

AN INTEGRATED CHANGE MANAGEMENT MODEL FOR E-GOVERNANCE IN INDIA

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Abstract

E-governance implementation demands simultaneous transformation of government employees and citizen experience, yet most studies examine only one stakeholder group using a single method. This study investigates change management antecedents and outcomes of e-governance in Tamil Nadu from both perspectives, identifying the conditions associated with employee perceptions of change success and citizen satisfaction. Two independently collected surveys are analysed: a Government Employee Survey (n = 412) covering 83 items across 16 constructs and a General Public Survey (n = 407) covering 41 items across 4 constructs. PLS-SEM, fuzzy-set Qualitative Comparative Analysis (fsQCA) with negated-outcome analysis, and Importance-Performance Map Analysis (IPMA) are applied separately to each dataset. Nine hypothesis families comprising fifteen directional structural paths are tested. All analyses use a fully reproducible, open-source analysis pipeline (5,000 bootstrap resamples); the complete code, outputs, and audit trail are provided as supplementary material. Results. Eleven of the fifteen hypothesised paths are supported; two are non-significant (Change Acceptance → Perceptions of Change Success; Communication Perception → Citizen Satisfaction); and two are statistically significant in the direction opposite to that hypothesised (Communication → Cynicism; Perceptions of Change Success → Challenges), which were reported as contrary-direction findings and interpreted with caution. Views about Change is the strongest predictor of Change Acceptance ($\beta = 0.801$), although a high HTMT ratio between the two constructs (0.917) qualifies this result. Perceptions of Change Success are strongly associated with post-implementation job satisfaction and e-governance impact perceptions. Change Acceptance does not independently predict Change Success when Commitment is controlled. Structural Support records the lowest institutional performance score on the employee side (65.5/100) and reverse-coded cynicism the lowest overall (40.0/100). For citizens, Benefits Outcomes is the only significant direct predictor of Citizen Satisfaction of the two candidate antecedents tested, while Communication Perception has no direct effect; a clearly labelled post-hoc mediation analysis indicates its association with satisfaction operates entirely through Benefits Outcomes. The evidence suggests that departments should cultivate positive dispositional orientations before implementation, invest in Structural Support, and address cynicism through participatory co-design. For citizens, improving accessibility, speed, and transparency appears to be the most promising lever among those measured for raising satisfaction. The findings are consistent with the proposition that dispositional readiness, institutional enablement, and substantive service delivery are jointly important to e-governance success. The negated fsQCA configurations indicate that psychological readiness alone does not compensate for absent institutional enablement, and that communication without delivery is associated with citizen dissatisfaction. Because the study is cross-sectional and single-source,

these results are theory-guided associations rather than the causal effects demonstrated.

Keywords:

E-governance, Partial Least Squares Structural Equation Modelling, Fuzzy-set Qualitative Comparative Analysis, Importance-Performance Map Analysis, Tamil Nadu

1. INTRODUCTION

Tamil Nadu is a rich laboratory in India for studying the nature of digital government transformation. Over the last two decades, the State has pursued nationally relevant, institutionally embedded, architecture-led approach to e-governance [1].

The Tamil Nadu e-Governance Agency (TNeGA), formally established in 2007 under the Tamil Nadu Societies Registration Act as the nodal agency of the state's e-governance initiatives, with the Directorate of e-Governance first set up in 2006, is the hub of this ecosystem [57]. Whereas some states have digitised services in piecemeal fashion, Tamil Nadu has adopted an integrated approach to digitisation, securing a top ranking in the Good Governance Index among large states in 2019, and continuing to rank well in other governance reports [15].

This sustained and systematic nature of the e-governance initiatives in Tamil Nadu makes it an excellent empirical setting to study the relationship between organisational change management and the quality of digital public service delivery - from the viewpoint of both bureaucrats who make it happen and the citizens who use it [4] [11]. The breadth and depth of Tamil Nadu's digital governance initiatives is evident on several fronts [13] [14]. At the front-end of citizen service delivery, the e-District and e-Sevai network expanded to more than 10,558 Common Services Centres in 2016, electronically delivering high-volume service transactions such as income, community and nativity certificates, utility bill payments and social welfare entitlements - which were subsequently adopted nationally under CSC Version 2.0 [57] [39] [18]-[20]. At the back-end management level, the Integrated Financial and Human Resource Management System (IFHRMS) transformed treasury, budget, pension and human resource management of government departments, allowing real-time fiscal monitoring and eliminating delays in discretionary processing [27] [57].

Land administration reform was initiated by TamilNILAM and TNREGINET, which digitised land records, and enabled online property registration, thereby minimising corruption in high-value transactions [8]. Infrastructure was brought to the doorsteps of all Village Panchayats, Municipalities and Corporations through TANFINET's 55,000 km optical fibre network [60].

In the vanguard of AI governance, TNeGA developed the Uzhavan app for more than 500,000 farmers for AI-powered pest and disease recognition, and e-Paarvai, an AI tool for screening cataract in all 34 districts that identified more than 20,000 cases, which won the NASSCOM National AI Game Changers Award 2021 [58] [59] [43]. Tamil Nadu also pioneered the use of government-wide blockchain infrastructure - Nambikkai Inaiyam - to secure and verify documents - a first in India [30] [31]. The development of human capital was institutionalised through the Naan Mudhalvan skill development initiative benefiting more than 10 lakh students every year [57].

But the very scale and scope of this portfolio create a governance conundrum: the more ambitious the digital transformation, the more disruptive it is for the public servants who have to learn and implement it [37] [39]. Studies of the deployment of technology around the world and in India consistently show that the micro-level causes of e-governance implementation failure are human: resistance, low digital self-efficacy, insufficient training, poor communication and supervisory support, and so on, consistently cripple technically robust systems [22] [48] [34]. This is also the case in Tamil Nadu: while the state invests in large-scale infrastructure, the field-level implementation of e-governance varies between departments and districts; and the experiential gap between what e-governance promises and what the citizen experiences is well documented [8] [54]. These human factors of digital transformation represent the domain of change management - an area that has received increasing attention in public administration research but is less explicit and empirically tested in the e-governance literature [64].

This gap has become more, not less, salient in the recent digital-government literature. Mergel et al. [36] show that practitioners define digital transformation primarily as an organisational and cultural change problem rather than a technology problem, while [61] in a structural equation model of Italian public administrations, find that organisational barriers and the absence of managerial support significantly impede digital government transformation - though, counter-intuitively, they do not find cultural resistance to change itself to be a significant impeding factor, underlining that organisational-level enablement rather than individual attitudes may be the binding constraint [49].

Janssen and Estevez [29] argue that "lean government" transformations succeed or fail on institutional adaptation rather than platform capability, and Gabryelczyk [17] documents how the COVID-19 pandemic compressed years of digital change into months, magnifying the human-readiness problem [55] [56]. At the technological frontier, the adoption of artificial intelligence in government raises the same organisational questions in sharper form: Wirtz et al. [65] and Zuiderwijk et al. [67] both identify workforce capability, trust, and organisational implementation challenges as core determinants of AI-in-government outcomes. Yet this recent literature remains predominantly qualitative, single-stakeholder, or conceptual [62] [66]. What it lacks and

what the present study supplies - is a quantitative, dual-stakeholder, multi-method test of an integrated change management model in a large developing-country administrative setting.

The current research takes up this challenge by conceptualising Tamil Nadu's implementation of e-governance as a change management issue that needs to be analysed from two complementary perspectives. On the supply front, public servants - from the lowest clerks to department heads - are the human systems that implement e-governance. Their self-confidence, change readiness, leadership responsiveness, and organisational support shape whether they use digital systems competently, consistently and in the spirit of public service. On the demand side, citizens are the destiny of e-governance: their responses to communication quality, governance antecedents, and performance outcomes indicate whether digital public services meet their equity and efficiency goals or are merely aspirational policy statements. In spite of this two-pronged dependency, the vast majority of e-governance studies focus on either the employee perspective or the citizen perspective, and most apply a single statistical approach that does not provide simultaneous insights into directional associations, sufficiency conditions and performance gaps [52].

The study's methodology uses two independent surveys - a Government Employee Survey (n = 412) surveying employees in the Tamil Nadu state government departments, and a General Public Survey (n = 407) surveying citizens who have used at least one government e-service - and a tri-methodological analysis design for each. Partial Least Squares Structural Equation Modelling (PLS-SEM) assesses the net effects between change management constructs; fuzzy-set Qualitative Comparative Analysis (fsQCA) determines the sufficient configurations of conditions associated with high outcomes; and Importance-Performance Map Analysis (IPMA) identifies the performance gaps on high importance constructs for policy prioritisation [21] [50] [24].

The two sets of data are analysed separately - not combined - as they represent non-matched, independently sampled populations of stakeholders measuring constructs that are logically specific to the stakeholders. The only inferences across datasets are interpretive in the Discussion. Against this background, the study has three objectives: (i) to identify the antecedents (including self-efficacy, leader support, structural support and communication) associated with employee commitment, acceptance, perceptions of change and perceived change success in Tamil Nadu's e-governance environment; (ii) to assess the association of governance-level antecedents and citizen perceptions of communication with citizen perceptions of e-governance benefits and service satisfaction; and (iii) to integrate the two sets of findings into a unified diagnostic of the strengths and performance gaps of Tamil Nadu's change management ecosystem.

2. THEORETICAL FRAMEWORK

The effective adoption of e-governance projects is a multidimensional interaction of organisational readiness and societal benefits [41] [44]. In this study, an Integrated Multi-Level e-Governance Change Model (IMECM) is used which connects

the micro-level psychological states of the employees with the macro-level objectives of public value and citizen satisfaction [23] [26]. This model rests on five key theoretical foundations that explain how the journey from pre-implementation to impact is made.

2.1 THEORETICAL FOUNDATIONS

2.1.1 *Social Cognitive Theory (SCT):*

SCT offers a micro-level explanation of employee self-efficacy [5] [6]. In the context of e-governance, self-efficacy is a multifaceted concept that refers to an individual's belief in his or her ability to adapt to change, learn new technology, and implement e-governance workflows. According to SCT, there is a "reciprocal determinism" among personal factors, behavioural skills and organisational environmental enablers that interact with each other to affect the implementation [5]. The multidimensional construct of self-efficacy used in this study - adapting to change (SE-AC), learning new technologies (SE-LT) and implementing e-governance (SE-IM) - is a direct adaptation of the SCT.

