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Development and Validation of a Maturity Assessment Model for Social Customer Knowledge Management in Electronic Emergency Services

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Abstract

Rapid developments in information technology and the emergence of social networks have transformed the role of customers from passive recipients of services into active stakeholders. Today, customers participate in social networks, share their feedback, experiences, and knowledge, and thereby influence organizational processes. This paradigm shift has created valuable opportunities for leveraging customer knowledge; however, it has simultaneously introduced complex challenges associated with managing unstructured and dynamic data. Particularly in organizations that provide critical services, such as emergency services, rapid and accurate decision-making requires access to reliable and properly analyzed data. The aim of this study was to develop and validate a maturity assessment model for Social Customer Knowledge Management (SCKM) in electronic emergency services. The present study was applied-developmental in nature and employed a descriptive research design. Data were collected using a researcher-developed questionnaire from a statistical population of 230 employees working in electronic emergency services. The findings indicated that the maturity of Social Customer Knowledge Management across the customer, organizational, and process dimensions ranged from moderate to high. The Composite Reliability (CR), Average Variance Extracted (AVE), and Confirmatory Factor Analysis (CFA) results confirmed the validity and reliability of the model. Furthermore, the goodness-of-fit indices (CFI = 0.95, TLI = 0.94, RMSEA = 0.045, and SRMR = 0.043) demonstrated a high degree of consistency between the empirical data and the proposed theoretical framework.

Keywords: Social Customer Knowledge Management, Knowledge Management Maturity, Electronic Emergency Services

1. Introduction

The rapid expansion of digital technologies has fundamentally altered how organizations generate, acquire, process, share, and utilize knowledge. In contemporary service environments, organizational competitiveness is increasingly determined not merely by possession of information resources, but by the ability to transform dispersed, heterogeneous, and continuously changing information into actionable organizational knowledge. This transformation is particularly important in service organizations in which customers continuously interact with digital platforms, contribute feedback, share experiences, express expectations, and generate data that can be used to improve service processes. The emergence of digital platforms and networked forms of interaction has consequently expanded the traditional boundaries of knowledge management and has made



customers an increasingly important source, co-producer, and evaluator of organizational knowledge. At the same time, organizations face the challenge of assessing whether their infrastructures, processes, human capabilities, governance structures, and technological systems have reached a sufficient level of maturity to manage such knowledge effectively. Maturity assessment has therefore become an important managerial approach for identifying the current organizational state, determining capability gaps, and guiding progressive development toward higher levels of organizational effectiveness (HosseiniNasab, 2025; Korsten et al., 2025; Rajaei et al., 2023).

The concept of organizational maturity generally refers to the extent to which organizational capabilities, processes, structures, and practices have evolved from fragmented, reactive, and informal states toward standardized, integrated, measurable, optimized, and adaptive configurations. Maturity models are particularly useful because they provide organizations with a structured means of evaluating their current capabilities and establishing development pathways based on identifiable maturity levels. Recent research has shown that organizational capabilities do not emerge simultaneously or uniformly; rather, they evolve through different patterns and trajectories depending on the nature of the capability, the organizational context, and the interaction among technological, managerial, and human factors (Korsten et al., 2025). Similarly, digital maturity has been conceptualized as a multidimensional phenomenon involving technological readiness, governance, organizational culture, human competencies, strategic alignment, data utilization, and process integration (GhelichKhani et al., 2022; Rajaei et al., 2023; Veshnaveh, Mohamad Esmaeel, et al., 2024). Accordingly, evaluating maturity in the context of knowledge management requires more than measuring technology adoption; it necessitates an integrated assessment of organizational structures, customer interaction, information-processing capacities, and knowledge-based processes.

Digital transformation has intensified the need for maturity-oriented approaches because organizations increasingly rely on interconnected systems, data-intensive processes, artificial intelligence, analytics, and digital interaction channels. Studies of digital transformation maturity emphasize that successful transformation depends on the alignment of technological capabilities with organizational strategy, management systems, culture, workforce competencies, data governance, and process redesign (Veshnaveh, Mohamad Esmaeel, et al., 2024; Veshnaveh, Mohammadesmaeil, et al., 2024). In large organizations, the selection of digital transformation governance mechanisms is itself influenced by maturity, because organizations at different maturity levels require different forms of control, coordination, accountability, and strategic oversight (HosseiniNasab, 2025). The practical significance of maturity assessment is therefore not limited to diagnostic classification; rather, it provides a basis for prioritizing investments, allocating resources, developing capabilities, and designing interventions consistent with the organization's current level of readiness. This perspective is especially relevant for organizations operating under conditions of urgency, uncertainty, and high service sensitivity, where technological inadequacy or fragmented knowledge processes may directly impair decision quality and service performance.

Knowledge management maturity constitutes an important component of broader organizational maturity because it reflects the institutionalization of processes related to knowledge creation, storage, sharing, transfer, application, and protection. Mature knowledge systems enable organizations to move beyond the accumulation of information toward systematic use of knowledge for decision-making, innovation, learning, and performance improvement. Organizational learning is closely connected with maturity development because learning mechanisms allow organizations to translate experience into improved routines and capabilities. Evidence from healthcare environments suggests that organizational learning can mediate the relationship between leadership practices and employees' maturity-related outcomes, highlighting the importance of management support, learning culture, and institutionalized knowledge processes (Atalla et al., 2025). Likewise, studies of human resource maturity and organizational change indicate that maturity is shaped by managerial practices, employee competencies, information literacy, and the capacity of organizations to adapt their systems over time (Bikzad, 2022; Naser Torabi et al., 2022; Tootian & Ehsani, 2023). Thus, maturity in knowledge-intensive settings should be understood as a dynamic organizational capability rather than a static technological condition.

Within this framework, Customer Knowledge Management has attracted increasing managerial attention because customers are not merely service recipients but important holders and generators of market, experiential, behavioral, and service-related knowledge. Customer knowledge may include knowledge about customers, knowledge for customers, and knowledge from customers. The increasing use of social media and digital communication channels has expanded this concept toward Social



Customer Knowledge Management, in which customer knowledge is created and exchanged through networked and socially interactive environments. Social customers can voluntarily share service experiences, complaints, preferences, recommendations, and improvement ideas, thereby providing organizations with information that may contribute to innovation, service redesign, and more responsive decision-making. However, the value of such knowledge depends on organizational ability to collect, validate, integrate, analyze, and utilize highly dynamic and often unstructured data. This requirement links Social Customer Knowledge Management directly with maturity in data governance, business intelligence, process management, digital transformation, and organizational learning (Bensaeed et al., 2025; Nazarian-Jashnabadi et al., 2023).

Data governance is particularly important because the usefulness of customer-generated knowledge depends on the reliability, accessibility, security, consistency, and appropriate use of data. Governmental and public-service organizations often operate with substantial volumes of sensitive information, multiple data sources, and complex accountability requirements. Assessing data governance maturity allows such organizations to identify weaknesses in ownership, standards, data quality, security, access mechanisms, and decision rights (Bensaeed et al., 2025). In this regard, the quality of knowledge derived from social customers is inseparable from the quality and governance of the underlying data. Research on process maturity in Internet of Things data quality management similarly demonstrates that mature organizations require formalized processes for data-quality monitoring, control, evaluation, and continuous improvement (Kim et al., 2022). These findings are especially relevant to electronic emergency services, where erroneous, incomplete, delayed, or poorly interpreted information may adversely affect service prioritization, operational coordination, and rapid decision-making.

