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Designing a Digital Transformation Maturity Model Based on Service-Oriented Architecture in the Social Security Organization: A Qualitative Thematic Analysis Study

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Abstract

Digital transformation has become one of the most important organizational strategies for enhancing efficiency, agility, and service delivery quality. Despite the development of numerous digital transformation maturity models, most existing models have focused primarily on technological and managerial dimensions, paying limited attention to the role of service-oriented architecture as a technical infrastructure and to the behavioral and cultural dimensions of large service organizations. Accordingly, the present study aimed to develop a digital transformation maturity model based on service-oriented architecture for the Social Security Organization. In terms of purpose, this was an applied study, and in terms of approach, it was qualitative and employed thematic analysis. The participants comprised 15 academic experts and managers familiar with digital transformation, service-oriented architecture, and the Social Security Organization. They were selected through purposive sampling, which continued until theoretical saturation was achieved. Data were collected through semi-structured interviews and analyzed using MAXQDA software and Braun and Clarke's six-phase framework. The findings resulted in the identification of 140 initial codes, 52 final codes, 16 organizing themes, and seven overarching themes, which collectively formed the framework of the digital transformation maturity model. The validity of the findings was also confirmed through expert review and the within-subject agreement index. The results indicated that achieving digital transformation maturity in the Social Security Organization requires the integration of the technical components of service-oriented architecture with managerial, cultural, and behavioral dimensions. This synergy can provide the foundation for improving organizational performance and ensuring the sustainability of digital transformation.

Keywords: *digital transformation, maturity model, service-oriented architecture (SOA), thematic analysis, Social Security Organization.*

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1. Introduction

Digital transformation has emerged as a central strategic imperative for contemporary organizations seeking to enhance operational efficiency, organizational agility, service quality, innovation capacity, and responsiveness to changing stakeholder expectations. Unlike earlier waves of information technology adoption, digital transformation is not limited to the acquisition or deployment of new technological tools; rather, it involves fundamental changes in organizational structures, processes, capabilities, governance mechanisms, business models, and patterns of value creation. In this sense, digital transformation represents a systemic reconfiguration of how organizations operate, make decisions, deliver services, interact with stakeholders, and sustain performance in increasingly dynamic environments. The growing importance of this phenomenon has encouraged organizations in both the private and public sectors to move beyond isolated automation initiatives and develop comprehensive transformation programs aligned with their strategic objectives [1-3].

Digital transformation is frequently misunderstood as a predominantly technological initiative. However, evidence indicates that organizational strategy, leadership, culture, employee capabilities, and governance are often more decisive than technology itself in determining transformation success. Technologies can create opportunities for process integration, data-driven decision-making, service innovation, and organizational flexibility, but these opportunities can only be realized when they are supported by an appropriate strategic vision, coherent governance, managerial commitment, and a culture receptive to change. Organizations that focus exclusively on infrastructure acquisition may digitize existing inefficiencies rather than transform them. Consequently, successful digital transformation requires the alignment of technological investments with organizational redesign, process reengineering, workforce development, and strategic leadership [2, 4, 5].

The multidimensional nature of digital transformation has also changed the way organizational performance and readiness are assessed. Traditional measures of information technology capability are insufficient for determining whether an organization has developed the competencies required to sustain transformation. Digital transformation maturity therefore refers to the degree to which an organization has systematically developed and institutionalized the technological, strategic, operational, managerial, cultural, and human capabilities needed to achieve digital objectives. A digitally mature organization is not merely one that possesses advanced information systems; it is an organization capable of integrating technology into its strategy, processes, governance arrangements, workforce practices, and stakeholder relationships. Digital maturity thus reflects a progressive developmental condition in which digital capabilities become coordinated, repeatable, measurable, and embedded in organizational routines [6-8].

Maturity models provide a structured means of assessing this developmental condition. Such models typically divide organizational progress into a sequence of stages, ranging from fragmented or initial digital activities to integrated, optimized, and adaptive transformation. They enable organizations to diagnose their current state, identify capability gaps, establish priorities, allocate resources, and design realistic transformation roadmaps. In addition, maturity models can provide a common language for managers, technical experts, and policymakers, thereby facilitating coordination across organizational units. Their practical value lies not only in measurement but also in their ability to guide gradual and cumulative improvement. This is particularly important because digital transformation rarely occurs as a single event; it is an ongoing organizational journey involving successive cycles of experimentation, learning, standardization, integration, and renewal [9-11].

Existing maturity models have made important contributions to the assessment of digital readiness and transformation capability. Some models have been developed for manufacturing enterprises and Industry 4.0 environments, emphasizing technological readiness, vertical and horizontal integration, smart operations, digital products, and data-based production systems [7, 9]. Other models have examined sector-specific settings, such as food production, banking, municipalities, automotive industries, and innovation ecosystems, demonstrating that the meaning and requirements of maturity vary considerably across institutional and industrial contexts [10-14]. These studies indicate that a maturity model should not be regarded as universally transferable without adaptation, because organizations differ in their mandates, stakeholder structures, regulatory constraints, technological legacies, service processes, and cultural conditions.

The need for contextualization is especially significant in large public and social service organizations. Such organizations usually operate under complex legal and administrative frameworks, manage extensive and heterogeneous data, provide services to diverse populations, and maintain numerous interconnected but historically developed information systems. Their transformation processes are often constrained by legacy technologies, fragmented databases, bureaucratic procedures, departmental boundaries, rigid regulations, and resistance to change. Moreover, the consequences of digital failure in these organizations may extend beyond financial losses and affect citizens' access to essential services, administrative justice, public trust, and institutional legitimacy. Therefore, digital maturity in public service organizations must encompass not only technological advancement but also accessibility, accountability, transparency, continuity of service, regulatory compliance, and equitable stakeholder experience.

The Social Security Organization represents a particularly important context for examining these issues. As a large service-oriented institution, it must process substantial volumes of information, coordinate activities across multiple organizational units, and provide continuous

services to a broad range of beneficiaries, insured individuals, employers, pensioners, healthcare providers, and other stakeholders. In such an environment, isolated information systems and fragmented processes can create duplication, inconsistent data, delayed decision-making, limited transparency, and inefficient service delivery. Digital transformation can potentially address these challenges by enabling integrated services, data-based management, remote service provision, improved traceability, and more responsive stakeholder interactions. Nevertheless, these outcomes depend on the organization's ability to establish a coherent technical and organizational architecture rather than merely introduce separate digital applications.

