

## Employees Role in Attaining Sustainable eGovernment Projects : PPP Projects Perspective

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### Abstract

*Implementation of eGovernment along with its associated challenges have received an extra attention worldwide. It is witnessed in various studies that the development of ICT use is still very low and feeble and eGovernment projects are still not sustainable in developing countries. Theoretical factors have been taken from existing literature and through qualitative interviews conducted by audit personnel. Factors have been considered from employees of both private and government perspective. Users' response has been collected from employees working in Indian projects under Public Private Partnership mode. Data for 550 respondents have been recorded for analysis on identified critical success factors. The collected statistics are then validated empirically and model is prepared using Partial Least Square method. The study has used both Quantitative and Qualitative techniques in analysing the results. The results could thus be used by policy makers during various stages of eGovernment projects. The study contributes to existing literature by measuring the importance of critical factor from developing country like India perspective. The study provides insights in addressing challenges related to adoption and successful operationalization of eGovernment projects for developing countries.*

**Keywords:** eGovernment; Sustainability; Stakeholder Consultation, Employee - Government Technocracy Approach (EGTA); Partial Least Square (PLS)

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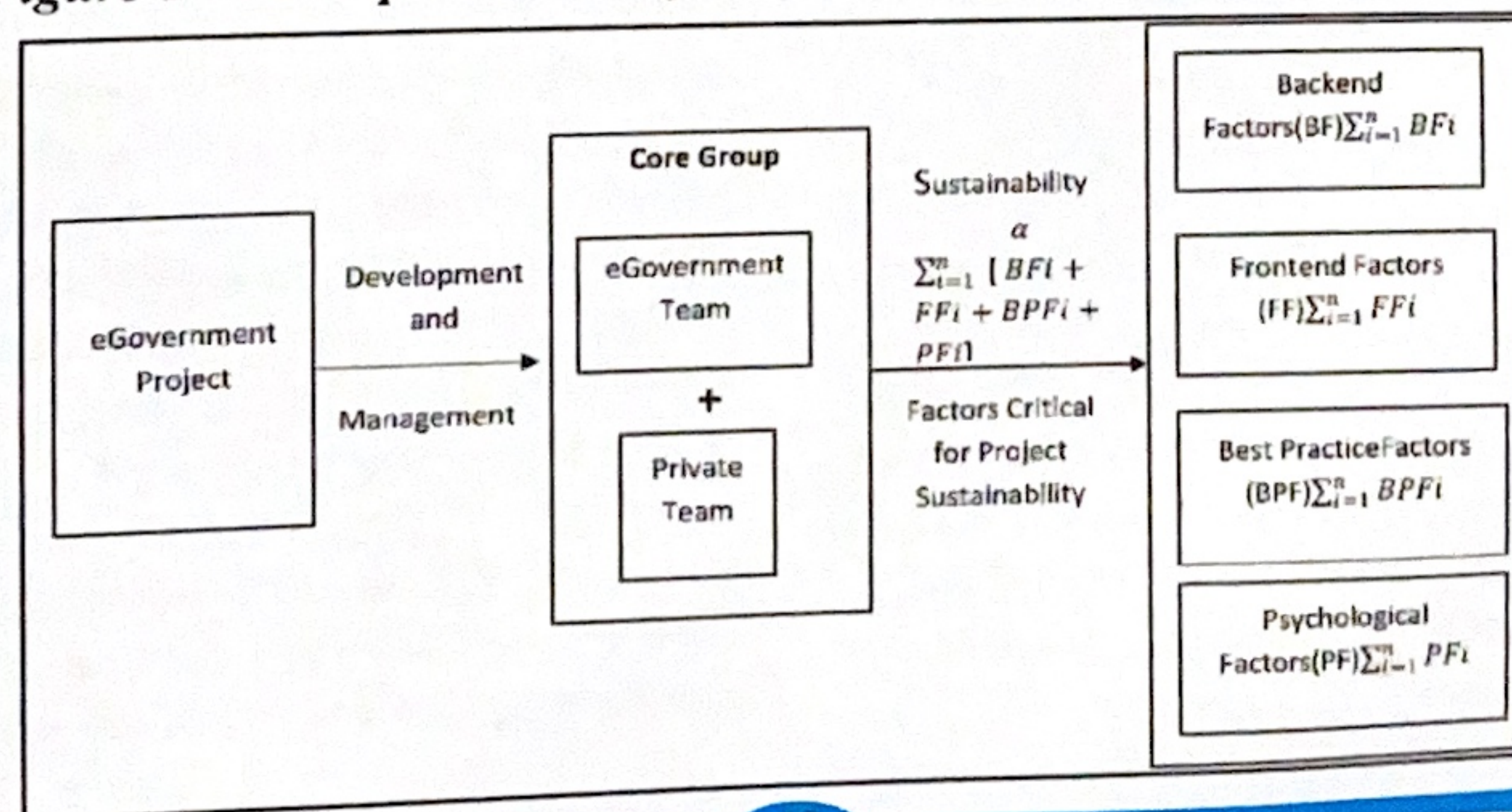
# 1. INTRODUCTION

E-Governance is a modern way of governance which includes the zeal of participation, transparency, accountability, democracy and utilization of Information and Communication Technology (ICT). It is a mechanism used for the dissemination of services up to grassroots level and upliftment of all sections of society at large. The current population of India is over 1.39 billion with a regular growth rate of 1.26%. In this varied and perplexing scenario, the implementation of a strategy which is common for all can't give successful results. Hence a strategy consisting of actions as per the stage of the project and intended stakeholders is an important aspect which needs to be planned and executed cautiously. With active adoption of ICT in various sectors it is evident that governments across the world have been taking various initiatives to have an empowered society by enabling technology enabled platforms for various processes. The enormous kind of advantages the technologies have introduced is embraced by larger set of users. However, the core team who works continuously in making them successful are rarely credited or are assessed at a defined interval over the critical factors which contributes significantly in ensuring sustainability aspect of eGovernment projects. With introduction of NeGP plan in India eGovernment projects in India have also started within various departments. These set of departments have gone through business process reengineering and have changed the traditional system into a more transparent, efficient and easily available for end user. These set of projects are operationalised either with the help of NIC wherever the scope of project was less. However private partners have been onboarded

wherever the scope of work was huge and couldn't be managed by internal set of employees. Hence most of eGovernment projects are now being operationalized in Public Private Partnership kind of mode and employees from both sectors plays an active and crucial role in ensuring sustainability of these projects. These employees are the backbone which shows a central role in making the system robust and easy to use for all set of users. As per the existing literature it is evident that eGovernment initiatives in developing countries still face various kinds of challenges however developed countries shows enormous benefits because of mature system. As per researchers (Ashaye & Irani, 2019; Deng et al., 2018, Bhatiasevi 2016) the strategic objective of eGovernance is to upkeep and streamline governance for all stakeholders which includes businesses, citizens, and entities government. This includes the strategic approach with an adequate team size who can work on all peripherals of these crucial projects so that the projects can remain sustainable in dynamic ecosystem. The current study has been carried out from employee perspective wherein the associated factors are identified and are then empirically tested for results.

