Journal of Engineering Science and Technology
Vol. 21, No. 2 (2026) 392 - 410

IMPROVING DEMAND MANAGEMENT IN INFORMATION TECHNOLOGY: AN ANALYSIS OF CRITICAL FACTORS

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Abstract

Demand management in information technology (ITDM) complements existing software development methods, facilitates resource allocation, and requires an organisation with clearly defined roles and skills. However, efficient ITDM requires an understanding of the factors that are essential to its success. Consequently, the purpose of this article is to determine the critical success factors (CSF) that influence ITDM. This research study follows a quantitative, non-experimental design. Data were collected from 144 public institution employees through a self-administrated survey using a questionnaire, and a Likert scale was used to measure the factors associated with ITDM. Structural equation modelling (SEM) was used for this analysis, which revealed that ITDM is influenced by CSF such as top management support, strategic alignment between IT and business, IT portfolio alignment, and leadership. This study provides valuable insights for professionals and decision-makers on the CSF influencing ITDM, highlighting the importance of their prioritisation. It contributes to the existing literature on ITDM by providing a deeper understanding of the importance of these CSF in the ITDM process.

Keywords: Critical success factors, IT demand management, IT governance, Structural equations.

1. Introduction

Information technology demand management (ITDM) complements existing software development methods and facilitates effective resource allocation in implementing business requirements, ultimately leading to process improvement [1]. ITDM enables organisations to meet their information technology (IT) needs by managing both strategic and tactical demands, which are typically prioritised within IT portfolios based on the value they deliver to the business. Consequently, it is a process of capital and human resource allocation for the benefit of the organisation, aligned with the demand lifecycle and dependent on the maturity level of the organisation [2]. ITDM is a critical function that significantly impacts IT projects and extends beyond satisfying IT resource requests or automating workflows. For this reason, it requires the attention of IT leaders, whose effective management ensures appropriate support for IT initiatives [3, 4]. Furthermore, ITDM has been recognised as an important process for achieving strategic objectives and adding value to services [5], as well as for the strategic planning of IT innovations [6].

In this context, ITDM is closely related to IT governance (ITG), Information Systems (IS) and Software Process Improvement (SPI). ITG defines what is prioritised, how resources are allocated, and who makes investment decisions. Without ITG, ITDM risks becoming a disorganised list of requests without clear prioritisation criteria. ITDM regulates which IS initiatives must be developed ensuring strategic alignment and value, and PSI strengthens the ability to execute by having sufficiently mature software processes. ITDM, ITG, IS and SPI are determined by a set of critical factors that influence their success. For example, in their study of two Brazilian banking institutions, Da Silva et al. [7] identified several factors conditioning the successful implementation of ITG. Similarly, the consideration of such critical factors in the public sector can contribute to improving services and increasing public value [8].

Factors such as poor communication, lack of trust from top management, and misalignment between stakeholders and organisational policies or strategies [9] not only hinder the implementation of ITG but also limit the ability to manage IT demand in an orderly and strategic manner. Schulte et al. [10] argue that, in the context of digital transformation and globalisation, critical ITG factors combined with organisational maturity enhance value creation through IT portfolios, thereby reinforcing ITDM. However, a literature review shows that while several studies on ITDM models have been conducted and frameworks have been proposed, few studies have specifically analysed critical factors [11]. Moreover, there is little empirical evidence of their influence on ITDM, providing the motivation for this study. Prioritisation in ITDM focuses on aspects such as business strategy alignment and leadership to achieve business-IT alignment. Despite the growing number of IT requirements, there remains a lack of clear understanding regarding these demands [12].

Research has shown that unrealistic expectations of ITDM, along with a lack of business knowledge, result in ineffective management of IT demand [13]. Such failures may also arise from neglecting the various factors involved in the process, reinforcing the need to investigate their role more systematically. Ineffective ITDM may also originate from a failure to consider the various factors involved in the process. In this context, decision-making must ensure control over IT investments while eliminating non-strategic or underperforming investments [14]. However, although organisations strive to balance the supply and demand of their products and services, IT managers are often focused on delivering IT faster, better, and at a lower cost (supply side), often neglecting crucial aspects of IT demand. This article addresses these gaps by examining the factors that influence the implementation of ITDM, statistically testing the impact of five critical factors, and proposing strategies for improvement.

1.1. IT Demand management

The concept of ITDM is essential for companies striving to meet their objectives in the face of external competition and uncertainty. As noted by [2], ITDM is a critical process that extends beyond requests for workflow automation and IT resource provisioning; it complements software development methods and ensures the appropriate and efficient allocation of IT resources in consideration of both stakeholder expectations and alignment with business objectives [1]. The need for effective control over IT demand arises from various challenges, including budgetary limitations, constant technological changes, staff shortages [4], and lack of a clear understanding of IT requirements or demand [12]. The successful adoption of ITDM largely depends on a set of critical factors, which bear some similarities to those of IT governance (ITG) due to their correlation.