One of the central technical foundations for achieving such coherence is service-oriented architecture. Service-oriented architecture is an architectural paradigm in which organizational functions and information system capabilities are designed as modular, reusable, interoperable, and loosely coupled services. These services can be accessed and combined across different systems and organizational processes through standardized interfaces. The principal value of this architecture lies in its ability to reduce rigid dependencies among applications, facilitate integration, promote reuse, and support the flexible composition of business processes. In complex organizations with multiple legacy systems, service-oriented architecture can create an intermediate layer through which heterogeneous applications exchange information and provide coordinated functionality without requiring the immediate replacement of all existing systems [15, 16].

The principles of service design are particularly relevant to digital transformation maturity. Standardized service contracts, loose coupling, abstraction, reusability, autonomy, statelessness, discoverability, and composability can enhance the adaptability and sustainability of organizational information systems. When these principles are effectively implemented, changes in one part of the system are less likely to disrupt the entire technological environment, and new digital services can be developed by recombining existing capabilities. This architectural flexibility supports gradual transformation, reduces duplication, lowers integration costs, and enables organizations to respond more quickly to emerging requirements. However, service-oriented architecture should not be considered only a technical configuration. Its successful implementation also requires governance structures, ownership responsibilities, common standards, service management practices, shared data definitions, and coordination between business and information technology units [15, 16].

Recent research on convergent service architectures further demonstrates that system integration capabilities are dynamic organizational competencies rather than static technical properties. Organizations must continuously coordinate knowledge across technical, operational, and managerial boundaries in order to integrate systems and develop new services. This process involves organizational learning, cross-functional collaboration, shared understanding, and the ability to recombine technological and organizational resources. Accordingly, service-oriented architecture can contribute to digital transformation only when the organization has sufficient capabilities to govern, maintain, adapt, and strategically exploit the architecture over time [17].

The relationship between digital transformation and architecture has also been emphasized in the concept of designing organizations for sustained digital success. From this perspective, organizational architecture should provide stable core capabilities while simultaneously enabling rapid innovation. A well-designed digital foundation integrates data, processes, platforms, and services so that organizational units can develop new solutions without recreating basic capabilities or generating further technological fragmentation. This balance between standardization and flexibility is critical for large organizations because excessive decentralization creates siloed systems, whereas excessive centralization may restrict responsiveness and experimentation. Service-oriented architecture can help establish this balance by standardizing interfaces and core services while preserving the ability to configure diverse stakeholder-facing applications [18].

Despite these potential advantages, the literature on digital transformation maturity has often treated technological architecture as one dimension among many rather than examining its structural role in enabling maturity. A considerable number of maturity models emphasize strategy, customer experience, operations, technology, organizational culture, leadership, and workforce skills, but they provide limited detail on how heterogeneous systems should be integrated or how architectural capabilities develop across maturity stages. Conversely, technical studies of service-oriented architecture frequently focus on design principles, interoperability, service composition, and implementation technologies without adequately addressing behavioral maturity, managerial commitment,

organizational culture, and institutional adaptation. This separation creates a theoretical and practical gap because digital transformation maturity is unlikely to be achieved when technical architecture and organizational development are treated independently.

Research conducted in Iranian organizational contexts similarly indicates the need for comprehensive and contextualized models. Existing studies have identified dimensions such as strategy, digital infrastructure, leadership, human resources, organizational culture, process transformation, customer orientation, innovation, and governance as central components of maturity [6, 8, 11]. Studies focused on technology transfer and the Fourth Industrial Revolution have also highlighted the importance of technological capability, knowledge absorption, environmental readiness, and the alignment of emerging technologies with organizational structures and industry requirements [13, 19]. These findings demonstrate that digital transformation is contingent on a broad organizational ecosystem and cannot be explained through a single technological or managerial variable.

The soft components of digital transformation deserve particular attention. Leadership behavior, employee attitudes, organizational trust, learning capacity, willingness to collaborate, change acceptance, and shared digital vision can either facilitate or obstruct transformation. Even when advanced systems are available, employees may continue using informal, manual, or parallel processes if they do not trust the data, understand the new systems, or perceive managerial commitment. Managers may also resist transparency or avoid high-risk transformation decisions when accountability mechanisms are unclear. Soft components therefore influence whether digital practices become institutionalized and whether technological capabilities are translated into actual organizational performance [4, 5].

The importance of these components becomes greater in public organizations characterized by formal hierarchies and long-established administrative routines. In such settings, digital transformation may challenge existing distributions of authority, access to information, job roles, and discretionary decision-making. Resistance may arise not only from inadequate skills but also from concerns regarding transparency, role displacement, loss of control, or increased accountability. Therefore, a maturity model intended for a public service organization must evaluate both visible technological capabilities and less visible behavioral-organizational conditions. It should examine whether managers model digital practices, whether employees possess and apply digital skills, whether learning is continuous, whether data are trusted, and whether transformation remains stable despite managerial turnover.

Governance constitutes another essential element of maturity. Digital governance establishes decision rights, accountability arrangements, standards, priorities, resource allocation mechanisms, and performance monitoring procedures for digital initiatives. Without effective governance, separate units may develop incompatible systems, maintain inconsistent data, duplicate services, or prioritize local interests over organization-wide objectives. Data governance is especially important because data-driven decision-making depends on data quality, common definitions, accessibility, traceability, and clearly assigned responsibilities. In a mature organization, data and digital services are managed as shared strategic assets rather than as the property of individual departments.

Transparency and rule-based administration are closely related to digital governance. Integrated digital systems can make processes more traceable, reduce arbitrary decisions, and provide managers with timely performance information. They can also embed legal and procedural requirements directly into service workflows, thereby improving consistency and administrative integrity. However, transparency may generate resistance where informal practices or discretionary authority are institutionally entrenched. A maturity model must therefore consider transparency not merely as an output of technology but as an organizational and behavioral achievement that depends on governance, leadership, trust, and cultural acceptance.

Sector-specific studies reinforce the importance of developing models that correspond to organizational realities. The review of maturity models in the banking sector, for example, has shown that general frameworks may not adequately capture sectoral concerns such as regulatory compliance, security, integrated service delivery, and customer trust [10]. Research on small municipalities has similarly emphasized smart citizen services, limited organizational resources, local conditions, and the need for implementable maturity pathways [12]. In industrial settings, maturity models have focused on production integration, technology readiness, and intelligent operations [7, 9]. These variations demonstrate that maturity models should reflect the service logic, institutional responsibilities, and operational constraints of the organization for which they are designed.

Innovation ecosystem research also suggests that digital maturity influences an organization's ability to interact with external actors, share knowledge, and support innovation. Organizations with more mature digital capabilities are better positioned to connect internal systems with external partners, coordinate information flows, and develop collaborative services. In Iran, the relationship between digital transformation maturity and innovation ecosystem performance has been proposed as an important area for organizational development, emphasizing the interaction between internal capabilities and broader institutional networks [14]. For the Social Security Organization, this perspective is relevant because service delivery may require interaction with employers, healthcare organizations, financial institutions, governmental agencies, and citizens through interoperable digital channels.

Digital transformation also has significant implications for management and economics. It can reduce transaction costs, improve resource allocation, enhance monitoring, facilitate evidence-based management, and create new forms of service delivery. At the same time, it requires substantial investment, new competencies, institutional coordination, and careful management of technological and organizational risk [3]. A maturity framework can support these decisions by clarifying the organization's current capabilities and identifying the sequence in which investments and reforms should occur. This staged approach is particularly useful for large organizations in which abrupt system replacement may create operational instability or service disruption.

The literature therefore points to several interrelated requirements for a robust maturity model: it must conceptualize digital transformation as a multidimensional and systemic phenomenon; incorporate process reengineering and data-driven management; explain the enabling role of integrated and service-oriented architecture; include governance, transparency, and accountability; account for cultural, behavioral, and leadership factors; and provide staged, localized, and operationally feasible pathways. Although prior studies have addressed many of these dimensions separately, there remains a need for an integrated framework that explicitly connects service-oriented architectural capabilities with organizational and behavioral maturity in a large public service institution.

This gap is especially important because architecture determines whether digital initiatives can be integrated and scaled, while managerial and behavioral capabilities determine whether those initiatives are accepted, governed, and sustained. An organization may possess a technically advanced architecture but fail to achieve maturity due to weak leadership, limited employee skills, fragmented governance, or resistance to transparency. Conversely, a supportive culture and committed leadership cannot overcome persistent system fragmentation, limited interoperability, poor data quality, and rigid technological dependencies. Digital transformation maturity must therefore be understood as the outcome of alignment and synergy among technical architecture, process transformation, governance, organizational learning, and behavioral adaptation.

Accordingly, the aim of this study was to design a digital transformation maturity model based on service-oriented architecture for the Social Security Organization through a qualitative thematic analysis of expert perspectives.

2. Methodology

In terms of purpose, the present study was applied, and in terms of approach, it was qualitative and interpretive. Given the exploratory nature of the study and the need to identify the dimensions, components, and indicators affecting digital transformation maturity based on service-oriented architecture in the Social Security Organization, a qualitative approach was considered the most appropriate method for obtaining an in-depth understanding of experts' experiences, perspectives, and perceptions. Accordingly, thematic analysis was selected as a recognized qualitative data analysis method because it enables the identification, organization, and interpretation of patterns of meaning within data (Braun & Clarke, 2019). The study population comprised academic experts, senior information technology managers, human resource management specialists, and experienced professionals from the Social Security Organization who had at least 10 years of specialized or managerial experience in relevant fields. Participant selection began through purposive sampling to identify individuals with specialized knowledge and lived experience of transformation projects. Data collection continued until theoretical saturation was achieved. The principal themes and codes were identified by the twelfth interview, and three additional interviews, up to the fifteenth interview, were conducted to ensure that theoretical saturation had been fully achieved. At this stage, the conceptual patterns and extracted themes reached stability. The data collection instrument consisted of semi-structured interviews containing principal questions concerning the dimensions of digital transformation, the challenges associated with siloed

systems, and the role of service-oriented architecture in achieving digital transformation. Each interview lasted approximately 30 to 40 minutes. To protect participants' confidentiality and privacy, the objectives of the study were explained to them before the interviews, and their informed consent was obtained for participation and audio recording. Participants' identities remained confidential, and identification codes ranging from Expert 1 to Expert 15 were used during the analysis.

To enhance the trustworthiness of the findings, established criteria for qualitative research were considered. To assess the credibility of the findings, the transcribed interview texts and preliminary analysis results were sent to six participants, who were asked to comment on the accuracy of the researcher's interpretations and understandings. Necessary revisions were subsequently made based on their feedback. To enhance dependability, all stages of the research process, analytical decisions, and procedures used to extract the themes were systematically documented and reported, thereby creating an audit trail that enabled the research process to be followed and reviewed. To ensure confirmability, the findings were compared with the existing literature and interpreted on the basis of established theoretical foundations. In addition, the findings were presented to several specialist university professors, and their recommendations were incorporated into the final revision of the model. Coding reliability was assessed using the inter-coder agreement method. A doctoral student in statistics was invited to serve as the second coder and received the necessary training on the principles and procedures of qualitative data coding before the coding process began. A portion of the interviews was then independently analyzed by the two coders, and the level of agreement between their coding results was used to assess the reliability of the analytical process.

3. Findings and Results

This section presents the findings derived from the qualitative analysis of the interviews. The purpose of this stage was to identify and extract the dimensions, components, and indicators associated with digital transformation, service-oriented architecture, and digital maturity in the Social Security Organization. These findings, which constitute the theoretical and empirical foundation of the proposed model, were extracted through an inductive thematic analysis process using MAXQDA 2022.

A total of 15 experts participated in the qualitative phase of the study. Participants were selected based on their expertise, executive experience, and familiarity with digital transformation and service-oriented architecture. The frequency distribution of the experts is presented in Table 1.

Table 1. Characteristics of the Experts Participating in the Qualitative Phase

Variable	Category	Frequency
Gender	Male	11
	Female	4
Education	Master's degree	10
	Doctoral degree	5
Length of service	10–15 years	4
	16–20 years	6
	More than 20 years	5

An examination of the experts' demographic characteristics indicated that the participants possessed adequate knowledge and experience in the areas of digital transformation and organizational management in terms of both educational attainment and length of service.

To analyze the interview data, the complete interview transcripts were transcribed, reviewed, and analyzed using MAXQDA 2022 in accordance with Braun and Clarke's six-phase framework (Braun & Clarke, 2019). During this process, the interview transcripts were read and reviewed several times to develop an in-depth understanding of the concepts and patterns embedded in the data. As a result of this stage, 140 initial codes were extracted from the raw data. These codes reflected the experts' views and perceptions concerning digital transformation, service-oriented architecture requirements, structural and cultural challenges, and factors affecting digital transformation maturity in the Social Security Organization.

Subsequently, the extracted codes were refined through constant comparison, review, and the integration of overlapping concepts, reducing their number to 52 final codes. The refined codes constituted the principal units of analysis and served as the basis for extracting the organizing and overarching themes of the study. Some of the most

important extracted codes included “digital transformation beyond technology,” “systems integration,” “data-driven decision-making,” “systemic transparency,” “managerial commitment,” “employee resistance,” and “maturity staging.” In the next stage, the refined codes were categorized according to conceptual similarity and semantic relationships, thereby forming the preliminary conceptual structure of the study. This process provided the necessary foundation for extracting the organizing themes and ultimately developing the conceptual model of digital transformation maturity based on service-oriented architecture in the Social Security Organization. Table 2 presents examples of the initial codes extracted from the interviews.

Table 2. Examples of Initial Codes Extracted From the Interviews

No.	Initial Basic Theme	Raw Initial Codes—Examples From the Data	Number of Interview Excerpts	Relevant Interviews / Number of References
1	Digital transformation beyond technology	Digitalization is not merely IT; changing organizational mindsets is more important than software; technology is ineffective without a change in mindset	9	1, 2, 3, 5, 9, 12
2	Systemic change	Simultaneous change in structures and processes; transformation must involve the entire organization	8	2, 4, 6, 10, 12
3	Reengineering	Some flawed processes have merely been automated; digital bureaucracy has been created	10	1, 3, 4, 6, 10
4	Service orientation	Focusing on stakeholder convenience; simplifying the service pathway; expanding remote and online services	7	2, 5, 7, 10
5	Data-driven decision-making	Decisions without data are subjective; reporting is often merely ceremonial	8	1, 3, 5, 9
6	Data integration	Data are siloed; there is no reliable single source for obtaining statistics	6	2, 4, 8
7	Systems integration	Systems do not communicate with one another; each unit has its own system	9	1, 2, 6, 7, 11
8	Interoperability	Data exchange among units is difficult; no common standards exist	7	3, 6, 8, 11
9	Service orientation	Service enablement facilitates reuse and reduces duplicated work	6	2, 7, 12
10	Incremental change	The system cannot be replaced all at once; change must be implemented in stages	6	3, 7, 8, 12
11	Risk reduction	Fear of system disruption; limited pilot testing before organization-wide implementation	5	6, 8, 12
12	Transparency	Transparency threatens the interests of some individuals; resistance to transparency	8	4, 5, 8, 12
13	Rule-based operation	Rules must be embedded in the system; discretionary practices must be eliminated	6	4, 9, 14
14	Decision traceability	Decisions cannot be effectively tracked	5	5, 9, 14
15	Sustainability	The system must not depend on individuals; it should not cease functioning when a manager or specialist leaves	9	6, 9, 10, 13
16	Standardization	Absence of standardized procedures; each unit follows its own method	7	3, 6, 10
17	Organizational learning	Digital training is intermittent; learning has not been institutionalized	6	5, 7, 12
18	Trust in the system	Employees do not trust the data and perform parallel work	7	7, 8, 15
19	Managerial commitment	Managers merely make statements; practical support is limited	8	1, 5, 6, 15
20	Managerial role modeling	Managers themselves do not use the system	6	3, 9, 15
21	Management stability	Frequent managerial turnover; projects are discontinued or left incomplete	6	6, 10, 13
22	Employee resistance	Fear of transparency; fear of job-position elimination	7	4, 7, 8, 11
23	Risk aversion	Managers fear failure and make conservative decisions	6	3, 6, 11
24	Silo mentality	Each unit protects its own territory; conflicts of interest exist	6	4, 8, 14
25	Model simplicity	Complex models cannot be implemented effectively	5	2, 6, 12
26	Maturity staging	Maturity must be achieved gradually; maturity levels are required	6	6, 12, 13

In the next stage, the raw initial codes were reviewed, continuously compared, and refined. The purpose of this stage was to eliminate duplicate codes, integrate overlapping concepts, and increase the level of abstraction without losing the original meaning of the data. Through the continuous comparison of codes across the different interviews, an

attempt was made to identify common and stable concepts. Following the extraction of the initial codes, the raw codes were reviewed, constantly compared, and refined to enhance the conceptual coherence of the data. The objective of this part of the analysis was to eliminate repetitive codes, integrate conceptually overlapping codes, and increase their level of abstraction without compromising the original meaning of the data. Accordingly, the codes were continuously compared across interviews to identify common and stable concepts. Compared with the initial codes, the refined codes possessed a higher level of abstraction and served as a conceptual link between the empirical data and the study's conceptual themes. Table 3 presents the complete list of refined codes.

Table 3. List of Refined Codes

No.	Refined Code
1	Digital transformation beyond technology
2	Change in organizational mindset
3	Systemic transformation
4	Business process reengineering
5	Elimination of digital bureaucracy
6	Service orientation
7	Data-driven decision-making
8	Data integration
9	Data quality
10	Systems integration
11	Interoperability
12	Service orientation
13	Organizational agility
14	Incremental change
15	Transformation risk reduction
16	Systemic transparency
17	Digital rule-based operation
18	Decision traceability
19	Digital sustainability
20	Independence from individuals
21	Process standardization
22	Organizational learning
23	Trust in the system
24	Digital skills
25	Managerial commitment
26	Managerial role modeling
27	Management stability
28	Accountability
29	Employee resistance
30	Managerial risk aversion
31	Silo mentality
32	Conflicts of interest
33	Digital governance
34	Reduction of discretionary decision-making
35	Digital equity
36	Stakeholder experience
37	Digital service quality
38	Accessibility
39	Institutionalization of transformation
40	Continuous monitoring
41	Decision-making autonomy
42	Performance transparency
43	Model simplicity
44	Model usability
45	Maturity staging
46	Model localization

47	Service sustainability
48	Managerial accountability
49	Administrative integrity
50	Organizational trust
51	Learning from errors
52	Behavioral-organizational maturity

Following the refinement of the initial codes, axial coding was conducted to identify the conceptual relationships among the codes and organize them into organizing themes. At this stage of the analysis, the refined codes were categorized according to conceptual overlap, semantic proximity, and their role in explaining the various dimensions of the phenomenon under investigation. This analysis resulted in the identification of 16 organizing themes. Each organizing theme comprises a set of refined codes referring to one of the principal dimensions of digital transformation, service-oriented architecture, or digital transformation maturity. These subthemes represent an intermediate level of abstraction and play an important role in moving the analysis from dispersed concepts toward coherent conceptual structures. Table 4 presents the extracted organizing subthemes and the codes associated with each theme.

Table 4. Extracted Organizing Subthemes

No.	Organizing Subtheme	Extracted Basic Themes/Codes
1	Nature of digital transformation	1, 2, 3
2	Process transformation	4, 5
3	Service orientation	6, 7
4	Managerial data orientation	8, 9
5	Organizational integration	10, 11
6	Service orientation	6, 12
7	Agility and incremental change	13, 14, 15
8	Transparency and governance	16, 17, 18
9	Digital sustainability	19, 20
10	Standardization	10, 21
11	Organizational learning	22, 51
12	Digital trust and skills	23, 24, 25
13	Transformation leadership	25, 26, 27
14	Accountability and equity	28, 35, 49
15	Behavioral-structural barriers	29, 30, 31, 32
16	Model usability	43, 44, 45, 46

In the final stage of the qualitative data analysis, after the organizing themes had been identified, selective coding was conducted to identify the conceptual cores and integrate the study findings. At this stage, the organizing themes were reviewed and integrated at a higher level of abstraction based on their conceptual correlations, their roles in explaining the phenomenon under investigation, and their positions along the digital transformation pathway. This analysis resulted in the identification of seven overarching themes that formed the final conceptual framework of the digital transformation maturity model based on service-oriented architecture in the Social Security Organization. The first theme, “multidimensional and systemic digital transformation,” indicates that digital transformation is not merely a technological change but a comprehensive process that transforms organizational mindsets and managerial practices. The second theme, “process transformation and data orientation,” emphasizes the importance of business process reengineering, data-driven decision-making, and the use of integrated information to guide the organization toward digital maturity. The third theme, “service-oriented architecture foundation,” explains the role of service-oriented architecture as an infrastructure for systems integration, enhanced interoperability, the development of service orientation, and improved organizational agility.

The fourth theme, “digital governance and transparency,” encompasses components such as systemic transparency, rule-based operation, accountability, and digital equity, indicating that sustainable digital transformation cannot be achieved without establishing appropriate governance mechanisms. The fifth theme, “digital organizational maturity,” emphasizes the sustainability of digital

infrastructures, process standardization, and the institutionalization of digital capabilities within the organization. The sixth theme, "behavioral-organizational maturity," highlights the importance of factors such as organizational learning, trust in the system, digital skills development, transformational leadership, and managerial commitment to the success of digital transformation. Finally, "transformation staging and organizational adaptation" was identified as the seventh overarching theme. This theme emphasizes the need for gradual and staged progression along the digital transformation pathway, consideration of the organization's contextual conditions, management of behavioral and structural barriers, and the design of a practical model aligned with the characteristics of the Social Security Organization. Table 5 presents the overarching themes and the associated organizing themes.

Table 5. Overarching Themes and Associated Organizing Themes

No.	Overarching Theme	Associated Organizing Themes
1	Multidimensional and systemic digital transformation	1, 2, 3, 4
2	Process transformation and data orientation	2, 4
3	Service-oriented architecture foundation	5, 6, 7
4	Digital governance and transparency	8, 14
5	Digital organizational maturity	9, 10
6	Behavioral-organizational maturity	11, 12, 13
7	Transformation staging and organizational adaptation	15, 16

The conceptual model of the study was developed on the basis of the extracted overarching themes. Analysis of the relationships among the overarching themes indicated that, in terms of their nature and function, they could be organized into three principal components of the conceptual model. The first component is "digital transformation," which functions as the principal driver and catalyst of transformation and represents the contextual and initiating factors of digital transformation within the organization. This component includes the two themes of "multidimensional and systemic digital transformation" and "process transformation and data orientation," which emphasize the necessity of fundamental changes in organizational structures, processes, and decision-making practices. The second component is "service-oriented architecture," which functions as the operational mechanism of the model and plays an infrastructural and executive role in realizing digital transformation. By integrating systems, enhancing interoperability, and improving organizational agility, this component provides the necessary foundation for achieving digital transformation objectives. The third component is "digital transformation maturity," which is regarded as the outcome and final maturity state and encompasses various dimensions, including digital maturity, digital governance, and behavioral-organizational maturity. This component indicates that sustainable digital transformation requires not only the development of technological infrastructures but also the institutionalization of a digital culture, transparency, accountability, organizational learning, and behavioral and managerial competencies. The principal model components, their roles in the transformation process, and their associated organizing themes are presented in Table 6.

Table 6. Analytical Levels of the Themes According to Their Conceptual Nature and Roles in the Model

No.	Principal Model Component	Role in the Model	Principal Organizing Themes
1	Digital transformation	Transformation drivers and catalysts	Multidimensional digital transformation; process transformation and data orientation
2	Service-oriented architecture	Operational mechanism	Service-oriented architecture foundation; integration; agility
3	Digital transformation maturity	Outcomes and final maturity state	Digital maturity; digital governance; behavioral maturity

As indicated in Table 6, the conceptual model of the study demonstrates that digital transformation maturity in the Social Security Organization results from the interaction among transformation drivers, operational mechanisms based on service-oriented architecture, and behavioral and organizational outcomes. This model can be used as a localized and practical framework for evaluating, planning, and directing the digital transformation pathway in the Social Security Organization and other public service organizations.

