: There is no association between the 'Absence of process and tools for end to end project management' as a reason for the project failure and the sector in which the project is implemented.	0.786	Accept null hypothesis		
2.6		**Requirements change over time**	B.H06: There is no association between the 'Requirements change over time' as a reason for the project failure and the sector in which the project is implemented.	0.625	Accept null hypothesis		
3	**Project management methodologies**		C.H01: There is no association between the 'project management methodology' and the sector in which the project is implemented.	0.000	Reject null hypothesis	0.516	Relatively strong
4	**Extent of usage of project management tools**		D.H01: There is no association between the 'Extent of usage of project management tools' and the sector in which the project is implemented.	0.000	Reject null hypothesis	0.451	Relatively strong
5.1	**Components required for effective project management**	**PM methodology**	E.H01: There is no association between 'Project Management methodology as a component of Project Management' and the sector in which the project is implemented.	0.155	Accept null hypothesis		
5.2		**PM tools and templates**	E.H02: There is no association between 'Project tools and templates as a component of Project Management' and the sector in which the project is implemented.	0.016	Reject null hypothesis	0.324	Moderate

5.3		**Project Management Office**	E.H03: There is no association between 'Project Management Office as a component of Project Management' and the sector in which the project is implemented.	0.567	Accept null hypothesis		
5.4		**Project Management Software**	E.H04: There is no association between 'Project Management Software as a component of Project Management' and the sector in which the project is implemented.	0.655	Accept null hypothesis		
5.5		**End to end project management**	E.H05: There is no association between 'End to end project management as a component of Project Management' and the sector in which the project is implemented.	0.955	Accept null hypothesis		
6.1		**Changing technology**	F. H01: There is no association between 'Changing technology' as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.003	Reject null hypothesis	0.419	Relatively strong
6.2		**Delay in adoption of new practices/ processes**	F.H02: There is no association between 'Delay in adoption of new practices/ processes' as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.175	Accept null hypothesis		
6.3		**Lack of technical skills within the organization**	F. H03: There is no association between the 'Lack of technical skills' within the organization as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.010	Reject null hypothesis	0.370	Moderate
6.4		**Lack of PM skills**	F. H04: There is no association between 'Lack of Project Management skills' as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.001	Reject null hypothesis	0.457	Relatively strong
6.5	**Challenges faced in the implementation of project management framework**	**Lack of end- to end project management**	F. H05: There is no association between 'Lack of end- to end project management' as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.003	Reject null hypothesis	0.426	Relatively strong
6.6		**Lack of Compliance to requirements**	F. H06: There is no association between 'Lack of Compliance to requirements' as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.077	Accept null hypothesis		
6.7		**No proper Management Information System (reporting)**	F. H07: There is no association between 'Absence of a Management Information System (reporting)' as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.022	Reject null hypothesis	0.360	Moderate
6.8		**Lack of project Governance framework**	F. H08: There is no association between 'Lack of project Governance framework 'as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.008	Reject null hypothesis	0.395	Moderate
6.9		**Lack of leadership support for Project Management**	F. H09: There is no association between 'Lack of leadership support for Project Management' as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.042	Reject null hypothesis	0.332	Moderate

6.1		**Lack of reference material about similar projects**	H04: There is no association between 'Lack of reference material about similar projects' as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.517	Accept null hypothesis		
6.11		**Legislative / legal decisions**	H04: There is no association between 'Legislative / legal decisions' as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.031	Reject null hypothesis	0.355	Moderate
6.12		**Lack of support from the sponsoring department**	F. H010: There is no association between 'Lack of support' from the sponsoring department as a challenge in the implementation of project management framework and the sector in which the project is implemented.	0.014	Reject null hypothesis	0.361	Moderate
7.1	**Most challenging phase of project**	**Initiate**	G. H01 There is association between the 'Initiate as the most Challenging phase' in the implementation of project and the sector in which the project is implemented	0.560	Accept null hypothesis		
7.2		**Plan**	G. H02 There is association between the 'Plan as the most Challenging phase' in the implementation of project and the sector in which the project is implemented	0.412	Accept null hypothesis		
7.3		**Execute**	G. H03 There is association between the 'Execute as the most Challenging phase' in the implementation of project and the sector in which the project is implemented	0.895	Accept null hypothesis		
7.4		**Monitor & Control**	G. H04 There is association between the ' Monitor & Control as the most Challenging phase' in the implementation of project and the sector in which the project is implemented	0.331	Accept null hypothesis		
7.5		**Close**	G. H05 There is association between the 'Closure as the most Challenging phase' in the implementation of project and the sector in which the project is implemented	0.853	Accept null hypothesis		