1.2. Critical success factors

Critical success factors (CSF) are the "key areas of activity for favourable results and are necessary for top management to achieve their objectives" [15]. CSF must be carefully analysed, classified, and synthesised [16]. Previous ITDM-related studies have identified some CSF, such as alignment between business and IT, leadership to execute business and IT alignment, alignment with the IT project portfolio, involvement of top management and CIOs, and having trained personnel. However, these factors have typically been examined in isolation, and to date, no empirical study has investigated how they collectively influence ITDM [11, 13]. In the context of ITDM, these factors play a pivotal role in shaping the success of IT projects and ongoing maintenance efforts that aim to fulfil both the strategic and tactical objectives of the company. Supporting this view, Lashkari et al. [17] used detailed firm-level data and found a positive elasticity of ITDM, particularly in environments with rapidly changing technological factors, highlighting their collective impact on effective ITDM.

This article aims to determine the influence of five key factors (top management support, strategic alignment between IT and business, alignment with the IT portfolio, leadership, and stakeholder involvement) on ITDM. This integrated study of these CSF contributes to the existing literature and offers practical insights for IT demand management functions, providing a valuable reference for organisations seeking to enhance their ITDM processes by considering these critical factors in their planning and execution.

2. Literature Review and Research Hypotheses

The following describes the critical factors identified in the literature review and their relationship with the proposed hypotheses (SH).

2.1. Factor 1: Top management support (PE_1)

Top management plays a relevant role in the success of an organisation by defining the vision and perspectives, seeking new business opportunities based on limited resources [6], and directly supporting ITG [18]. The commitment of top management is important in the promotion of IT management [19] since the involvement of top management and business area executives enables informed decision-making, ensuring that these are aligned with organisational needs [2]. Moreover, the influence of top management in shaping the culture within ITG is one of the most powerful levers for its successful implementation [20].

In addition, top management must analyse and evaluate IT investments to ensure that they contribute to the overall success of the business, making ITDM important in strategic planning [6]. Therefore, strategic IT demand is key for business and requires continuous support from top management to ensure the alignment of IT strategy with business and IT portfolios. However, for Abrahamsson and Iivari [21] who studies the commitment factor in SPI, this factor does not necessarily explain the results and that the most important thing is the structural governance mechanisms. In this regard, Pombinho et al. [22] argue that the increase in the maturity of the ITDM process is supported by formal artifacts such as value models, the use of portfolio management tools, and explicit steps of evaluation, estimation, and approval that strengthen business alignment. In a study on factors associated with SPI, it has been found that SPI managers in organizations with low levels of process maturity tend to assign greater importance to leadership and management, in contrast to those responsible for organizations with greater maturity [23].

The specific hypotheses proposed for Factor 1 were as follows:

- **SH1**: Top management support influences IT demand management.
- **SH2**: Top management support influences strategic IT-business alignment.
- **SH6**: Top management support influences IT portfolio alignment.

2.2. Factor 2: Strategic alignment between IT and business (PF_1)

Strategic alignment between IT and business is the process of allocating capital and human resources for the benefit of the organisation, building stronger relationships between IT and business areas [2]. Considering the alignment between ITDM and business is essential to avoid the common challenges faced by organisations that neglect this integration [12, 22, 24]. A range of organisational and managerial factors must be considered to establish an effective relationship between IT and business that is capable of managing IT demand [3]. Although achieving strategic IT alignment is crucial, many organisations find it an elusive goal [25]. ITDM is most effective when IT projects are guided by strategic alignment and are designed to support the achievement of organisational objectives. In ITDM, there must be communication between top executives of the organisation to align business strategies with organisational objectives, with the support of IT [26].

The specific hypotheses proposed for Factor 2 were as follows:

- **SH3**: Strategic alignment between IT and business influences ITDM.
- **SH5**: Strategic alignment between IT and business influences IT portfolio alignment.

2.3. Factor 3: Alignment with the IT portfolio (PG_1)

Managing IT requires an emphasis on the importance of IT portfolio management in ITDM [4]. The importance of alignment with the IT portfolio in ITDM has been evidenced in studies by [27, 28]. IT portfolio management is a critical factor, and solutions that support ITDM should be in place, especially in the later stages of ITDM maturity [2]. IT areas must develop new skills and strategies to face IT demand, with their IT portfolios aligned for evaluation and approval [2]. ITDM is closely related to IT governance (ITG), with a recognised dependency between ITG and IT portfolio management in guiding IT demand. This relationship supports decision-making processes and enables effective control over IT investments [14]. As organisations face increasingly complex IT project demands, they rely on IT portfolios as a mechanism to prioritise, monitor, and manage these initiatives effectively [8]. Furthermore, the optimal alignment of IT portfolios requires stakeholder participation [3].

The specific hypotheses proposed for Factor 3 were as follows:

- **SH4**: IT portfolio alignment influences ITDM.
- **SH7**: IT portfolio alignment influences stakeholder participation.

2.4. Factor 4: Leadership (PH_1)

Leadership (at both the strategic and operational levels) is another factor that directly supports ITG [4, 18] and demonstrates commitment to ITDM [2, 28]. IT leaders must have control over ITDM [4]. Efficient ITDM influences projects and is a priority for IT leaders, and stakeholder participation is essential [3]. A leader conveys and demonstrates complex ideas, provides IT value delivery solutions [8], and leads strategic plans that deliver IT value to the business [6]. For many business leaders, the ability to model and visualise ITDM is essential and requires qualified personnel for optimal IT performance [29].

