National and sectoral information technology planning: a systematic literature review

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Abstract

Purpose – The public sector (PS) has extensively utilized information technology (IT); however, research reveals that the failure rate remains high, particularly for national and sectoral IT (NaSIT) applications. To this end, numerous studies have been conducted to gauge the success of IT applications, where a significant number have demonstrated the importance of planning in this regard. Consequently, the current study aims to investigate the factors that influence the success of NaSIT planning and implementation within this sector.

Design/methodology/approach – A qualitative methodology and a systematic literature review encompassing papers indexed in seven databases until November 2022 were utilized.

Findings – The review of 92 selected papers revealed that the success of NaSIT planning and implementation is influenced by a number of factors divided into nine main categories. These include vision, goals and objectives; alignment; interoperability; infrastructure; involvement; equity and digital divide; privacy, security and trust; administration; and culture. Human, social, economic and organizational factors comprise the vast majority of these factors. By addressing these factors, the failure rate of IT plans can be reduced. Governments will be able to effectively employ this technology to accomplish their missions if these factors are considered in order to decrease the failure rate of IT plans.

Originality/value – By examining the factors that influence the success of NaSIT planning and implementation in the PS, this study attempts to provide a comprehensive view of various types of research. Furthermore, policymakers can employ this perspective to improve the efficiency and effectiveness of the PS.

Keywords Information technology, National planning, Sectoral planning, Public sector, Public management, Success, Failure

Paper type Literature review

1. Introduction

Information technology (IT) refers to hardware, software and telecommunications networks which include tangible aspects like personal computers, network cables, servers and so on, and intangible aspects that is, all kinds of software (Ward and Peppard, 2002, p. 3). In terms of speed, size, complexity and transformative power, the proliferation of IT has created a revolution that cannot be compared to previous ones (Xu et al., 2018). Over the last few decades, governments across the globe have endeavored to utilize this technology in an effort to accomplish their objectives, facilitate citizen communication, and creating public value, particularly in the context of e-government (Criado and Gil-Garcia, 2019; McIvor et al., 2002; UNDESA, 2022, p. 185).

The success and failure of IT applications have been the focus of a multitude of studies. The current study investigates the significance of planning and its execution in this context, with a specific emphasis on sectoral and national levels. Accordingly, the question is, “what factors should be considered in NaSIT planning and implementation in the PS to succeed?” By examining these factors, this study attempts to provide a comprehensive view of various factors.
types of research. Furthermore, policymakers can employ this perspective to improve the efficiency and effectiveness of the PS.

The remainder of this article is as follows. Firstly the statement of the problem is defined. Then the systematic literature review (SLR) as the methodology of this study is explained. It follows with the findings in summary and in detail. Finally the key results, contributions to literature and practice, limitations and research agenda are discussed.

2. Problem statement

Apart from the significant and extensive financial investments in the IT industry (Statista, 2022), societies have encountered a “productivity paradox” (Solow, 1987). According to Lin and Shao (2006), we are still failing to apply IT, and thus, “the productivity paradox is still existent.” We must, therefore, anticipate and accept the possibility of IT project failures (Thomas and Fernández, 2008). Large IT projects, particularly those requiring coordination and integration across multiple organizations, are prone to failure (Rottman et al., 2007). According to Goldfinch (2007), previous research indicates that the remarkable prevalence of failure in IT application within the PS is what sets it apart; that is to say, failure in IT application is the norm in this sector.

Meanwhile, “planning” has consistently been recognized as one of the key success factors in the application of IT at various levels, especially in the PS (e.g. Acharya et al., 2022; Brown and Thompson, 2011; Tsokota et al., 2017). On the other hand, a lack of planning or inadequate planning, in addition to the absence of a well-defined goal and schedule, have been cited as factors contributing to the failure of IT applications (Rosacker and Olson, 2008; Gauld, 2007). Integrated plans are required when two or more organizations collaborate on cross-sectoral or cross-organizational IT applications. These plans should clearly delineate the responsibilities of each organization involved and ensure coordination among the different layers (Cabinet Office, 2000, pp. 48–49; Rose and Grant, 2010).

