

**A MULTI-STAKEHOLDER  
FRAMEWORK FOR PERFORMANCE  
OF E-GOVERNMENT: DEVELOPMENT  
AND VALIDATION**

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OF E-GOVERNMENT: DEVELOPMENT  
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by

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## CERTIFICATE

“This is to certify that the thesis entitled “**A Multi-Stakeholder Framework for Performance of e-Government: Development and Validation**”, being submitted by **Harjit Singh** to the **Indian Institute of Technology Delhi** for the award of the degree of **Doctor of Philosophy (Ph.D.)**, is a record of bonafide research work carried out by him. He has worked under our guidance and supervision and has fulfilled the requirement for submitting this thesis, which has attained the standard required for the Ph.D. degree of this institute. The results presented in this have not been submitted in part or in full to any other university or institute for the award of any degree or diploma.

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## ABSTRACT

The main purpose of this research was to develop a comprehensive framework appropriate for measuring the performance of e-government considering the context of multi-stakeholders and rigorously validating the same empirically. The main stakeholders considered for scope are citizens (G2C), businesses (G2B) and government agencies (G2G). The research summarised the literature review of electronic government frameworks and models in a stipulated way to identify various constructs and their relationships. The literature review was executed using the procedure of doing a systematic review. This exercise identified a total of 136 constructs which were further clubbed into groups like people, technology, policy, institution and economic. This exercise identified leading constructs in literature. Some of these constructs have been used across several studies. It was also observed that most of the studies in the e-government field are directly or indirectly using the existing dominant theories from the research areas of acceptance and adoption of technology. The review also highlighted that the citizens were the dominant user groups being studied while other stakeholders (like government agencies and businesses) were not much covered in studies from the field of e-government. Based on the output of literature review phase, an integrated framework for the performance of e-governance projects was developed. The literature review also provided insights into the research and studies in the theme of e-government performance frameworks and models which helped in developing a suitable framework appropriate for measuring the performance of e-government projects considering the context of multiple stakeholders. In this developed framework, along with the important and established constructs such as quality-related constructs and behavioural intention constructs, some of the potentially important but less prominent constructs like Privacy & confidentiality and previous experience of the internet & e-Commerce, are also included in design and development of the framework.

As a scope of the field studies for this research, four Indian e-government projects were finalised across different stakeholders. This was done as a result of expert opinion exercise, adopted for this activity. In the field studies, first, the exploratory research (case study) was executed for the selected e-government projects. The relevance of the developed framework and its constructs was explored in these studies. Thereafter, the empirical studies (survey) were executed on the selected e-government projects. For the data collection part of these surveys, the self-administered questionnaires were utilised. The questionnaires were customised in the context of relevant project studies and stakeholders before being used for the surveys. The

questions included were self-explanatory and in the context of the project so the respondents understand them easily. While preparing the questionnaires for the survey, earlier similar studies were referred, especially those studies which considered similar constructs as identified in this research. Structural equation modeling using partial least squares (PLS-SEM) was applied using the statistical tool Smart PLS 3.2 for the data analysis phase.

The results of the empirical studies for the same framework across studies were observed to be similar. It indicates that the perspective of the users has an impact on the outcome of the same framework used across stakeholders. This confirmed the validation of the developed framework empirically for the e-government projects from the perspective of different stakeholders (citizens, businesses, and government agencies).

In these studies, it was found that there are dominant constructs used across studies of the various domain areas. It was also observed that there is a group of constructs where the value of the potential of usage is high but they have not been used much in the models and frameworks. Focus is required for refining and redefining them to encourage their usage in their respective domains.

The framework has been meticulously validated across studies and is now available for use by policymakers, auditors and other agencies for assessment of the performance of an e-government project across different phases of the project (development to deployment of the projects).

Considering the resource constraints, the scope of empirical validation for this study was limited to Indian e-government projects. There could be opportunities to test this framework on the e-government projects of other countries. Also, there would be the opportunity to include some other potentially important constructs and then test the updated frameworks empirically.