The specific hypotheses proposed for Factor 4 were as follows:

- **SH8**: Leadership influences ITDM.
- **SH9**: Leadership influences stakeholder participation.

2.5. Factor 5: Stakeholder participation (PI_1)

Stakeholder participation is essential in both the public and private sectors, involving key roles such as CIOs, CEOs, CFOs, and other executives responsible for managing IT demand within the broader framework of ITG [4]. In addition, business leaders must gain the trust of stakeholders by ensuring that decisions are transparent and verifiable and by meeting user needs through IT value delivery [6]. In ITDM, early involvement of stakeholders in the demand process supports a clear understanding of requirements and dependencies, which reduces risk and improves decision-making [1].

Stakeholder participation is referenced through **SH7** and **SH9**.

2.6. Proposed model

Figure 1 shows the initial conceptual model developed for analysing the influence of the previously discussed factors (from 2.1 to 2.5) on ITDM. It was based on a literature review of critical success factors, which led to the consideration of the following: top management support, strategic IT-business alignment, IT portfolio alignment, leadership, and stakeholder participation. The validity of these relationships is supported by previous studies [3, 4, 12, 28, 30, 31], which have emphasised the importance of leadership [4], strategic IT-business alignment [26], integration of IT with business [30], and stakeholder participation [3].

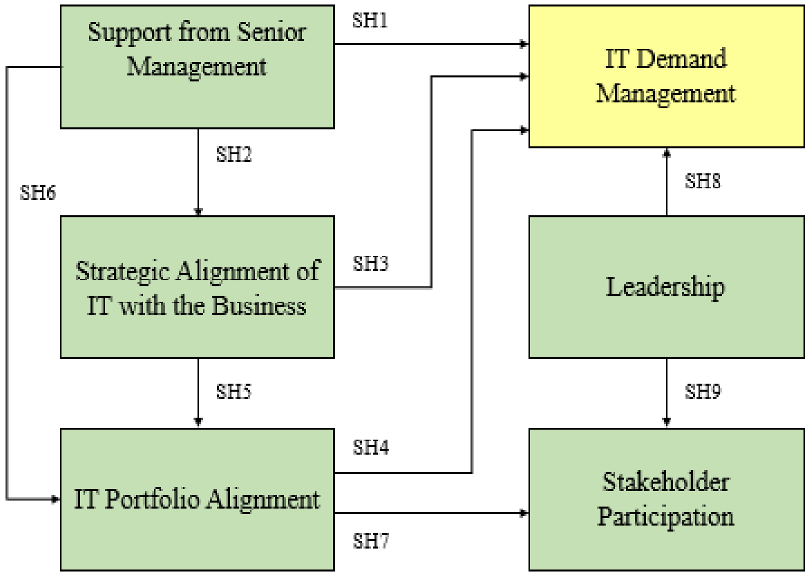

Fig. 1. Initial conceptual model of IT demand management based on CSF.

3. Materials and Methods

This research study adopts a quantitative approach with a non-experimental, cross-sectional design. The unit of analysis is the person responsible for ITDM in the public institution. Surveys were administered to these individuals or those directly responsible for managing IT demand to capture the necessary empirical evidence. The study population is limited to the geographical area of Metropolitan Lima, Peru. A convenience sampling method was employed, which is a non-probabilistic and non-random technique applied when participants are readily accessible and able to complete the survey within an acceptable timeframe [32].

3.1. Measuring instrument

A questionnaire was designed and reviewed by five experts in ITDM. It was subsequently validated through a pilot survey with 30 IT demand managers to ensure and adjust its suitability. As a result of this process, some questions were updated based on comments from the demand managers. The first module is related to sociodemographic questions, and the second module is related to factors. All items related to the factors studied were evaluated using a Likert scale from 1 (strongly disagree) to 5 (strongly agree).

3.2. Data collection and analysis

The questionnaire was sent to ITDM leaders in institutions using Google Forms. Data collection was conducted over a single period, and the sample consisted of 144 ITDM leaders in public institutions who responded to the survey either online or by phone. Descriptive statistics for participants can be found in Table 1.

Table 1. Sociodemographic characteristics of the participants.

Characteristics	Category	Frequency	Percentage
Gender	Female	41	28.5%
	Male	103	71.5%
Years of Experience	[0-5>	25	17%
	[5-10>	29	20%
	[10-15>	39	27%
	[15-20>	20	14%
	[20-25>	19	13%
	[25 +	12	19%
Acad. Background	Bachelor	19	13.2%
	Graduate	75	52.1%
	Master	46	31.9%
	Doctor	4	2.8%
Work Area	Business Area	13	9%
	Adm. Areas	15	10.4%
	I.T.	116	80.6%

A multivariate technique was applied in the analysis of the collected data using the structural equation modelling (SEM) method to validate the quality of the model. The AMOS 23 software was used in the analysis. Model interpretation was based on the initial theoretical framework and a set of estimated coefficients, which were analysed to assess their contribution to explaining variance in the dependent and independent variables, as well as the adequacy of the sample size. A higher cumulative value of these coefficients indicates reduced variance and an increased likelihood of statistical significance [33]. The aforementioned nine hypotheses related to the CSF in the model were validated. Cronbach's Alpha was verified for each variable included in the proposed model, as shown in Table 2. The CR (composite reliability) and the average variance extracted (AVE) for each construct are presented.

Table 2. Cronbach's alpha for the ITDM model.

Factors	Cronbach's Alpha	CR	AVE
F1: Top Management Support	0.921	0.852	0.537
F2: Strategic Alignment of IT with Business	0.916	0.848	0.659
F3: IT Portfolio Alignment	0.912	0.907	0.662
F4: Leadership	0.924	0.918	0.652
F5: Stakeholder Participation	0.917	0.848	0.529
ITDM: IT Demand Management	0.926	0.910	0.716

Table 3 presents the descriptive statistics and the respective factor loadings.

Table 3. Descriptive statistics and factor loadings.

Factor	Item	Mean	Std	Loadings
F1	PE_1_32	0.730	0.066	0.670
	PE_1_33			0.711
	PE_1_34			0.798
	PE_1_35			0.803
	PE_1_36			0.669
F2	PF_1_37	0.726	0.016	0.707
	PF_1_38			0.742
	PF_1_39			0.717
	PF_1_40			0.742
	PF_1_41			0.722
F3	PG_1_42	0.812	0.060	0.814
	PG_1_43			0.877
	PG_1_44			0.858
	PG_1_45			0.727
	PG_1_46			0.783
F4	PH_1_48	0.805	0.073	0.805
	PH_1_49			0.844
	PH_1_50			0.865
	PH_1_51			0.671
	PH_1_52			0.781
	PH_1_53			0.863
F5	PI_1_54	0.726	0.044	0.661
	PI_1_55			0.722
	PI_1_56			0.753
	PI_1_57			0.716
	PI_1_58			0.779
ITDM	PA_1_1	0.846	0.026	0.859
	PA_1_2			0.837
	PA_1_3			0.814
	PA_1_4			0.874

4. Results

In this section, the statistical results of the hypothesis tests (SH) regarding IT Demand Management (ITDM) and the factors are analysed. The results obtained were carried out through two runs, which are shown below.

4.1. Statistical tests

Figure 2 shows the first run of the estimated Causal Model based on AMOS [33]. Table 4 presents the analysis of the significance of relationships from run 1.

As in the previously described relationship, the effect of the latent variable F1 on PA_1 was found to be statistically non-significant. Figure 3 shows the second iteration of the estimated causal model based on AMOS.

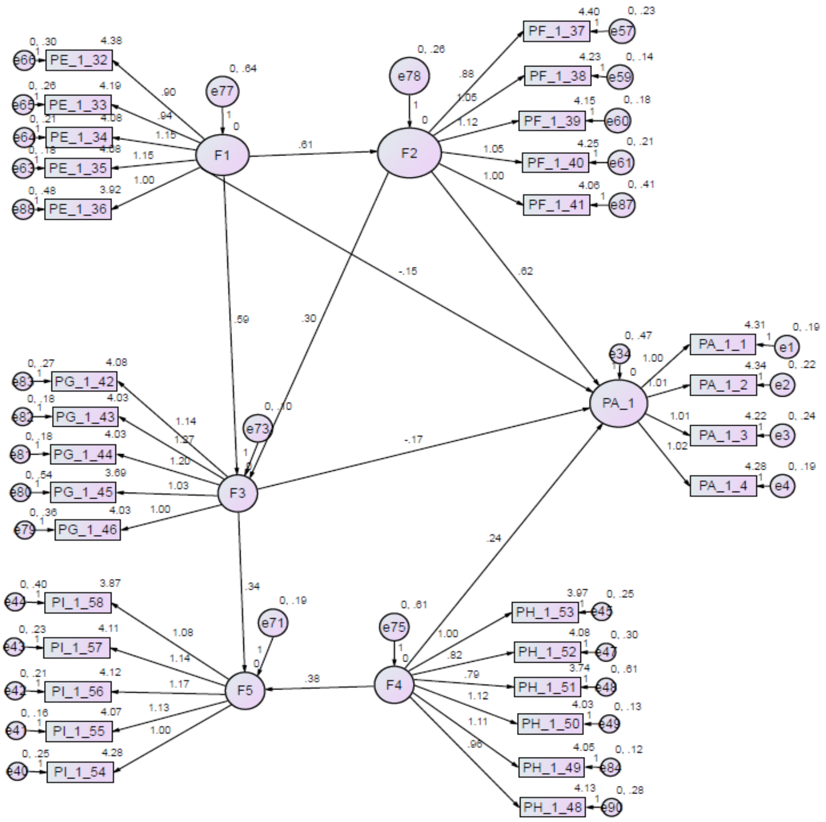

Fig. 2. Estimated causal model of IT demand management with five CSF (run 1).

Table 4. Significance analysis of the relationships from run 1.

Relation			Est.	S.E.	C.R.	P.L	SH
F2	<---	F1	0.613	0.088	6.991	***	SH2
F3	<---	F2	0.305	0.079	3.837	***	SH5
F3	<---	F1	0.591	0.087	6.785	***	SH6
ITDM	<---	F2	0.621	0.160	3.870	***	SH3
ITDM	<---	F4	0.238	0.082	2.917	0.004	SH8
ITDM	<---	F3	-0.174	0.237	-0.732	0.464	SH4
F5	<---	F3	0.342	0.068	5.065	***	SH7
F5	<---	F4	0.385	0.063	6.108	***	SH9
ITDM	<---	F1	-0.149	0.189	-0.787	0.431	SH1

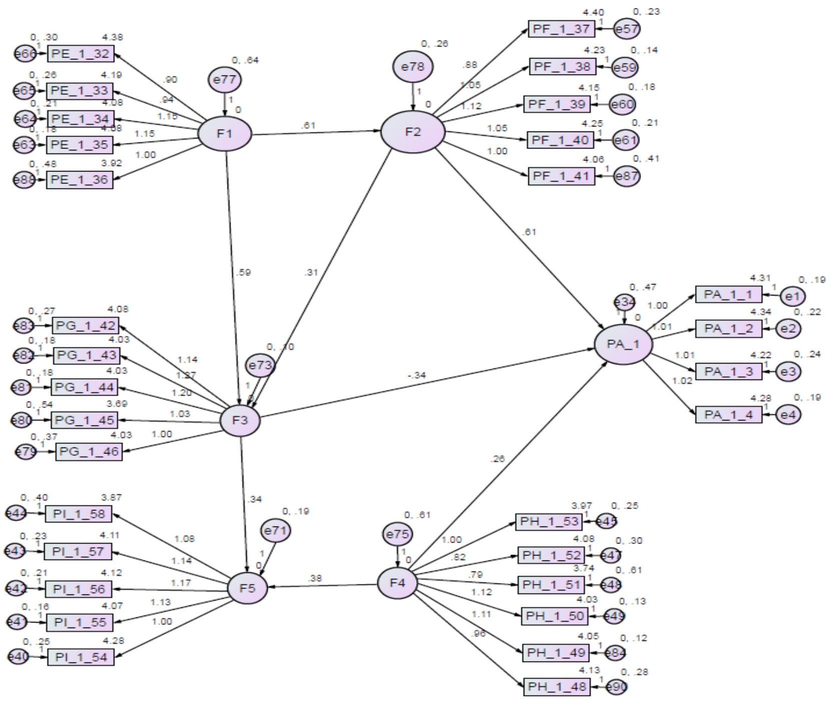

Fig. 3. Estimated causal model of ITDM with five CSF (run 2).

Table 5 presents the significance analysis of the relationships from run 2. In the analysed SEM, all relationships between latent variables are significant.

Table 5. Significance analysis of the relationships from run 2.

Relation			Est.	S.E.	C.R.	P.L.	SH
F2	<---	F1	0.612	0.088	6.983	***	SH2
F3	<---	F2	0.306	0.079	3.862	***	SH5
F3	<---	F1	0.591	0.087	6.807	***	SH6
ITDM	<---	F2	0.612	0.161	3.806	***	SH3
ITDM	<---	F4	0.257	0.082	3.123	0.002	SH8
F5	<---	F3	0.343	0.068	5.070	***	SH7
F5	<---	F4	0.384	0.063	6.106	***	SH9
ITDM	<---	F3	-0.335	0.151	-2.224	0.026	SH4

This indicates that each latent variable influences at least one other latent variable in the model. The following summarises the significant relationships identified:

- F2 <--- F1: There is a positive and significant relationship between the latent variable F1 and the latent variable F2 (Estimate = 0.612, $p < 0.001$).
- F3 <--- F2: A positive and significant relationship is observed between the latent variable F2 and the latent variable F3 (Estimate = 0.306, $p < 0.001$).

- F3 <--- F1: A positive and significant relationship is identified between the latent variable F1 and the latent variable F3 (Estimate = 0.591, $p < 0.001$).
- ITDM <--- F2: A positive and significant relationship is found between the latent variable F2 and the latent variable ITDM (Estimate = 0.612, $p < 0.001$).
- ITDM <--- F4: A significant relationship is evident between the latent variable F4 and the latent variable ITDM (Estimate = 0.257, $p = 0.002$).
- F5 <--- F3: A positive and significant relationship is shown between the latent variable F3 and the latent variable F5 (Estimate = 0.343, $p < 0.001$).
- F5 <--- F4: A positive and significant relationship is established between the latent variable F4 and the latent variable F5 (Estimate = 0.384, $p < 0.001$).
- ITDM <--- F3: A negative and significant relationship is detected between the latent variable F3 and the latent variable ITDM (Estimate = -0.335, $p = 0.026$).

These findings highlight the complexity of interactions among the latent variables in the model, suggesting that multiple factors are at play and contribute to the studied phenomenon. It is essential to consider these relationships when interpreting the results and developing interventions or strategies based on the SEM. The equations for the five factors, ITDM, and the structural model are presented below:

F1 (PE_1):

$$\begin{cases} PE_1\_32 = 0.897 \cdot F_1 + \varepsilon_{32} \\ PE_1\_33 = 0.938 \cdot F_1 + \varepsilon_{33} \\ PE_1\_34 = 1.151 \cdot F_1 + \varepsilon_{34} \\ PE_1\_35 = 1.146 \cdot F_1 + \varepsilon_{35} \\ PE_1\_36 = 1.000 \cdot F_1 + \varepsilon_{36} \end{cases}$$