The conceptual diagram for sustainable eGovernment projects for developing countries is depicted in Figure 1 as below. The core team for development and management of these crucial projects is done by Government employees' team and Private employees which are engaged as part of PPP mode through a well-defined RFP along with defined contract and service level agreements.

Figure 1 : Conceptual Model for eGovernment Projects Sustainability



## 2. PURPOSE OF RESEARCH

The existing literature reflects the crucial role of both employees and citizens in ensuring sustainable eGovernment projects in dynamic ecosystem. Nevertheless, while going through literature review it has been noticed that there have been many studies from end user's perspective who are users of these eGovernment services and very few are available who specifically discusses about the employee perspective and their thoughts. NeGP in India has been launched in 2006 and has introduced 27 Mission Mode Projects, these projects are conceptualised with clear objectives and guidelines along with defined goals which have to be achieved. The projects were made operational along with private entities in Public Private Partnership mode. During all these times the projects are into various stages of projects existence during their life cycle. It is imperative to mention that each stage plays a very different and crucial role which can't be underestimated in ensuring the sustainability aspect of these crucial projects. The objective of research is to identify the significance of identified factor on the sustainability of eGovernment project from employee perspective.

The introduction of NeGP plan in India is a wave of introducing technology in disseminating government services using ICT based platform, this includes a business process reengineering of old and traditional system into a technology-based system. All projects navigate through various stages during the project, the stages include conceptualisation stage as first, development stage as second, operational stage as third and further exit management and on-boarding of another vendor as last stage during the lifecycle of any project. In each stage the involvement of departmental employees has a very significant role, these employees are aware of the challenges the existing system faces along with the need of stakeholders from new system. On getting the contract, once the private entity gets onboarded the synchronization between both set of employees makes the project smooth and efficient (Seetharaman, 2017; Dahiya & Mathew, 2016; Hoe, 2016). The projects are delivery based and hence gets the payment on the basis of defined service level agreements and milestones, any deviation from defined standards leads to substantial

loss to private entity and hence best of efforts are put up for making these high aiming projects landing into success in all terms. Currently there are 44 mission mode projects which are grouped into Integrated, State and Central projects. In order to provide end users also a bird eyes view, the transaction count across various projects is also being showcased on eTaal portal. The success in few of critical MMP projects has got recognition across the globe also. In current study the crucial factors from Citizen and Employee perspective have been taken from existing literature and through interviewing expert groups. The determinants have been then collated and a conceptual model has been prepared which could be used to identify the area which needs to be strengthen up for any particular eGovernment Project. Considering the challenges being faced by developing countries factors as listed below have been taken which are crucial for sustainable eGovernment projects in developing countries. Study conducted by (Yadav et al., 2019; Rana et al., 2015) have mentioned in their study that taking response of employees during various stages of project helps in identifying the critical area which is falling upon and needs attention for sustainability aspect.

As per the studies conducted by (Yadav et al., 2019; Venkatesh & Bala, 2008; Dwivedi et al., 2019; Mahmood & Nurul, 2015) it is evident that it is important to have inhouse resources who are sound and are well versed with functional and technical aspects of eGovernment project. As working in PPP framework does provides ample kind of benefits but considering pace at which there are upgradations in ICT area it has been noticed that departments found themselves in vendor lock in scenario. In this scenario all measures are taken right from conceptualisation stage of project so that in any given situation such lock in condition doesn't arise. A set up is ensured right from starting so that institutional knowledge remains with the organization. It is important to keep the staff deployed also abreast with the latest technologies and techniques so that they are well equipped in evaluating the solutions being proposed. It has also been noticed that though the projects start will well defined scope and objective but the changes which are introduced from time to

time makes the project cost grow enormously. In this situation it becomes critical to run the system without the said change. Further the cost justification for the change and its evaluation from department resources is of critical importance. Hence it is crucial to have equipped team inside the organization also who can help in dealing with this kind of situation efficiently. In this reference STQC, Standardisation Testing and Quality Certification (STQC) Directorate a government organization under Government of India who helps in technical audit of these projects at regular interval.

For projects under Digital India programme of government STQC has prepared a draft RFP document along with contact agreement and guidance notes. These documents include the basic framework of guidelines and instructions which should be part of any RFP. The documents work as guiding document for the projects in dealing with associated challenges during various stages of project lifecycle.

### **3. LITERATURE REVIEW AND THEORETICAL MODEL**

Considering eGovernment projects the role of each stakeholder which includes Citizens, Employees, Government and Business entities are very important. The whole ecosystem revolves around the critical elements like what is required and how it would be delivered to intended stakeholders efficiently. The association of Government (G), Business Entities (B) and Costumer (C) as G2G, G2C and G2B makes the entire ecosystem. In order to have an efficient system the role of regular interactions, assessment at defined intervals plays very crucial role. Further handling various project dynamics insynchronous way by both departmental and private employees in meeting the stakeholders' expectations results in having an efficient and transparent system. The eGovernment systems are also expected to accommodate the changes being introduced by

government from time to time. At few places these projects are being developed and delivered by inhouse team itself, however for large projects and considering the various verticals which are there in order to manage these projects both set of Government and Private team form the core group. In eGovernment projects sustainability, employees' plays very significant role, as they are those set of crucial resources who have observed the earlier system, knew the expectation of new system and are part of various business process reengineering which are building blocks of these projects.

As part of existing study four crucial parameters have been identified and then factors as listed in below section have been taken, A study of such kind during various phases of project provides meaningful insights for the policy makers to identify the gap area which needs to be strengthen up for successful eGovernment projects. Employee of both Private and Government could be taken for such kind of studies, since most of these eGovernment Projects are developed and operationalized in a mode with partnership between public and private sector. In few critical project's consultants are also engaged to have best of technology and practices to be adopted for the project. In recent studies it is also seen that consultant role is not limited to preparing of RFP for selection of vendor.

It is extended beyond, as they now even play crucial role in getting the vendor on boarded. Making the project live with defined expectation and achieving desired service level agreements as per the contractual agreement.

Factors as listed in Table 1 are important for sustainability of eGovernment Projects from Employee Perspective, the factors are namely categorised as Back-end Factors, Front-end Factors, Best Practices Factors and Psychological Factors as per the literature and structured interviews of auditors.