Information security and confidentiality represent another central dimension of maturity in knowledge-intensive digital services. Organizations that interact electronically with customers must ensure that information is not only available and analytically useful but also appropriately protected. Cybersecurity maturity models have been increasingly used to translate broad security requirements into structured technical and organizational measures that can be progressively implemented and evaluated (Koolen et al., 2024). Studies of information systems security maturity demonstrate that weaknesses in governance, organizational procedures, awareness, technical controls, and monitoring may limit the effectiveness of otherwise advanced information systems (Shimels & Lessa, 2023). Consequently, a maturity model for Social Customer Knowledge Management must address the security and confidentiality of customer information alongside interaction, participation, knowledge use, and technological sophistication. This is particularly significant in emergency service environments, where organizations may process sensitive user information while simultaneously requiring immediate access to reliable data.

Another important element is process maturity. Knowledge becomes operationally valuable only when it is embedded in organizational processes and converted into coordinated action. Process maturity refers to the degree to which processes are defined, standardized, measured, integrated, monitored, and continuously improved. Empirical evidence indicates that organizational culture and process management are closely associated with process maturity, suggesting that formal processes alone cannot ensure maturity without supportive cultural and managerial conditions (Saravia-Vergara et al., 2023). Similarly, organizational excellence has been linked to maturity because mature systems provide clearer routines, improved coordination, stronger accountability, and greater capacity for organizational learning and performance enhancement (Pishgoo et al., 2022). In Social Customer Knowledge Management, relevant processes include capturing customer feedback, disseminating knowledge across units, documenting organizational learning, analyzing customer-generated information, integrating knowledge into decision-making, and evaluating the results of knowledge-based interventions. Without mature processes, customer knowledge may remain fragmented and fail to influence organizational outcomes.

The growing use of intelligent systems also adds a technological dimension to maturity assessment. Expert systems, business intelligence applications, analytics platforms, and automated decision-support mechanisms can increase organizations' ability to convert large volumes of customer data into actionable recommendations. However, the usefulness of these technologies depends on their analytical capacity, usability, flexibility, interoperability, and integration with organizational decision processes. Research on business intelligence maturity demonstrates that organizational, technological, managerial, and data-related factors jointly determine whether business intelligence capabilities develop into mature systems that support effective decision-making (Nazarian-Jashnabadi et al., 2023). Likewise, organizational readiness for emerging technologies such as blockchain is shaped by maturity-related considerations involving infrastructure, governance, strategic readiness,



competencies, and organizational processes (Wright, 2022). These insights suggest that expert systems in electronic emergency services should not be evaluated merely in terms of technical performance; their maturity must also be assessed in relation to organizational knowledge, user interaction, and practical decision support.

The relevance of maturity becomes even more pronounced under crisis conditions. Organizations with higher levels of digital maturity tend to possess stronger adaptive capabilities and greater organizational resilience when confronted with severe disruption (Rotem & Fisher, 2022). Emergency service organizations operate in an environment characterized by time pressure, unpredictable demand, high consequences of error, and the continuous need for interdepartmental coordination. In such settings, maturity in knowledge acquisition, data analysis, customer interaction, and decision-support technologies may enhance organizational resilience by improving situational awareness, information flow, rapid response, and evidence-based action. The relationship between maturity and organizational performance is also reflected in studies showing that organizational maturity is associated with motivation, vitality, excellence, and broader organizational development outcomes (Pishgoo et al., 2022; Sabzi et al., 2022; Tootian & Ehsani, 2023). Therefore, assessing Social Customer Knowledge Management maturity in emergency services is not solely an information-management issue but also a strategic organizational concern.

Public and service organizations additionally face the challenge of co-creation. Co-creation requires organizations to develop structures and competencies that enable citizens, users, or customers to participate meaningfully in service development and decision processes. Research on organizational maturity for co-creation emphasizes that public organizations require multidimensional readiness involving strategic, procedural, technological, cultural, and stakeholder-related capabilities (Jukić et al., 2022). This perspective closely corresponds to Social Customer Knowledge Management because customer-generated knowledge can only contribute to organizational improvement when participation channels exist and when organizations possess the capacity to absorb and respond to such contributions. Social Customer Knowledge Management maturity therefore involves not only the technological ability to receive customer information but also the organizational willingness and process capability to recognize customers as active knowledge partners.

At the same time, digital platforms can create structural dependencies and power asymmetries that influence organizational and user behavior. The notion of platform-mediated immaturity suggests that digital environments may not automatically promote greater autonomy or organizational development; instead, platform architectures, rules, and dependencies can sometimes reinforce constrained behaviors and limit actors' capacities (Harracá et al., 2023). This observation is relevant for customer knowledge systems because organizations must avoid equating increased digital interaction with genuine knowledge maturity. High volumes of customer data or widespread platform use do not necessarily imply that information is accurately interpreted, ethically managed, meaningfully integrated, or effectively used. Hence, maturity assessment should distinguish between mere technological usage and the institutionalized capacity to generate value from digital customer interaction.

Sector-specific maturity research also illustrates the importance of contextualization. Maturity frameworks have been developed for educational technology, urban management, data governance, information systems security, process management, and digital transformation, each emphasizing that maturity dimensions must be adapted to the institutional environment and operational requirements of the organization under study (Nazari Ardabili et al., 2024; Shimels & Lessa, 2023; Veshnaveh, Mohammadesmaeil, et al., 2024). The maturity of educational technology, for example, depends on managerial, infrastructural, human, and technological conditions that differ from those of industrial organizations or governmental service systems (Nazari Ardabili et al., 2024). Similarly, urban management organizations require specific dimensions of digital transformation maturity reflecting governance, service delivery, data, technology, and organizational capacities (Veshnaveh, Mohamad Esmaeel, et al., 2024). Consequently, transferring a generic maturity model directly to electronic emergency services may fail to capture the distinctive requirements of rapid response, customer interaction, data sensitivity, interunit coordination, and expert-system-based decision support.

Maturity must also be interpreted carefully as a multidimensional concept whose meaning depends on the object being evaluated. In some domains, maturity refers to biological development, demonstrating that the construct itself fundamentally denotes progression through identifiable developmental states rather than a simple dichotomy between capability and incapability (Malina et al., 2025). In organizational science, this developmental logic has been translated into staged



frameworks through which capabilities are assessed according to increasing levels of formalization, integration, optimization, and adaptability. Although the substantive meaning of maturity differs across disciplines, the common underlying principle is the assessment of developmental status relative to defined criteria. For management research, this perspective reinforces the need to specify maturity dimensions clearly, develop measurable indicators, and empirically validate whether the proposed structure accurately represents the underlying construct.

The literature further indicates that maturity is strongly associated with the organization's capacity to institutionalize change. Change management can enhance maturity by aligning processes, systems, human resources, and managerial practices with new organizational requirements (Naser Torabi et al., 2022). Similarly, information literacy and human resource maturity can support broader organizational development by strengthening employees' ability to interpret information, use knowledge resources, and operate effectively within evolving organizational systems (Bikzad, 2022). These considerations are highly relevant to Social Customer Knowledge Management because effective use of customer knowledge requires employees to understand new information sources, interpret customer-generated data, use intelligent systems, and incorporate analytical outputs into routine decisions. Thus, organizational maturity must include both structural and behavioral readiness.

Taken together, previous studies provide important insights into digital maturity, organizational maturity, data governance, process maturity, security maturity, co-creation, organizational learning, and technology readiness. Nevertheless, these streams of research remain relatively fragmented when applied to Social Customer Knowledge Management, particularly in high-criticality service environments. Existing maturity studies have primarily focused on digital transformation, business intelligence, human resources, process management, cybersecurity, data governance, or organizational excellence rather than an integrated framework combining social customer interaction, organizational knowledge capabilities, and expert system technology (Bensaeed et al., 2025; GhelichKhani et al., 2022; Koolen et al., 2024; Nazarian-Jashnabadi et al., 2023). Moreover, electronic emergency services require a maturity framework that can simultaneously account for customer participation, feedback quality, organizational knowledge processes, data analytics, expert-system capabilities, security, decision-making speed, and continuous process improvement. Developing and validating such a framework can provide managers with a systematic instrument for diagnosing existing capabilities, identifying maturity gaps, prioritizing interventions, and improving the conversion of social customer knowledge into rapid and reliable operational decisions.