2.1.2 *Theory of Planned Behaviour (TPB):*

TPB explains the interactions between employee attitudes, social norms (leader support) and perceived behavioural control (structural support) that lead to behavioural intentions [2]. This model augments TPB by considering 'readiness for change' as a central cognitive component of the sustained commitment needed during the implementation-behaviour gap [28]. Leader support (LS) and structural support (SS) in the employee questionnaire are based on the normative and perceived behavioural control components of TPB, respectively, whereas views about change (VC) and employee enjoyment (EE) represent the attitudinal component.

2.1.3 *Organisational Change Theory (OCT)*

OCT addresses psychological processes of employee assessment and response to organisational change. This research focuses on post-change attitudes, including change acceptance, satisfaction with change and the reduction of cynicism [46] [47]. The conceptual distinction between the behavioural disposition to engage in change as a sustained commitment (CC) and pessimism about organisational intent (CYN) is captured by the CC and CYN constructs, respectively [25] [63]. Importantly, the current study adds Views about Change (VC) - a dispositional antecedent - to the framework, which influences the shift from cognitive to behavioural acceptance - a link that is supported by Holt et al.'s (2007) readiness for change model.

2.1.4 *Public Value Theory (PVT):*

PVT underpins the external part of the framework. It asserts that the purpose of government is to produce "public value" through services that meet the vision of a society being transparent, accessible and trustworthy [41] [42]. [44] builds on this by claiming that the public value paradigm refocuses management attention from internal process compliance to outcomes seen as legitimate and valuable by citizens - an approach directly operationalised in the public survey's Antecedents (ANT) and Citizen Satisfaction (CitSAT) constructs.

2.1.5 *Technology Acceptance Model (TAM):*

On the citizen side, TAM accounts for how perceptions of usefulness and ease of use drive the acceptance and satisfaction

with digital services [12]. The Benefits Outcomes (BO) construct, which considers accessibility, transparency, speed and cost efficiency, captures the perceived usefulness dimension of TAM while Communication Perception (CP) captures the trust and information sufficiency conditions which moderate adoption.

2.2 THEORISATION: THE INTEGRATED CHANGE MANAGEMENT MODEL (IMECM)

The IMECM brings together these five theories in a coherent structure using the 'Satisfaction Mirror' hypothesis. It proposes that internal service quality, as affected by leader and organisational support and communication, affects employee satisfaction and organisational commitment. This, in turn, translates into a high-quality service that is the key driver for citizen satisfaction [23] [26].

2.2.1 *Internal Readiness and Performance:*

The internal dimension has a sequence from psychological ante-pre-implementation to post-implementation outcomes. Self-efficacy leads to initial commitment (CC) and enjoyment (EE). Supervisory support (LS) and organisational support (SS) support commitment and satisfaction (SC). Communication is hypothesised to relieve cynicism (CYN) and boost acceptance (CA). Attitudes about Change (VC) - an employee's general predisposition that organisational change is necessary and good - is an attitudinal gateway to specific acceptance. Finally, commitment and acceptance together predict perceptions of change success (PCS), which predict post-implementation wellbeing and perceived societal impact via EH6 [25] [63].

2.2.2 *Realisation of Public Value and Citizen Impact:*

The external model examines the societal impact of departmental change readiness. Governance antecedents - leadership, resource sufficiency, public education and public participation - lead to benefits outcomes such as cost efficiency, accessibility and transparency. Citizen experiences with public communication translate into trust and high satisfaction. The model demonstrates how an organisation's internal goals are reflected in the provision of public value, via the Satisfaction Mirror (JSM) hypothesis.

2.3 CONCEPTUAL MODEL OVERVIEW

The flow in the employee model is from SE, through implementation constructs (EE, CC, COM, LS, SS) to post-change constructs (VC, CA, SC, CYN) including the new VC → CA path (EH5), and to PCS and post-implementation outcomes JSM and IEG (EH6), as shown in Figure 1a. Figure 1b shows the public-side model from CP and ANT to BO and CitSAT. The models are not linked. Both figures are now provided in file Tables and Figures.

2.4 CONSTRUCT-LEVEL THEORETICAL BACKING

The Table.1 presents the correspondence of each construct from the two surveys with its theoretical home, and the key literature justifying its measurement. All 20 constructs have theoretical grounding and are analytically operationalised across the two datasets.

Table.1. Construct-Level Theoretical Backing

Abbr.	Construct	Dataset / Stage	Theory	Key Supporting References
SE-AC / SE-LT / SE-IM (HOC: SE)	Self-Efficacy	Emp - pre-implementation	SCT	Bandura (1977, 1997); Compeau & Higgins (1995); Agarwal et al. (2000)
EE	Employee Enjoyment	Emp - implementation	SCT + TPB	Bandura (1997); Davis et al. (1992); Ryan & Deci (2000)
CC	Commitment to Change	Emp - implementation	OCT + TPB	Herscovitch & Meyer (2002); Holt et al. (2007); Meyer et al. (2002)
COM	Communication	Emp - implementation	TPB + OCT	Miller et al. (1994); Wanous et al. (2000); Men (2014)
LS	Leader Support	Emp - implementation	TPB	Kotter (1996); Bass & Avolio (1994); Yukl (2002)
SS	Structural Support	Emp - implementation	TPB + OCT	Armenakis & Bedeian (1999); Holt et al. (2007); Oreg et al. (2011)
VC	Views about Change	Emp - post-change	OCT + TPB	Oreg (2003); Holt et al. (2007); Judge et al. (1999)
CA	Change Acceptance	Emp - post-change	OCT	Oreg et al. (2011); Armenakis & Harris (2002); Rafferty & Griffin (2006)
SC	Satisfaction with Change	Emp - post-change	OCT	Oreg et al. (2011); Vakola & Nikolaou (2005)
CYN	Cynicism towards Change	Emp - post-change	OCT	Wanous et al. (2000); Reichers et al. (1997); Stanley et al. (2005)
PCS	Perceptions of Change Success	Emp - outcome	OCT + SCT	Oreg et al. (2011); Higgs & Rowland (2005); Herscovitch & Meyer (2002)
JSM	Job Satisfaction & Motivation	Emp - post-implementation	SCT + OCT	Hackman & Oldham (1976); Judge et al. (2001); Ryan & Deci (2000)
CAL	Change Adaptability & Learning	Emp - post-implementation	SCT	Bandura (1997); Senge (1990)
PIS	Post-Impl. Support & Resources	Emp - post-implementation	TPB	Armenakis & Bedeian (1999); Holt et al. (2007)
CHAL	Challenges & Improvement	Emp - post-implementation	OCT	Heeks (2006); Oreg et al. (2011)
IEG	Impact of e-Governance	Emp - post-implementation	SCT + PVT	Bandura (1997); Kumar & Best (2006); Heeks (2006)
CP	Communication Perception	Public	TAM + PVT	Davis (1989); Carter & Bélanger (2005); Bhatnagar (2014)
ANT	Antecedents to Change Mgmt	Public	PVT + OCT	Moore (1995, 2013); Kotter (1996); Heintzman & Marson (2005)
BO	Benefits Outcomes	Public	TAM + PVT	Davis (1989); Carter & Bélanger (2005); Moore (1995)
CitSAT	Citizen Satisfaction / Impact Perception	Public	TAM + PVT	Oliver (1980); Carter & Bélanger (2005); Heintzman & Marson (2005)

2.5 POSITIONING THE IMECM: WHAT IS NEW, AND WHAT IS NOT

In response to the need to delimit the model's novelty precisely, it is explicitly stated what the IMECM does and does not claim. The IMECM is not a new theory; it is an integrative structural model whose novelty is modest and threefold. First, it is a dual-stakeholder specification: the same change episode is modelled simultaneously from the supply side (employees, 16 constructs) and the demand side (citizens, 4 constructs), whereas

prior integrations of SCT, TPB, OCT, PVT and TAM in e-government research model one stakeholder group at a time [64] [61]. Second, it introduces Views about Change (VC) as a dispositional antecedent of situational Change Acceptance, connecting the trait-oriented resistance literature [46] to the state-oriented readiness literature [28] within a single estimated model. Third, it pairs symmetric (PLS-SEM), configurational (fsQCA, including negated outcomes) and diagnostic (IPMA) analyses of the same measurement model, which remains rare in digital-government research [36] [67]. Beyond these three elements,

every construct and path in the model is theory-derived rather than invented, and no claim is made that the IMECM supersedes existing frameworks; it operationalises them jointly in a setting - a large Indian State administration - where they have not previously been tested together.

3. EMPLOYEE DATASET - HYPOTHESES

EH1: Self-Efficacy → Commitment to Change & Employee Enjoyment

Drawing on Bandura's Social Cognitive Theory [5] [6] and Holt et al. [28] readiness-for-change theory, this study suggests that employees who believe that they can successfully adapt to and implement e-governance systems are more likely to show higher levels of commitment to the change effort and enjoy the process of implementing the change. As such, employee self-efficacy is expected to positively impact commitment to change (EH1a) and employee enjoyment (EH1b).

EH2: Leader Support → Commitment to Change & Structural Support → Satisfaction with Change

Based on Ajzen [2], Kotter [33] and Armenakis and Bedeian [3], this research suggests that support structures influence employees' responses to e-governance implementation in two ways. Leader support, through its reinforcing effect on subjective norms and social acceptance of the change, is expected to positively affect commitment to change (EH2a); whereas structural support, through its increasing effect on perceived behavioural control (ability to complete the change) in terms of resources and training, is expected to positively affect satisfaction with the change process (EH2b).

EH3: Intra-departmental Communication → Change Acceptance & Cynicism (Negative)

Building on the work of Wanous et al. [63] and Miller et al. [38], this study argues that intra-departmental communication is critical in minimising information asymmetry and supporting an inclusive environment during e-governance reform. Thus, intra-departmental communication is expected to positively impact change acceptance (EH3a) and to mitigate change cynicism (EH3b).