**Table 1 : Critical Factors from Literature: Employee Perspective**

Variables/Parameter	Implication/Explanation	Reference
Backend Factors	Factors ensured by employees from backend in order to support eGovernment projects sustainability.	[Kalsi & Kiran, 2015; Jurburg et al. ,2019; Kamoun & Basel, 2014; Yadav et al., 2019; Sarantis et al., 2011; Seetharaman, 2017; Dahiya & Mathew, 2016; Hoe ,2016]
Front-end Factors	Factors needed focus while planning any eGovernment project. The factors listed in this category ensure eGovernment projects sustainability.	[Sandoval-Almazan & Gil-Garcia, 2012; Rana et al., 2015; Kalsi and Kiran, 2015; Krishnaraju et al., 2016; Dwivedi et al., 2019]
Best Practices Factors	Factors form the backbone for smooth running of these high aiming projects	[Sachdeva, 2009; Vassilakis et al., 2003; Cellary and Strykowski, 2009; Sandoval-Almazan & Gil-Garcia, 2012; Kalsi & Kiran, 2015; Choi et al., 2016; Herazo & Lizarralde ,2016; Yadav et al., 2019]
Psychological Factors	These consist of set of sociological factors which are crucial to be taken care of considering the satisfaction and wellness of employees who are involved in operationalizing these high aiming projects.	[Karim, 2003; Venkatesh & Bala, 2008; Sachdeva, 2009; Almarabeh & AbuAli ,2010; Preuss & Walker, 2011; Singh & Kiran, 2013; Renken & Heeks, 2014; Venkatesh et al., 2016]

### 3.1 Backend Factors

These are those set of factors which works as a backend set of attributes and contribute significantly for ensuring sustainability of eGovernment projects. These backend factors act as pillars for eGovernment projects, the factors identified have been taken from existing literature and based on interviews of audit personnel who are involved in auditing these crucial projects at regular interval. Ten determinants along with their description and references from literature is articulated as under.

The first determinant is Quality of Documentation (B1), this signifies that since employees both from government and private keep on moving for various reasons, hence the said determinant has critical impact on quality of documentation. The said determinant has also been used by researchers (Kalsi

& Kiran, 2015; Bhatnagar, 2009 and Audit Personnel). The second determinant Automated Processes [B2] is defined as an approach towards automating most of the processes to have maximised output, researchers (Jurburg et al. , 2019; Kamoun & Basel, 2014) have mentioned the significance of determinant for studies similar in nature. The third determinant Minimal Manual intervention [B3] is defined as process automation with minimum manual interventions, researchers (Jurburg et al., 2019; Singh & Kiran, 2013) have used the said determinant for similar kind of studies. Systematic change controlling process [B4] is defined as a planned system to introduce any new enhancements in existing system without compromising security. Researchers (Bhatnagar, 2009; Sarantis et al., 2011; Strachan et al., 2015) have used the said determinant

in their studies. The fifth determinant is Training on monitoring tools [B5] is used by researchers (Kalsi & Kiran, 2015; Seetharaman, 2017) and is defined as Training on monitoring tools effects the sustainability of projects positively. The sixth determinant is named as Timely deployments [B6] taken from study of researchers (Kalsi & Kiran, 2015; Dahiya & Mathew, 2016; Hoe, 2016) this implied that changes as per the surrounding needs to incorporated in timely manner. The seventh determinant is having a core team competent [B7], this determinant implies that there shouldn't be complete dependency on external resources and each department should have an internal team of technical experts. Researchers (Deng et al., 2018; Choi et al., 2016) and Audit Personnel have also emphasised on importance of the said determinant. The eighth determinant as Make essential processes redundant [B8] is defined as importance to have redundancy of various important infrastructure components. This is to improve the accessibility of essential services (Deng et al., 2018; Thorpe & Rhodes, 2018). Having Comprehensive Security Architecture [B9] is defined as having well planned security architecture to provide protective layer to the organisation from cyber threats. The significance of said determinants is also mentioned by researchers (Kalsi & Kiran, 2015; Jurburg et al., 2019; Kamoun & Basel, 2014). Having an Organizational Structure to support the project [B10] is defined as clarity in the hierarchy of organisation structure for effective functioning. This implies pre-decided decision flow and information flow clarity. The significance has also been mentioned by researchers (Deng et al., 2018; Choi et al., 2016).

### **3.2 Front-end Factors**

It is evident that project sustainability is reliant on robust design and an easy interface to end users. Hence considering this as crucial parameter, determinants as listed below have been identified based on literature and interviews conducted of audit agencies which assures their significant role in ensuring the sustainability from application perspective which would be front face to end users.

The seven determinants have been taken for study conducted, Bug Free functionality [F1] is defined

as set of processes as part of which hosted application is free from errors. Internal comprehensive testing ensures that there are no errors in production environment. Researchers (Rana et al., 2015; Dwivedi et al., 2019; Wirtz & Kurtz, 2017; Alomari et al., 2012) have mentioned the said determinant in their study. The second determinant [F2] is preparing a website which is friendly for end users' usage. This implies that system should be created with friendly interface for interacting with end users. This enables end user to easily work on the functionalities provided through eGovernment portals. Researchers (Kalsi & Kiran, 2015; Wirtz & Kurtz, 2017; Bhattacharya et al., 2012) have also considered the said determinant in their study. The third determinant Single Sign On [F3] implies that the users doesn't have to sign in at every associated portal differently. The significance of said determinant has also been mentioned by (Mecca et al., 2016; Hoe, 2016; Alomari et al., 2012; Bhatnagar, 2009; Heeks & Bailur, 2007) and Audit Personnel. The fourth determinant [F4] is Support Services, researchers (Alomari et al., 2012; Bhatnagar, 2009) and Audit Personnel have mentioned the said determinants significance in their study. This implies that Support services enable end users in leveraging the benefits of functionality. Support services like email monitoring and response mechanism, availability of call centre and other associated tools provides easiness to end users. The fifth determinant is mentioned by researchers (Alomari et al., 2012; Bhattacharya et al., 2012; Kamoun & Basel, 2014; Kalsi & Kiran, 2015) the determinant is ensuring security for end users [F5], this implies that Ensuring data security during utilizing the services is most important to gain trust of an end user. This makes end users confident to use services being offered by the portal. The sixth determinant [F6] is Integrated Apps, this determinant implies that apps play an important role in service accessibility. A common government app which is integrated with all government agencies will give its reach to larger set of people and hence will provide ease of access to users. Researchers (Sandoval- Almazan & Gil-Garcia, 2012; Wirtz & Kurtz, 2017; Mecca et al., 2016) and Audit Personnel have mentioned its significance in their studies. The seventh

determinant is Web Personalization [F7] it implies having personalised dashboard experience for customer retention in eGovernment portals. The said determinant has been used by researchers (Krishnaraju et al., 2016; Wirtz & Kurtz, 2017).