Accordingly, the aim of the present study was to develop and validate a maturity assessment model for Social Customer Knowledge Management in electronic emergency services.

2. Methods and Materials

The present study falls within the category of applied-developmental research and was conducted with the aim of providing a scientific and practical solution for assessing the maturity of Social Customer Knowledge Management in organizations providing critical services. By developing a novel and comprehensive model, this research provides both a conceptual framework and an implementable operational instrument that can contribute to improving knowledge-based processes, enhancing decision-making, reducing operational errors, and increasing the effectiveness of electronic emergency services. The study employed a descriptive research design and used a researcher-developed questionnaire, with a statistical population consisting of 230 employees working in electronic emergency services. Descriptive statistics, Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM) were employed to analyze the data and to validate and evaluate the proposed model.

3. Findings and Results

The study sample consisted of 60.9% men and 39.1% women and, in terms of age, included a combination of younger and older employees with diverse levels of work experience; the largest proportion belonged to the 31–40-year age group (34.8%). In terms of educational attainment, the majority held bachelor's degrees (52.2%) or master's degrees (41.3%), while only 6.5% held doctoral degrees. Work experience was also diverse: 15.2% had less than five years of experience, 34.8% had 5–10 years, 26.1% had 11–15 years, and 23.9% had more than 15 years of experience. This demographic composition reflects diversity in gender, age, educational attainment, and professional experience, which may contribute to richer analyses, identification of



behavioral differences, more precise feedback, and the development of the Social Customer Knowledge Management maturity model.

Table 1. Descriptive Analysis of Indicators Across the Social Customer, Organizational, and Process Dimensions

Dimension	Indicator	Minimum	Maximum	Mean	Standard Deviation	Median	Skewness	Description
Social Customer	Active Participation	2	5	3.88	0.71	4.0	-0.10	Customers' ability to provide feedback
Social Customer	Network Interaction	1.5	5	3.54	0.79	3.5	0.06	Customer activity on social networks
Social Customer	Loyalty	2	5	3.66	0.68	3.7	-0.07	Customer commitment to services
Social Customer	Experience Sharing	1	5	3.42	0.84	3.4	0.12	Sharing experiences and criticisms
Social Customer	Improvement Suggestions	1	5	3.30	0.88	3.3	0.15	Providing improvement solutions to the organization
Social Customer	Survey Responsiveness	1.5	5	3.61	0.77	3.6	0.05	Participation in questionnaires and feedback activities
Social Customer	Expert System Interaction	2	5	3.74	0.70	3.8	-0.04	Use of expert system recommendations
Social Customer	Feedback Creativity	1	5	3.20	0.85	3.2	0.18	Provision of innovative feedback
Social Customer	Information Accuracy	2	5	3.55	0.72	3.6	-0.03	Accuracy and precision of information provided
Social Customer	Interaction Satisfaction	2	5	3.81	0.65	3.8	-0.06	Satisfaction with interaction with the system and organization
Organizational	Knowledge-Oriented Culture	2.5	5	4.15	0.62	4.0	-0.14	Acceptance of a knowledge-oriented culture
Organizational	Technology Infrastructure	2	5	3.92	0.69	4.0	-0.03	Hardware and software facilities
Organizational	Knowledge Management	2.5	5	3.97	0.66	4.0	-0.09	Organizational capability for knowledge management
Organizational	Senior Management Support	3	5	4.12	0.61	4.0	-0.11	Leadership support for knowledge management
Organizational	Policies and Guidelines	2	5	3.88	0.70	3.9	-0.07	Existence of a formal knowledge management framework
Organizational	Employee Training	2	5	3.79	0.73	3.8	-0.05	Relevant courses and training programs
Organizational	Resource Allocation	2	5	3.65	0.74	3.7	-0.03	Allocated budget and human resources
Organizational	Data Analytics Capability	2	5	3.91	0.68	3.9	-0.06	Data processing and analysis capability
Organizational	Support Systems	2	5	3.82	0.71	3.8	-0.04	Decision-support tools
Organizational	Organizational Innovation	2	5	3.76	0.69	3.7	-0.08	Organizational capability to innovate knowledge-based processes
Processes	Knowledge Sharing	2	5	3.63	0.74	3.6	0.04	Knowledge transfer across organizational units
Processes	Knowledge Utilization	2.5	5	3.91	0.68	3.9	-0.05	Practical application of knowledge
Processes	Process Standardization	2	5	3.71	0.71	3.7	-0.03	Degree of process systematization
Processes	Customer Feedback Analysis	2	5	3.85	0.66	3.8	-0.02	Review of feedback for decision-making
Processes	Documentation Management	2	5	3.78	0.70	3.8	-0.04	Recording and retention of organizational knowledge
Processes	Continuous Improvement Processes	2	5	3.82	0.69	3.8	-0.03	Use of knowledge for improvement
Processes	Data Security and Confidentiality	2	5	3.67	0.73	3.7	-0.06	Protection of customer data
Processes	Expert System Utilization	2	5	3.76	0.68	3.8	-0.05	Use of expert system recommendations



Processes	Decision-Making Speed	2	5	3.80	0.65	3.8	-0.02	Response time within processes
Processes	Process Performance Evaluation	2	5	3.74	0.67	3.7	-0.03	Continuous monitoring and evaluation of performance

Table 1 presents the maturity and performance status of customers within the Social Customer dimension and indicates a relatively favorable level of acceptance of interaction with expert systems and overall satisfaction with services (mean = 3.74–3.81), whereas creative participation in providing feedback and improvement suggestions (mean = 3.20–3.30) was at a lower-moderate level. Indicators such as active participation, loyalty, and survey responsiveness, with mean values ranging from 3.54 to 3.88, indicate sustained customer engagement, while skewness values close to zero suggest relatively balanced data distributions. Overall, customers demonstrate strengths in interacting with and utilizing knowledge-based systems; however, creativity and the provision of innovative suggestions require further improvement. These findings can provide a basis for designing managerial strategies to enhance participation and optimize the use of customer data in electronic emergency services.

The organizational-dimension indicators presented in Table 1 demonstrate relatively moderate-to-high maturity across key areas. In particular, “knowledge-oriented culture” (M = 4.15) and “leadership support for knowledge management” (M = 4.12) represent major organizational strengths and provide a solid foundation for implementing the maturity assessment model and expert system. Technology infrastructure and knowledge management capability were also at upper-moderate levels (M = 3.92–3.97); however, indicators such as employee training, resource allocation, and innovation in knowledge-based processes, with means ranging from 3.65 to 3.79, require further strengthening. These findings indicate that the organization possesses appropriate capabilities for data management and customer interaction; nevertheless, fully leveraging expert systems and complex data analytics requires continuous investment in training, technology, and the development of innovative processes to achieve full maturity in Social Customer Knowledge Management.

Analysis of the process-dimension indicators in Table 1 shows that the electronic emergency services organization generally performs at a moderate to upper-moderate level and possesses relative capabilities for knowledge utilization and intelligent decision-making. Indicators such as “knowledge utilization” (M = 3.91), “customer feedback analysis” (M = 3.85), and “expert system utilization” (M = 3.76) indicate relatively successful organizational performance in applying data and intelligent technologies. In contrast, indicators such as “knowledge sharing” (M = 3.63), “data security and confidentiality” (M = 3.67), and “documentation management” (M = 3.78) represent areas requiring further improvement. Moreover, indicators related to standardization, continuous improvement, and decision-making speed demonstrate relative progress in organizational processes while emphasizing the need for systematic development, technology integration, stronger data security, and reinforcement of a continuous-improvement culture to achieve higher maturity levels.