EH4: Change Commitment & Change Acceptance → Perceptions of Change Success

Drawing upon Herscovitch and Meyer [25] and Oreg et al. [47], this research suggests that employees' motivational and cognitive acceptance of an e-governance initiative combine to shape perceptions of change success. It is postulated that the two factors of employee commitment to change (EH4a) and change acceptance (EH4b) positively influence perceptions of change success.

EH5: Views about Change → Change Acceptance

Drawing on the Organisational Change Theory and the Theory of Planned Behaviour, and building on the work of Holt et al. [28], Oreg [46] and Ajzen [2], this research suggests that an employee's dispositional view of change as necessary and good is a prerequisite for cognitive acceptance of particular change programs. Therefore, views about change are expected to positively predict change acceptance, closing the attitudinal-behavioural gap in e-governance change.

EH6: Change Success Perception → Job Satisfaction & Motivation, E-Governance Impact, and Operational Challenges (Negative)

Following Bandura [5], Herscovitch and Meyer [25] and Kumar and Best [34], this study argues that perceptions of the e-governance change's success have downstream implications. It is proposed that views about change success positively predict post-implementation job satisfaction and motivation (EH6a) and perceived e-governance impact (EH6b), and negatively predict operational challenges (EH6c).

PH1: Governance Antecedents → Benefits Outcomes

Based on Moore [41] [42], Public Value Theory and Davis [12] Technology Acceptance Model, this study contends that the organisational and institutional antecedents of e-governance (including organisational leadership commitment, strategy formulation, citizen education, resource allocation and citizen participation) operate as indicators of citizens' perceived benefits outcomes of e-governance. Furthermore, drawing from Heintzman and Marson [23] public service value chain, which emphasises quality governance as antecedents of citizen-perceived value, it is proposed that governance antecedents are positively related to citizens' perceived benefits outcomes of e-governance.

PH2: Citizen Perception of Communication → Citizen Satisfaction

Drawing on the Technology Acceptance Model [12], e-government adoption model [9] and public value perspectives [44], this research argues that how citizens perceive the ease of understanding, access and responsiveness of e-governance service providers' communication positively impacts their overall evaluative assessment of the services. Thus, this study hypothesises that communication perception from the citizen side leads to greater overall citizen satisfaction of e-governance services.

PH3: Benefits Outcomes → Citizen Satisfaction

Drawing on Davis [12], Moore [41] and Heintzman and Marson [23], this research assumes that citizens who perceive the benefits of e-governance in terms of increased efficiency, transparency and accessibility of public services will have higher overall satisfaction with e-governance. Thus, it is expected that the perceived benefits outcomes positively and significantly influence overall citizen satisfaction with e-governance services.

In total, the nine hypothesis families (EH1–EH6, PH1–PH3) comprise fifteen directional structural paths: EH1a, EH1b, EH2a, EH2b, EH3a, EH3b, EH4a, EH4b, EH5, EH6a, EH6b, EH6c, PH1, PH2 and PH3. All counts of hypothesis support in this manuscript refer consistently to these fifteen paths.

4. METHODOLOGY

4.1 RESEARCH DESIGN

The research is a double cross-sectional survey with two independent, non-matching samples. PLS-SEM, fsQCA and IPMA are applied independently for each sample. Comparative analysis between the two samples is limited to interpretative synthesis (Section 7) and does not involve statistical inference with the two samples together. Because both surveys are cross-

sectional and single-source, all structural estimates in this study are directional associations specified by theory; they are not demonstrations of causality (see Section 7.4).

4.2 SAMPLE 1: SURVEY OF GOVERNMENT EMPLOYEES (N = 412)

This sample includes government employees from Tamil Nadu state departments involved in or impacted by e-governance, stratified and purposively sampled across four categories of government employment (Groups A-D). The survey includes 83 Likert-scaled items (1 = Strongly Disagree to 5 = Strongly Agree) for 16 constructs grouped into three stages - pre-implementation (SE-AC, SE-LT, SE-IM), implementation phase (EE, CC, COM, LS, SS), and post-change (VC, CA, SC, CYN) - plus the primary outcome construct (PCS) and the post-implementation opinion block (JSM, PIS, CAL, CHAL, IEG). Data screening confirmed that all 412 returned questionnaires were complete, with no missing item responses; the analytic sample for all employee-side analyses is therefore $n = 412$.

4.3 SAMPLE 2: GENERAL PUBLIC SURVEY (N = 407)

The survey participants are adult Tamil Nadu citizens who have accessed at least one e-service in the past 12 months, and are surveyed using convenience and snowball sampling. Using the formula developed by Cochran [10] for an unknown population, 95% level of confidence and 5% margin of error, the minimum sample size was calculated to be 384. A total of 407 completed questionnaires were received. Data screening of the returned questionnaires showed no missing item responses and therefore no case required exclusion under the pre-specified rule of removing questionnaires with more than 10% missing data. Accordingly, the analytic sample for every public-side table and analysis in this manuscript (Table.9–Table.14 and Sections 6.1–6.5) is $n = 407$. This is the sole analytic sample used throughout; no public-side table in this manuscript is computed on any other sample size. The complete data-screening log is included in the supplementary audit package. Screening did identify 40 respondents (9.8%) whose responses were invariant (a single repeated response category) within the long Citizen Satisfaction block; because such patterns can reflect either genuine uniform evaluations or inattentive responding, these cases were retained in the main analysis on $n = 407$. As a robustness check reported solely in Section 6.3.4, the hypothesised model is additionally re-estimated after excluding this subgroup ($n = 343$); this is a supplementary sensitivity subsample, not an alternative analytic sample, and it is not used for Table.9–Table.14 or for any other reported statistic. The achieved sample of 407 exceeds the Cochran minimum (384) and the recommended minimum for PLS-SEM given the largest construct block. The questionnaire covers 41 Likert-style items of 4 constructs: Communication Perception (CP), Antecedents to Change Management (ANT), Benefits Outcomes (BO) and Citizen Satisfaction / Impact Perception (CitSAT).

4.4 ANALYTICAL METHODS

Please refer to Table.2, which summarises the complementarity of the three methods applied to each dataset.

Table.2. Complementarity of the three analytical methods

Criterion	PLS-SEM	fsQCA	IPMA
Analytical logic	Symmetric, net effects	Asymmetric, configurational	Importance $\times$ Performance gap
Question answered	Which variables predict outcomes and how strongly?	Which condition combinations are sufficient?	Where are the most actionable gaps?
Output	Path coefficients, R^2 , Q^2	Solution paths, coverage, consistency	Priority map
Applied to	Employee (EH1–EH6) + Public (PH1–PH3)	Employee (outcome = PCS) + Public (outcome = CitSAT)	Employee (target = PCS) + Public (target = CitSAT)

4.4.1 PLS-SEM:

PLS-SEM was employed to test hypotheses in both data sets. Its preference over CB-SEM is based on the predictive nature of the two models, the lack of normality associated with Likert scales and the presence of a higher-order Self-Efficacy construct in the employee model. Estimation software and audit trail: All models are estimated end-to-end with a fully scripted, open-source PLS-SEM implementation in Python (Mode A reflective measurement, path weighting scheme for inner estimation, standardised indicators, convergence tolerance 10^{-7}), with structural inference based on 5,000 bootstrap resamples using percentile confidence intervals and a fixed random seed. The complete pipeline code, all intermediate outputs, and the full bootstrap reports for every path are provided in the supplementary audit package so that every figure in this manuscript can be independently regenerated from the raw data. Quality of the measurement model is evaluated through indicator loadings (≥ 0.70), Average Variance Extracted ($AVE \geq 0.50$), Composite Reliability ($CR \geq 0.70$), and the HTMT discriminant validity ratio (< 0.85 , with bootstrap HTMT-inference against 1.0 for pairs exceeding this threshold [24]. Indicator purification: indicators with loadings below 0.60 were removed iteratively; this affected three of the eighteen IEG items (retaining 15) and ten of the twenty-six CitSAT items (retaining 16). Retained-item lists are reported with the measurement results (Sections 5.2 and 6.2) and in the supplementary package. Significance of the structural model is tested with bootstrapping (5,000 samples). Higher-order construct estimation: The SE higher-order construct is estimated using the repeated indicators approach (Mode A), where the indicators of the three first-order sub-constructs (SE-AC, SE-LT, SE-IM) are used as indicators of the HOC. This approach is preferred as the three sub-constructs are conceptually reflective of a common factor of self-efficacy, and their items are conceptually parallel [5]. Common method bias (CMB) analysis: Since the predictor and outcome variables are measured from the same respondent at the same time, the possibility of CMB exists. Two procedural steps were taken: (a) anonymity was assured and the questionnaire was administered in the absence of the supervisor to minimise evaluation apprehension; and (b) the items of predictor and outcome constructs in the questionnaire were separated using distracters to reduce item-level priming. The statistical approach followed the

full collinearity Variance Inflation Factor (VIF) method advocated by Kock [32] in which all constructs are considered both as predictors and criteria. In the public dataset all full-collinearity VIFs are below the 3.3 benchmark (maximum 1.67). In the employee dataset, however, several constructs exceed the benchmark (nine of fourteen constructs fall between 3.4 and 5.1, with the maximum of 5.06 for Change Acceptance). The Kock [32] criterion is therefore not satisfied for the employee model; the elevated full-collinearity VIFs indicate that common method variance and/or genuine conceptual overlap among the attitudinal constructs may inflate the employee-side structural estimates, and this is treated as a substantive limitation (Section 7.4). Nevertheless, it is recognised that no post-hoc statistical test can completely rule out CMB in single-source survey studies.