In essence, “planning” denotes the systematic procedure of establishing objectives and selecting the means to attain them (Stoner et al., 1995, p. 265). Therefore, it is primarily concerned with “objectives and how they are accomplished” (Dufner et al., 2002). IT planning concerns identifying opportunities for utilizing IT, determining what is required to make use of them, and designing the strategies and actions to take advantage of them (Boytont and Zmud, 1987). Planning addresses three questions; “Where are we now, where do we want to be, and how do we get there” (Venkatraman and Hughes, 2009).

IT planning at the national and sectoral levels is characterized by the number of institutions involved, the diversity of people and personnel engaged, and the different organizational levels. IT planning and implementing, with its process, is placed in the school of planning or strategy formation, in which strategy emerges in a formal process (Mintzberg et al., 1998, pp. 48–79). Such an approach is effective for managing very large and complex resource commitments (Mintzberg, 1981).

National IT plans are those that primarily affect or consider the entire country and are typically cross-provincial and cross-sectoral in nature. National IT plans may include e-government, e-society, e-economy and other similar initiatives. Sectoral plans are specifically concerned with a country’s industry sectors. These plans are cross-organizational in nature, and they may also be cross-provincial. These plans could include e-content, e-tourism and e-legislation, among others. National plans and sectoral plans are both strategic in nature (US Congress, 1981, p. 5; Young, 2008, pp. 33–38).

Given the importance of planning and implementation in the application of IT at the national and sectoral levels, the question is, “what factors should be considered in NaSIT planning and implementation in the PS to succeed?” Many studies have previously been conducted to answer this question and have emphasized one or more factors in this regard. However, this study
examines them in order to form a comprehensive, integrated and broad view. Policymakers can also use this viewpoint to improve the effectiveness and efficiency of the PS.

3. Methodology
This work employed a qualitative approach, utilizing the SLR method per the guidelines recommended by Jesson et al. (2011, pp. 103–127). According to the cited study, "a systematic review is a comprehensive review of all published articles selected to address a specific question using a systematic method of identifying relevant studies in order to minimize biases and error" (p. 108). SLR is widely exploited in PS research (e.g. Coccia secca et al., 2021; Tallaki and Bracci, 2021) and IT-related studies in this sector (e.g. Akesson et al., 2008; Lopes et al., 2019).

3.1 SLR planning
SLR plan clarified the review question: “what factors should be considered in NaSIT planning and implementation in the PS to succeed?” Accordingly, search keywords and inclusion and exclusion criteria for papers in the systematic review were identified. Based on these criteria, research papers in the English language with methods, models, policies, strategies, frameworks, drivers and inhibitors for the success of NaSIT planning and implementation were included until November 2022.

3.2 Comprehensive search
At this stage, seven scientific databases were thoroughly and methodically searched for relevant articles. In this step, pilot searches were used to refine keywords. Following refinement, 21 keywords remained. Keywords including “information technology,” “communication technology,” “information system,” and “ICT” for IT; keywords “plan,” “policy,” “strategy,” “program,” “design,” “model,” “framework,” “development,” “accept,” “implement,” “success,” “challenge,” and “failure” for the purpose of research; and “national,” “sectoral,” “government,” and “public” were used for the scope of the studies. According to each database, these keywords were then reorganized and mixed. The search strategy used in Scopus (on 12 Nov. 2022) and WoS (on 8 Nov. 2022) were as follows. During this step, 1,317 records were retrieved (Table 1).