### *3.3 Best Practices Factors*

For smooth running of any project there are few best practices parameter which makes the project smooth and running. Further once these factors become part of the process there have been success stories ensuring the sustainability of these high aiming projects. Eight factors have been taken for current study using existing literature and criticality mentioned by audit personals under the Best Practices factor. The first determinant [BP1] is defined as reusability of written code it is defined as an important parameter to induct reusability aspect during programming. The said determinant has been mentioned in various studies in similar domain (Vassilakis et al., 2003; Cellary & Strykowski, 2009). The second determinant [BP2] is named as Continuous Learning and Training, studies conducted by (Sachdeva, 2009; Bhattacharya et al., 2012; Singh & Kiran, 2013; Choi et al., 2016) implies that it's an important parameter for sustainability of any eGovernment project. The third parameter [BP3] is identified as feedback mechanism from various stakeholders, this implies that having continuous feedback from various stakeholders is an important aspect for making eGovernment project as per the ecosystem requirement. Researchers (Sandoval-Almazan & Gil-Garcia, 2012; Choi et al., 2016; Herazo & Lizarralde, 2016) and Audit Personnel have also mentioned this as an important determinant for sustainable eGovernment projects. Inclusion of campaigns regarding good governance is the fourth determinant [BP4] this implies that while working in PPP framework it is important that user's feedback for offered services is taken on regular basis. This will help in identifying pitfalls for current system, having such kind of campaigns makes end users feel they are part of system itself. It definitely contributes in sustainability of eGovernment projects. Researchers (Choi et al., 2016; Sachdeva, 2009; Millard, 2018) and Audit Personnel have also mentioned it as an important aspect in their studies. The fifth determinant is Periodical Auditing [BP 5], the determinant is considered as an important aspect in studies

conducted by (Sachdeva, 2009; Choi et al., 2016; Singh & Kiran, 2013). This implies that it is important for every system to execute as per the process. Periodical Auditing helps in keeping system free from any kind of vulnerabilities and helps in moving towards a stable system which definitely affects sustainability aspect. The sixth determinant is Ensuring Interoperability [BP6], it implies that application hosted should be browser independent. The said determinant has been identified as significant by (Kalsi & Kiran, 2015; Singh & Kiran, 2013; Das & Narasimhan, 2016). The seventh determinant [BP7] is Consulting Draft RFP prepared by government organization STQC. The organization based on experience of auditing multiple projects have prepared a draft RFP which could be used by eGovernment projects. Researchers Bhatnagar, 2009 and Audit Personnel have mentioned its significance for sustainability of eGovernment projects. The eighth determinant [BP8] is identified as having Knowledge Sharing Portal among various projects/modules, this implies that presence of such kind of portal helps in knowing the best ways of handling associated challenges across various projects. The significance has been reflected in various studies in similar domain (Yadav et al., 2019; Herazo & Lizarralde, 2016; Sandoval-Almazan & Gil-Garcia, 2012).

### *3.4 Psychological Factors*

The employees of any organization play key role in success or failure of any projects. The psychological factors considered for study ensures wellness of an employee, the said factors are critical factors for sustainability of any eGovernment project. Eight determinants have been identified for the study based on discussions with audit personals and existing literature in this context. The first determinant is [P1] named as continuity of top Championship, this implies that it helps in clearly defining the objectives, scope and timelines of project. Researchers (Sachdeva, 2009; Renken & Heeks, 2014) and Audit Personnel have mentioned the significance of same as part of studies conducted by them. The determinant [P2] mentioned in (Sachdeva, 2009; Karim, 2003; Das & Narasimhan, 2016) is defined as deliveries within timelines this implies defining the clearly defined timelines for project related deliveries. The third determinant [P3] is named as,

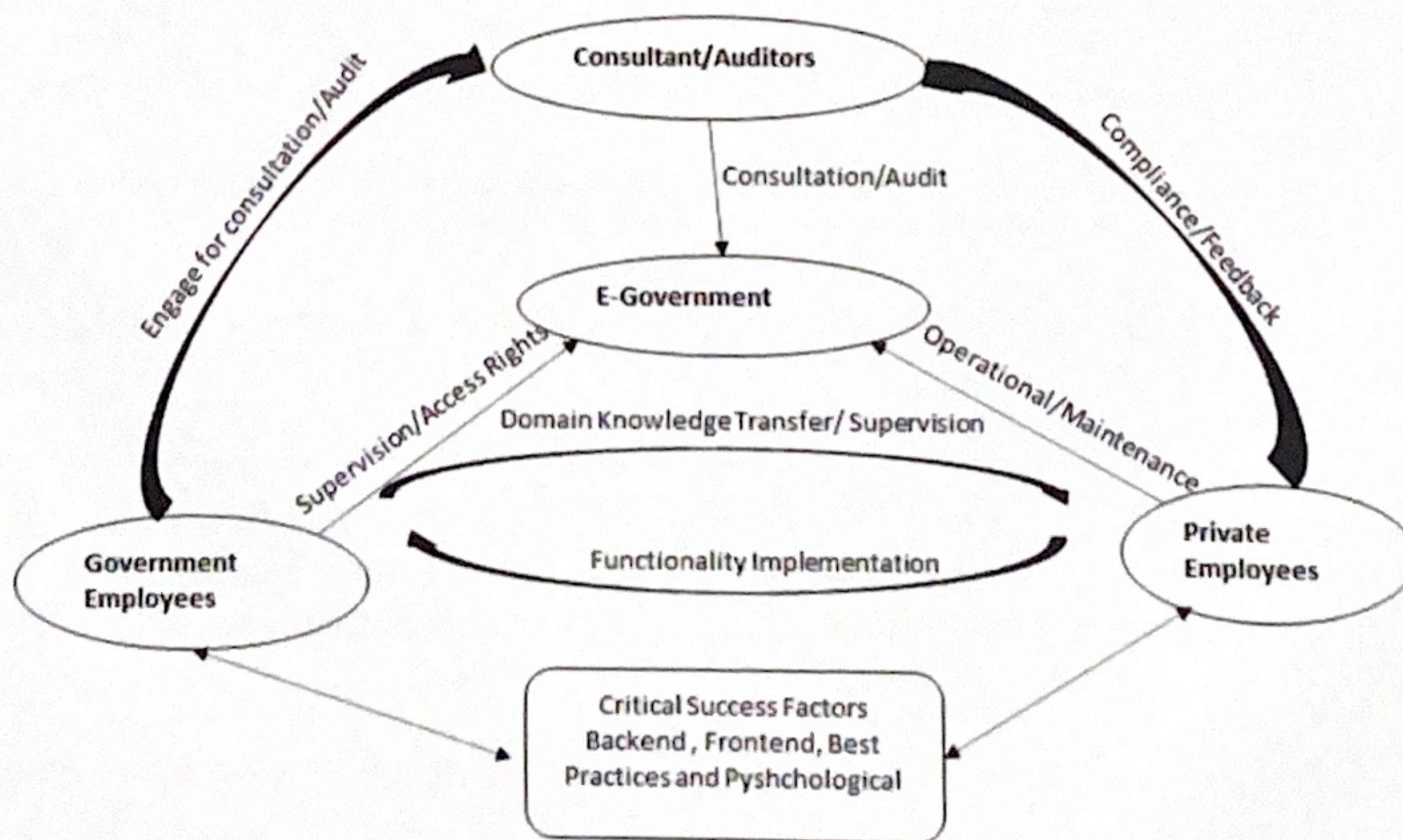
Performance Expectancy this implies that it's important that end users should be satisfied and should have belief in the system. The extent of end users believe on the system is termed as performance expectancy. Scholars (Bala & Venkatesh, 2008; Venkatesh et al., 2016) have mentioned the importance of the said determinant in their study. The fourth determinant is efficiently handling of legacy system challenges [P4]. The said determinant has been used by researchers (Venkatesh & Bala, 2008; Almarabeh & Abu Ali, 2010) the determinant implies handling of legacy challenges effectively in new system in all aspects. The fifth determinant [P5] is Participative in Decision Making, this implies that the decisions must be taken through a participative discussion with all concerned team members. The determinant has been mentioned as a significant by studies conducted by researchers (Venkatesh & Bala, 2008; Venkatesh et al., 2016; Millard, 2018; Heeks & Bailur, 2007). The sixth determinant for the study conducted is motivation in changed environment [P6], it is defined as having clarity in terms of specific crucial contribution employee is doing for the project. The employee should be motivated to give its services in their workplace. The determinant has been used by researchers (Venkatesh & Bala, 2008; Almarabeh & Abu Ali