4.4.2 Fuzzy-set Qualitative Comparative Analysis (fsQCA):

fsQCA is conducted for both datasets. Seven conditions are included in the employee dataset: SE, LS, SS, COM, CC, CA, and VC; the outcome is PCS. For the public dataset, the three conditions are ANT, CP and BO; and the outcome is CitSAT. The presence and absence of each outcome (Sections 5.4 and 6.4) was examined in line with fsQCA's logic that the conditions sufficient for an outcome are not necessarily the reverse of the conditions sufficient for the opposite outcome [50]. Calibration: Fuzzy membership is calculated using direct calibration [50]. The anchors are based on the 95th percentile (membership = 1.0), 50th percentile (crossover point = 0.5) and 5th percentile (non-membership = 0.0) of each condition's distribution in the sample. This empirical approach is chosen because external anchors for employee attitudes toward change management and citizen perceptions of e-governance in Tamil Nadu are not found in the literature, precluding the use of theoretical external anchors. The direct method to set the anchors is recommended in this situation and is in line with the method preferred in public administration research using fsQCA [16] [40]. The empirical anchor values used for every condition and outcome are reported in Table.2a to allow exact replication. The solution was tested for sensitivity to alternative (5th percentiles up and down) calibrations of the anchors, with no substantive change to the core conditions identified. Analysis settings: truth-table rows are retained with a frequency threshold of 3 cases, a raw consistency threshold of 0.85, and a PRI consistency threshold of 0.65, and the conservative (complex) solution obtained through Quine–McCluskey minimisation without easy or difficult counterfactuals is reported. All fsQCA tables report this conservative solution.

Table.2(a). Direct calibration anchors (5th / 50th / 95th percentile of composite scores)

Condition/ Outcome	Non- membership (5th)	Crossover (50th)	Full membership (95th)
SE	3.00	4.00	5.00
LS	2.00	4.00	5.00
SS	2.25	4.00	5.00
COM	2.25	4.00	5.00
CC	3.00	4.00	5.00
CA	3.00	4.00	5.00
VC	3.00	4.00	5.00

PCS (outcome, employee)	2.50	4.00	4.75
ANT	3.00	4.80	5.00
CP	3.20	4.20	5.00
BO	3.00	4.20	5.00
CitSAT (outcome, public)	2.58	3.94	4.81

4.4.3 Importance-Performance Map Analysis (IPMA):

An Importance-Performance Map Analysis (IPMA) was conducted following PLS-SEM for each dataset [52]. Importance is the unstandardised total effect of each predecessor on the target (PCS for employees; CitSAT for public). Performance is the rescaled mean score on a 0–100 scale: $\text{Performance} = [(\text{mean}-1) / (5-1)] \times 100$, computed from the raw construct means reported in Tables 4 and 10. Highest priority is given to constructs in the high-importance, low-performance quadrant. Median importance and median performance of all plotted constructs are used for the boundaries, as per the visual “rule of thumb” advocated by [52]. It is recognised that these boundaries are set subjectively, not statistically; hence, the substantive interpretation is based on the relative placement of constructs on the map, not their absolute placement in quadrants. Constructs that are not model antecedents of the IPMA target (Structural Support and Cynicism on the employee side, which reach PCS through no estimated structural path) are reported as performance-only diagnostics and are not assigned importance values.

4.5 ETHICS, CONSENT AND DATA AVAILABILITY

Ethics approval: The study was conducted after obtaining prior permission from the Government of Tamil Nadu (Letter No. 3144/Special B-I/2010). Informed consent: All respondents were informed of the purpose of the study, that participation was voluntary, that they could withdraw at any time, and that responses would be anonymised; oral informed consent was obtained from every participant before the questionnaire was administered. No personally identifying information is reported. Data availability: The underlying data and analysis code have been provided to the reviewers as supplementary files. Because of privacy and confidentiality considerations, these data are not publicly posted but will be made available by the corresponding author upon reasonable request.

5. EMPLOYEE DATASET – RESULTS

5.1 DEMOGRAPHIC DETAILS OF EMPLOYEES

This section presents results exclusively from the government employee survey (n = 412). All constructs, items, and outputs refer solely to this dataset. Results are reported for all twelve employee-side structural paths (EH1a–EH6c). Refer to Table.3.

Table.3. Demographic details of the employees (n = 412)

Characteristic	Category	n (%)
Gender	Male	232 (56.3%)
	Female	180 (43.7%)

Age	Below 25 years	7 (1.7%)
	25–30 years	44 (10.7%)
	31–35 years	111 (26.9%)
	36–40 years	84 (20.4%)
	41–45 years	50 (12.1%)
	46–50 years	30 (7.3%)
	Above 50 years	86 (20.9%)
Grade	Group A	76 (18.4%)
	Group B	90 (21.8%)
	Group C	194 (47.1%)
	Group D	52 (12.6%)
Experience	Less than 1 year	13 (3.2%)
	1.1–5 years	76 (18.4%)
	5.1–10 years	104 (25.2%)
	10.1–15 years	91 (22.1%)
	15.1–20 years	25 (6.1%)
	Above 20 years	103 (25.0%)
Education	School level	34 (8.3%)
	Undergraduate	164 (39.8%)
	Postgraduate	154 (37.4%)
	Professional	60 (14.6%)

The sample is broadly balanced by gender (56.3% male) and dominated by the operational cadres who actually run e-governance transactions: Group C employees form the single largest grade (47.1%). Experience is well spread, with a quarter of respondents having more than twenty years of service and another quarter between five and ten years, meaning the sample contains both employees who lived through the manual-to-digital transition and those recruited into an already digital administration. Over half the respondents (52.0%) hold a postgraduate or professional qualification.

5.2 DESCRIPTIVE STATISTICS AND MEASUREMENT MODEL

The Table.4 reports the descriptive statistics and measurement quality of the employee constructs after indicator purification (three IEG items with loadings below 0.60 were removed, retaining 15 of 18). All retained loadings range from 0.63 to 0.93, AVE ranges from 0.52 (IEG) to 0.85 (LS), composite reliability from 0.88 to 0.96, and Cronbach's alpha from 0.82 to 0.94, satisfying conventional thresholds (Hair et al., 2022).

Discriminant validity requires a open qualification. Four construct pairs exceed the HTMT 0.85 benchmark: CA–VC (0.917), CC–EE (0.880), CC–SE (0.854) and PCS–SC (0.853). Bootstrap HTMT-inference (Henseler et al., 2015) shows that the 90% confidence interval upper bound remains below 1.0 for all four pairs (CA–VC: 0.946; CC–EE: 0.925; CC–SE: 0.897; PCS–SC: 0.901), so the constructs are empirically distinguishable at the inference criterion, but the CA–VC ratio in particular indicates substantial conceptual overlap between dispositional views about change and acceptance of the specific change. This overlap qualifies the interpretation of the large EH5 coefficient (Section

5.3) and is registered as a limitation (Section 7.4). Full-collinearity VIF results are reported in Section 4.4.1.

Table.4. Descriptive statistics and measurement quality - employee constructs (n = 412; after purification)

Construct	Items	Mean	SD	Min load	Max load	AVE	CR	α
HOC: SE	9	4.11	0.55	0.73	0.90	0.70	0.95	0.94
EE	4	3.94	0.61	0.83	0.91	0.76	0.93	0.89
CC	4	4.01	0.59	0.85	0.90	0.78	0.93	0.90
COM	4	3.67	0.75	0.88	0.92	0.81	0.95	0.92
LS	4	3.70	0.77	0.91	0.93	0.85	0.96	0.94
SS	4	3.62	0.77	0.89	0.90	0.80	0.94	0.91
VC	4	4.13	0.59	0.84	0.91	0.79	0.94	0.91
CA	4	4.08	0.59	0.91	0.93	0.84	0.96	0.94
SC	4	3.85	0.66	0.86	0.91	0.79	0.94	0.91
CYN	4	3.40	0.75	0.72	0.91	0.70	0.90	0.87
PCS	4	3.69	0.64	0.81	0.88	0.72	0.91	0.87
JSM	4	3.87	0.69	0.86	0.93	0.81	0.95	0.92
IEG	15	3.76	0.57	0.63	0.84	0.52	0.94	0.93
CHAL	4	3.88	0.52	0.72	0.88	0.65	0.88	0.82

5.3 PLS-SEM RESULTS - EH1–EH6

The employee structural model has nine endogenous constructs, with R^2 ranging from 0.053 (Cynicism) to 0.739 (Change Acceptance); all constructs record positive Q^2 values (blindfolding, omission distance 7), indicating predictive relevance. The Table.5 reports the full bootstrap results; superscript letters in the Result column link each qualified result to its footnote. Of the twelve employee-side paths, nine are supported, one is non-significant, and two are significant in the direction opposite to the hypothesis.

- EH1 is strongly supported: self-efficacy shows very large associations with commitment to change ($\beta = 0.674$, $f^2 = 1.20$) and employee enjoyment ($\beta = 0.721$, $f^2 = 1.08$). Together with leader support, self-efficacy accounts for 68.9% of the variance in commitment.
- EH2 is fully supported: leader support shows a medium-sized association with commitment ($\beta = 0.277$, $f^2 = 0.20$), and structural support a very large association with satisfaction with change ($\beta = 0.716$, $f^2 = 1.05$).
- EH3 is only half supported: Communication positively predicts change acceptance with a small effect (EH3a: $\beta = 0.131$, $f^2 = 0.056$), as hypothesised. However, contrary to EH3b, communication is positively - not negatively - associated with cynicism ($\beta = +0.230$, $t = 4.31$, $p < 0.001$). Employees who report more intra-departmental change communication also report more cynicism about the change; EH3b was therefore reported as a significant contrary-direction finding. Possible post-hoc interpretations - such as greater exposure to change messaging heightening awareness of unmet promises, or communication intensifying in precisely those units where cynicism is already high (reverse causality that a cross-sectional design

cannot exclude) - are discussed in Section 7.1 and clearly labelled as speculative. The explained variance in cynicism is in any case very small ($R^2 = 0.053$).