<table>
<thead>
<tr>
<th>Database</th>
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<th>Database</th>
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<tbody>
<tr>
<td>Scopus</td>
<td>696</td>
<td>Taylor &amp; Francis</td>
<td>51</td>
</tr>
<tr>
<td>Web of Science (WoS)</td>
<td>320</td>
<td>Wiley</td>
<td>31</td>
</tr>
<tr>
<td>Science Direct</td>
<td>125</td>
<td>Sage</td>
<td>26</td>
</tr>
<tr>
<td>Ebsco (Lista)</td>
<td>68</td>
<td>Total</td>
<td>1,317</td>
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</table>

**Source(s):** Authors own creation

| Table 1. The number of records retrieved from seven databases |
3.3 Quality assessment of retrieved papers

The initial evaluation criterion was the frequency of findings. Consequently, 514 duplicate papers were identified and subsequently eliminated. In addition to reviewing all accepted papers, titles and abstracts of 803 additional papers were evaluated. In this procedure, the notable papers cited by the selected papers were also incorporated.

All papers were evaluated first for their relevance to the review question and then for their quality. Nonresearch or nonEnglish papers were discarded in this step (including notes and opinions, among others). Several papers discussed obsolete technologies, were not linked to national and sectoral levels; or used similar models without extension. Furthermore, these were not accepted for review. Finally, 92 papers remained for systematic review (Figure 1).

The reviewed articles were published in 55 journals (Table 2).

The selected papers were published over 23 years (Table 3).

3.4 Relevant data extraction

The qualitative content analysis method was used to extract the factors affecting the success of NaSIT planning and implementation. This is to provide a systematic summary of the key findings of many texts (Erlingsson and Brysiewicz, 2017). Its approach was “conventional,” in which the research findings derived from the frequent and dominant themes in the raw data (Thomas, 2006). Different data points relevant to the research question were assigned codes in accordance with this methodology and Saldana’s (2013) coding process Miles et al. (2014, pp. 73–74). The primary subjects of the texts were briefly summarized through the use of a word or brief phrase as part of a “descriptive coding approach.”

3.5 Extracted data integration

In order to integrate the extracted data, a “centralized coding approach” was employed for the group, and similar codes were combined into final categories, themes or concepts. As the result, they were placed in nine main categories of which, five had 14 subcategories. While

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**Figure 1.**
PRISMA flowchart for selecting papers for systematic review

**Source(s):** Authors own creation
these factors can be applied at different levels, their application in national and sectoral planning and implementation was the key to select them.

All procedures were executed by two researchers in order to validate the research and its results; in the event of a disagreement, the perspective of the third researcher was utilized. The peer debriefing method was employed as per Creswell and Miller (2000). This involved two experts providing feedback on the research process and data, and their perspectives were used to review, strengthen and edit the coding. To ensure consistency in coding and categorization, they underwent multiple rounds of revision and editing in accordance with Mayring’s (2000) approach. Furthermore, the substantial time dedicated to conducting the systematic review steps and one of the author’s prior experiences with the research topic also enhanced the credibility and reliability of the results. Researchers further bolstered the dependability of the findings through the implementation of a systematic review approach, scrupulousness in code extraction and categorization, and meticulous editing.

4. Findings
Data from the review of 92 papers were compiled into nine categories (5 had 14 subcategories) to answer the research question (Table 4).

4.1 Vision, goals and objectives
Every planning process is intrinsically linked to the establishment of objectives. Numerous NaSIT plans commence with idealistic goals. Nevertheless, the visions must be converted into

<table>
<thead>
<tr>
<th>Journal</th>
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<tbody>
<tr>
<td>Government Information Quarterly</td>
<td>17</td>
</tr>
<tr>
<td>Information Development</td>
<td>4</td>
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<tr>
<td>The Journal of Strategic Information Systems</td>
<td>4</td>
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<tr>
<td>Transforming Government: People, Process and Policy</td>
<td>4</td>
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<tr>
<td>Journal of Information Science</td>
<td>3</td>
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<tr>
<td>Telecommunications Policy</td>
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<tr>
<td>International Journal of Public Sector Management</td>
<td>2</td>
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<tr>
<td>Public Performance and Management Review</td>
<td>2</td>
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<tr>
<td>Information Management and Computer Security</td>
<td>2</td>
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<tr>
<td>International Journal of Medical Informatics</td>
<td>2</td>
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<tr>
<td>Technological Forecasting and Social Change</td>
<td>2</td>
</tr>
<tr>
<td>Business Process Management Journal</td>
<td>2</td>
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<tr>
<td>Technology in Society</td>
<td>2</td>
</tr>
<tr>
<td>The Information Society</td>
<td>2</td>
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<tr>
<td>Others (*1)</td>
<td>41</td>
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Source(s): Authors own creation