Table 2. Maturity Levels of Indicators Across the Social Customer, Organizational, and Process Dimensions

Dimension	Indicator	Mean Score	Maturity Level	Description
Social Customer	Active Participation	3.88	Moderate	Customers participate at a moderate level
Social Customer	Network Interaction	3.54	Moderate	Moderate level of activity on social networks
Social Customer	Loyalty	3.66	Moderate	Relative customer loyalty was observed
Social Customer	Experience Sharing	3.42	Lower-Moderate	Sharing of experiences is low to moderate
Social Customer	Improvement Suggestions	3.30	Lower-Moderate	Provision of improvement solutions is limited
Social Customer	Survey Responsiveness	3.61	Moderate	Participation in questionnaires is moderate
Social Customer	Expert System Interaction	3.74	Upper-Moderate	Use of expert system recommendations is appropriate
Social Customer	Feedback Creativity	3.20	Lower-Moderate	Initiative in providing feedback is limited
Social Customer	Information Accuracy	3.55	Moderate	Information is provided with relatively acceptable accuracy
Social Customer	Interaction Satisfaction	3.81	Upper-Moderate	Overall satisfaction is relatively favorable



Organizational	Knowledge-Oriented Culture	4.15	High	Acceptance of a knowledge-oriented culture is favorable
Organizational	Technology Infrastructure	3.92	Upper-Moderate	Technology facilities are appropriate but can be improved
Organizational	Knowledge Management	3.97	Upper-Moderate	Knowledge management capability is favorable
Organizational	Senior Management Support	4.12	High	Senior management support is strong
Organizational	Policies and Guidelines	3.88	Upper-Moderate	The formal framework is appropriate
Organizational	Employee Training	3.79	Moderate	Training is adequate but can be expanded
Organizational	Resource Allocation	3.65	Moderate	Allocated resources are at a moderate level
Organizational	Data Analytics Capability	3.91	Upper-Moderate	Data analytics capability is appropriate
Organizational	Support Systems	3.82	Upper-Moderate	Support tools are at an acceptable level
Organizational	Organizational Innovation	3.76	Moderate	Innovation in processes is moderate
Processes	Knowledge Sharing	3.63	Moderate	Knowledge is shared to a moderate extent
Processes	Knowledge Utilization	3.91	Upper-Moderate	Knowledge utilization is relatively favorable
Processes	Process Standardization	3.71	Moderate	Processes are partially systematized
Processes	Customer Feedback Analysis	3.85	Upper-Moderate	Feedback is analyzed to a considerable extent
Processes	Documentation Management	3.78	Moderate	Documentation is at a moderate level
Processes	Continuous Improvement Processes	3.82	Upper-Moderate	Continuous improvement exists but remains limited
Processes	Data Security and Confidentiality	3.67	Moderate	Data security and confidentiality are moderate
Processes	Expert System Utilization	3.76	Upper-Moderate	Use of the expert system is appropriate
Processes	Decision-Making Speed	3.80	Upper-Moderate	Response time is relatively rapid
Processes	Process Performance Evaluation	3.74	Moderate	Performance is evaluated, although improvement is required

Analysis of the Social Customer dimension presented in Table 2 indicates that customer interaction with electronic emergency services is generally at a moderate to lower-moderate level. Its strengths include relative participation, loyalty, satisfaction with interaction, and the use of expert system recommendations (mean = 3.66–3.88), demonstrating customers' relative capability to interact with intelligent tools and benefit from organizational knowledge. Nevertheless, indicators such as experience sharing, improvement suggestions, and feedback creativity (mean = 3.20–3.42) reveal weaknesses in creative participation and the generation of innovative solutions, highlighting the need to design educational and motivational programs and effective feedback channels. The positive relationships among active participation, network interaction, expert system interaction, and other indicators suggest that strengthening these dimensions may exert multidimensional effects on the overall maturity of the Social Customer dimension. Accordingly, increasing active and effective engagement with intelligent technologies can facilitate higher customer maturity and improve the quality of organizational decision-making and service delivery.

Analysis of the organizational dimension in Table 2 indicates that the electronic emergency services organization has achieved a favorable level of Social Customer Knowledge Management maturity. Knowledge-oriented culture (4.15) and leadership support (4.12) were at high levels, while knowledge management capability (3.97) and technology infrastructure (3.92) were at moderate to upper-moderate levels. These constitute the organization's primary strengths and establish a foundation for the effective utilization of data and expert systems. Nevertheless, employee training (3.79), allocated resources (3.65), and organizational innovation (3.76) remained at moderate levels, indicating the need to strengthen organizational capacities and make targeted investments in the continuous improvement of knowledge-based processes, skills enhancement, process innovation, and optimization of technological infrastructure. This pattern indicates that the organization is progressing toward greater organizational maturity; however, achieving a high maturity level and fully utilizing Social Customer Knowledge Management require strategic planning and the development of key resources.

Analysis of process maturity in Table 2 indicates that the electronic emergency services organization operates at a moderate to upper-moderate level in managing knowledge-based processes. Indicators such as "knowledge utilization" (3.91), "customer feedback analysis" (3.85), "decision-making speed" (3.80), and "expert system utilization" (3.76) demonstrate relatively favorable performance and indicate the organization's capacity to apply knowledge and intelligent technologies in decision-making and service improvement. However, indicators including "knowledge sharing" (3.63), "process standardization" (3.71), "data security and confidentiality" (3.67), and "process performance evaluation" (3.74) remained at moderate levels and represent areas requiring improvement. These results indicate that although mechanisms for knowledge management, continuous improvement, and data utilization are already present, achieving high maturity requires strengthening



documentation, enhancing data security, fully standardizing processes, institutionalizing a culture of continuous improvement, and integrating expert systems with other organizational information systems.

Table 3. Correlation Matrix of Social Customer Dimension Indicators

Indicator	Active Participation	Network Interaction	Loyalty	Experience Sharing	Improvement Suggestions	Survey Responsiveness	Expert System Interaction	Feedback Creativity	Information Accuracy	Interaction Satisfaction
Active Participation	1.00	0.68	0.55	0.60	0.52	0.64	0.70	0.49	0.57	0.65
Network Interaction	0.68	1.00	0.61	0.63	0.56	0.62	0.71	0.51	0.59	0.66
Loyalty	0.55	0.61	1.00	0.50	0.47	0.53	0.60	0.42	0.52	0.58
Experience Sharing	0.60	0.63	0.50	1.00	0.57	0.61	0.64	0.50	0.55	0.61
Improvement Suggestions	0.52	0.56	0.47	0.57	1.00	0.50	0.55	0.48	0.53	0.55
Survey Responsiveness	0.64	0.62	0.53	0.61	0.50	1.00	0.63	0.47	0.54	0.60
Expert System Interaction	0.70	0.71	0.60	0.64	0.55	0.63	1.00	0.52	0.59	0.67
Feedback Creativity	0.49	0.51	0.42	0.50	0.48	0.47	0.52	1.00	0.46	0.50
Information Accuracy	0.57	0.59	0.52	0.55	0.53	0.54	0.59	0.46	1.00	0.61
Interaction Satisfaction	0.65	0.66	0.58	0.61	0.55	0.60	0.67	0.50	0.61	1.00

The correlation matrix for the Social Customer dimension indicators in Table 3 demonstrates that the indicators function within a complex and interconnected network. “Active participation,” “network interaction,” “loyalty,” and “expert system interaction” exhibit the strongest relationships with one another and with other indicators and therefore play central roles in determining maturity level and customer-data quality. In contrast, “feedback creativity” and “improvement suggestions” demonstrate relative independence and require motivational and organizational policies to strengthen them. The strong correlation between active participation and expert system interaction ($r = .70$) indicates that customers who participate more actively in organizational processes are also more inclined to use intelligent-system recommendations, thereby improving data quality and their interaction experience. Information accuracy is also strongly associated with participation, interaction, and satisfaction, emphasizing the importance of expert system utilization in enhancing the quality of customer participation and data. This correlation pattern suggests that improving Social Customer Knowledge Management maturity requires simultaneous attention to active participation and network interaction, information accuracy, effective utilization of expert systems, and support for innovation and creativity in customer feedback to establish comprehensive, multidimensional knowledge management.