- EH4 is partially supported: commitment to change significantly predicts perceptions of change success with a medium effect (EH4a: $\beta = 0.514$, $f^2 = 0.160$), while change acceptance does not (EH4b: $\beta = 0.064$, $t = 0.77$, $p = 0.443$) when both are entered simultaneously (R^2 for PCS = 0.318). The pattern is consistent with commitment carrying the association between acceptance and perceived success, though it is not described as demonstrated “full mediation” given the design limitations.
- EH5 is supported with the largest coefficient in the model: views about change strongly predict change acceptance ($\beta = 0.801$, $t = 31.6$, $f^2 = 2.10$; R^2 for CA = 0.739). Two qualifications apply. First, the CA–VC HTMT ratio of 0.917 (Section 5.2) means part of this association may reflect conceptual overlap between the dispositional and situational attitude measures rather than a structural relationship between fully distinct constructs. Second, the downstream indirect path $VC \rightarrow CA \rightarrow PCS$ is not significant ($\beta_{\text{indirect}} = 0.051$, 95% CI $[-0.081, 0.172]$), because CA does not significantly predict PCS; the dispositional effect therefore does not demonstrably propagate to perceived change success in this model.
- EH6 is two-thirds supported. Perceptions of change success are strongly associated with job satisfaction and motivation (EH6a: $\beta = 0.664$, $R^2 = 0.442$) and with perceived e-governance impact (EH6b: $\beta = 0.743$, $R^2 = 0.552$). Contrary to EH6c, however, PCS positively - not negatively - predicts the Challenges & Improvement construct ($\beta = +0.441$, $t = 7.94$, $p < 0.001$; $R^2 = 0.194$). This is the second contrary-direction finding. A candidate post-hoc explanation, clearly labelled as such, is that the CHAL items are phrased in improvement-oriented terms (“some processes could be simplified”, “additional training would help”), so that

engaged employees who perceive the change as successful may also be more attentive to remaining improvement opportunities; the hypothesised reading of CHAL as pure operational burden may not match the item content. This reinterpretation is offered after seeing the data and should be tested with re-worded burden items in future work.

Significant indirect effects support the commitment pathway: $SE \rightarrow CC \rightarrow PCS$ ($\beta = 0.346$, 95% CI $[0.252, 0.452]$) and $LS \rightarrow CC \rightarrow PCS$ ($\beta = 0.142$, 95% CI $[0.077, 0.227]$).

5.4 FSQCA RESULTS - EMPLOYEE DATASET (OUTCOME: HIGH PCS)

5.4.1 Necessity Analysis

Four conditions individually exceed the conventional 0.90 necessity-consistency threshold for high PCS: Views about Change (consistency 0.939, coverage 0.671), Change Acceptance (0.921, 0.691), Self-Efficacy (0.916, 0.671) and Commitment to Change (0.905, 0.727). Leader Support (0.870), Communication (0.856) and Structural Support (0.838) fall below the threshold. The psychological readiness conditions are therefore quasi-necessary for high perceived change success in this sample: virtually no employee reports high PCS in their absence, although their coverage values indicate they are far from sufficient on their own.

5.4.2 Sufficiency Analysis - High PCS

Under the analysis settings of Section 4.4.2 (frequency ≥ 3 , raw consistency ≥ 0.85 , PRI ≥ 0.65 , conservative solution), a single configuration is sufficient for high PCS (Table.6): the joint presence of all seven conditions, with raw coverage 0.706 and consistency 0.918. In other words, the empirically dominant route to high perceived change success in this dataset is full enablement - psychological readiness (SE, CC, CA, VC) and institutional enablement (LS, SS, COM) together - and this single configuration accounts for roughly 71% of membership in the high-PCS outcome.

Table.5. PLS-SEM structural path results - employee dataset ($n = 412$; 5,000 bootstrap resamples; percentile 95% CIs; $p < 0.001$; ns = not significant).

Superscripts: ^a contrary direction - significant but opposite in sign to the hypothesis; ^b not significant.

Hypothesis	Path	Std. β	t	p	f^2	95% CI	Result	R^2	Q^2
EH1a	$SE \rightarrow CC$	0.674	17.59	< 0.001	1.203	[0.596, 0.746]	Supported	0.689 (CC)	0.534
EH2a	$LS \rightarrow CC$	0.277	6.02	< 0.001	0.203	[0.189, 0.366]	Supported		
EH1b	$SE \rightarrow EE$	0.721	20.83	< 0.001	1.084	[0.649, 0.787]	Supported	0.520 (EE)	0.390
EH2b	$SS \rightarrow SC$	0.716	22.39	< 0.001	1.054	[0.652, 0.777]	Supported	0.513 (SC)	0.403
EH3a	$COM \rightarrow CA$	0.131	4.06	< 0.001	0.056	[0.071, 0.197]	Supported	0.739 (CA)	0.623
EH5	$VC \rightarrow CA$	0.801	31.61	< 0.001	2.099	[0.748, 0.847]	Supported		
EH3b	$COM \rightarrow CYN$	+0.230 ^a	4.31	< 0.001	0.056	[0.148, 0.347]	Contrary ^a	0.053 (CYN)	0.029
EH4a	$CC \rightarrow PCS$	0.514	6.64	< 0.001	0.160	[0.365, 0.664]	Supported	0.318 (PCS)	0.229
EH4b	$CA \rightarrow PCS$	0.064 ^b	0.77	0.443	0.002	$[-0.104, 0.222]$	Not supported ^b		
EH6a	$PCS \rightarrow JSM$	0.664	13.89	< 0.001	0.791	[0.568, 0.754]	Supported	0.442 (JSM)	0.358
EH6b	$PCS \rightarrow IEG$	0.743	26.75	< 0.001	1.230	[0.687, 0.795]	Supported	0.552 (IEG)	0.284
EH6c	$PCS \rightarrow CHAL$	+0.441 ^a	7.94	< 0.001	0.241	[0.332, 0.551]	Contrary ^a	0.194 (CHAL)	0.119

Within this sample, no partial combination of conditions passes conventional sufficiency standards; high perceived change success is observed where everything works together.

Table.6. fsQCA sufficiency solution - employee dataset, outcome = high PCS (conservative solution; frequency ≥ 3 ; raw consistency ≥ 0.85 ; PRI ≥ 0.65). • - condition present.

Condition	E-C1
SE (Self-Efficacy)	•
LS (Leader Support)	•
SS (Structural Support)	•
COM (Communication)	•
CC (Commitment to Change)	•
CA (Change Acceptance)	•
VC (Views about Change)	•
Raw coverage	0.706
Unique coverage	0.706
Consistency	0.918
Solution coverage / consistency	0.706 / 0.918

5.4.3 fsQCA for the Negated Outcome - Configurations for Low PCS

A full fsQCA analysis not only tests configurations that are sufficient for the outcome (high PCS) but also for the negated outcome (low PCS). The configurations associated with low PCS are not the logical complement of the configurations associated with high PCS - this is the most important theoretical insight of the fsQCA method (Ragin, 2008). The negated-outcome analysis uses the same seven conditions with membership in the absence of high PCS as the outcome. Seven configurations are sufficient (Table.7; solution coverage 0.804, solution consistency 0.947).

Table.7. fsQCA negated-outcome configurations - low PCS (~PCS), employee dataset (conservative solution; solution coverage 0.804; solution consistency 0.947).

• present; ○ absent; blank = condition not in term.

Condition	~E-C1	~E-C2	~E-C3	~E-C4	~E-C5	~E-C6	~E-C7
SE		•			•	•	○
LS	○	○	○			○	○
SS	○	○	○	○	○		○
COM	○	○	○	○	○	○	
CC		•	○	○	•	•	○
CA	○			○	•	•	○
VC			•	○	•	•	○
Raw coverage	0.662	0.514	0.531	0.604	0.500	0.495	0.566
Consistency	0.964	0.940	0.968	0.983	0.937	0.939	0.986

Three substantive patterns stand out. First, the highest-coverage configuration (~E-C1: absence of leader support, structural support, communication and acceptance; coverage 0.662, consistency 0.964) shows that low perceived success is most commonly associated with a broad institutional-enablement

deficit. Second, configurations ~E-C5 and ~E-C6 show that low PCS occurs even when the psychological readiness conditions are fully present (SE, CC, CA and VC all present) but institutional enablement is absent (structural support and communication absent in ~E-C5; leader support and communication absent in ~E-C6), each with consistency above 0.93 and coverage around 0.50. The evidence therefore indicates that it is psychological readiness that cannot compensate for absent institutional enablement. Motivated, self-confident, change-accepting employees still perceive the change as unsuccessful when leadership, resources and communication are missing. Third, configuration ~E-C4 (near-total absence of enablers) confirms, with the highest consistency in the solution (0.983), that compound deprivation of conditions is reliably associated with perceived failure. Taken together with the necessity analysis, the configurational evidence positions psychological readiness as quasi-necessary but institutionally contingent: it is required for success, but it is not protective against failure when the institutional platform is absent.

5.5 IPMA FINDINGS - EMPLOYEE DATASET (TARGET: PCS)

Structural Support “via SC” is excluded from the importance calculation because it has no estimated path into PCS; that construct’s entry is reported as a performance-only diagnostic. Three managerial readings follow. First, Commitment to Change combines the highest importance for PCS (total effect 0.555) with good performance (75.2/100): the priority is to sustain, and to protect its two significant feeders, self-efficacy (importance 0.399, performance 77.6) and leader support (importance 0.117, performance 67.5) - of which leader support has the clearer headroom for improvement. Second, on the diagnostic side, Structural Support records the lowest institutional performance score in the model (65.5/100).

Table.8. IPMA - employee dataset (target = PCS). Importance = unstandardised total effect on PCS from the estimated model;

Performance = $[(\text{mean} - 1)/4] \times 100$ from the raw construct means in Table 4. SS, CYN and SC have no estimated structural path into PCS and are reported as performance-only diagnostics

Construct	Importance (total effect on PCS)	Performance (0–100)	Reading
CC	0.555	75.2	High importance / good performance - sustain
SE	0.399	77.6	High indirect importance / good performance - sustain
LS	0.117	67.5	Moderate importance / moderate performance - improve
CA	0.069	77.1	Low importance (EH4b ns) / good performance
VC	0.055	78.3	Low total effect on PCS (via ns CA path) / high performance - monitor

COM	0.007	66.9	Negligible total effect on PCS / moderate performance
PCS (target)	-	67.4	Target performance
SS-diagnostic	n/a	65.5	Lowest institutional performance in the model
CYN_rev-diagnostic	n/a	40.0	Lowest performance overall - critical concern

Although the model contains no structural path from SS to PCS (SS predicts Satisfaction with Change, which is not a modelled antecedent of PCS), the configurational results of Section 5.4.3 independently identify absent structural support as a component of every negated configuration, so the low SS score remains a defensible investment target on configurational rather than regression evidence. Third, reverse-coded cynicism records by far the lowest performance value in the entire employee model (40.0/100; raw cynicism mean 3.40/5), indicating that the average employee holds substantially cynical attitudes towards e-governance change. Because the EH3b finding shows communication is positively associated with cynicism in this sample, the earlier prescription of “more communication” cannot be sustained; addressing cynicism will likely require participatory co-design and visible follow-through on commitments rather than messaging volume, a proposition that requires longitudinal testing.