1. Association between project Characteristics and Sector

Project characteristics is divided into two sub variables, project value and project duration.

a. Project Duration

The results indicate that Project Duration is associated with the sector (Government/ Private) in which the project is implemented. The majority of the projects in Government have duration of 2 years and above (41.7%) where as majority of the projects in private has duration 6 months to 1 year (28%).
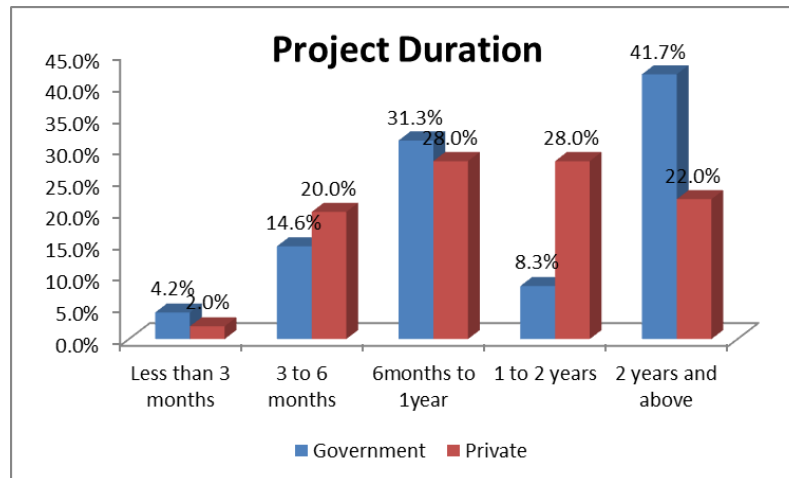
Figure 2 Project Duration vs. Sector

b. Project Value

The analysis indicates that Project value is independent of the sector (Government/ Private) in which it is implemented.
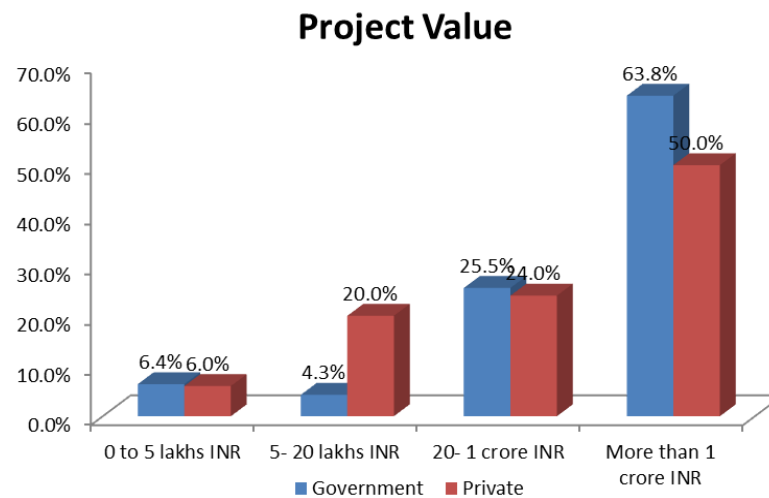

Figure 3 Project Value vs. Sector

Hence considering the above two sub variables it can be inferred that that private IT sector projects are usually of shorter duration compared to government sector IT projects where as the project value does not have an association with the sector in which the project is implemented.