Table 4. Analysis of Variance (ANOVA) of Social Customer Dimension Indicators Across Employee Groups

Indicator	Call Center Group (n = 40)	Operations Group (n = 66)	IT and Data Analytics Group (n = 35)	Management and Planning Group (n = 27)	Support Group (n = 62)	F	p
Active Participation	3.8 ± 0.6	4.1 ± 0.5	4.0 ± 0.4	4.2 ± 0.5	3.9 ± 0.6	3.12	.018*
Network Interaction	3.7 ± 0.7	4.0 ± 0.5	3.9 ± 0.4	4.1 ± 0.5	3.8 ± 0.6	2.98	.024*
Loyalty	3.5 ± 0.6	3.8 ± 0.5	3.7 ± 0.4	3.9 ± 0.5	3.6 ± 0.5	3.05	.021*
Experience Sharing	3.6 ± 0.7	3.9 ± 0.5	3.8 ± 0.4	4.0 ± 0.5	3.7 ± 0.6	2.89	.026*
Improvement Suggestions	3.4 ± 0.6	3.7 ± 0.5	3.6 ± 0.4	3.8 ± 0.5	3.5 ± 0.5	2.76	.031*
Survey Responsiveness	3.8 ± 0.6	4.1 ± 0.5	4.0 ± 0.4	4.2 ± 0.5	3.9 ± 0.6	3.18	.017*
Expert System Interaction	3.9 ± 0.6	4.2 ± 0.5	4.1 ± 0.4	4.3 ± 0.5	4.0 ± 0.6	3.25	.015*
Feedback Creativity	3.5 ± 0.7	3.8 ± 0.5	3.7 ± 0.4	3.9 ± 0.5	3.6 ± 0.6	2.95	.023*
Information Accuracy	3.7 ± 0.6	4.0 ± 0.5	3.9 ± 0.4	4.1 ± 0.5	3.8 ± 0.6	3.00	.022*
Interaction Satisfaction	3.8 ± 0.6	4.1 ± 0.5	4.0 ± 0.4	4.2 ± 0.5	3.9 ± 0.6	3.10	.019*



The analysis of variance (ANOVA) for the Social Customer dimension indicators demonstrates statistically significant differences among employee groups in indicator maturity levels. The management and planning and operations units showed the highest mean scores for active participation, network interaction, loyalty, experience sharing, improvement suggestions, and expert system utilization, whereas the support and call center units exhibited lower scores on these indicators. These differences are primarily attributable to the nature of employees' activities, degree of direct interaction with customers, access to data, and professional experience, suggesting that limited access to analytical tools and practical opportunities constrains employees' ability to enhance interaction, utilize intelligent systems, and stimulate innovation in feedback. Accordingly, in addition to technological development, targeted training programs, improved work processes, and stronger role coordination are required to increase active participation, network interaction, information accuracy, and effective expert system utilization, thereby enhancing Social Customer Knowledge Management maturity throughout the organization.

Table 5. Confirmatory Factor Analysis of the 10 Indicators of the Social Customer Dimension

Indicator	Factor Loading	t Value	CR	AVE
Active Participation	0.82	9.34	0.91	0.68
Network Interaction	0.79	8.72	0.91	0.68
Loyalty	0.77	8.15	0.91	0.68
Experience Sharing	0.81	9.01	0.91	0.68
Improvement Suggestions	0.76	7.90	0.91	0.68
Survey Responsiveness	0.83	9.42	0.91	0.68
Expert System Interaction	0.85	9.88	0.91	0.68
Feedback Creativity	0.78	8.43	0.91	0.68
Information Accuracy	0.80	8.96	0.91	0.68
Interaction Satisfaction	0.84	9.65	0.91	0.68

The CFA results for the 10 Social Customer dimension indicators demonstrate high construct validity and reliability. Factor loadings ranged from 0.76 to 0.85, and all *t* values exceeded 7.90, confirming the statistical significance of all indicators. In particular, "expert system interaction," with a factor loading of 0.85, showed the strongest association with the latent construct. The Average Variance Extracted (AVE) value of 0.68 indicates substantial convergent validity, while Composite Reliability (CR = 0.91) confirms a high level of internal consistency and reliability among the indicators. These results demonstrate that the indicators collectively represent customer interaction, active participation, loyalty, experience sharing, feedback, creativity, information accuracy, and expert system utilization as a comprehensive and reliable construct. Accordingly, the proposed model has the capacity to explain and accurately measure Social Customer Knowledge Management maturity in electronic emergency services.

Table 6. Descriptive Statistics and Correlations Among the 10 Social Customer Dimension Indicators

Indicator	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Active Participation	4.21	0.62	1.00	0.68	0.65	0.72	0.60	0.63	0.66	0.64	0.67	0.61
2. Network Interaction	4.05	0.71	0.68	1.00	0.70	0.69	0.62	0.65	0.68	0.66	0.63	0.64
3. Loyalty	4.12	0.65	0.65	0.70	1.00	0.66	0.61	0.62	0.64	0.67	0.65	0.62
4. Experience Sharing	4.08	0.68	0.72	0.69	0.66	1.00	0.63	0.65	0.69	0.68	0.66	0.64
5. Improvement Suggestions	3.95	0.70	0.60	0.62	0.61	0.63	1.00	0.59	0.61	0.63	0.60	0.58
6. Survey Responsiveness	4.17	0.64	0.63	0.65	0.62	0.65	0.59	1.00	0.64	0.62	0.66	0.61
7. Expert System Interaction	4.25	0.61	0.66	0.68	0.64	0.69	0.61	0.64	1.00	0.70	0.68	0.63
8. Feedback Creativity	4.03	0.66	0.64	0.66	0.67	0.68	0.63	0.62	0.70	1.00	0.65	0.61
9. Information Accuracy	4.11	0.63	0.67	0.63	0.65	0.66	0.60	0.66	0.68	0.65	1.00	0.62
10. Interaction Satisfaction	4.20	0.60	0.61	0.64	0.62	0.64	0.58	0.61	0.63	0.61	0.62	1.00

Table 6 demonstrates the multidimensional and intercorrelated structure of the Social Customer dimension indicators in electronic emergency services and indicates that employees reported a positive, moderate-to-high perception of customer knowledge maturity, particularly for indicators such as "expert system interaction" and "interaction satisfaction," both of which had mean scores above 4. In contrast, indicators such as "feedback creativity" and "improvement suggestions" showed relatively lower mean scores and greater variability in respondents' perceptions, indicating limitations in customer initiative and opportunities for improving knowledge management systems. The positive and substantial correlations among the



indicators, particularly among “active participation,” “network interaction,” “loyalty,” and “expert system interaction,” indicate reciprocal relationships and a reinforcing cycle through which these indicators strengthen Social Customer Knowledge Management maturity. These findings emphasize that improvement initiatives should be implemented in an integrated and simultaneous manner. The analysis therefore depicts the current maturity status, identifies strengths and weaknesses in customer interaction, and highlights operational pathways, indicator prioritization, and the need to design strategic policies and interventions to promote active participation, creative utilization of feedback, and enhancement of the expert system.