6. PUBLIC DATASET - RESULTS

This section presents results exclusively from the general public survey (n = 407; Section 4.3). All constructs, items, and outputs refer solely to this dataset in relation to the three hypotheses of the public dataset investigation. Please see Table.9 for details about the respondents.

Table.9. Demographic details of the public respondents (n = 407; computed from raw survey data)

Characteristic	Category	n (%)
Gender	Male	289 (71.0%)
	Female	117 (28.7%)
	Transgender	1 (0.2%)
Age	Below 25 years	21 (5.2%)
	25–30 years	44 (10.8%)
	31–35 years	59 (14.5%)
	36–40 years	36 (8.8%)
	41–45 years	54 (13.3%)
	46–50 years	57 (14.0%)
	Above 50 years	136 (33.4%)
Occupation	Private sector	239 (58.7%)
	Government	81 (19.9%)
	Self-employed	42 (10.3%)
	Not employed	37 (9.1%)
	Agriculture	8 (2.0%)

e-Gov awareness	Very aware	145 (35.6%)
	Somewhat aware	225 (55.3%)
	Not aware	37 (9.1%)
Education	School level	9 (2.2%)
	Undergraduate	92 (22.6%)
	Postgraduate	193 (47.4%)
	Professional	113 (27.8%)

6.1 DEMOGRAPHIC PROFILE OF PUBLIC RESPONDENTS

The public sample has four features that matter for interpreting the results. First, the sample is comparatively senior: one third of respondents (33.4%) are above 50 years of age. These citizens have personally experienced the transition from manual, counter-based service delivery to digital channels, which makes their evaluations of e-governance change particularly informative, though it also means the sample under-represents the youngest users. Second, the sample is highly educated: 75.2% hold a postgraduate or professional qualification. Such respondents are well placed to assess transparency, efficiency and service-quality dimensions, but their expectations are also likely to be calibrated against sophisticated private-sector digital services, and generalisation to less-educated user groups should be made cautiously. Third, private-sector employees dominate the occupational profile (58.7%), reinforcing the same expectation effect: these users routinely compare government e-services with commercial digital experiences. Fourth, awareness levels validate the instrument’s premise: 90.9% of respondents are at least somewhat aware of e-governance initiatives, and 86.5% rate change management in government as somewhat or very important, indicating that respondents understood the object of evaluation. The pronounced male skew of the sample (71.0%) is a representativeness limitation noted in Section 7.4.

6.2 DESCRIPTIVE STATISTICS AND MEASUREMENT MODEL

The 26-item CitSAT block as originally administered did not meet measurement standards: ten items loaded below 0.60 (two below 0.35) and the block’s AVE was 0.38. Following the purification rule of Section 4.4.1, the ten weak items were removed, retaining 16 items with loadings 0.63–0.76. The purified CitSAT construct achieves strong internal consistency (CR = 0.94, α = 0.93) but its AVE (0.478) remains marginally below the 0.50 convention. This construct was retained on the grounds that composite reliability is high, that Fornell and Larcker’s criterion treats AVE as a convergent-validity guideline rather than an absolute bar when CR is well above 0.60, and that the 16 items span deliberately heterogeneous facets of the satisfaction experience; the shortfall is nonetheless disclosed prominently here and in Section 7.4 rather than smoothed over. All other public constructs comfortably satisfy every criterion, and discriminant validity is unproblematic on the public side: the maximum HTMT ratio is 0.708 (CP–BO), well below 0.85. Full-collinearity VIFs are all below 1.7.

Table.10. Public construct descriptive statistics and measurement quality
(n = 407; CitSAT after purification to 16 items)

Construct	Items	Mean	SD	Min load	Max load	AVE	CR	α
CP	5	4.17	0.57	0.68	0.81	0.58	0.87	0.82
ANT	5	4.59	0.72	0.76	0.86	0.67	0.91	0.87
BO	5	4.16	0.68	0.77	0.87	0.70	0.92	0.89
CitSAT	16	3.81	0.64	0.63	0.76	0.48	0.94	0.93

Substantively, the descriptive pattern that motivates the analysis is a stepped decline from aspiration to experience. ANT records a near-ceiling mean of 4.59 (76.2% of respondents average 4.5 or higher across its five items): citizens overwhelmingly rate governance foundations - leadership, planning, education, resources, participation - as important. CP (mean 4.17) and BO (mean 4.16) are also high; within CP, the single strongest item is agreement that training/awareness support helps citizens use e-services (92.9% agree), and within BO the strongest delivered benefit is speed (88.0% agree). CitSAT, however, averages 3.81 - roughly ten rescaled points below the antecedent constructs - and its weakest items are precisely the transactional-experience items (speed of petition replies, data-security confidence, overall satisfaction) rather than the aspirational ones. This aspiration-experience gap is the central diagnostic fact of the public dataset and frames the structural results that follow.

6.3 PLS-SEM RESULTS - PH1-PH3

The Table.11 reports the bootstrapped structural results for the hypothesised public model; the full 5,000-resample bootstrap reports for every path are included in the supplementary audit package.

Table.11. PLS-SEM structural path results - public dataset (n = 407; 5,000 bootstrap resamples; percentile 95% CIs; $p < 0.001$; ns = not significant)

Hypothesis	Path	β	t	p	f^2	95% CI	Decision
PH1	ANT → BO	0.266	3.65	<.001	0.076	[0.137, 0.419]	Supported
PH2	CP → CitSAT	0.035	0.45	0.650	0.001	[-0.096, 0.196]	Not supported (ns)
PH3	BO → CitSAT	0.277	4.29	<.001	0.052	[0.151, 0.408]	Supported
R^2 / Q^2	BO	0.071	/	0.049		CitSAT	0.090 / 0.031

6.3.1 Explained Variance:

The R^2 values - 0.071 for BO and 0.090 for CitSAT - are modest and fall below the 0.10 floor sometimes applied in PLS-SEM. It is stated plainly rather than explaining it away. Both Q^2 values are positive (0.049 and 0.031), so the model has out-of-sample predictive relevance above the naïve mean, and the significant paths (PH1, PH3) are assessed on their coefficients and bootstrap distributions, not on R^2 . One plausible contributing mechanism is the measurement-scale heterogeneity in the design:

ANT was administered on an importance scale (1 = Very Unimportant to 5 = Very Important) whereas BO and CitSAT use agreement scales, and the ANT distribution is severely ceiling-bound (mean 4.59; 76.2% of respondents at 4.5 or above), leaving little variance to correlate with other constructs. It is noted that this scale-mismatch account is a post-hoc explanation formulated after observing the results, not a pre-registered or independently validated mechanism; it is consistent with the observed ceiling statistics but has not been demonstrated by a split-sample or experimental scale-format test. Future data collection should harmonise all public constructs on a single agreement scale, which would allow the mechanism to be tested rather than asserted. In the meantime, the honest characterisation of the public-side structural model is that it identifies two robust but small directional associations within a weakly explained outcome, not a strongly predictive model of citizen satisfaction.

6.3.2 Hypothesis Results:

PH1 - ANT → BO (supported): $\beta = 0.266$, $t = 3.65$, $p < 0.001$, $f^2 = 0.076$. Citizens who rate the governance foundations of e-governance as more important also report perceiving greater delivered benefits. The effect is small, consistent with the ANT ceiling described above.

PH2 - CP → CitSAT (not supported): $\beta = 0.035$, $t = 0.45$, $p = 0.650$, $f^2 = 0.001$. With Benefits Outcomes in the model, Communication Perception has no significant direct association with Citizen Satisfaction. The zero-order correlation between the CP and CitSAT composites is positive but weak ($r = 0.19$ on purified scores), so the construct is not unrelated to satisfaction; it simply adds nothing once perceived benefits are controlled. This is a non-significant path, whose most natural reading - that CP's association with satisfaction runs through perceived benefits - is examined as an explicitly post-hoc mediation analysis in Section 6.3.3.

PH3 - BO → CitSAT (supported): $\beta = 0.277$, $t = 4.29$, $p < 0.001$, $f^2 = 0.052$. Of the two candidate antecedents tested in the model (CP and BO), Benefits Outcomes is the only significant direct predictor of Citizen Satisfaction. The qualifier was stated deliberately: the model tests two antecedents, so this finding establishes BO's primacy over CP, not over all conceivable predictors of satisfaction. Citizens who perceive greater accessibility, transparency, speed, trust and cost efficiency report higher satisfaction; given the CitSAT R^2 of 0.090, this association, while the strongest lever among those measured, accounts for a small share of the satisfaction variance.

6.3.3 Post-Hoc Mediation Analysis (Exploratory)

Because PH2's direct path is null while CP correlates strongly with BO ($r = 0.61$), a post-hoc model was estimated adding the CP → BO path. This analysis was specified after observing the confirmatory results and is labelled exploratory throughout. In the extended model, CP strongly predicts BO ($\beta = 0.591$, $t = 10.41$, $p < 0.001$; R^2 for BO rises to 0.391), the direct CP → CitSAT path remains null ($\beta = 0.026$, $p = 0.759$), and the indirect path CP → BO → CitSAT is significant ($\beta_{\text{indirect}} = 0.165$, 95% bootstrap CI [0.097, 0.269]). The pattern is consistent with full mediation of the communication-satisfaction association through perceived benefits. Notably, once CP → BO is included, the ANT → BO path attenuates to marginal significance ($\beta = 0.097$, $p = 0.053$), suggesting that communication perception and governance

antecedents overlap in what they contribute to perceived benefits. These exploratory results generate - but do not confirm - the proposition that communication matters for satisfaction only insofar as it translates into perceived delivery; a confirmatory test requires new data.