<table>
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<th>Year</th>
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<td>2008</td>
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<td>2007</td>
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<td>4</td>
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<td>2017</td>
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<td>2009</td>
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<tr>
<td>2006</td>
<td>8</td>
<td>2010</td>
<td>3</td>
<td>2014</td>
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<td>1987</td>
<td>1</td>
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<tr>
<td>2002</td>
<td>7</td>
<td>2021</td>
<td>2</td>
<td>2012</td>
<td>1</td>
<td>Total</td>
<td>92</td>
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</tbody>
</table>

Source(s): Authors own creation

Table 2. The number of reviewed papers by journals

Table 3. The year in which reviewed papers were published

National and sectoral IT planning
<table>
<thead>
<tr>
<th>No</th>
<th>Key factors</th>
<th>From</th>
</tr>
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<tbody>
<tr>
<td>3</td>
<td>Interoperability Technical</td>
<td>Ahmadi et al. (2017), Batini et al. (2009), Evans and Yen (2005), Gauld (2005), Hussein et al. (2007), Ke and Wei (2004), Lam (2005), Peristeras et al. (2008), Salmea and Turunen (2003), Tsokota et al. (2017), Vest et al. (2014)</td>
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Table 4.
Key factors in NaSIT planning and implementation
(continued)
a precise collection of clear goals and objectives that shall serve as benchmarks for assessing the execution of the vision and guiding the planning process. These plans are more likely to succeed (Al-Mashari, 2007; Frieden, 2005; Lam, 2005; Rabaiah and Vandijck, 2009; Rosacker and Olson, 2008).

4.2 Alignment

4.2.1 Alignment with users’ needs. Technology alone cannot be expected to solve social problems (Nwagwu, 2006). Thus, IT-based systems and services must be planned and aligned to meet the needs of users who are widely scattered. In practice, users should be provided with improved services when and where they are needed (Carter and Weerakkody, 2008; Goyal, 2007; Rose and Grant, 2010).

4.2.2 Alignment with other plans. Maximizing utility requires considering IT applications as “just one ingredient of the solution” (Harris, 2004, pp. 15–16). To create synergy and avoid inconsistencies and conflicts, these plans must be aligned with other IT plans and other national and sectoral plans. This produces macro-level visions and strategies that are coherent and comprehensive (Cabinet Office, 2000, pp. 9–13; Choi, 1988; Jaeger and Thompson, 2003).

4.2.3 Alignment with context. Every context possesses distinct attributes that differentiate it from others. Considering the impracticability of universally applying a single solution, IT applications within the PS of any given nation must be tailored to its specific and contextual characteristics. This implies that adopting models from other countries and the private sector to implement in PS may be unsuccessful (Evans and Yen, 2005; Holley et al., 2002; Ramírez, 2001).

4.3 Interoperability

4.3.1 Technical interoperability. Integrating systems across multiple organizations and utilizing standardized data is not a new challenge in the PS (Salmela and Turunen, 2003;
IT-enabled cross-system and cross-organizational services may produce inconsistencies due to disparities in technical infrastructures such as platforms, standards, design methods, programming, security models and organization-related technologies, as well as diverse formats, units, scales and data models (Hussein et al., 2007; Lam, 2005; Peristeras et al., 2008). Furthermore, some issues may arise as a result of legacy systems, which may contain inflexible, non-adaptable, obsolete or no longer supported software or hardware (Avison and Fitzgerald, 2006, p. 151; Gauld, 2005). Every IT plan must include solutions for and integrating new services and systems with these systems (Batini et al., 2009; Evans and Yen, 2005; Lam, 2005).