## सार

इस शोध का मुख्य उद्देश्य बहु-हितधारकों के संदर्भ पर विचार करते हुए ई-सरकार के प्रदर्शन को मापने के लिए उपयुक्त एक व्यापक ढांचा विकसित करना और उसे अनुभवजन्य रूप से मान्य करना था। दायरे के लिए माने जाने वाले मुख्य हितधारक नागरिक (G2C), व्यवसाय (G2B) और सरकारी एजेंसियां (G2G) हैं। शोध ने इलेक्ट्रॉनिक सरकारी ढांचे और मॉडलों की साहित्य समीक्षा को एक निर्धारित विभिन्न निर्माणों और उनके संबंधों की पहचान करने का तरीका। साहित्य समीक्षा को व्यवस्थित समीक्षा करने की प्रक्रिया का उपयोग करके निष्पादित किया गया था। इस अभ्यास ने कुल 136 निर्माणों की पहचान की, जिन्हें आगे लोगों, प्रौद्योगिकी, नीति, संस्था और आर्थिक जैसे समूहों में जोड़ा गया। इस अभ्यास ने अग्रणी की पहचान की साहित्य में निर्माण करता है। इनमें से कुछ निर्माणों का उपयोग कई अध्ययनों में किया गया है। यह भी देखा गया कि ई-सरकार के क्षेत्र में अधिकांश अध्ययन प्रत्यक्ष या अप्रत्यक्ष रूप से प्रौद्योगिकी की स्वीकृति और अपनाने के अनुसंधान क्षेत्रों से मौजूदा प्रमुख सिद्धांतों का उपयोग कर रहे हैं। समीक्षा में इस बात पर भी प्रकाश डाला गया कि अध्ययन किए जा रहे प्रमुख उपयोगकर्ता समूह नागरिक थे, जबकि अन्य हितधारक (जैसे सरकारी एजेंसियां और व्यवसाय) ई-सरकार के क्षेत्र से अध्ययन में ज्यादा शामिल नहीं थे। साहित्य समीक्षा चरण के परिणाम के आधार पर, ई-गवर्नेंस परियोजनाओं के निष्पादन के लिए एक एकीकृत ढांचा विकसित किया गया था। साहित्य समीक्षा ने विषय में शोध और अध्ययन में अंतर्दृष्टि भी प्रदान की कई हितधारकों के संदर्भ में ई-सरकारी परियोजनाओं के प्रदर्शन को मापने के लिए उपयुक्त एक उपयुक्त ढांचा विकसित करने में मदद करने वाले ई-सरकारी प्रदर्शन ढांचे और मॉडल। इस विकसित ढांचे में, महत्वपूर्ण और स्थापित निर्माण जैसे गुणवत्ता से संबंधित निर्माण और व्यावहारिक इरादे निर्माण, गोपनीयता और गोपनीयता और इंटरनेट और ई-कॉमर्स के पिछले अनुभव जैसे कुछ संभावित महत्वपूर्ण लेकिन कम प्रमुख निर्माण भी शामिल हैं। ढांचे के डिजाइन और विकास में।

इस शोध के लिए क्षेत्रीय अध्ययन के दायरे के रूप में, विभिन्न हितधारकों के बीच चार भारतीय ई-सरकारी परियोजनाओं को अंतिम रूप दिया गया। यह इस गतिविधि के लिए अपनाए गए विशेषज्ञ राय अभ्यास के परिणामस्वरूप किया गया था। क्षेत्र अध्ययनों में सबसे पहले चयनित ई-सरकारी परियोजनाओं के लिए खोजपूर्ण अनुसंधान (केस स्टडी) निष्पादित किया गया था। इन अध्ययनों में विकसित ढांचे और उसके निर्माणों की प्रासंगिकता का पता लगाया गया था। तत्पश्चात, चयनित ई-सरकारी परियोजनाओं पर अनुभवजन्य अध्ययन (सर्वेक्षण) निष्पादित किए गए। इन सर्वेक्षणों के डेटा संग्रह भाग के लिए, स्व-प्रशासित प्रश्नावली का उपयोग किया गया था। सर्वेक्षण के लिए उपयोग किए जाने से पहले प्रश्नावली को प्रासंगिक परियोजना अध्ययनों और हितधारकों के संदर्भ में अनुकूलित किया गया था। शामिल प्रश्न स्व-

व्याख्यात्मक और परियोजना के संदर्भ में थे ताकि उत्तरदाता उन्हें आसानी से समझ सकें। सर्वेक्षण के लिए प्रश्नावली तैयार करते समय, पहले इसी तरह के अध्ययनों का उल्लेख किया गया था, विशेष रूप से वे अध्ययन जो इस शोध में पहचाने गए समान निर्माणों को मानते थे। डेटा विश्लेषण चरण के लिए सांख्यिकीय उपकरण स्मार्ट पीएलएस 3.2 का उपयोग करके आंशिक न्यूनतम वर्गों (पीएलएस-एसईएम) का उपयोग करके संरचनात्मक समीकरण मॉडलिंग लागू किया गया था।