Association between reasons for project failure and sector

The frequency of responses to various sub variables identified as reasons for project failure in the sector is given below.

Table 4 Reasons for project failure vs. sector

Reasons for Project failure	Sector	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Total
Scope changes	Government	0.0%	4.2%	18.8%	43.8%	33.3%	100.0%
	Private	0.0%	8.9%	0.0%	57.8%	33.3%	100.0%
Schedule overrun	Government	0.0%	6.3%	18.8%	58.3%	16.7%	100.0%
	Private	0.0%	5.1%	7.7%	66.7%	20.5%	100.0%
Cost overrun	Government	0.0%	10.4%	27.1%	45.8%	16.7%	100.0%
	Private	0.0%	2.6%	23.1%	61.5%	12.8%	100.0%
Lack of steering committee meeting for tracking the project progress	Government	0.0%	4.2%	22.9%	54.2%	18.8%	100.0%
	Private	2.7%	2.7%	21.6%	45.9%	27.0%	100.0%
Absence of process and tools for end to end project management	Government	0.0%	12.2%	30.6%	36.7%	20.4%	100.0%
	Private	0.0%	8.1%	40.5%	35.1%	16.2%	100.0%
Requirements change over time	Government	0.0%	2.0%	26.5%	38.8%	32.7%	100.0%
	Private	0.0%	2.6%	15.8%	50.0%	31.6%	100.0%

Significant relationship exists between sector and changes in 'project scope' as one of the reasons for failure of project in the sector. 43.8 % of Government IT sector employees and 57.8 %of private IT sector employees agree that Scope changes are a reason for project failure in their sector. Private sector employees show a better awareness that 'changes in project scope' as a reason for project failure.

Schedule overrun, Cost overrun, Lack of steering committee meeting for tracking the project progress, Absence of process and tools for end to end project management, Requirements change over time – all these sub variables were found to be similar in Government IT sector and Private IT sector as reasons for project failures. That is the type of the sector did not have an association with project failure reasons.

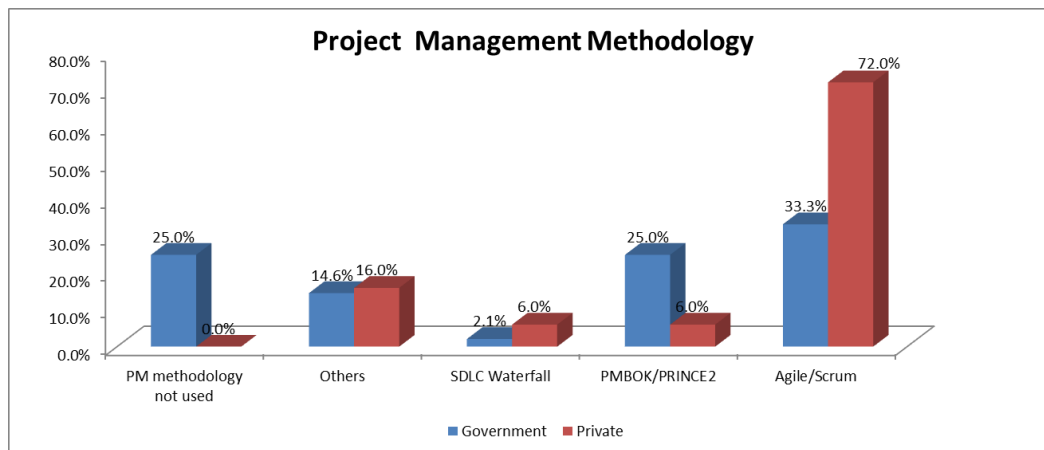**Association between Project Management Methodology and Sector**

Figure 4 Project Management Methodology vs. Sector

There is relationship between the project management methodology and the sector in which the project is implemented. The relatively strong association indicates that the type of project management methodology adopted is influenced by the sector i.e. Government or private. Of the recent project management methodologies adopted, 72% of the participants from Private IT Sector accepted that they follow agile/ scrum and only 33% from Government sector follow agile scrum methodology. 25% of the participants from Government and 6% from private sector follow PMBOK/PRINCE2. It can be noted that there is a better adoption of agile methodology in the private IT sector and traditional methodologies such as PMBOK and PRINCE2 in the Government sector. 25 % of Government sector participants said that they do not follow a PM methodology where as none of the private sector participants indicated that they do not follow a PM methodology. It can be understood that Government IT sector projects do not mandatorily follow a specific Project Management methodology.