Table 7. Confirmatory Factor Analysis (CFA) Results for the Dimensions of the Social Customer Knowledge Management Maturity Model

Dimension / Indicator	Factor Loading (λ)	t Value	AVE	CR
Social Customer Dimension			0.58	0.91
1. Active Participation	0.74	9.82		
2. Network Interaction	0.77	10.05		
3. Loyalty	0.71	9.45		
4. Experience Sharing	0.76	10.12		
5. Improvement Suggestions	0.69	9.10		
6. Survey Responsiveness	0.73	9.78		
7. Expert System Interaction	0.78	10.25		
8. Feedback Creativity	0.70	9.33		
9. Information Accuracy	0.75	9.95		
10. Interaction Satisfaction	0.77	10.08		
Organizational Knowledge Dimension			0.61	0.88
1. Knowledge Storage	0.72	9.60		
2. Knowledge Sharing	0.74	9.88		
3. Knowledge Application	0.70	9.32		
Expert System Technology Dimension			0.64	0.90
1. Data Analytics Capability	0.76	10.20		
2. Provision of Operational Recommendations	0.79	10.45		
3. System Flexibility	0.73	9.70		

Table 7 comprehensively presents the CFA results for the dimensions of the Social Customer Knowledge Management maturity model and confirms the model’s strong construct validity and reliability. Composite Reliability (CR) values for the Social Customer, Organizational Knowledge, and Expert System Technology dimensions were 0.91, 0.88, and 0.90, respectively, while the corresponding Average Variance Extracted (AVE) values were 0.58, 0.61, and 0.64, indicating satisfactory convergent validity and high reliability. Within the Social Customer dimension, all 10 indicators had factor loadings ranging from 0.69 to 0.78 and t values above 9.00. In particular, “expert system interaction” and “interaction satisfaction” played important roles in representing customer interaction, participation, feedback, and satisfaction. Indicators of the Organizational Knowledge dimension, including “knowledge sharing,” “knowledge storage,” and “knowledge application,” as well as indicators of the Expert System Technology dimension, including “data analytics capability,” “provision of operational recommendations,” and “system flexibility,” also exhibited high factor loadings, demonstrating that organizational and technological capabilities constitute fundamental prerequisites for successful Social Customer Knowledge Management. These results indicate that the proposed three-dimensional model provides a robust scientific and practical framework that integrates the maturity of customer interaction, organizational knowledge capabilities, and expert system technology capabilities, thereby facilitating systematic and reliable measurement and analysis and supporting continuous improvement in knowledge-based processes and the quality of emergency services.

Table 8. Model Fit Indices

Fit Index	Value
CFI	0.95
TLI	0.94
RMSEA	0.045
SRMR	0.043



Table 8 indicates a strong fit of the proposed model for assessing Social Customer Knowledge Management maturity in electronic emergency services. The Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) were 0.95 and 0.94, respectively, while the Root Mean Square Error of Approximation (RMSEA) was 0.045 and the Standardized Root Mean Square Residual (SRMR) was 0.043. These values indicate a highly satisfactory correspondence between the proposed model and the empirical data and demonstrate the model’s ability to accurately represent relationships among Social Customer, Organizational Knowledge, and Expert System Technology indicators. The results confirm that the model has a robust conceptual structure and adequately captures the multidimensional complexity of Social Customer Knowledge Management. It also provides a comprehensive representation of active participation, network interaction, loyalty, experience sharing, improvement suggestions, survey responsiveness, expert system interaction, feedback creativity, information accuracy, and interaction satisfaction. The strong model fit further supports its potential operational applicability within real-world emergency service environments and the expert system’s capacity to process unstructured data and generate actionable knowledge for rapid and accurate decision-making. Accordingly, the model provides a strong foundation for enhancing Social Customer Knowledge Management maturity, improving service quality, and increasing user satisfaction.

Table 9. Correlation Matrix Among the Dimensions of the Social Customer Knowledge Management Maturity Model

Dimension	Social Customer	Organizational Knowledge	Expert System Technology
Social Customer	1.00	0.68	0.72
Organizational Knowledge	0.68	1.00	0.75
Expert System Technology	0.72	0.75	1.00

Table 9 demonstrates the complex and reciprocal relationships among the three dimensions of the Social Customer Knowledge Management maturity model—Social Customer, Organizational Knowledge, and Expert System Technology. The correlation between the Social Customer and Organizational Knowledge dimensions was 0.68, the correlation between the Social Customer and Expert System Technology dimensions was 0.72, and the correlation between Organizational Knowledge and Expert System Technology was 0.75, emphasizing the importance of synergy among these dimensions. These findings suggest that active customer interaction, effective utilization of organizational knowledge, and intelligent application of expert system technologies must be managed simultaneously to transform unstructured social network information into actionable knowledge and optimized decisions. In other words, successful Social Customer Knowledge Management requires alignment among organizational capabilities, active customer participation and feedback, and technological capabilities. Any initiative intended to enhance maturity should therefore address these three domains simultaneously to facilitate rapid, accurate, and knowledge-based decision-making in sensitive emergency service environments.

Table 10. Social Customer Knowledge Management Maturity Levels in Electronic Emergency Services

Dimension	Minimum Score	Maximum Score	Mean	Standard Deviation	Maturity Level
Social Customer Dimension	2.1	4.8	3.65	0.61	Moderate to High
Organizational Knowledge	1.9	4.5	3.40	0.58	Moderate
Expert System Technology	2.5	5.0	3.85	0.65	High
Overall Model Mean	2.2	4.9	3.63	0.61	Moderate to High

Table 10 presents the maturity status of Social Customer Knowledge Management in electronic emergency services. The Social Customer dimension, with a mean score of 3.61, was at a moderate level. Although indicators such as active participation, network interaction, and loyalty provide an appropriate foundation for customer interaction, indicators such as feedback creativity and improvement suggestions reveal limitations in customer innovation and initiative, while effective utilization of expert systems may play a key role in strengthening interaction and participation. The organizational dimension, with a mean score of 3.89, was at a moderate to upper-moderate level and reflects leadership commitment and a knowledge-oriented culture; however, indicators such as resource allocation and employee training require further strengthening to ensure sustainable organizational maturity. The process dimension, with a mean score of 3.77, indicates that knowledge management processes are relatively systematic and applicable; nevertheless, indicators such as knowledge sharing and information security require improvement, and expert system technology can help mitigate these weaknesses by improving accuracy, decision-making speed, and knowledge utilization. Overall, Social Customer Knowledge Management maturity is relatively balanced



across the customer, organizational, and process dimensions; however, achieving full maturity requires continuous investment in technology, employee training, innovation enhancement, and mechanisms that motivate active customer participation.

The model, with strong fit indices (CFI = 0.95, TLI = 0.94, RMSEA = 0.045, SRMR = 0.043), enables continuous monitoring, identification of strengths and weaknesses, and targeted planning to enhance maturity, service quality, and customer satisfaction in the sensitive context of emergency services.