6.3.4 Sensitivity Analysis (Robustness Check; n = 343 Subsample)

This subsection reports a single supplementary robustness check and does not alter the n = 407 analytic sample used everywhere else in this manuscript. Estimating the hypothesised model after excluding the 40 respondents with zero within-block variance on the retained CitSAT items (n = 343; a subsample of the n = 407 analytic sample, defined in Section 4.3) leaves all conclusions unchanged: PH1 β = 0.200 (p = 0.002), PH2 β = 0.008 (p = 0.921), PH3 β = 0.261 (p < 0.001). The findings are therefore not artefacts of invariant response patterns. This n = 343 figure is reported only in this subsection, for this robustness purpose; it is not the analytic sample for Tables 9–14 or for any other result in this manuscript, all of which use n = 407.

6.4 FSQCA RESULTS - PUBLIC DATASET (OUTCOME: HIGH CITSAT)

6.4.1 Necessity Analysis:

No condition approaches the 0.90 necessity threshold for high CitSAT: ANT records consistency 0.798, BO 0.755 and CP 0.720. No individual condition is necessary for high citizen satisfaction.

6.4.2 Sufficiency Analysis - High CitSAT:

Under the uniform analysis settings of Section 4.4.2, no configuration of the three conditions passes conventional sufficiency thresholds for high CitSAT: no truth-table row simultaneously satisfies the frequency (≥ 3), raw consistency (≥ 0.85) and PRI (≥ 0.65) requirements. This null configurational result is consistent with the modest symmetric results of Section 6.3: with weak overall associations and a ceiling-bound antecedent, membership in high satisfaction is not consistently attributable to any combination of the three measured conditions. Substantively, high citizen satisfaction in this sample is driven largely by factors outside the measured condition set - itself a finding with design implications for future instruments.

6.4.3 Negated-Outcome Analysis - Low CitSAT:

The negated analysis, by contrast, yields one configuration that passes all thresholds (Table 13): the combination of communication perception present with governance antecedents and benefits outcomes absent ($\sim$ ANT $\cdot$ CP $\cdot$ $\sim$ BO) is sufficient for low citizen satisfaction, with consistency 0.930 and raw coverage 0.287. This is the “hollow communication” pattern: citizens who perceive government communication about e-governance but perceive neither strong governance foundations nor delivered benefits reliably report low satisfaction. It is a genuinely asymmetric finding - it appears only in the negated solution, with no positive-outcome counterpart (Section 6.4.2). The policy reading is correspondingly focused: communication unaccompanied by substance is not merely ineffective; it is associated with dissatisfaction, so citizen-facing communication campaigns should be anchored to demonstrable service improvements (Section 7.3).

Table.13. fsQCA negated-outcome configuration - low CitSAT ($\sim$ CitSAT), public dataset (conservative solution).
● present; ○ absent.

Condition	$\sim$ P-C1
ANT (Antecedents)	○
CP (Communication Perception)	●
BO (Benefits Outcomes)	○
Raw coverage	0.287
Consistency	0.930
Solution coverage / consistency	0.287 / 0.930

7. IMPORTANCE-PERFORMANCE MAP ANALYSIS: PUBLIC DATASET

The public IPMA offers a sharp diagnostic. The three predecessor constructs all perform well above the target: ANT at 89.8, CP at 79.3 and BO at 78.9, against CitSAT at 70.1 - the target trails its own best-performing antecedent by roughly twenty points and its delivery antecedent by nine. Benefits Outcomes carries the highest importance for satisfaction (total effect 0.254) and is therefore the primary actionable lever: incremental gains in perceived accessibility, speed, transparency and cost efficiency have the largest expected association with satisfaction among the measured constructs. Communication Perception’s importance (0.206) is real but, per Section 6.3.3, operates entirely through Benefits Outcomes; investment in communication is accordingly justified only as a complement to delivery - a conclusion reinforced from the failure side by the hollow-communication configuration of Section 6.4.3. ANT’s near-ceiling performance (89.8) and negligible marginal importance (0.023) indicate that citizens’ valuation of governance foundations is already saturated and offers no policy headroom. Given the modest R² of the underlying model, these IPMA readings should be treated as directional prioritisation aids rather than precise effect forecasts.

Table.14. IPMA - public dataset (target = CitSAT). Importance = unstandardised total effect on CitSAT (exploratory mediation model of Section 6.3.3, which contains the only significant route from CP to CitSAT); Performance = [(mean – 1)/4] $\times$ 100 from raw construct means (Table 10)

Construct	Importance (total effect on CitSAT)	Performance (0–100)	Reading
BO	0.254	78.9	Highest importance / good performance - the primary lever
CP	0.206 (fully indirect via BO)	79.3	Indirect importance only - invest jointly with delivery
ANT	0.023	89.8	Near-ceiling performance / negligible marginal importance
CitSAT (target)	-	70.1	Target performance

8. DISCUSSION

8.1 EMPLOYEE AND PUBLIC: A DUAL SYNTHESIS

The two independent analysis streams, read together, support four themes; all cross-dataset statements below are interpretive juxtapositions of two non-matched samples, not statistical tests.

First, both datasets show a gap between institutional/delivery performance and its importance. On the employee side, Structural Support records the lowest institutional performance (65.5/100); on the public side, Benefits Outcomes (78.9/100) sits nine points above Citizen Satisfaction (70.1/100), and satisfaction's weakest items are transactional-experience items. This parallel under-delivery pattern is consistent with the IMECM's Satisfaction Mirror hypothesis [23], but the mirror remains an interpretive linking: the samples were not matched at departmental or transactional level, and a formal test would require longitudinal, matched data.

Second, the dispositional finding (EH5: $VC \rightarrow CA$, $\beta = 0.801$) supports the proposition that general openness to organisational change transfers to acceptance of a specific e-governance change (Holt et al., 2007) - with two qualifications. The CA-VC HTMT ratio of 0.917 means the measures overlap substantially, so part of the association may be definitional; and the indirect path $VC \rightarrow CA \rightarrow PCS$ is not significant ($\beta = 0.051$, CI $[-0.081, 0.172]$), so the dispositional effect does not demonstrably propagate to perceived change success in this model.

Third, the two contrary-direction findings are, it is believed, the most generative results of the employee model, provided they are read with post-hoc humility. Communication is positively associated with cynicism (EH3b: $\beta = +0.230$): candidate explanations include expectation inflation (more messaging, more visible unmet promises), reverse causality (management communicates hardest where cynicism is highest), or an ambient-intensity effect in units undergoing the most disruptive change - none of which the cross-sectional design can adjudicate. Perceived change success is positively associated with the Challenges & Improvement construct (EH6c: $\beta = +0.441$): inspection of the CHAL items shows they are phrased as improvement opportunities rather than burdens, so the finding plausibly reflects engaged, success-perceiving employees being more attentive to refinement needs - a measurement-framing insight as much as a substantive one. Both interpretations are explicitly post hoc and require confirmatory designs.

Fourth, the negated-outcome analyses carry the configurational payload. On the employee side, psychological readiness cannot compensate for absent institutional enablement: employees with self-efficacy, commitment, acceptance and positive views intact still land in low perceived success when leadership, structures and communication are absent ($\sim E-C5$, $\sim E-C6$; Section 5.4.3). On the public side, the "hollow communication" configuration ($\sim ANT \cdot CP \cdot \sim BO$) shows that communication without governance substance or delivered benefits is reliably associated with dissatisfaction. Jointly, the two negated analyses locate the binding constraint on both sides of the mirror in institutional delivery, not in psychology or messaging.

8.2 THEORETICAL CONTRIBUTIONS

This research makes five contributions, each stated with the evidential strength the design permits.

First, it supports the applicability of SCT in public-sector digital transformation: the three-dimensional self-efficacy operationalisation (adapting, learning, implementing) shows very large associations with commitment and enjoyment (EH1), and self-efficacy is quasi-necessary for high perceived success in the configurational analysis.

Second, it extends OCT by modelling Views about Change as a dispositional antecedent of situational Change Acceptance (EH5), connecting Oreg [46] trait-resistance tradition to Holt et al. [28] state-readiness tradition within one estimated model - subject to the discriminant-validity qualification (HTMT 0.917) that future work should address with more clearly separated instruments.

Third, it documents that perceptions of change success are strongly associated with post-implementation outcomes (EH6a, EH6b), bridging change-process quality with the job-attitudes and organisational-impact literatures via Herscovitch and Meyer [25] commitment-outcome chain - while the contrary EH6c result cautions that "challenges" constructs must distinguish burden from improvement orientation.

Fourth, the configurational analyses contribute an asymmetry finding with theoretical bite: success requires the joint presence of psychological and institutional conditions (single full-enablement sufficient configuration), whereas failure is reachable through institutional deficits alone even under full psychological readiness. Change management theory that treats individual readiness as the binding constraint is, in this sample, looking at the wrong side of the ledger.

Fifth, on the citizen side, the combination of a null direct communication effect, a significant exploratory full-mediation pattern through perceived benefits, and a surviving hollow-communication failure configuration offers a coherent - though partly post hoc - account of communication in e-governance: it operates through, and only through, perceived delivery.

8.3 POLICY IMPLICATIONS

Six policy prescriptions follow from the evidence, numbered consecutively. They are proposed in system-wide priority order, with the caveat that aggregate IPMA scores hide inter-departmental variability - departments should run their own diagnostics before adopting any prescription - and that all prescriptions rest on associational, not causal, evidence.

1. **Invest in Structural Support first:** SS records the lowest institutional performance (65.5/100), and its absence is a component of every negated configuration on the employee side. Infrastructure, training frequency, technical access and inter-departmental collaboration tools are the concrete levers.
2. **Protect and Sustain the Commitment Pathway:** Commitment to Change carries the largest total effect on perceived success (0.555) at good performance (75.2). Its significant feeders - self-efficacy and leader support - should be maintained through capability-building and

visible supervisory sponsorship, with leader support (67.5/100) offering the clearer improvement headroom.