सभी अध्ययनों में एक ही ढांचे के लिए अनुभवजन्य अध्ययनों के परिणाम समान पाए गए। यह इंगित करता है कि उपयोगकर्ताओं के परिप्रेक्ष्य का हितधारकों में उपयोग किए जाने वाले समान ढांचे के परिणाम पर प्रभाव पड़ता है। इसने विभिन्न हितधारकों (नागरिकों, व्यवसायों और सरकारी एजेंसियों) के दृष्टिकोण से ई-सरकारी परियोजनाओं के लिए अनुभवजन्य रूप से विकसित ढांचे के सत्यापन की पुष्टि की।

इन अध्ययनों में, यह पाया गया कि विभिन्न डोमेन क्षेत्रों के अध्ययनों में प्रमुख निर्माणों का उपयोग किया गया है। यह भी देखा गया कि निर्माणों का एक समूह है जहां उपयोग की क्षमता का मूल्य अधिक है लेकिन मॉडल और ढांचे में उनका अधिक उपयोग नहीं किया गया है। उनके संबंधित डोमेन में उनके उपयोग को प्रोत्साहित करने के लिए उन्हें परिष्कृत और पुनर्परिभाषित करने पर ध्यान देने की आवश्यकता है।

सभी अध्ययनों में सावधानीपूर्वक मान्य किया गया है और अब परियोजना के विभिन्न चरणों (परियोजनाओं के विकास के लिए विकास) में ई-सरकारी परियोजना के प्रदर्शन के मूल्यांकन के लिए नीति निर्माताओं, लेखा परीक्षकों और अन्य एजेंसियों द्वारा उपयोग के लिए उपलब्ध है।

संसाधनों की कमी को ध्यान में रखते हुए, इस अध्ययन के लिए अनुभवजन्य सत्यापन का दायरा भारतीय ई-सरकारी परियोजनाओं तक सीमित था। अन्य देशों की ई-सरकारी परियोजनाओं पर इस ढांचे का परीक्षण करने के अवसर हो सकते हैं। साथ ही, कुछ अन्य संभावित रूप से महत्वपूर्ण निर्माणों को शामिल करने और फिर अनुभवजन्य रूप से अद्यतन ढांचे का परीक्षण करने का अवसर होगा।

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## List of Abbreviations

<b>Abbreviation</b>	<b>Description</b>
AIMA	All India Management Association
AO	Assessing Officer
AVE	Average Variance Extracted
BI	Behavioural Intention
CA	Cronbach's Alpha
CII	Confederation of Indian Industry
CR	Composite Reliability
CSD	Canteen Stores Department
CSI	Computer Society of India
DOI	Diffusion of Innovations
DR	Disaster Recovery
EGDI	E-government Development Index
EGOV4SD	Electronic Governance for Sustainable Development
ESCIMS	Excise Supply Chain Information Management System
FLC	Fornell and Larcker Criterion
FOU	Frequency of Use
FY	Financial Year
G2B	Government to Business
G2C	Government to Citizens
G2CBG	Government to Citizens, Businesses and Government
G2G	Government to Government
GIFT	Global Institute of Flexible Systems Management
GOF	Goodness-Of-Fit
GSTN	Goods and Service Tax Network
HTMT	Heterotrait-Monotrait Ratio of Correlations
ICT	Information and Communication Technology
INFQ	Information Quality
INTU	Intention to Use or Use
IoT	Internet of Things
IPS	Intrusion Prevention System
IS	Information System
IT	Information Technology
ITR	Income Tax Return
KPIs	Key Performance Indicators
MMP	Mission Mode Project
NCT	National Capital Territory
NeGP	National e-Governance Plan
NTA	National Tax Agency
OEB	Overall Expected Benefits
OECD	The Organisation for Economic Co-operation and Development
PAN	Permanent Account Number

<b>Abbreviation</b>	<b>Description</b>
PLS	Partial Least Squares
PNC	Privacy and Confidentiality
POS	Point Of Sale
POU	Potential of Usage
PPP	Public-Private Partnership
PREE	Previous Experience
PSP	Passport Seva Project
SEC	Security
SEM	Structural Equation Modeling
SERQ	Service Quality
SLA	Service Level Agreement
SPV	Special Purpose Vehicle
SRMR	Standardised Root Mean Square Residual
SSL	Secure Socket Layer
SYSQ	System Quality
TAM	Technology Acceptance Model
TDS	Tax deduction at Source
TPB	Theory of Planned Behavior
TRAN	Transparency
TRA	Theory of Reasoned Action
UCPAF	User-Centric Performance Assessment Framework
UGC	University Grants Commission
UN	United Nations
UNES	United Nations E-government Survey
USES	User Satisfaction
USET	User Trust
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor