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Penulis : Tining Haryanti, Nur Aini Rakhmawati, Apol Pribadi Subriadi

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1	Submit Artikel	29 April 2023
2	Revised Manuscript	11 Juni 2023
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Submission 29 April 2023

ISICO 2023 Submission 40

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Submission 40	
Title	Assessing the Digital Transformation Landscapes of Organization: The Digital Transformation Self-Assessment Maturity Model (DX-SAMM)
Paper:	 (Apr 29, 13:00 GMT)
Author keywords	Digital Transformation Digitalization Maturity Model Maturity Level
EasyChair keyphrases	digital maturity model (221), digital maturity measurements (95), computer science (80), measure digital maturity (79), digital transformation self assessment maturity model (77), business processes (70), comparative analysis (70), maturity level of digital transformation (69), digital maturity models (63), dimensions and sub dimensions (60), seventh information systems international (60), maturity models (60), digital maturity development model (60), various domains (60), affiliation address city and postcode country (51), maturity index (50), maturity levels (50), maximum value (50), customer experience (50), seven dimensions (50), model for industry (47), digital maturity measurement (42), literature review (40), industrial engineering and management (40), maturity model (40), digital transformation of industry (40), computer and information science (40), organization s digital transformation (40), study proposes (40), maturity model for assessing (40), dimensions used (40), success of digital transformation (40), dimensions of digital transformation (40), monitoring of digital maturity (40), dimensions used customer strategy (40), digital maturity measurement model (40), digital maturity measurement models (40), digital transformation maturity level (40), digital maturity measurement application (40), sub dimensions (40), customer trust (40), customer engagement (40), sub dimension (40), peer review under responsibility (40), maturity level (40)
Topics	
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Seventh Information Systems International Conference (ISICO 2023)

Assessing the Digital Transformation Landscapes of Organization: The Digital Transformation Self-Assessment Maturity Model (DX- SAMM)

First Author^a, Second Author^b, Third Author^{a,b,*}

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Abstract

The increasing digitalization of business and society has brought major changes for organizations to transform in an effort to maintain their sustainability. Adaptation to technological developments that have an impact on various adjustments to strategies, business processes, and organizational structures has become an integral part of being able to transformation. This transformation effort is accompanied by monitoring and evaluation to ensure conformity of the transformation with digital transformation maturity level standards. This study proposes an independent digital maturity measurement model (DX-SAMM Digital Transformation Self-Assessment Maturity Model) that allows companies to classify the achievement of their digital maturity. The expansion of existing digital maturity measurement models to include multidimensional engagement that dominates Digital Transformation is the focus of the research objectives. Overall, seven dimensions and twenty-one sub-dimensions were defined to measure the maturity level of digital transformation in organizations. This digital maturity measurement application considers various dimensions related to Digital Transformation, namely Strategy, Organizational Structure, Technology, Employees, Customers, Business Processes, and Culture. The Digital Transformation maturity level standard used adopts SPICE. It is part of the ISO/IEC 3300XX family of standards that specifically serves as a maturity reference for established structures. Case topics as empirical tests of model implementation are presented in this paper.

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Peer-review under responsibility of the scientific committee of the Seventh Information Systems International Conference.