F2 (PF_1):

$$\begin{cases} PF_1\_37 = 0.882 \cdot F_2 + \varepsilon_{37} \\ PF_1\_38 = 1.049 \cdot F_2 + \varepsilon_{38} \\ PF_1\_39 = 1.124 \cdot F_2 + \varepsilon_{39} \\ PF_1\_40 = 1.050 \cdot F_2 + \varepsilon_{40} \\ PF_1\_41 = 1.000 \cdot F_2 + \varepsilon_{41} \end{cases}$$

F3 (PG_1):

$$\begin{cases} PG_1\_42 = 1.136 \cdot F_3 + \varepsilon_{42} \\ PG_1\_43 = 1.268 \cdot F_3 + \varepsilon_{43} \\ PG_1\_44 = 1.202 \cdot F_3 + \varepsilon_{44} \\ PG_1\_45 = 1.033 \cdot F_3 + \varepsilon_{45} \\ PG_1\_46 = 1.000 \cdot F_3 + \varepsilon_{46} \end{cases}$$

F4 (PH_1):

$$\begin{cases} PH_1\_48 = 0.963 \cdot F_4 + \varepsilon_{48} \\ PH_1\_49 = 1.108 \cdot F_4 + \varepsilon_{49} \\ PH_1\_50 = 1.121 \cdot F_4 + \varepsilon_{50} \\ PH_1\_51 = 0.794 \cdot F_4 + \varepsilon_{51} \\ PH_1\_52 = 0.818 \cdot F_4 + \varepsilon_{52} \\ PH_1\_53 = 1.000 \cdot F_4 + \varepsilon_{53} \end{cases}$$

F5 (PI_1):

$$\begin{cases} PI_1\_54 = 1.000 \cdot F_5 + \varepsilon_{54} \\ PI_1\_55 = 1.126 \cdot F_5 + \varepsilon_{55} \\ PI_1\_56 = 1.175 \cdot F_5 + \varepsilon_{56} \\ PI_1\_57 = 1.136 \cdot F_5 + \varepsilon_{57} \\ PI_1\_58 = 1.079 \cdot F_5 + \varepsilon_{58} \end{cases}$$

PA_1 (Overall construct):

$$\begin{cases} PA_1\_1 = 1.000 \cdot PA_1 + \varepsilon_1 \\ PA_1\_2 = 1.008 \cdot PA_1 + \varepsilon_2 \\ PA_1\_3 = 1.005 \cdot PA_1 + \varepsilon_3 \\ PA_1\_4 = 1.022 \cdot PA_1 + \varepsilon_4 \end{cases}$$

Structural model including estimates:

$$\begin{cases} F_2 = 0.612 \cdot F_1 + \zeta_2 \\ F_3 = 0.591 \cdot F_1 + 0.306 \cdot F_2 + \zeta_3 \\ F_5 = 0.343 \cdot F_3 + 0.384 \cdot F_4 + \zeta_5 \\ PA_1 = 0.612 \cdot F_2 - 0.335 \cdot F_3 + 0.257 \cdot F_4 + \zeta_p \end{cases}$$

In summary, ITDM (PA_1) is primarily explained by *F2* (0.612) and *F4* (0.257), both of which have positive influences, while *F3* has a negative effect (-0.335). The model also reveals hierarchical interdependencies: *F1* influences both F2 and *F3*, while *F3* and *F4* together drive *F5*, creating an interconnected structure.

4.2. Significance of the indices

Table 6 presents the model fit indices obtained during the second run. Of the five indicators reported, four (Indicators 1 through 4) fall within ranges that reflect an acceptable level of model quality. The fifth indicator, while not fully within the recommended threshold, is close to acceptable parameters, suggesting that the model demonstrates an overall good fit. Although the model was developed using a sample of reasonable size and is thus subject to a margin of error, the fit indices and statistical significance of the relationships suggest that the model is of high quality and has strong potential for generalising to the broader population of professionals involved in ITDM.

The results indicate that the model has a good fit to the data, suggesting that the specified relationships between the latent variables are valid and adequately represent the underlying structure of the observed data. The relationships between the latent variables (F1 to F5) and their respective indicators have significant standardised regression weights. The standardised regression weights between ITDM (PA_1) and its indicators are also significant, confirming the relationship between the elements of ITDM and the latent construct.

Table 6. Expected and obtained fit indices for the ITDM with SEM.

	Fit Index	Expected	Obtained
1	Chi-Square $\chi 2$	< 0.05	0.000
2	Ratio of $\chi 2$ and degrees of freedom (CMIN/DF)	< 5	3.047
3	Parsimony ratio (PRATIO)	0.90- 1	0.913
4	Root mean square error of approximation (RMSEA)	< 0.05 / 0.10	0.120
5	Comparative fit index (CFI)	0.90-1	0.812

4.3. Hypothesis tests

Table 7 presents the unidirectional causal relationship for each of the nine (9) hypotheses, along with the associated parameters: estimate (regression coefficient), S.E. (standard error), C.R. (critical ratio), and P-value (significance level, where $p < 0.05$ is considered statistically significant). Given the error level used for the sample in this analysis, the results confirm the relationship between the CSF influencing ITDM.

Table 7. Unidirectional causal relationship between the tested hypotheses.