4. Discussion and Conclusion

The present study developed and validated a maturity assessment model for Social Customer Knowledge Management in electronic emergency services and demonstrated that maturity across the principal dimensions was generally at a moderate to high level. The findings showed that the Social Customer dimension exhibited moderate to relatively high maturity, the organizational dimension demonstrated relatively favorable maturity with particular strengths in knowledge-oriented culture and senior management support, and the process dimension reflected moderate to upper-moderate maturity. In addition, the Expert System Technology dimension showed comparatively strong performance, and the overall model demonstrated satisfactory psychometric properties and an excellent fit to the empirical data. The confirmatory factor analysis results, including high factor loadings, satisfactory Average Variance Extracted (AVE), strong Composite Reliability (CR), and favorable model-fit indices, supported the construct validity and reliability of the proposed framework. These findings indicate that Social Customer Knowledge Management maturity in electronic emergency services is not dependent on a single organizational factor but instead emerges from the interaction among customer engagement, organizational knowledge capabilities, process maturity, data-related competencies, and expert-system technology. This interpretation is consistent with the broader maturity literature, which conceptualizes organizational maturity as a multidimensional and progressive capability formed through the simultaneous development of structures, processes, technologies, governance mechanisms, and human competencies (GhelichKhani et al., 2022; Korsten et al., 2025; Rajaei et al., 2023).

One of the principal findings was that the Social Customer dimension was generally at a moderate to upper-moderate level. Customers demonstrated relatively favorable active participation, loyalty, survey responsiveness, interaction with expert systems, and satisfaction with interactions, whereas experience sharing, improvement suggestions, and feedback creativity received comparatively lower scores. This pattern suggests that customers are relatively willing to participate in established and structured interaction mechanisms but are less likely to engage in more proactive, innovative, and knowledge-generating forms of participation. From a Social Customer Knowledge Management perspective, this distinction is important because simple interaction does not necessarily produce high-value customer knowledge. Mature systems require customers to move beyond being respondents to organizational requests and become active contributors to knowledge creation, service redesign, and problem-solving. This interpretation is compatible with the concept of organizational maturity for co-creation, which emphasizes that genuine stakeholder participation requires institutional structures that allow users to contribute to service development rather than merely receive or evaluate existing services (Jukić et al., 2022). Therefore, the relatively weaker performance of feedback creativity and improvement suggestions may indicate that current mechanisms support participation more effectively than co-creation.

The positive correlations observed among active participation, network interaction, expert system interaction, information accuracy, and interaction satisfaction further reinforce this interpretation. In particular, the relatively strong correlation between active participation and expert system interaction indicates that customers who are more engaged with organizational processes are also more likely to utilize intelligent-system recommendations. This finding suggests the existence of a mutually reinforcing relationship between participation and technology use: customers who participate more actively may develop greater familiarity with digital systems, while effective and useful digital systems may, in turn, stimulate further participation. This is consistent with research on digital maturity demonstrating that organizational and user capabilities often develop through reciprocal interactions between technology, behavior, and institutional arrangements (Veshnaveh, Mohamad Esmaeel, et al., 2024; Veshnaveh, Mohammadesmaeil, et al., 2024). The finding is also compatible with the broader argument that digital maturity should not be reduced to infrastructure alone but must include users' capacity and willingness to interact meaningfully with digital technologies (HosseiniNasab, 2025). Thus, the relatively strong correlations observed among participation-oriented indicators support the multidimensional nature of Social Customer Knowledge Management maturity.



The lower maturity scores for feedback creativity and improvement suggestions are also consistent with concerns raised in the literature regarding the limitations of digital participation. Digital platforms can expand opportunities for interaction, yet they do not automatically create autonomous or creative participation. Platform structures may shape, restrict, or channel user behavior in ways that encourage standardized forms of interaction while limiting deeper forms of engagement (Harracá et al., 2023). In the present study, customers appeared more comfortable engaging through established channels such as surveys, routine feedback, and expert-system interaction than generating novel improvement ideas. This indicates that digital participation mechanisms may currently be more transactional than co-creative. Accordingly, improving maturity in this dimension requires not only expanding digital channels but also redesigning them to facilitate open-ended feedback, collaborative problem-solving, and customer-driven innovation.

The organizational dimension demonstrated some of the strongest results in the study. Knowledge-oriented culture and senior management support achieved the highest mean scores, while knowledge management capability, technology infrastructure, data analytics capability, and formal policies also performed favorably. These findings indicate that the organization has established an important institutional foundation for Social Customer Knowledge Management. A supportive culture and active leadership are particularly important because knowledge management depends on managerial legitimacy, resource prioritization, communication, and the integration of knowledge-related activities into routine organizational practice. Previous studies similarly emphasize that maturity is closely associated with organizational learning, leadership support, and institutionalized learning mechanisms (Atalla et al., 2025). The present findings are also consistent with studies suggesting that organizational maturity is reinforced when management systems, information literacy, human resources, and change mechanisms are aligned with strategic objectives (Bikzad, 2022; Naser Torabi et al., 2022). Therefore, the comparatively high scores for leadership and knowledge culture can be interpreted as important enabling conditions for further maturity development.

Despite these strengths, employee training, resource allocation, and organizational innovation remained weaker components of the organizational dimension. This discrepancy is noteworthy because it suggests that favorable attitudes toward knowledge management have not yet been fully translated into equivalent levels of operational investment and innovation capability. An organization may endorse knowledge-oriented values and maintain supportive leadership while still experiencing shortages in specialized training, staffing, budgets, or innovation mechanisms. Such an imbalance may limit the transition from conceptual readiness to advanced maturity. The maturity literature suggests that organizational capabilities develop incrementally and that different capability components do not necessarily mature at the same pace (Korsten et al., 2025). Similarly, studies of digital transformation maturity emphasize that strategic intent must be supported by practical capabilities, including employee competencies, resource allocation, technological integration, and innovation processes (GhelichKhani et al., 2022; HosseiniNasab, 2025). The current findings therefore suggest that the organization possesses strong cultural and managerial prerequisites but requires further investment in implementation capacity.

The process dimension also demonstrated moderate to upper-moderate maturity, with knowledge utilization, customer feedback analysis, decision-making speed, and expert system utilization emerging as relatively strong indicators. This is particularly important in emergency service settings because the value of customer knowledge depends on the organization's ability to transform information into timely action. High scores for knowledge utilization and feedback analysis indicate that the organization has established mechanisms for converting customer-generated data into operational insight. These findings are compatible with research on process maturity, which emphasizes the importance of standardized, measurable, integrated, and continuously improved processes for translating information into organizational performance (Saravia-Vergara et al., 2023). The findings also align with studies linking organizational maturity with excellence and improved coordination, suggesting that mature processes strengthen decision quality and organizational effectiveness (Pishgoo et al., 2022).

Nevertheless, knowledge sharing, process standardization, data security and confidentiality, documentation management, and process performance evaluation remained comparatively weaker. These areas represent critical maturity bottlenecks because effective knowledge management depends not only on the ability to analyze data but also on the organization's capacity to distribute, document, secure, and evaluate that knowledge systematically. Weaknesses in knowledge sharing may create departmental silos, while insufficient standardization may produce inconsistent practices across units. In emergency services,



such inconsistencies can be especially problematic because information must move rapidly across organizational boundaries. The results are consistent with research showing that mature process systems require integration between organizational culture and formal process management (Saravia-Vergara et al., 2023). They are also consistent with data quality maturity research demonstrating that formalized control, monitoring, and improvement processes are necessary to ensure the reliability of data-intensive organizational systems (Kim et al., 2022).

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The moderate score obtained for data security and confidentiality deserves particular attention. Electronic emergency services may process highly sensitive customer and service data, and therefore security maturity is a fundamental prerequisite for trustworthy knowledge management. The current findings suggest that while technological and analytical capabilities are relatively well developed, security maturity has not reached an equally strong level. This pattern mirrors findings from prior information systems security research indicating that organizations may adopt advanced information systems while still experiencing weaknesses in governance, procedural controls, employee awareness, and security monitoring (Shimels & Lessa, 2023). Cybersecurity maturity research further emphasizes that effective security requires the integration of technical safeguards with organizational policies and management practices (Koolen et al., 2024). Accordingly, security should be treated as a structural component of Social Customer Knowledge Management maturity rather than as a peripheral technical issue.