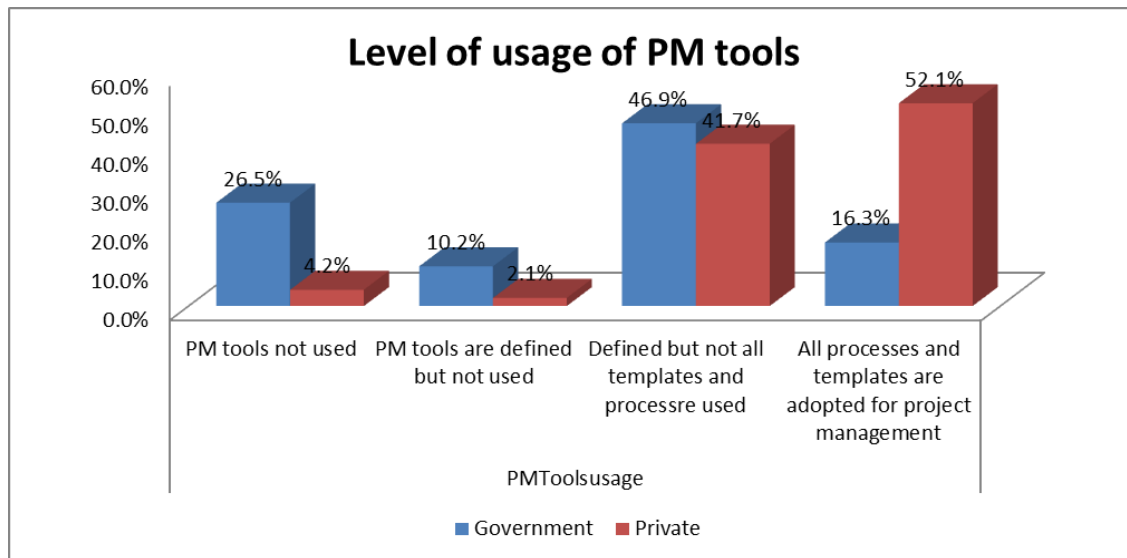### Extent of usage of Project Management Tools and Sector

Figure 5 Level of usage of tools vs. Sector

The analysis shows that there is relationship between the extent of usage of project management tools and the sector in which the project is implemented. Private sector employees show a better acceptance of usage of project tools in the execution of their projects.

26% of Government IT sector staff has agreed that PM tools are not used in comparison with the 4.2% in private sector. 52.1 % of staff from private sector has agreed that they have adopted all processes and templates of project management when compared with

16.3% of staff from Government sector. 46.9% of staff from Government agree that tools are defined not all processes and templates are used. There is a well-defined PM methodology and better adoption of project management tools in the projects in Private IT sector compared to Government IT Sector.

Association between Reasons for Components required for Effective Project Management and Sector

The adoption of components such as Methodology, Project Management Office (PMO), Project Management Software (PMS) and End to End Project Management in project management does not differ between Government sector and Private IT sector was analysed. Significant relationship exists between sector and 'project management tools' as a component of Project Management framework. 26.1 % of Government sector participants and 46.2 % of private IT sector participants strongly agree that PM tools are a component of implementation of PM framework.