3. **Foster Dispositional Openness before Specific Rollouts:** The EH5 association ($\beta = 0.801$) suggests that change-philosophy communication (“why change is good”, not just “how to use the system”) targeted at pre-implementation stages is a plausible acceptance lever - while recognising that acceptance did not, in this model, translate into perceived success independently of commitment.
4. **Do not rely on Institutional Support to Substitute for Engagement or Vice Versa:** The configurational evidence shows a single sufficient route to success (full enablement) and failure routes through institutional deficits even under full psychological readiness. Interventions should be bundled, not sequenced.
5. **Anchor Citizen Communication to Demonstrable Delivery:** The hollow-communication configuration ($\sim\text{ANT}\cdot\text{CP}\cdot\sim\text{BO}$) shows communication without substance is associated with dissatisfaction. Every citizen-facing campaign should be tied to specific, verifiable service improvements - for example, open performance dashboards.
6. **Treat Perceived benefits as the Primary Satisfaction Lever:** BO carries the highest importance for CitSAT (0.254); accessibility, speed, transparency and cost efficiency are the measured dimensions with the largest expected satisfaction payoff, subject to the modest explained variance of the public model.

8.4 LIMITATIONS AND FUTURE RESEARCH

The study openly acknowledges a number of limitations, which circumscribe what can be said with its findings.

Cross-sectional design and temporal ordering: Most fundamentally, both surveys were conducted at one point in time. The change management model is premised on a temporal ordering from pre-implementation self-efficacy through implementation-phase variables to post-change outcomes, but this ordering is theoretical. When employees assess their “pre-implementation” self-efficacy, they are recalling a period after the implementation has taken place: their retrospective self-rating may be influenced by hindsight and post-hoc rationalisation, whereby employees with successful change retrospectively rate their self-efficacy as higher: a reverse causal link is possible, which PLS-SEM cannot reveal. Thus, all structural claims in this study are theory-guided associations, not empirical demonstrations of causality, and the Discussion and Conclusion have been worded accordingly. Longitudinal panel data collecting pre-implementation and post-implementation measures of employees would be needed to establish temporal precedence [46].

- **Common Method Variance:** The full-collinearity VIF check does not pass on the employee side (nine of fourteen constructs between 3.4 and 5.1, maximum 5.06), so common method variance and/or conceptual overlap may inflate the employee structural estimates. The public side passes comfortably (maximum 1.67). Replications should obtain

predictor and criterion data from separate sources or with temporal separation.

- **Discriminant Validity and Measurement:** Four employee construct pairs exceed HTMT 0.85, with CA–VC at 0.917; although HTMT-inference upper bounds remain below 1.0, the EH5 coefficient should be read net of this overlap. The purified CitSAT construct’s AVE (0.478) falls marginally below 0.50 despite high composite reliability, and ten of its original 26 items were removed; the construct should be redeveloped with a shorter, unidimensional satisfaction scale.
- **Public-Model Explanatory Power and Post-Hoc Reasoning:** The public R^2 values (0.071, 0.090) are modest, and the scale-mismatch explanation offered for them, the mediation model of Section 6.3.3, and the interpretations of the two contrary-direction findings are all post hoc; they are flagged as such wherever they appear and require confirmatory tests with harmonised scales.
- **Reflective Measurement Assumptions:** All constructs are reflective; that is, items are assumed to be equally interchangeable expressions of a construct. But both the IEG block and the ANT construct have diverse content that could be measured in a composite or formative manner. Future studies should model these constructs as formative composites and compare estimates.
- **Satisfaction Mirror is Interpretive, not Formal:** The parallel finding that Structural Support (employee) and delivery-experience gaps (public) are the respective critical deficiencies is consistent with the Satisfaction Mirror, but not a formal test; matched longitudinal designs are required.
- **Sample Representativeness:** Both samples are from Tamil Nadu and reflect that State’s system of public administration, infrastructure spending and demographics; in addition, the public sample skews male (71.0%), older and highly educated, and the employee sample was purposively rather than probabilistically drawn. The results may not transfer to other Indian States, other countries, or the private sector. Replications across contexts are encouraged.
- **IPMA Performance Scores are Aggregate:** The IPMA scores are averages over all respondents and conceal departmental variability; departmental-level diagnostics with the same instrument are needed to localise the priorities.

9. CONCLUSION

In this study, the human aspects of e-governance reforms in Tamil Nadu were examined using two independently analysed data sets - a Government Employee Survey ($n = 412$) and a General Public Survey ($n = 407$) - with a tri-methodological approach employing PLS-SEM, fsQCA (including negated-outcome analyses) and IPMA. Every statistic reported is drawn from a fully reproducible open-source pipeline supplied as an auditable supplement.

Nine hypothesis families comprising fifteen directional paths were tested. Eleven paths are supported; two are non-significant (EH4b: Change Acceptance $\rightarrow$ Perceived Change Success; PH2: Communication Perception $\rightarrow$ Citizen Satisfaction); and two are

significant in the direction opposite to the hypothesis (EH3b: Communication → Cynicism; EH6c: Perceived Change Success → Challenges). This count is reported identically in the Abstract, Results and Conclusion. In the employee stream, self-efficacy shows very large associations with commitment and enjoyment (EH1); leader and structural support are associated with commitment and satisfaction respectively (EH2); communication is associated with higher acceptance but also, contrary to hypothesis, with higher cynicism (EH3); commitment - but not acceptance - predicts perceived change success (EH4; $R^2 = 0.318$); dispositional views strongly predict acceptance, subject to a discriminant-validity caveat (EH5: $\beta = 0.801$, $R^2 = 0.739$, HTMT CA-VC = 0.917); and perceived success is strongly associated with post-implementation job satisfaction and perceived e-governance impact, and - contrary to hypothesis - positively with improvement-framed challenges (EH6). Configurationally, a single full-enablement pathway is sufficient for high perceived success (coverage 0.706, consistency 0.918), the four psychological conditions are individually quasi-necessary, and the negated analysis shows that psychological readiness does not protect against perceived failure when institutional enablement is absent. Structural Support is the weakest-performing institutional construct (65.5/100) and reverse-coded cynicism the weakest overall (40.0/100).

On the public side, governance antecedents predict perceived benefits (PH1: $\beta = 0.266$) and perceived benefits predict satisfaction (PH3: $\beta = 0.277$), while communication perception has no direct effect (PH2: $\beta = 0.035$, ns); an explicitly post-hoc mediation analysis indicates its association with satisfaction runs entirely through perceived benefits (indirect $\beta = 0.165$, CI [0.097, 0.269]). No configuration is sufficient for high citizen satisfaction under strict thresholds, but the asymmetric “hollow communication” configuration - communication present amid absent governance substance and absent benefits - is reliably sufficient for dissatisfaction (consistency 0.930). The public model’s explained variance is modest ($R^2 = 0.071-0.090$), and its diagnostic rather than predictive character is stated plainly.

The results should be seen as theory-driven empirical associations rather than demonstrations of causal effects, due to the cross-sectional research design and single-source data collection, the failed employee-side full-collinearity check, and the discriminant-validity and measurement caveats disclosed above. The Satisfaction Mirror interpretation, that employee structural deficits parallel citizen experiential deficits, is consistent with the IMECM framework, but needs to be tested with a matched longitudinal design. Within these limits, the study represents a detailed multi-method, dual-stakeholder empirical report on e-governance change management in Tamil Nadu, and its diagnostic findings - especially the IPMA gap maps, the quasi-necessity of psychological readiness, and the asymmetric failure configurations - provide evidence-based, suitably hedged advice to the State’s departments on how they might proceed during the second wave of the digital revolution.

9.1 APPENDIX A. STRUCTURAL MODEL FIGURES

The Fig.1(a) and Fig.1(b), referenced in Section 2.3, are provided below. Path coefficients are the standardised values of Table.5 and Table.11; solid arrows denote supported paths,

dashed arrows non-significant paths, and marked arrows the two contrary-direction findings.

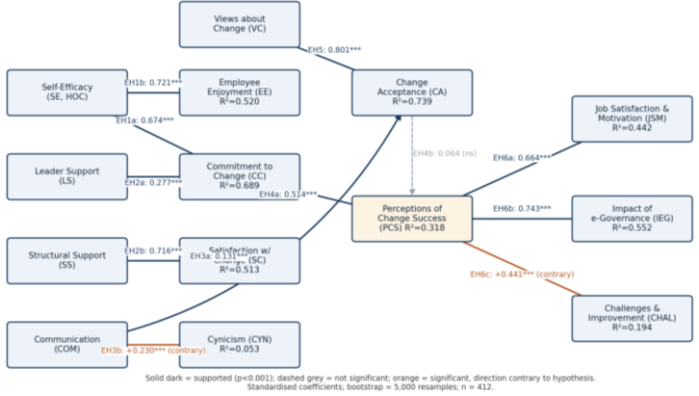


Fig.1(a). Employee-side structural model (n = 412) with standardised path coefficients

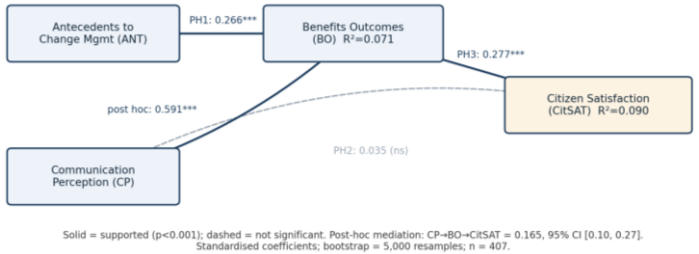


Fig.1(b). Public-side structural model (n = 407) with standardised path coefficients

DECLARATIONS

- **Ethics approval:** The study was conducted after obtaining prior permission from the Government of Tamil Nadu (Letter No. 3144/Special B-I/2010).
- **Informed Consent:** Informed consent was obtained orally from all individual participants included in the study. Participation was voluntary, anonymous, and withdrawable at any time.
- **Data Availability:** The underlying data and analysis code have been provided to the reviewers as supplementary files. Because of privacy and confidentiality considerations, these data are not publicly posted but will be made available by the corresponding author upon reasonable request.
- **Competing Interests:** The author declares no competing interests.
- **Funding:** No funding was received for this study.

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