Hypothesis	Relation	Est.	S.E.	C.R.	P.V.	Result
SH1: Top management support influences IT demand management	ITDM <--- F1	-0.149	0.189	-0.787	0.431	Not Supported
SH2: Top management support influences strategic IT-business alignment.	F2 <--- F1	0.612	0.088	6.983	***	Supported
SH3: Strategic alignment between IT and business influences ITDM	ITDM <--- F2	0.612	0.161	3.806	***	Supported
SH4: IT portfolio alignment influences ITDM	ITDM <--- F3	-0.335	0.151	-2.224	0.026	Supported
SH5: Strategic alignment between IT and business influences IT portfolio alignment.	F3 <--- F2	0.306	0.079	3.862	***	Supported
SH6: Top management support influences IT portfolio alignment	F3 <--- F1	0.591	0.087	6.807	***	Supported
SH7: IT portfolio alignment influences stakeholder participation	F5 <--- F3	0.343	0.068	5.07	***	Supported
SH8: Leadership influences ITDM	ITDM <--- F4	0.257	0.082	3.123	0.002	Supported
SH9: Leadership influences stakeholder participation	F5 <--- F4	0.384	0.063	6.106	***	Supported

Figure 4 shows the final conceptual model. Hypothesis SH1 was not supported.

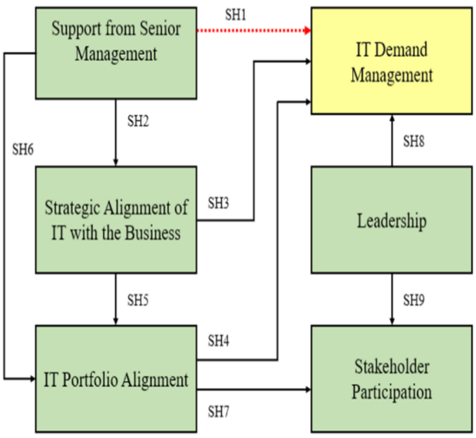

Fig. 4. Final conceptual model of ITDM based on CSF.

4.4. Discussion

The demand for IT has significantly increased to meet the needs of business areas and citizens, underscoring the importance of effective management. Although ITDM models have been reviewed in prior studies, no research has specifically examined the CSF that may impact IT demand to ensure its success. According to this study, ITDM in the public sector relies on several highly significant CSF. The following discussion presents the results of the model and insights gained from the literature review related to the relationships among the five factors analysed in connection to ITDM.

The influence of senior management on ITDM was rejected based on the collected data, where the p-value was 0.431, which exceeds a significance level of 0.05. This result contrasts with arguments by Cramm [2], who maintains that senior management and executives play an important role in ITDM. Similarly, Nicho and Mourad [18] and Urbach et al [19] argue that senior management must be committed to IT management. However, these findings are consistent with Abrahamsson and Livari [21], who argue that traditional improvement models overestimated the role of commitment. Furthermore, Novak et al. [1] and Pombinho et al. [22] show that ITDM relies on structural mechanisms, such us committees, prioritization criteria, Enterprise architecture artifact and formal portfolio governance, rather than on the personal will of executives.

In this sense, senior management exerts indirect influence through IT strategic alignment rather than through direct involvements in the demand process. In other words, management is based more on structural mechanisms than on the personal commitment of senior management [22] or depending on process maturity level [23]. Also, this outcome can be explained by the actual level of commitment that senior management and executives provide to ITDM. This support should be periodically reinforced, as IT demand managers perceive that the current commitment is not adequate for the support required.

The influence of senior management support on IT strategic alignment with the business was supported, with a p-value of 0.0, which is below the 0.05 significance level. This result aligns with other studies, such as [2], which supports the positive relationship between IT and business areas with senior management support, and [4], which advocates for the importance of senior management and executive support in achieving IT strategic alignment with the business. Additionally, Legner and Löhe [12], van Outvorst and Scholten [24], and Pombinho et al. [22] highlight the importance of ensuring IT-business alignment through senior management support. The influence of IT strategic alignment with the business on ITDM was also supported, with a p-value of 0.0, again below the $p < 0.05$ significance level. This result is consistent with other studies that indicate an effective relationship between the two [3]. Specifically, IT demand influences IT investments that benefit the business [6], and IT strategic alignment with the business influences ITDM [11, 13].

The influence of IT portfolio alignment on ITDM was also supported ($p = 0.026$). This result is consistent with other studies: IT portfolio management ensures IT management [14]; the IT portfolio must be aligned with ITDM [27]; managing IT demand requires a focus on IT portfolio management [4]; the IT portfolio optimises ICT services and IT demand [31]; and IT portfolio alignment is related to ITDM [28]. The influence of IT strategic alignment with the business on IT portfolio alignment was supported with $p < 0.05$. This finding aligns with [34], which states that meeting IT needs within a business requires an IT portfolio.

The influence of senior management support on IT portfolio alignment was also supported, with a p-value of 0.0, below the 0.05 significance level. This finding aligns with studies such as [14], showing that executives support IT management through portfolios, and [3], which states that IT demand requires operational capacity through IT portfolios with senior management support.