,2010; Preuss & Walker, 2011). The seventh determinant for the study is Skill Utilization [P7], this implies as a characteristic of having fulfilment of an individual that skills attained over a period of time are useful in the changed environment. The significance of said determinant has been mentioned by researchers (Almarabeh & Abu Ali, 2010; Singh & Kiran, 2013; Venkatesh et al., 2016) in their studies in similar domain. The eighth determinant [P8] is Job Satisfaction, the said determinant implies that satisfaction in job affects the performance of an individual at its work place. The said determinant is mentioned in studies conducted by researchers (Venkatesh & Bala, 2008; Almarabeh & Abu Ali, 2010; Das & Narasimhan, 2016; Preuss & Walker, 2011).

### 3.5 Sustainability Factors

The Sustainability aspect of the study has been measured by determinants in consensus with government launched NeGP plan. The determinants taken for study are namely efficiency [S1], Data Integrity [S2], Reliable Service [S3], Affordable Cost [S4], Transparency [S5] and 24\*7 Service [S6]. The theoretical model considering above listed factors have been prepared for sustainable eGovernment projects from employee perspective as Figure 2.

Figure 2 : Theoretical Models from Employee Perspective for Sustainable eGovernment Projects



#### 4. RESULTS AND ANALYSIS

For the current study, a data of approx 500 respondents have been taken, from complete data set, a data of 450 respondents have been considered for conducting study and carrying out analysis from employee's perspective who are working in MMP projects launched under NeGP plan and are operational in PPP mode. The results have been statistically analysed using Partial Least Squares (PLS) regression/path analysis method. The advantage of using PLS is that it does not make the assumption of multivariate normality and has ability to handle multicollinearity among the independents unlike the SEM techniques of AMOS (Mateos Aparacio, 2011). A Partial Least Squares (PLS) model reduces the large number of predictors to a smaller set of uncorrelated components with the greatest predictive ability and performs least squares regression on these components.

Below mentioned Hypothesis have been framed for

the study:

H1: Backend Factor is positively related to sustainability of e-Government project.

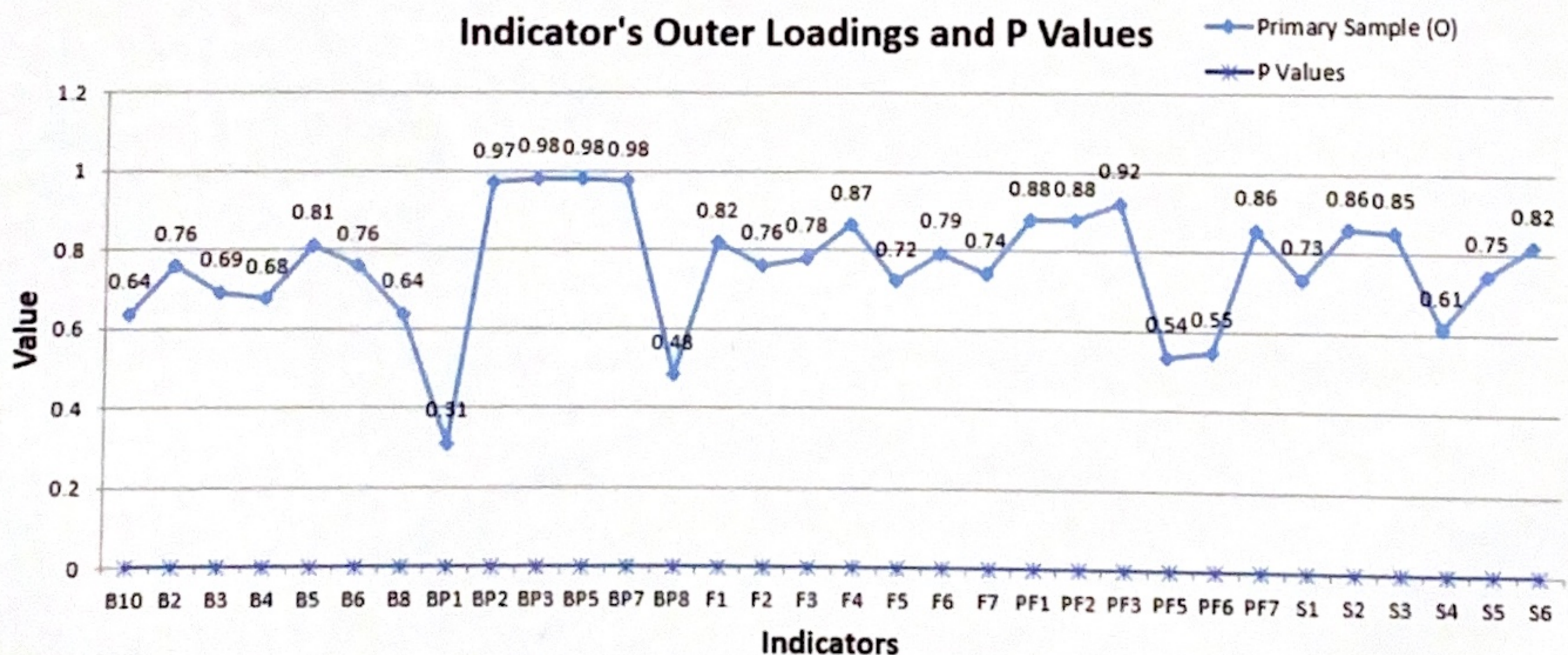
H2: Front-end Factor is positively related to sustainability of e-Government project.