Figure 1 presents the thematic tree of the study and illustrates how the conceptual model emerged from the qualitative data. In this structure, the basic themes were derived from the initial coding of the interviews and were subsequently grouped into organizing themes following their aggregation and review. At the final stage, the organizing themes were organized into three principal components—"digital transformation," "service-oriented architecture," and "digital transformation maturity"—based on their conceptual and functional commonalities. This hierarchical structure indicates that the final model was directly derived from field data and expert experiences and that the relationships among its components were established through the systematic analysis of themes.

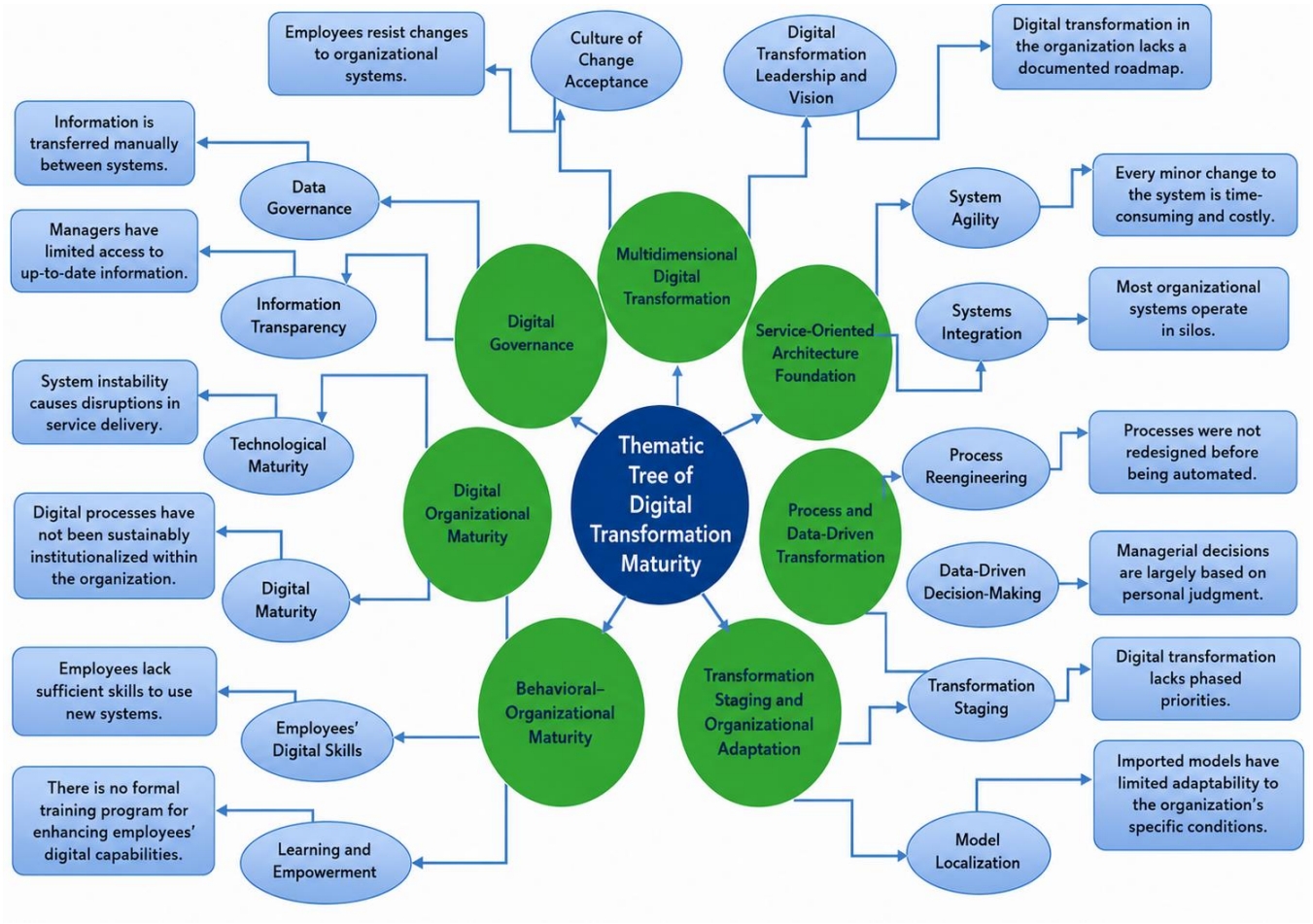

Figure 1. Thematic Tree

A set of established qualitative research strategies was used to assess the credibility and trustworthiness of the study findings. To enhance credibility, member checking was conducted by presenting the extracted themes and interpretations to several experts. Necessary revisions were made after receiving their feedback. To reduce bias and strengthen the robustness of the findings, triangulation was also employed through diversity in participant selection, comparison of the data across different levels of analysis, and the alignment of the findings with the theoretical foundations and previous research. In addition, cases that differed from the principal patterns were examined separately to increase the robustness of the interpretations. To assess the dependability of the study, all stages of data collection, coding, and analysis were fully documented. Furthermore, to evaluate the reliability of the coding process, a portion of the data was coded by an independent researcher, and the results were compared with the primary researcher's coding. The resulting agreement rate was 75%, indicating an acceptable level of stability and dependability in the coding and theme-extraction processes.

4. Discussion and Conclusion

The present study developed a digital transformation maturity model based on service-oriented architecture for the Social Security Organization. The qualitative analysis yielded 140 initial codes, 52 refined codes, 16 organizing

themes, and seven overarching themes. These overarching themes comprised multidimensional and systemic digital transformation, process transformation and data orientation, a service-oriented architecture foundation, digital governance and transparency, digital organizational maturity, behavioral-organizational maturity, and transformation staging and organizational adaptation. The relationships among these themes were subsequently organized into three principal components: digital transformation as the driver of change, service-oriented architecture as the operational mechanism, and digital transformation maturity as the resulting organizational state. Overall, the findings demonstrate that digital maturity in a large public service organization cannot be achieved through technological investment alone; rather, it emerges from the alignment of technological architecture, redesigned processes, governance mechanisms, managerial leadership, employee capabilities, organizational learning, and context-sensitive implementation.