4.3.2 Organizational interoperability. As NaSIT plans involve multiple organizations, organizational inconsistencies may result (InforDev and Center for Democracy and Technology, 2002, p. 19; Peristeras et al., 2008). Organizations involved should demonstrate a willingness to collaborate and synchronize efforts. Challenges to the implementation of organizational interoperability include rigid regulations, limited resources, disregard for cultural diversity, absence of standardized practices, rigid organizational structures, difficulties in integrating organizational information and knowledge, and resistance to change (Ezz et al., 2009).

4.4 Infrastructure
4.4.1 Technical infrastructure. Implementing IT plans requires adequate and appropriate technical infrastructure, including networks and telecommunications (Hussein et al., 2007; Ke and Wei, 2004). The necessary infrastructure should be established or systems should be developed based on the available infrastructure. Although the first approach is utilized by the majority of the countries (Hassanlou et al., 2009), when new infrastructure is expensive or cannot be provided quickly, the second approach is preferable (Allen et al., 2001; Ebrahim and Irani, 2005).

4.4.2 Legal infrastructure. Sometimes, implementing IT plans requires a legal infrastructure or framework (Adeyeye and Iweha, 2005), which can be provided by revising or enacting new laws, policies and regulations. To accommodate NaSIT plans, these must be straightforward, adaptable, flexible and agile (Bagchi and Paik, 2001; Scupola and Mergel, 2022). The establishment of a legal framework governing the implementation of IT signifies the political will to develop this technology further (Tsokota et al., 2017).

4.5 Involvement
4.5.1 Stakeholders’ participation. Stakeholders’ participation is intrinsically linked to the achievement of IT project objectives (Alipour et al., 2017; Chan and Pan, 2008). Engagement in the planning process serves to prevent the neglect of stakeholders’ requirements and guarantees the fulfillment of their priorities. By integrating the viewpoints, expertise and experiences of stakeholders into a plan, their level of support and acceptance of IT will be enhanced (Azad and Faraj, 2008; Chopyak and Levesque, 2002; Córdoba, 2007; Shin, 2007). This is difficult, complex and challenging due to their high number and heterogeneity, as well as the fact that they may be located in different organizational layers (Hwabamungu et al., 2018; Pilemalm et al., 2016).

4.5.2 Communication with citizens. Communication with citizens “as providing or exchanging information” (Warsen, 2023) is important, as the lack of awareness among citizens regarding government affairs and the objectives of IT initiatives will substantially hinder their engagement in said endeavors (InforDev and Center for Democracy and Technology, 2002, p. 17). Citizens and stakeholders are more likely to accept the concept of improved services if they are made aware of IT plans and their benefits. Additionally, they identify the areas where such services significantly impact them (Duggan and Green, 2008, pp. 10–11; Jaeger and Thompson, 2003).
4.6 Equity and digital divide
The PS must hold a commitment to justice and equality for all citizens at all times. This sector should provide services that are accessible to all individuals on an equal basis (Berman, 1998, p. 8). Consequently, one of the challenges of IT planning is the digital divide. Geography, center and periphery, city and countryside, literate and illiterate, income, class, race, age, descent and disability are key factors that create this gap (Batini et al., 2009; Hawkins, 2005; Thajchayapong et al., 1997; Shin, 2007; Yu, 2006). People readiness is among the most important prerequisites of IT plan implementation (Luhan and Novotná, 2015). All stakeholders and end users should be adequately prepared to implement and utilize the systems (Badamas, 2009; Lam, 2005; Malodia et al., 2021; Pan et al., 2006). Furthermore, in certain nations, individuals converse in two or more languages. In order to meet the needs of users in multiple languages, “standardization of spellings, word use, and a common language or languages” is necessary (Jaeger and Thompson, 2003).