H3: Best Practices Factor is positively related to sustainability of e-Government project.

H4: Psychological Factor is positively related to sustainability of e-Government project.

For evaluation PLS-SEM a two-step process is followed, as a first step the measurement model is derived and then structural model is prepared. While deriving Structural model the indicators whose loading is less than 0.5 are removed from the study, since they were found to be less significant statistically. The values derived using PLS-SEM has been described statistically for each indicator in Figure 3.

Figure 3 : Pictorial Representation of T-Value, Standard Deviation, Mean and P-Value



The algorithm for finding sustainability for eGovernment projects is devised as Algorithm 1 as mentioned below.

Algorithm 1

1. Input: Factor {BF, FF, BP, PF}, eGovernment Project, Ec {Government, Private}, P<sub>s</sub> {Conceptual, Development, Operational, Exit Management}, n= number of factors, i=1, j=1, k=1, s=1
2. Output: SD= Sustainability {BF, FF, BP, PF}.

BF= Backend Factor, FF= Front-end Factor, BP= Best Practice Factor, PF= Psychological Factor

- begin**
3.  $\forall P_s$
  4. For each s <= Number of P<sub>s</sub> stages

- 5.
6. While ( $i \leq n$ )
- 7.
8. For each  $j \leq$  Number of Indicators in each Factor,
- 9.
10. If (P value Factor\_Indicator<sub>j</sub>  $\leq 0.005$ )
11. {
12. Then Significant\_Factors\_Indicator [Factor\_Indicator<sub>j</sub>]
13. }
14. Else
15. {
16. Then Insignificant\_Factors\_Indicator [Factor\_Indicator<sub>j</sub>]
17. }
18.  $j=j+1$
- 19.
20.  $i=i+1$
- 21.
22.  $s=s+1$
- 23.
24. Significant\_Factor\_Indicators used to calculate Path coefficients and their respective P values
25. For each  $m \leq$  Number of Ps stages
- 26.
27. For each  $k \leq n$
- 28.
29. If (P value Path\_Coeff<sub>k</sub>  $\leq 0.005$ )
30. {
31. Then Significant\_Coeff [Path\_Coeff<sub>k</sub>]
32. }
33. Else
34. {
35. Then Insignificant\_Coeff [Path\_Coeff<sub>k</sub>]
36. }
37.  $k=k+1$
- 38.
39.  $m=m+1$
- 40.
41. SD  $\sum$  Significant\_Coeff[i] ( $i=1$  to  $n$ )
42. End

Table 2 as mentioned below reflects the validity and reliability of constructs used in model. The value of Average Variance Extracted and Cronbach's Alpha were giving significant values. This reflects that model prepared has all valid constructs in the study. It has been noticed that for

each construct, Cronbach's Alpha value more than 0.8. Further the value of Average Variance Extracted in more or close to 0.5 (Hair et al., 2012) this depicts that every construct is significant as per respondent also.

**Table 2 : Construct Validity and Reliability**

Factors	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Backend Factors	0.840	0.851	0.877	0.508
Best Practices Factors	0.880	0.948	0.922	0.690
Front-end Factors	0.898	0.927	0.918	0.616
Psychological Factors	0.875	0.950	0.903	0.619
Sustainability	0.868	0.900	0.899	0.602

As per Table 3 the discriminant validity has been calculated using Fornell Larcker Criterion method. In this method the diagonal value is

examined to know the significance of the factor. The values attained signifies that all factors considered for study are significant.

**Table 3 : Discriminant Validity**

Fornell-Larcker Criterion	Backend Factors	Best Practices Factors	Front-end Factors	Psychological Factors	Sustainability
Backend Factors	<b>0.713</b>				
Best Practices Factors	0.027	<b>0.831</b>			
Front-end Factors	0.484	-0.106	<b>0.785</b>		
Psychological Factors	0.237	0.186	0.046	<b>0.787</b>	
Sustainability	0.436	0.349	0.211	0.632	<b>0.776</b>

As per results reflected in Figure 4 it reflects that as per the respondent's response all the four identified factors play crucial role in ensuring sustainability of eGovernment projects at 1%

significance value. The p value obtained for Backend, Best Practice and Psychological is less than 0.01, and Front end at 5 % significance.