The influence of IT portfolio alignment on stakeholder participation was supported with a p-value of 0.0, below the 0.05 significance level. This finding aligns with studies such as [3], which indicate the need for stakeholder participation in IT portfolios to manage IT demand, and [19], which emphasise that stakeholders possess the knowledge to support business needs in IT governance. The influence of leadership on ITDM was supported, with a p-value of 0.002, below the 0.05 significance level.

This result is consistent with studies such as [14], which state that leadership from CIOs, CEOs, CFOs, and others supports IT management; [2] and [28], which argue that leadership demonstrates commitment to ITDM; [4], which states that leaders should be prepared for process management and focused on IT demand levels and IT performance; [3], which emphasises that leaders should prioritise IT demand projects; [18], which suggests that leadership supports IT governance; [29], which argues that leaders should be committed to ITDM; [11, 13], that find that leadership does influence ITDM; and [6], which highlights that leaders participate in strategic plans that deliver IT value.

Finally, the influence of leadership on stakeholder participation was supported, with a p-value of 0.0, below the 0.05 significance level. This finding aligns with studies such as [4], which argues that stakeholder participation must be led to manage IT demand, and [31], which holds that executives must have proactive and strategic leadership involving stakeholders. Other studies emphasise the importance of stakeholder participation in ITDM [3], the need for qualified stakeholders [29], and the need for a leader who builds trust with stakeholders to meet IT demand and deliver IT value [6].

This study contributes to the existing body of knowledge by identifying a set of factors within ITDM, as well as providing empirical evidence on the influence of CSF in ITDM. The systemic approach to ITDM is reinforced, with results validating the importance of analysing ITDM as an interdependent system in which factors, such as strategic alignment and IT portfolio alignment, act as key mediators. This finding underscores the value of system-based theoretical approaches and the relevance of indirect relationships between organisational constructs. The role of leadership is further explored, as it is confirmed to be a critical factor with a direct influence on both ITDM and stakeholder participation, thus expanding its function beyond the strategic realm toward that of a bridging role across different dimensions of IT management.

Additionally, this research contributes to the study of CSF in the public sector, a context that remains underexplored, by providing evidence on how CSF behave within governmental organisations, thereby encouraging the development of more context-sensitive theoretical frameworks.

Strategic IT alignment should be strengthened; given that strategic alignment with the business has been identified as a determining factor in demand management, organisations should invest in processes, structures, and communication channels that reinforce this connection, ensuring that IT initiatives clearly respond to business needs. IT portfolio alignment has emerged as a key node connecting leadership, strategic alignment, and stakeholder participation. This suggests that enhancing portfolio management capabilities can serve as an effective lever to optimise IT demand. A noteworthy aspect is the promotion of cross-functional leadership; that is, organisational leaders - including CIOs, CEOs, and CFOs - must assume a more active and transversal role in demand management, not only by setting strategic direction but also by engaging in stakeholder management and decision-making related to the IT portfolio. Empirical evidence reinforces that stakeholder participation should not be limited to formal consultations but must be actively managed through proactive leadership and governance structures that foster continuous collaboration aligned with strategic objectives.

It is important to acknowledge the limitations of this study. First, the use of a non-probabilistic sampling method prevents the generalisation of the findings; therefore, future research is encouraged to employ probabilistic and stratified sampling techniques. Second, the selected pool of participants may have influenced the results. Accordingly, it is recommended that a larger number of public institutions and private sector organisations be included to identify similarities and differences. Third, although the primary contribution of this study lies in analysing the influence of the selected factors, its approach is strictly quantitative. Thus, future research should consider incorporating a qualitative perspective to explore the phenomenon in greater depth. Finally, it is worth noting that this study considers only five CSF; consequently, it is recommended that future studies include a broader set of factors supported by the literature.

5. Conclusions

As previously indicated, the existing literature primarily presents general models or methodologies for ITDM with limited applicability to the actual performance and specific needs of the public sector; there is also a general failure to consider the factors that influence IT demand implementation and execution. This study proposes a conceptual model incorporating the following factors: senior management support, IT strategic alignment with the business, IT portfolio alignment, leadership, and stakeholder participation.

This model also includes nine relationships between ITDM and each of these CSF. The empirical phase of the study involved data collection through 144 surveys completed by the target audience from governmental ministries and public entities. Statistical analysis was performed using structural equation modelling (a multivariate analytical technique) to examine the relationships that supported the proposed conceptual model.

The validity of the applied technique was confirmed, and the obtained values confirmed its robustness. Additionally, eight out of the nine hypothesised relationships were found to be significant, thereby validating the majority of the proposed conceptual framework. These findings confirm that the five CSFs together form a strong model for understanding and improving ITDM.

Nevertheless, this model serves as a starting point for refining ITDM practices, and its application in real-world settings may guide the development of more responsive and effective IT governance strategies. Future work should (i) analyse factors related to IT value delivery, organisational culture, IT performance, management structure, IT demand committees, and overall organisational performance; (ii) design and implement an ITDM methodology based on these factors; (iii) evaluate ITDM quantitatively in organisations to measure benefits in strategic and tactical prioritisation, demand execution times, and satisfaction with IT value delivery; and (iv) develop and implement an ITDM system based on critical success factors for efficiently monitoring strategic and tactical demand in the public sector.

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