Table 5 Components of Project Management framework vs. Sector

	Sector	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
PM Methodology	Government	0.00%	0.00%	14.90%	51.10%	34.00%
	Private	0.00%	2.60%	7.90%	36.80%	52.60%
PM tools and templates	Government	0.00%	0.00%	19.60%	54.30%	26.10%
	Private	0.00%	2.60%	2.60%	48.70%	46.20%
Project Management Office	Government	0.00%	2.20%	32.60%	41.30%	23.90%
	Private	2.70%	2.70%	18.90%	45.90%	29.70%
Project Management Software	Government	4.20%	2.10%	25.00%	39.60%	29.20%
	Private	0.00%	2.60%	15.80%	44.70%	36.80%
End to End Project Management	Government	2.00%	2.00%	10.20%	42.90%	42.90%
	Private	0.00%	2.20%	11.10%	37.80%	48.90%

Association between Challenges Faced in the Implementation of Project Management Framework and Sector

The Challenges variable is broken down into sub variables as listed below in Table 6 and each sub variable is compared in both private IT and Government IT sector. The frequencies of these variables are compared in each sector to identify the perception of the employees towards each of these challenges. The challenges seem to be more recognized by Government sector than private sector, which indicates that the challenges exist more in Government than private sector.

Table 6 Challenges in implementation of Project Management framework vs. Sector

	Sector	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Total
Changing Technology	Government	0.0%	4.3%	6.5%	60.9%	28.3%	100.0%
	Private	0.0%	28.1%	18.8%	31.3%	21.9%	100.0%
Delay in adoption of new practices/ processes	Government	0.0%	4.3%	2.1%	66.0%	27.7%	100.0%
	Private	0.0%	8.1%	13.5%	59.5%	18.9%	100.0%
Lack of technical skills within the organization	Government	0.0%	12.8%	4.3%	55.3%	27.7%	100.0%
	Private	0.0%	11.4%	31.4%	37.1%	20.0%	100.0%
Lack of PM skills	Government	0.0%	14.9%	8.5%	57.4%	19.1%	100.0%
	Private	2.9%	20.6%	41.2%	26.5%	8.8%	100.0%
Lack of end- to end project management	Government	0.0%	4.3%	10.6%	57.4%	27.7%	100.0%
	Private	2.9%	20.0%	31.4%	31.4%	14.3%	100.0%
Lack of Compliance to requirements	Government	0.0%	10.6%	21.3%	42.6%	25.5%	100.0%
	Private	3.0%	21.2%	30.3%	39.4%	6.1%	100.0%
No proper Management Information System (reporting)	Government	2.1%	2.1%	27.7%	51.1%	17.0%	100.0%
	Private	2.9%	23.5%	29.4%	29.4%	14.7%	100.0%
Lack of project Governance framework	Government	2.1%	6.4%	14.9%	57.4%	19.1%	100.0%
	Private	0.0%	28.6%	*28.6%*	28.6%	14.3%	100.0%
Lack of leadership support for Project Management	Government	2.1%	12.8%	17.0%	48.9%	19.1%	100.0%
	Private	2.9%	17.6%	41.2%	20.6%	17.6%	100.0%
Lack of reference material about similar projects	Government	2.1%	12.8%	27.7%	36.2%	21.3%	100.0%
	Private	0.0%	25.0%	31.3%	31.3%	12.5%	100.0%
Legislative / legal decisions	Government	2.1%	14.9%	14.9%	55.3%	12.8%	100.0%
	Private	0.0%	21.9%	40.6%	34.4%	3.1%	100.0%
Lack of support from the sponsoring department	Government	0.0%	8.3%	27.1%	47.9%	16.7%	100.0%
	Private	0.0%	28.1%	40.6%	18.8%	12.5%	100.0%

- Changing technology - The influence of Changing Technology as a challenge in the adoption of Project management framework is different in private and corporate IT sector; Association is strong between sector and awareness that changing technology is a challenge for implementation of Project Management. 60.9 % of Government IT sector employees agree that changing technology is a challenge for implementation of project management. Only 31.3% of private sector employees consider changing technology as a challenge to PM implementation. This indicates that changing technology is a more a challenge in project management implementation in Government IT sector than private IT sector. Private IT sector is able to better adapt to changing technologies in the implementation of project management.