4.7 Privacy, security, and trust
Citizens’ and organizations’ privacy should be respected when collecting, utilizing and sharing their data. People may be reluctant to upload and share their data in systems if they lack privacy safeguards (Ebrahim and Irani, 2005; Joinson et al., 2006; Lam, 2005; Shin, 2007). Respecting the rights of individuals and organizations whose digital information is stored and shared in IT-based systems and services is essential to their success (Shin, 2007). Consequently, security represents an additional critical obstacle in IT plans (Yuliana and Hasibuan, 2022). To encourage people and organizations to use information systems on the one hand and to prevent cybercrime and threats such as theft, vandalism and natural disasters on the other hand; technical, social and legal safeguards must be implemented (Akman et al., 2005; Ebrahim and Irani, 2005; Gauld, 2005; Shin, 2007). In addition, it is essential to establish trust among and within all stakeholders, including organizations and citizens, in order to execute IT plans effectively. This trust must be placed in both the government and in technology (Carter and Bélanger, 2005).

4.8 Administration
4.8.1 Governance. According to Grant et al. (2007), governance is the hierarchy and various layers of policymaking and decision-making committees and bodies and the combination of organizations that manage IT plan implementation. Governance of IT plans involving multiple entities must be adequate for senior management to feel confident that they can confront significant risks with one another’s assistance and cooperation (Government of Canada, 2006, pp. 57–58). In addition, significant central coordination is required so that various government bodies recognize the importance of keeping up with IT and executing its plans (Allen et al., 2001).

4.8.2 Public-private relationship. Successful implementation of large-scale IT initiatives necessitates a transparent relationship between the public and private sectors. It is imperative to establish this relationship’s spectrum of potential outcomes, which spans from cooperation to competition, in the course of the planning phase (Al-Mashari, 2007; Badamas, 2009; El-Gohary et al., 2006; Frieden, 2005; Lucas et al., 2009). The success of the partnership and relationship depends on establishing mutual trust and agreement between the two sectors through planning and implementation as well as collaboration and aligning their interests, desires and attributes (Bagchi and Paik, 2001; Duhamel et al., 2021). This partnership should work toward a mutually beneficial objective and provide sustainable benefits, particularly for the private sector (Malodia et al., 2021).

4.8.3 Organizational readiness. PS organizations must be able to fulfill their responsibilities both independently and in collaboration with other engaged organizations in IT plans. This involves having trained and experienced employees and IT experts on staff.
The effectiveness of technology is contingent upon the presence of proficient users (Hussein et al., 2007) and its integration and incorporation into organizational processes and digitizing them (Gonzalez et al., 2007; Petrakaki, 2018). This preparation involves the commitment and engagement of top government managers, increasing the plan’s priority and leading to its implementation as well as improved investment and governance decisions (Irani et al., 2008). The alignment of the workforce’s culture, attitudes and skills with the requirements of large-scale IT applications is imperative for the effective execution of IT plans (Al-Mashari, 2007; Badamas, 2009; Rosacker and Olson, 2008). Both employees and managers require consistent training in this area to keep their attitudes, knowledge and skills updated (Alipour et al., 2017).

4.8.4 Financing. A significant correlation exists between sufficient funding and the success of IT applications in the PS (Kim et al., 2007; Serrano-Cinca et al., 2009). One of the challenges that the PS has always faced is a lack of funds, which can lead to a decline in the quality of IT-based systems and services (Ebrahim and Irani, 2005; Hazlett and Hill, 2003; Tsokota et al., 2017). When the duration of a project exceeds one fiscal year and more than one organization is involved, financing assumes greater significance (Government of Canada, 2006, p. 58; Lam, 2005). A fraction of the funds required for sustainable IT applications may be generated through increased revenue or reduced expenses (Al-Mashari, 2007; Brown and Thompson, 2011; Ojo, 2006).