The first major finding concerned the multidimensional and systemic nature of digital transformation. Participants consistently emphasized that digital transformation extends beyond information technology and requires changes in organizational mindsets, management practices, structures, and routines. This finding confirms that digital transformation should not be reduced to system installation, automation, or the introduction of digital channels. Vial conceptualized digital transformation as a process through which digital technologies generate disruptions that lead organizations to alter their value-creation paths, structures, and organizational responses [1]. Similarly, Westerman and colleagues argued that digital leadership depends on combining digital capabilities with strong transformational management capabilities [2]. The present findings are also consistent with the proposition that strategy, rather than technology alone, drives meaningful transformation [4]. In the Social Security Organization, this multidimensional perspective is especially important because technological modernization without changes in attitudes, accountability, and coordination may merely reproduce existing administrative inefficiencies in digital form.

The identification of culture of change acceptance and digital transformation leadership and vision as core dimensions further clarifies the organizational foundations of transformation. Participants noted that employee resistance, weak practical commitment among managers, and the absence of a documented roadmap could obstruct digital progress. These findings indicate that transformation requires visible leadership behavior, strategic continuity, and the creation of a shared understanding of why change is necessary. The emphasis on soft and behavioral components aligns with the conceptual model developed by Modarresi and colleagues, who identified organizational culture, leadership, human factors, and managerial support as central soft components of digital transformation [5]. The results also correspond with Kane and colleagues' argument that digitally mature organizations are distinguished by clear strategy, risk tolerance, collaborative culture, and leadership rather than by technology ownership alone [4]. Accordingly, resistance in the Social Security Organization should be interpreted not simply as unwillingness to use new tools but as a response to perceived threats involving transparency, altered roles, reduced discretionary authority, and uncertainty about the direction of change.

The second overarching theme was process transformation and data orientation. The findings showed that some organizational processes had been automated without prior redesign, thereby creating what participants described as digital bureaucracy. This result underscores the distinction between digitizing existing procedures and fundamentally transforming them. Automating a poorly designed process may accelerate inefficiency rather than eliminate it. The finding is consistent with Vial's view that digital transformation requires changes in organizational processes and value-creation arrangements rather than the superficial application of digital technologies [1]. It also supports Ross and colleagues' argument that organizations designed for digital success must establish coherent operational backbones and reusable digital platforms rather than accumulate disconnected applications [18]. In the present model, business process reengineering therefore functions as a prerequisite for meaningful digital transformation because it enables the organization to simplify service pathways, remove redundant procedures, and align workflows with integrated digital capabilities.

Data-driven decision-making, data integration, and data quality were also identified as essential components of process transformation. Participants reported that fragmented data sources, manual information transfer, limited managerial access to current information, and distrust in organizational data reduced the quality of decisions. These results indicate that digital maturity depends not merely on data availability but on the existence of integrated, reliable, timely, and governable data. The findings align with digital maturity frameworks developed in Iranian organizations, in which information management,

data integration, and analytical capability have been identified as major dimensions of transformation [6, 8]. They are also compatible with research concerning technology transfer and digital transformation, which emphasizes knowledge integration, information infrastructure, and absorptive capabilities as conditions for the effective use of technology [19]. For the Social Security Organization, data-driven management is particularly significant because service planning, resource allocation, eligibility determination, performance monitoring, and stakeholder support all depend on accurate and integrated information.

The third major finding concerned the service-oriented architecture foundation. Systems integration, interoperability, service orientation, organizational agility, incremental change, and transformation risk reduction were identified as key elements of this theme. Participants described an environment in which organizational systems often operated in silos and were unable to communicate effectively. This fragmentation increased manual work, duplicated data, delayed services, and made system changes costly and time-consuming. The findings support the basic principles of service-oriented architecture, according to which organizational capabilities should be provided through standardized, reusable, autonomous, loosely coupled, and composable services [16]. They are also consistent with Papazoglou and Van Den Heuvel's description of service-oriented architecture as an approach for integrating heterogeneous applications and enabling flexible service composition through standardized interfaces [15].

The role of service-oriented architecture in the proposed model extends beyond technical integration. It acts as the operational bridge through which strategic transformation objectives can be translated into scalable and reusable digital services. This interpretation is supported by Kim and Miles, who showed that the integration of convergent service architectures depends on dynamic system integration capabilities and the ability to coordinate knowledge across organizational boundaries [17]. The present findings similarly indicate that interoperability is not produced by technology alone; it requires common standards, coordinated governance, shared ownership, and organizational collaboration. Moreover, the emphasis on gradual implementation and limited pilot testing reflects the need to reduce operational risk in large service organizations. Since abrupt replacement of core systems could disrupt essential services, service-oriented architecture provides a means of gradually modernizing the technological environment while preserving continuity.

The fourth overarching theme, digital governance and transparency, included systemic transparency, digital rule-based operation, decision traceability, accountability, digital equity, and administrative integrity. This finding shows that digital transformation maturity is inseparable from governance arrangements. Participants believed that systems should embed rules, reduce discretionary decision-making, and make actions traceable. These observations are consistent with broader digital transformation models in which governance, strategic alignment, and performance monitoring constitute central maturity dimensions [7, 8]. The result also supports Ross and colleagues' view that a sustainable digital organization requires clear decision rights and an architecture that standardizes critical processes and data [18]. In the Social Security Organization, digital governance can improve consistency across branches and units, reduce dependence on individual judgments, and strengthen accountability in service delivery.

At the same time, participants indicated that transparency may threaten established interests and generate resistance. This suggests that transparency is not only a technical output but also a political and behavioral dimension of transformation. Systems capable of recording decisions and revealing performance differences may alter existing power relationships. Consequently, governance mechanisms must be accompanied by managerial commitment, clear accountability, and an organizational culture that supports evidence-based evaluation. Digital equity was also included in this theme, indicating that transformation must improve rather than restrict access to services. This finding is especially relevant to a social security institution whose stakeholders differ in age, digital literacy, geographical access, and socioeconomic circumstances. The model therefore treats accessibility and fairness as indicators of maturity rather than as secondary outcomes.