- Delay in adoption of new practices/ processes – The analysis shows that Delay in adoption of new practices/ processes in the implementation of project management framework does not vary between government sector and private sector.

- Lack of technical skills within the organization - Lack of technical skills within the organization as a challenge to the implementation of project management framework is found to be influencing between government sector and private sector is same. Government IT sector views lack of technical skills as a challenge to implementation of PM methodology more than private IT sector employees. This indicates that

Government sector needs more technically skilled people in implementation of projects.

- Lack of PM skills - 57.4% percent of Government sector employees agrees that 'Lack of PM Skills' is a challenge in adoption of project management. Only 26.5 % of private sector consider that 'Lack of technical skills within organization' is a challenge in implementation of project management. This indicates that Government sector needs more skilled project managers in implementation of projects.

- Lack of end- to end project management - Lack of end- to end project management as challenge to implementation of PM framework in private and government IT sector is different. 57.4% percent of Government sector employees agree that 'Lack of End to end project management' is a challenge in adoption of project management. Only 31.4 % of private sector considers that 'Lack of End to end project management' is a challenge in implementation of project management. This indicates that the end to end project management is less adopted in Government sector.

- Lack of Compliance to requirements management: Significant relationship does not exist between sector and 'Lack of Compliance to requirements ' as one of the challenges in implementation of project management.

- No proper Management Information System - 51.5% percent of Government sector employees agree that Absence of MIS' is a challenge in adoption of project management. Only 29.4 % of private sector considers that Absence of MIS' is a challenge in implementation of project management. Government IT sector agrees to absence of a Governance framework in the project as a challenge to implementation of PM methodology.

- Lack of Project Governance framework: Lack of Project Governance framework seem to be a challenge more in Government sector and private sector. Government IT sector needs a more robust project governance framework compared to IT sector in private.

- Lack of Leadership support: Government IT sector agrees to Lack of leadership support for project management influences as a challenge to implementation of PM methodology than private sector.

- Lack of reference material about similar projects - There is no relationship between Lack of reference material about similar projects and the implementation of project management framework between government IT sector and private IT sector.

- Legislative / legal decisions - Legal or legislative decisions seem to be a challenge more in Government sector and private sector. Project management is more affected

by legal or legislative decisions in Government sector. This indicates that legal or legislative decisions have an association with the project execution in Government sector.

- Lack of support from the sponsoring department - Lack of support from sponsoring department s seems to be a challenge more in Government sector and private sector. Sponsoring department has a significant role in the adoption of project management in Government sector than in the private sector. For project management to be successful, support from sponsoring department is one of the factors.

Challenges such as changing technology, Lack of technical skills within the organization, Lack of PM skills, Lack of end- to end project management, Absence of a proper Management Information System (reporting), Lack of project Governance framework, Legislative / legal decisions and Lack of support from the sponsoring department are found to have an association with the sector in which the projects are implemented. These challenges in implementation of project management are found to be different between sectors and results indicate that these challenges have more strong association in implementation of project methodology and practices in Government IT sector.

Association between Challenging Phases of the Project and Sector

The various phases of a project as defined in the Project Management Body of Knowledge, PMBOK is Initiate, Plan, Execute, Monitor & Control and Closure. The analysis of the responses was done to understand which of these 5 phases are found to be more challenging between these two sectors.

Table 7 Challenging phases of the project and Sector

Most Challenging Phase	Sector	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Initiate	Government	0.0%	6.4%	12.8%	63.8%	17.0%
	Private	0.0%	12.1%	18.2%	48.5%	21.2%
Plan	Government	0.0%	2.1%	8.5%	66.0%	23.4%
	Private	0.0%	0.0%	12.5%	52.5%	35.0%
Execute	Government	0.0%	6.4%	10.6%	66.0%	10.6%
	Private	2.7%	5.4%	10.8%	59.5%	10.8%
Monitor & Control	Government	0.0%	14.6%	20.8%	52.1%	17.0%
	Private	0.0%	3.3%	23.3%	66.7%	21.6%
Close	Government	2.1%	6.3%	8.3%	68.8%	14.6%
	Private	3.1%	6.3%	15.6%	59.4%	15.6%