4.8.5 Control. The control of IT plans will result in the timely implementation of diverse project tasks and the achievement of their objectives. Every IT project faces a variety of risks, and these risks must be anticipated and managed to minimize their impact on projects (Government of Canada, 2006, p. 59; InforDev and Center for Democracy and Technology, 2002, p. 22). Moreover, control requires continuous monitoring and feedback to supply data to all key actors via an efficient network (Rosacker and Olson, 2008).

4.9 Culture
Culture influences IT applications at all levels (Jones and Alony, 2007; Kummer et al., 2012). Thus, it is critical to consider not only the organizational culture but also the broader social system at the higher level of a country (Walsham and Han, 1993). IT application is impossible without cultural compatibility and congruence (Kim and Kim, 2010). Therefore, a new and appropriate culture must be developed to maximize IT utilization in the PS (Akman et al., 2005; Allen et al., 2001). Additionally, values should be considered, as success in this field is contingent on the interaction between IT and people’s values (Nwagwu, 2006). Without values such as public participation, effective communication and awareness, citizens are unlikely to use IT-based public systems and services (Abdulkareem and Mohd Ramli, 2022). Semantic inconsistencies may also arise when an IT program transcends sectoral or organizational boundaries, as distinct names or interpretations for identical data, signs and data models may emerge. This may lead to their applicability and validity across the diverse institutions that are engaged in the plan (Peristeras et al., 2008).

5. Discussion
5.1 Key results
An SLR of the papers published until November 2022 and the selection and content review of 92 papers revealed that the success of NaSIT planning and implementation depends on numerous factors. These factors can be placed in nine main categories (Table 4 and Figure 2).

In situations where NaSIT applications surpass the boundaries of an organization and organizational hierarchies become loose or even disappear, it becomes apparent that stakeholder engagement and collaboration are required in the adoption and utilization of IT.
NaSIT plans address several organizations and citizens who are extraordinarily diverse and unique. This diversity and variation may complicate the implementation of IT. It is impossible for the PS alone to achieve the widespread application of IT. Therefore, such plans should also involve the private sector.

IT is not an end in itself and must be utilized to address users’ needs; otherwise, it will not be accepted or adopted. Implementing IT applications can be simple to hard according to cultural factors. A culture that is not in line with IT application puts it in a difficult position. Furthermore, high expenses are associated with the implementation of IT at the national and sectoral levels. Failure to achieve success during project implementation, which may extend beyond a year, necessitates meticulous strategizing and the punctual allocation of adequate financial resources. End users of diverse NaSIT initiatives should be receptive and prepared to adopt and utilize them. Without the proper preparation of those involved and the resolution of the digital divide which can stem from a variety of sources, these endeavors cannot succeed. Critical to the success of NaSIT plans is the readiness of numerous organizations that are incorporated. This pertains to the entire organization, including its management and human resources. Without interoperability, widespread application of IT is impossible, particularly in terms of integrating new systems and maintaining compatibility with legacy ones. Infrastructure is an additional critical element, as the implementation of NaSIT applications requires a universal and flawless foundation.

5.2 Contributions to literature and practice
The first contribution of this study is a thorough understanding of the significance of planning and implementation in the success of NaSIT applications. This study gathered and analyzed the perspectives of numerous researchers in this field. Second, it classified and explained previous research results. This can also reveal important success factors in this regard. Classifications make it easier and faster to identify these factors. A concise explanation of each factor can also aid comprehension.

The findings of this study can inform policymakers about the importance of planning to avoid failure in the IT utilization process. They can also help these policymakers with NaSIT
planning and implementation. Each of the critical factors addressed by this study can be used to ensure the success of IT projects. A unified framework for planning and implementation can be created using a multifactor view of success factors. Using this viewpoint, governments at national and sectoral levels can use a comprehensive framework to direct their functions. Lower-level organizations, on the other hand, as stakeholders or participants in IT plans, can recognize their general and unique roles and responsibilities and better align with the big picture of plans. This study demonstrates the major implications for developing and fostering competencies within the PS to adopt and manage IT applications.