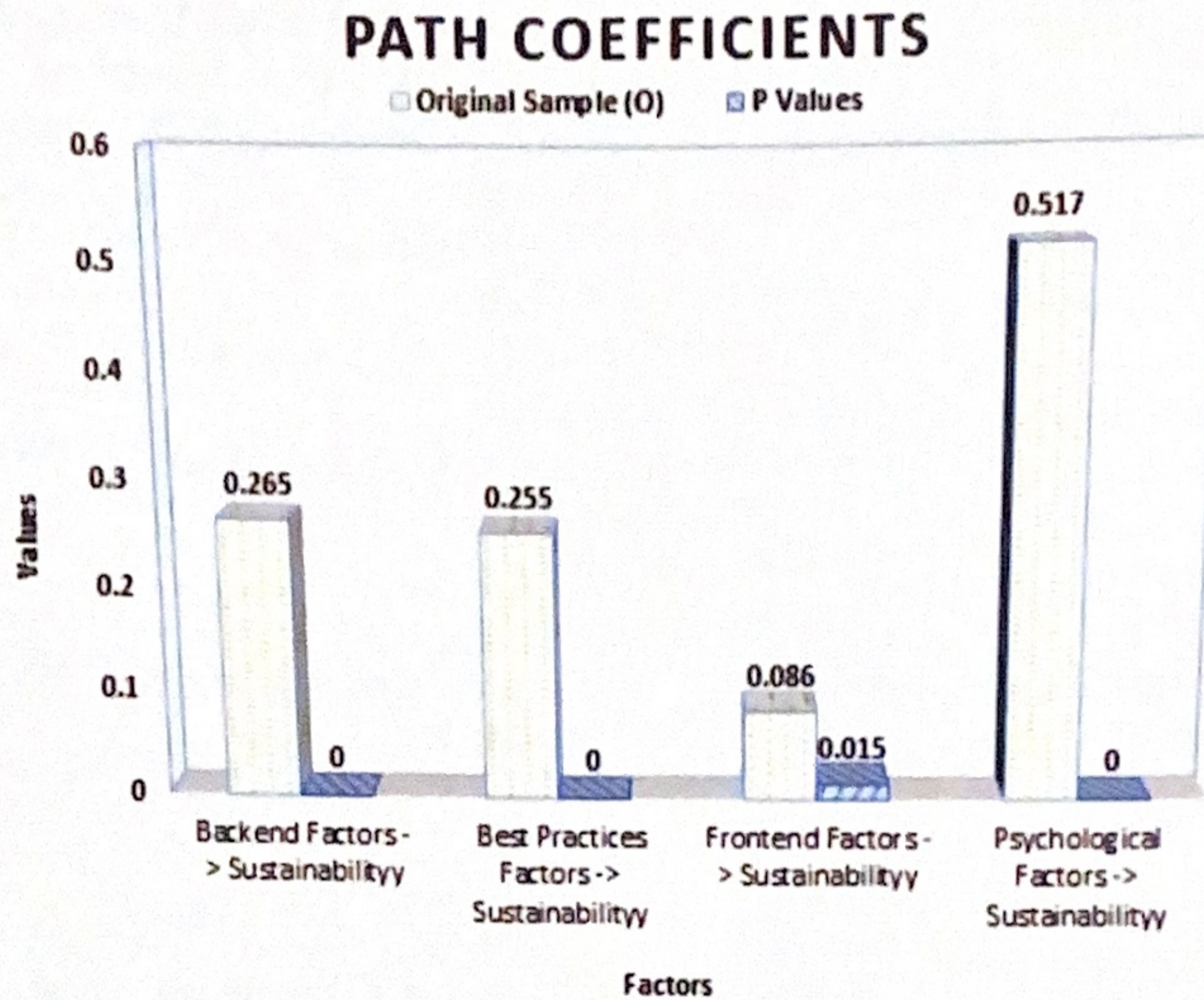
**Table 4 : Employee Perspective - Indicators Significance**

Statistical value of Significance(P), Standard Deviation, T-Values and Mean					
	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
Backend Factors -> Sustainability	0.265	0.272	0.043	6.161	0.000
Best Practices Factors -> Sustainability	0.255	0.257	0.036	7.171	0.000
Front-end Factors -> Sustainability	0.086	0.085	0.035	2.449	0.015
Psychological Factors -> Sustainability	0.517	0.512	0.043	11.919	0.000

The value of  $R^2$  has been derived as 0.55, this identifies that identified factors contributes towards 55 % in sustainability. Further it has been identified that all the factors contribute significantly in ensuring eGovernment projects sustainability aspect. Studies conducted by

authors (Quaddus and Woodside, 2015 and Singh, G et al., 2010) also confirms the acceptability of derived  $R^2$  for similar studies in eGovernment domain. Hence  $SD \forall$  Factor {BF, FF, BP, PF} as illustrated in algorithm and results mentioned above.

Figure 4 : Path Coefficient Values of Critical Success Factors



#### 4.1 Structural Model from Employee Perspective

On successfully validating the measurement model, the process for making structural model is initiated. The first crucial principle for the assessment of the PLS structural equation model is value of  $R^2$  using a bootstrapping procedure, the output of Smart PLS output as structural model has been prepared and illustrated as shown in Figure 5.

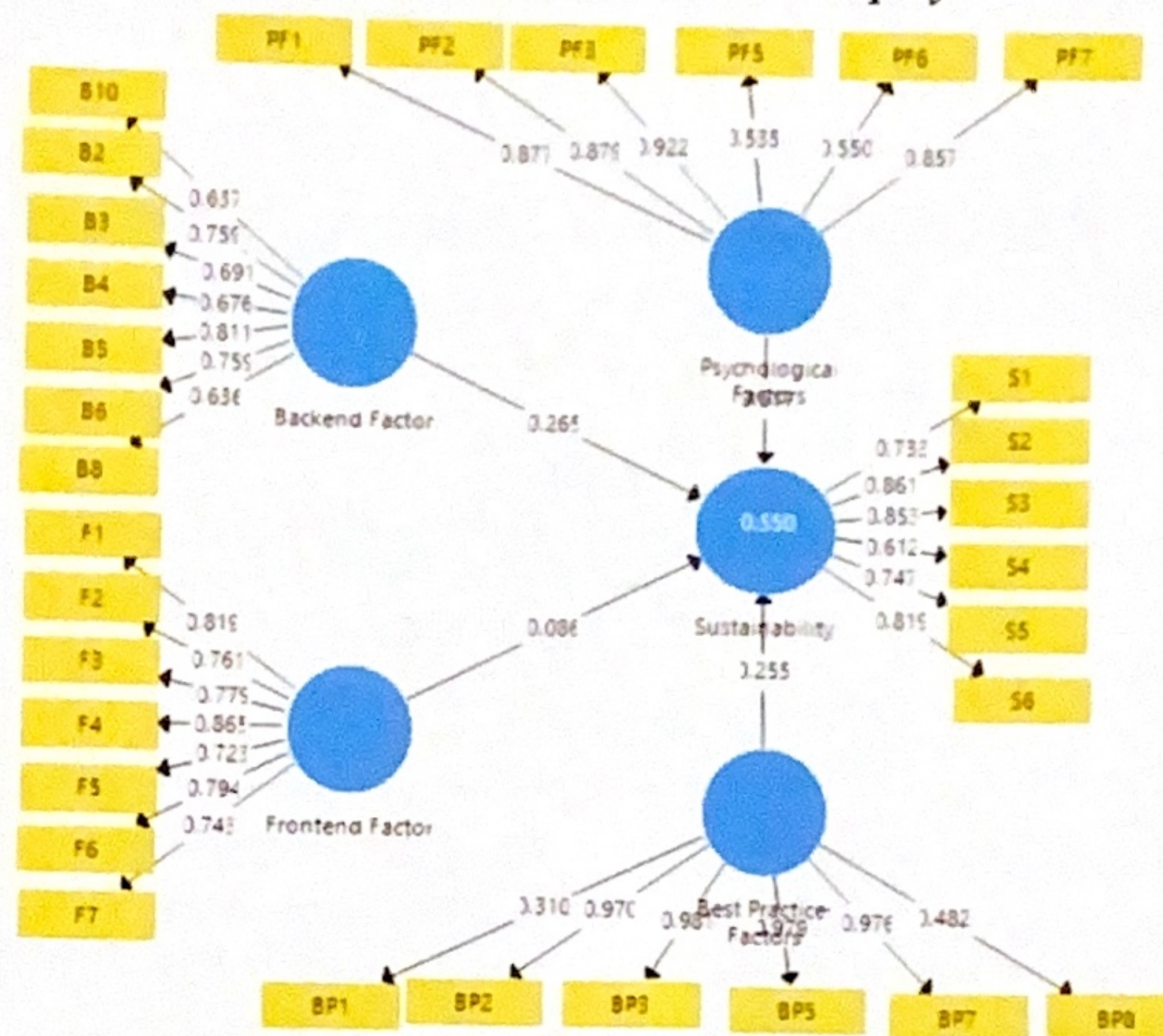
The value of  $R^2$  measures the relationship variance explained by constructs with total variance of the model. Model could be considered illustratively significant once the derived value was satisfactorily high. (Urbach & Ahlemann, 2010) has specified in his study that value of nearly .670 is significant, values around .333 lies in the bracket of average value, and values of .190 and lower is not considered as significant. However, in context of e-Government domain, study by various researchers (Gilbert et al., 2004; Quaddus & Woodside, 2015; Bhatnagar et al., 2010) have reflected that the value of  $R^2$  as 55.0 is substantial for the study.