For all sub-variables Initiate, Plan, Execute, Monitor and Control, Closure – the p0>0.05, hence accept Ho. This indicates that distribution of these phases as challenging phase is same across both Private IT Sector and public IT sector. The aim was to understand that if any specific phase of the project was challenging between private IT sector and Government IT sector. Analysis indicated that all five phases of the project seemed to be challenging for both Private IT sector and Government IT sector employees. No specific phase was a challenge to a specific sector. This indicates that all five phases of the project are equally significant to both Government and private sector employees.

Discussions

A close analysis of the results brings into light the similarities and differences in Government IT Sector and Private IT sector with respect to adoption of Project management.

Table 8 Comparison Project Management Adoption between Government IT and Private IT sector

Similarity	Differences
• Project Value does not differ according to the sector, it is same in private and Government IT sector	• Project duration is found to be lesser in Private sector
• Most of the reasons for project failure are equally significant for both private and Government IT sector except changes in the scope.	• Challenges in adoption of project management framework found to be more in Government sector than in Private sector.
• Both private and government sector consider PM Methodology, Project Management Office, Project Management Software and End to End project management as components of Project Management framework.	• Project Management methodologies have a more acceptance in private IT sector than government IT sector
• Project Phases are found to be equally significant for both Private and Government IT sector.	• Private sector is more adaptive to latest PM methodologies. Government IT sector often does not make Project Management practices mandatory in execution of their projects.
	• The acceptance and usage of project tools and templates seem to be more in private sector than in Government IT sector

The data analysis reveals that the project value, challenging phases of the projects and reasons for project failure are found to be same in both private and government IT sector. Government IT sector projects are characterised by longer duration. Both private IT and government IT sector consider PM Methodology, Project Management Office, Project Management Software and End to End project management as components of Project Management framework. However, the adoption of a project management framework and

tools are found to be less in Government IT sector than in Private IT sector. Corporate IT sector is more inclined towards modern methodologies of Project Management such as agile, whereas Government IT Sector still depends on SDLC and traditional models such as PMBOK or PRINCE2 for majority of their projects. The challenges in adoption of PM framework are found to be more significant in Government IT sector. Acceptance of a Project management methodology and Project Management tools are found to be lesser in Government IT sector. The usage of processes and tools for project management is found to be less in Government IT sector. Private sector is able to better follow a project management practices for the success of the projects. Efforts should be taken in effectively addressing the challenges in implementation of project management in Government IT sector. A proper project management framework needs to be defined at an organisation level in Government IT sector. Adoption of a project management methodology, defining tools and templates for project management and improving the level of usage of these tools is needed in Government IT sector. Feedback mechanism needs would help to ensure compliance to these Project Management frameworks.

Conclusion

Adopting agile models in e-Governance over the conventional waterfall model increase the chances of project success. Citizen centric approach can be better achieved by agile methodology than traditional methods of project management (Kumarwad & Kumbhar, 2018). The data analysis in this study also emphasize on the importance of agile methodology and faster response to change. Resistance to adoption of change is a major challenge in e-Governance project development (Kumar et al., 2019). Input from Government officials and input from citizens during development can bring more successful results in e-Governance projects (Kumar et al., 2019). Lack of project standardisation and vendor driven implementation, lack of understanding by departments for the components of e-Governance applications has been some of the challenges in implementation of e-Governance application (Joshi, 2017). From the data analysis, it can be understood that there should be standardised methods of project management and components with support from participating departments for implementing e-Governance projects successfully.

Studies have revealed that there is very little attention from researchers on the causes of project failures in Digital Governments (Baheer et al., 2020). From this study on comparison of challenges in adoption of project management methodology, it can be summarised that the Government IT sector find implementation of a Project management framework more challenging than private IT sector in the context of Kerala and puts

forward the need for a tailored and flexible framework for project management for effective management of e-Governance projects.

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