5.3 Limitations
Depending solely on journal articles without considering alternative technical reports may result in the exclusion of specific scientific experiences. Some articles related to practical experiences in different countries were added to the reviewed articles and some technical reports were also used to explain certain factors in response to this limitation. Furthermore, similar to any SLR, certain significant papers might have been disregarded. To circumvent this issue, an assessment was conducted of the papers’ citations to ensure that, should a significant paper have been neglected, it could be appended to the roster of papers selected for a comprehensive examination.

Additionally, selecting and combining keywords from multiple databases can be a constraint. As a consequence, measures were taken to optimize the visibility of the papers through a preliminary search of the databases, removal of inaccurate keywords and addition of accurate ones.

5.4 Conclusion and research agenda
Global transformations have been rapid and pervasive as a consequence of the fourth industrial revolution, also known as the second revolution of IT. All levels of government invest and spend substantially in IT to accomplish their missions which is becoming more prevalent at the national and sectoral levels. Despite this, research indicates that NaSIT applications continue to experience a high failure rate. The efficacy and inefficacy of implementing this technology has been the subject of a multitude of studies. A number of these studies have established the significance of planning and implementation in this context. Therefore the question is, “what factors should be considered in NaSIT planning and implementation in the PS to succeed?”

The SLR demonstrates that numerous factors have been identified in previous research for the success and failure of IT applications and that numerous guidelines have been proposed at various levels. Some of these are necessary for successful IT planning and implementation. Many social, economic, managerial, organizational, cultural, political and technical factors and challenges face PS NaSIT planning and implementation (Batini et al., 2009).

The SLR yields factors that are relevant to numerous aspects of the formulation and implementation of NaSIT plans. Certain factors are associated with the process of planning and executing, whereas others have an environmental impact. A significant portion of these factors relate to organizational, social, economic and human factors. By addressing these factors, governments will be able to utilize IT to accomplish their missions and the failure rate of these plans will be diminished.

Additional research can be suggested based on the study’s findings. The factors found here, mostly deal with national and sectoral levels (e.g. Bianchi and Trimigno, 2021; Kummer et al., 2012; Pilealm et al., 2016; Tsokota et al., 2017; Yuliana and Hasibuan, 2022). What if IT is supposed to be applied among a couple of different countries (e.g. in EU) or in most or all countries (e.g. in UN)? Thus the same research can be conducted at higher levels, such as the
international or global levels to find related key important factors. Second, given the importance of context in the application of IT (e.g. Al-Mashari, 2007; Avgerou, 2001; Evans and Yen, 2005; Holley et al., 2002; Kozłowski et al., 2021; Palvia et al., 2002; Ramírez, 2001), the importance of the factors identified here can be prioritized in the context of various countries, allowing for more attention to higher priorities in planning and implementation. Third, different sectors have different statuses based on some of the discovered factors (Ayat et al., 2021; Johnson, 2013; Sony et al., 2021). As a result, identifying differences in the importance and priority of these factors in various sectors of a country can aid in better planning and implementation in each sector.

Two additional studies can be conducted based on Goldfinch’s (2007) summary of the criticisms of the factor approach. This approach has been chastised for failing to take a process-oriented approach to IT planning and implementation. According to this viewpoint, the importance of each factor varies across process steps (e.g. Kamal, 2006; Sun et al., 2023). As the fourth research agenda, it is possible to quantify the importance of various factors in the IT planning and implementation process and consider the most important factors at each stage. The second criticism is that the relationship between factors is not considered. As the fifth research topic, it is suggested that the relationship between these factors be investigated and designed within a framework or model adopted from pre-defined ones such as GovQual (Batini et al., 2009) or strategy change cycle (Bryson, 2016).

References


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