#### 4.2 Path Coefficient

Path coefficients indicate the percent of variance contributed by each predictor to the  $R^2$  of the latent construct. In PLS, path coefficients are often

termed as beta ( $\beta$ ) values, as they are equivalent to standardised coefficients calculated in multiple regression analysis (Neupane et al., 2017). The exploratory power of the PLS structural model can be estimated by examining the amount of variation in the dependent variables based on independent variables of the study. The same has been depicted in Figure 5. According to the results, Psychological Factors (PF) is the most important and significant driver for sustainable e-Government project, with path coefficient value as 0.517. Similarly, other significant factors of path coefficient values are Backend Factors (BF) as 0.265 and Best Practices Factors (BP) as 0.255 and Front-end Factors(F) as 0.086. All the constructs taken for study are found to be significant indicators based on collected responses from employees from Government and Private sector who are working in these e-Government project. The value of  $R^2$  as 0.550 indicates that the model explains a considerable amount of variation for sustainability of e-Government project from employee's perspective. Studies conducted by authors (Quaddus & Woodside, 2015; Singh et al., 2010; Welch et al., 2005; Gupta et al., 2008) also confirms the acceptability of derived  $R^2$  for studies in e-Government domain.

**Figure 5 : Structural Model - Employee**



### 4.3 Testing and Interpretation of the Hypothesis

The Hypothesis of the study from Employee perspective along with their interpretation is mentioned below:

*H1 : Backend Factor is positively related to sustainability of e-Government project.*

Backend factor is found to be significant in ensuring the sustainability of e-Government projects. The statistical value of path coefficient as 0.265, indicates that there is variance of 26.5 % because of the said construct in ensuring sustainability of e-Government project. Further the statistical value of  $t = 6.161$  and value of  $p$  as 0.000 (i.e.  $p < .01$ ) depicts that the said construct is indicating a significant positive relationship for sustainability of e-Government project at 1 % significance. Thus, H1 is accepted.

*H2 : Front-end Factor is positively related to sustainability of e-Government project.*

Front-end factor is found to be significant in ensuring the sustainability of e-Government projects. The statistical value of path coefficient as 0.086, indicates that there is variance of 8.6 % because of the said construct in ensuring sustainability of e-Government project. Further the statistical value of  $t = 2.449$  and value of  $p$  as 0.015 (i.e.  $p < .05$ ) depicts that the said construct is

indicating a significant positive relationship for sustainability of e-Government project at 5% significance. Thus H2 is accepted.

*H3 : Best Practices Factor is positively related to sustainability of e-Government project.*

Best Practices factor is found to be significant in ensuring the sustainability of e-Government projects. The statistical value of path coefficient as 0.255, indicates that there is variance of 25.5 % because of the said construct in ensuring sustainability of e-Government project. Further the statistical value of  $t = 7.171$  and value of  $p$  as 0.000 (i.e.  $p < .01$ ) depicts that the said construct is indicating a significant positive relationship for sustainability of e-Government project at 1 % significance. Thus H3 is accepted.

*H4 : Psychological Factor is positively related to sustainability of e-Government project.*

Psychological factor is found to be significant in ensuring the sustainability of e-Government projects. The statistical value of path coefficient as 0.517, indicates that there is variance of 51.7 % because of the said construct in ensuring sustainability of e-Government project. Further the statistical value of  $t = 11.919$  and value of  $p$  as 0.000 (i.e.  $p < .01$ ) depicts that the said construct is indicating a significant positive relationship for

sustainability of e-Government project at 1 % significance. Thus H4 is accepted.

#### 4.4 Interpretation of Results from Employees Perspective

In reference to results tabulated in Table 4, it is derived that as per the response collected from respondents for e-Government project sustainability, hypothesis H1, H2, H3 and H4 are found to be true and hence the said hypothesis are accepted for the study. This indicates that as per collected sample of respondents the users have shown that for sustainability of e-Government projects, identified factors play significant role and are found to be contributing significantly for sustainability of e-Government projects.

#### 5. CONCLUSION

The parameters as recognized above are imperative for eGovernment projects sustainability. The factors are of significant importance as the lack of even one effect the overall performance of eGovernment projects. Further the assessment through framework as designed above at regular interval and during various stages of eGovernment projects helps in identifying the feeble areas which needs to be strengthened up. A survey questionnaire filled up by prospective stakeholders and on analysing them statistically definitely helps in providing meaningful insights to the policy leaders. This can help them in taking strategic steps at initial stages itself so that projects can remain sustainable and can benefit larger society. Results from various projects could also be compared with other projects which are similar in nature or the stage in life cycle of a project, this could help in identifying the gap areas. The use of technological solutions like machine learning, block chain, artificial intelligence, natural systems etc could make the end users compliance part easy and convenient and hence must be adopted as per project need.

#### 6. LIMITATIONS

Since all identified factors are important for eGovernment projects sustainability, hence a sample from more users separated with

geographical boundaries and working in various stages of project could give meaningful insights which can be adopted for a new project at grassroot level itself. Further taking feedback from same set of users after a specified time on same set of factors will also help in giving meaningful insights for project sustainability in dynamic ecosystem.

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