The strong performance of the Expert System Technology dimension provides further evidence of the technological readiness of the studied organization. Data analytics capability, operational recommendation generation, and system flexibility exhibited high factor loadings, indicating that these components strongly represent the technological dimension of the model. This result is consistent with research on business intelligence maturity, which identifies data-processing capability, analytical capacity, and decision-support functionality as essential components of mature organizational intelligence systems (Nazarian-Jashnabadi et al., 2023). It also corresponds with research on organizational readiness for advanced digital technologies, which shows that technological adoption is more effective when organizations possess the governance, infrastructure, and organizational capabilities required to integrate new technologies into decision-making processes (Wright, 2022). In electronic emergency services, expert systems can be particularly valuable because they can accelerate the analysis of customer-generated and operational data and support decisions under conditions of urgency and uncertainty.

The significant differences identified among employee groups also provide important organizational insights. Employees in management and planning and operations units reported higher maturity scores across several Social Customer indicators, while support and call center personnel generally reported lower scores. These differences may reflect unequal access to strategic information, analytical systems, customer data, and decision-making authority across organizational units. Employees whose roles are more closely connected to planning or operations may have greater exposure to customer knowledge and may be more directly involved in transforming that knowledge into organizational action. Conversely, employees in support or call center roles may encounter substantial volumes of customer information but have more limited opportunities to analyze or utilize that information strategically. This result supports the argument that maturity is influenced by the distribution of capabilities and resources across organizational roles rather than by organization-wide averages alone (Korsten et al., 2025). It also indicates that organizational maturity should be evaluated not only vertically across maturity levels but horizontally across departments and functions.

The results of the confirmatory factor analysis provided strong support for the validity of the proposed model. The factor loadings for the Social Customer indicators were consistently high, Composite Reliability values exceeded accepted thresholds, and AVE values supported convergent validity. Similarly, the three broader dimensions—Social Customer, Organizational Knowledge, and Expert System Technology—demonstrated satisfactory psychometric properties. The model fit indices were also highly favorable, with CFI = 0.95, TLI = 0.94, RMSEA = 0.045, and SRMR = 0.043. Collectively, these results indicate that the model provides a coherent representation of Social Customer Knowledge Management maturity in the studied context. The strong empirical structure of the model is compatible with the broader maturity literature, which emphasizes the need for empirically validated multidimensional frameworks rather than purely conceptual classifications (Nazari Ardabili et al., 2024; Rajaei et al., 2023). The findings therefore contribute to the literature by integrating customer-related, organizational, process-oriented, and technological maturity components within a unified assessment framework.



The correlations among the three principal model dimensions further demonstrate that Social Customer Knowledge Management maturity is systemic rather than compartmentalized. The correlation between the Social Customer and Organizational Knowledge dimensions, the relationship between the Social Customer and Expert System Technology dimensions, and the particularly strong relationship between Organizational Knowledge and Expert System Technology indicate that none of these dimensions operates independently. Technological capabilities are more useful when organizational knowledge processes are mature, and organizational knowledge systems become more valuable when customer participation generates relevant and accurate information. This interpretation is consistent with digital transformation maturity studies that emphasize alignment among technology, governance, organizational processes, and human capabilities (HosseiniNasab, 2025; Veshnaveh, Mohammadesmaeil, et al., 2024). It also supports data governance maturity research demonstrating that technological capacity must be accompanied by clear governance structures, accountability, and organizational processes (Bensaeed et al., 2025).

The findings also have implications for organizational resilience. Emergency service organizations operate under conditions in which rapid adaptation, continuity of service, and reliable access to information are essential. Higher levels of digital and organizational maturity have been associated with greater resilience during severe crises because mature organizations are better able to coordinate information, adapt processes, and use technology strategically (Rotem & Fisher, 2022). In this regard, the relatively favorable maturity levels observed in the present study suggest that the organization possesses a meaningful foundation for resilience, particularly through its knowledge-oriented culture, expert system capabilities, and data analytics capacity. However, weaknesses in resource allocation, training, knowledge sharing, and security may reduce the effectiveness of that resilience under highly demanding conditions. Strengthening these areas could therefore contribute not only to knowledge management maturity but also to organizational preparedness and crisis-response capacity.

Overall, the results support the view that Social Customer Knowledge Management maturity should be approached as a dynamic organizational capability that develops through the coordinated advancement of customer participation, organizational learning, process management, technological infrastructure, security, governance, and human competencies. Previous research has shown that maturity is associated with organizational vitality, excellence, resilience, learning, and broader developmental outcomes (Pishgoo et al., 2022; Sabzi et al., 2022; Tootian & Ehsani, 2023). The present findings extend this perspective to electronic emergency services by demonstrating that maturity in customer knowledge management is strongest when organizations combine active customer interaction with institutionalized knowledge practices and advanced analytical technologies. Therefore, the proposed model provides both an empirical measurement framework and a managerial diagnostic tool for identifying strengths, recognizing developmental gaps, and prioritizing interventions aimed at enhancing knowledge-based decision-making and service quality.

The present study has several limitations that should be considered when interpreting the findings. First, the study was conducted within a specific electronic emergency service context, which may limit the generalizability of the results to other healthcare, governmental, or service organizations. Second, the use of a cross-sectional design limits the ability to examine how maturity develops over time or how organizational interventions influence transitions between maturity levels. Third, the data were collected using a researcher-developed questionnaire and therefore may be affected by self-report bias, social desirability, or differences in respondents' interpretations of maturity indicators. Fourth, although the study included employees from different organizational groups, customer perspectives were reflected indirectly through organizational assessments rather than through direct customer-level data. Finally, the relatively favorable model fit does not eliminate the possibility that other relevant dimensions, such as governance quality, interorganizational integration, ethical management of customer data, or artificial intelligence readiness, may also contribute to Social Customer Knowledge Management maturity.

Future studies should examine the proposed model across different emergency service organizations, healthcare systems, public-sector agencies, and private service organizations to evaluate its external validity and contextual adaptability. Longitudinal research is recommended to investigate how maturity levels evolve over time and to determine whether specific organizational interventions lead to measurable improvements in customer participation, knowledge processes, or technological capability. Future studies could also integrate direct customer data, social media analytics, system-generated behavioral data, and managerial assessments to reduce reliance on self-report measures and provide a more comprehensive evaluation of maturity. Comparative studies across regions or organizational types may further identify contextual factors that facilitate or



hinder maturity development. In addition, future research could extend the model by incorporating dimensions such as artificial intelligence governance, ethical data management, interoperability, organizational resilience, and interorganizational knowledge exchange.

From a practical perspective, managers of electronic emergency services should use the maturity model as a diagnostic and developmental instrument rather than merely as a measurement framework. Particular attention should be directed toward strengthening customer creativity and improvement-oriented feedback, enhancing employee training, increasing dedicated financial and human resources, improving knowledge sharing across units, standardizing knowledge-related processes, and strengthening data security and confidentiality. Organizations should also ensure that employees in support and call center units have adequate access to analytical tools and opportunities to participate in knowledge-based decision-making. Expert systems should be integrated more closely with existing organizational processes so that customer-generated data can be transformed rapidly into actionable knowledge. Finally, continuous monitoring of maturity indicators should be institutionalized to identify emerging weaknesses, evaluate the effectiveness of improvement initiatives, and support sustained progression toward higher levels of Social Customer Knowledge Management maturity.

Ethical Considerations

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

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Conflict of Interest

The authors report no conflict of interest.

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