The fifth theme was digital organizational maturity, encompassing technological maturity, process standardization, digital sustainability, independence from individuals, and the institutionalization of transformation. Participants emphasized that organizational systems should remain stable despite managerial turnover or the departure of individual specialists. This finding highlights the importance of converting personal expertise and temporary projects into documented, standardized, and organizationally embedded capabilities. It is consistent with the general logic of maturity models, which describe

movement from ad hoc and person-dependent practices toward standardized, managed, measurable, and continuously improved systems [7, 9]. Iranian maturity studies have similarly identified institutionalization, process integration, infrastructure, and continuous improvement as indicators of advanced digital maturity [6, 11].

The emphasis on service continuity and technological stability is particularly important in the Social Security Organization because system failure may interrupt essential administrative, insurance, pension, or healthcare-related services. Digital maturity therefore requires resilient infrastructure, standard operating procedures, monitoring, redundancy, and knowledge documentation. The present findings support the argument that maturity models must be adapted to the operational risks and service obligations of specific sectors. Safajo and colleagues reached a similar conclusion in their review of digital transformation maturity models for the banking sector, noting that general models may not adequately address sector-specific requirements [10]. Likewise, research on small municipalities has emphasized the need to design maturity models around local service conditions and practical implementation constraints [12]. The present study extends this sectoral approach to a large social security institution.

The sixth overarching theme was behavioral-organizational maturity. Organizational learning, digital skills, trust in systems, managerial role modeling, leadership commitment, management stability, and learning from errors were identified as essential components. This result demonstrates that digital maturity has a distinctly human dimension. Employees may possess access to new systems while continuing to rely on parallel manual procedures if they lack confidence in data quality or do not receive sufficient training. Similarly, managerial support is unlikely to be credible when managers themselves do not use digital systems. These findings are aligned with Modarresi and colleagues' emphasis on the soft components of transformation [5] and with Westerman and colleagues' argument that digital transformation requires leadership capability and workforce engagement in addition to technological competence [2].

The importance of organizational learning also corresponds with the dynamic capability perspective. Digital transformation requires organizations to continually acquire, integrate, and apply new knowledge because technologies, stakeholder expectations, and service requirements evolve over time. Kim and Miles demonstrated that system integration capability develops through cross-boundary learning and the coordination of specialized knowledge [17]. In the present study, the absence of continuous training and the weak institutionalization of learning were viewed as barriers to maturity. Therefore, employee development should not be limited to one-time system training; it should involve ongoing digital literacy, problem-solving, data interpretation, process redesign, and collaborative learning.

The seventh theme, transformation staging and organizational adaptation, emphasized incremental progress, maturity levels, model simplicity, usability, localization, and the management of behavioral-structural barriers. Participants rejected highly complex or imported models that could not be adapted to the institutional realities of the Social Security Organization. This finding confirms that maturity pathways should be gradual, understandable, measurable, and sensitive to organizational context. The staged logic is consistent with established maturity models that assess progressive development across defined levels [7, 9]. It also aligns with the Iranian digital maturity frameworks developed by Gholikhani and colleagues and Bagheri and colleagues, which emphasize the need to identify contextually relevant dimensions and priorities [8, 11].

The importance of contextual adaptation is further supported by sector-specific research in municipalities, manufacturing, the automotive industry, banking, and innovation ecosystems [10, 12-14]. These studies collectively indicate that organizations differ in resources, regulatory pressures, technological infrastructure, stakeholder expectations, and innovation capacity. The present model therefore contributes to the literature by integrating a service-oriented architectural foundation with behavioral, managerial, governance, and maturity dimensions tailored to the Social Security Organization. It also supports the broader view that digital transformation affects management and economic performance by improving coordination, resource use, service delivery, and decision quality [3]. Overall, the model explains digital transformation maturity as an emergent outcome of alignment among transformation drivers, service-oriented operational mechanisms, and institutionalized organizational capabilities.

The present study has several limitations. First, the findings were derived from interviews with 15 academic and organizational experts and therefore reflect informed professional perceptions rather than the experiences of all employee groups, service recipients, employers, pensioners, or other stakeholders. Second, the qualitative design enabled an in-depth exploration of the phenomenon but did not

permit statistical testing of the relationships among the extracted themes and components. Third, the study was conducted within the specific institutional context of the Social Security Organization, and differences in legal mandates, technological infrastructures, organizational cultures, and service processes may limit the direct transferability of the proposed model to other organizations. Finally, the model was developed at a conceptual level and was not implemented longitudinally to evaluate changes in organizational maturity or the practical consequences of applying its stages.

Future studies should develop a quantitative measurement instrument based on the identified codes and themes and assess its content validity, construct validity, reliability, and predictive validity in larger samples. The causal relationships among digital transformation, service-oriented architecture capabilities, governance, behavioral maturity, and organizational performance could be examined through structural equation modeling. Comparative studies across different branches, public institutions, insurance organizations, municipalities, banks, and healthcare service providers would clarify the model's transferability and identify sector-specific dimensions. Longitudinal and action-research designs are also recommended to assess how maturity levels change during implementation and to determine whether progression through the proposed stages improves service quality, efficiency, transparency, stakeholder satisfaction, and organizational resilience.

The Social Security Organization should translate the proposed model into a staged digital transformation roadmap containing measurable indicators, responsible units, implementation schedules, and periodic evaluation mechanisms. Before automating additional procedures, managers should prioritize process reengineering, systems integration, data governance, and the development of reusable services based on service-oriented architecture. Practical attention should also be given to leadership continuity, managerial role modeling, employee participation, continuous digital training, trust in organizational data, and the management of resistance. Pilot implementation in selected units can reduce operational risk before organization-wide deployment. The resulting maturity assessment should be repeated periodically so that capability gaps can be identified, resources can be directed toward priority areas, and digital transformation can become an institutionalized and sustainable organizational process.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

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Ethical Considerations

All procedures performed in this study were under the ethical standards.

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