Keywords: Digital Transformation, Digitalization, Maturity Model, Maturity Level

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Review 11 Juni 2023

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Topics	The increasing digitalization of business and society has brought major changes for organizations to transform in an effort to maintain their sustainability. Adaptation to technological developments that have an impact on various adjustments to strategies, business processes, and organizational structures has become an integral part of being able to transform. This transformation effort is accompanied by monitoring and evaluation to ensure conformity of the transformation with digital transformation maturity level standards. This study proposes an independent digital maturity measurement model (DX-SAMM Digital Transformation Self-Assessment Maturity Model) that allows companies to classify the achievement of their digital maturity. The expansion of existing digital maturity measurement models to include multidimensional engagement that dominates Digital Transformation is the focus of the research objectives. Overall, seven dimensions and twenty-one sub-dimensions were defined to measure the maturity level of digital transformation in organizations. This digital maturity measurement application considers various dimensions related to Digital Transformation, namely Strategy, Organizational Structure, Technology, Employees, Customers, Business Processes, and Culture. The Digital Transformation maturity level standard used adopts SPICE. It is part of the ISO/IEC 33000X family of standards that specifically serves as a maturity reference for established structures. Case topics as empirical tests of model implementation are presented in this paper					
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Apol Pribadi	Subriadi	apolpribadi@gmail.com	Indonesia	Information System Department - ITS		✓
Reviews						
Review 1						
Overall evaluation	<p>2: (accept) Unclear:</p> <ol style="list-style-type: none"> "Based on a comparative analysis, seven dimensions and 21 subdimensions were proposed for digital maturity measurement.". The article does not explain how "comparative analysis" was done. How DX-SAMM Dimensions and Sub Dimensions are constructed. <p>Could be Improved:</p> <ol style="list-style-type: none"> More context on the case study: <ul style="list-style-type: none"> - How the questionnaire is distributed - Who and how many participants - Why the company is selected among other possible companies Providing the questionnaire Type: "He is intended" ... "It is"; "Click or tap here to enter text" 					
Review 2						
Overall evaluation	<p>1: (weak accept) I have reviewed the paper titled "[Paper Title]" submitted to the Information Systems International Conference. The authors present a digital maturity measurement model, DX-SAMM, for assessing the level of digital transformation in organizations. While the paper addresses an important topic and provides a foundation for further research, there are several areas that require revision and clarification before it can be considered for presentation at the conference.</p> <p>Strengths:</p> <ol style="list-style-type: none"> The paper explores the increasing digitalization of business and society and highlights the need for organizations to transform to maintain their sustainability. The proposed digital maturity measurement model, DX-SAMM, offers a comprehensive approach by considering multiple dimensions related to digital transformation. The inclusion of empirical case studies provides practical insights into the application of the DX-SAMM model. The paper contributes to the literature by adding references for digital maturity measurements that can be implemented in general. <p>Weaknesses:</p> <ol style="list-style-type: none"> The research question and its relationship to the motivation are not explicitly stated in the introduction. The authors need to clearly articulate the research question and connect it to the existing literature to highlight the significance of their study. The methodology used to undertake the research is not adequately explained. It is unclear how the research question informs the chosen methodology. The authors should provide a clear explanation of the methodology, including the utilization of both Bequier's and Hevner's methodologies. I would suggest the authors create a process model to demonstrate the step-by-step application of these methodologies and how they are intertwined. The paper lacks a theoretical contribution to the field of digital transformation or a specific domain. It is important for the authors to clearly state how their research extends the current understanding of digital transformation and its implications. The practical implications of the study are not clearly explained. The authors should explicitly state for whom their work is relevant (e.g., unit managers, IS project managers) and provide a formal definition for these roles. This information should be included in both the introduction and the conclusion. The conclusion could be strengthened by summarizing the main findings of the study and their implications for 					

practitioners and researchers. Additionally, the authors should address the need for future research to empirically test the DX-SAMM model in various domains. Please convey these comments to the authors and request them to revise the paper accordingly. I believe that with these revisions, the paper has the potential to make a valuable contribution to the field of information systems and digital transformation. Thank you for considering my review, and I look forward to reviewing the revised version of the paper.

Review 3

2: (accept)
[paper 40] Assessing the Digital Transformation Landscapes of Organization: The Digital Transformation Self-Assessment Maturity Model (DX- SAMM)

A. Strengths:

1. Clear objectives: The paper aims to propose the DX-SAMM model for measuring digital maturity across multiple dimensions and to provide empirical validation through case studies.
2. Comprehensive review: The abstract acknowledges the increasing digitalization of business and society and the need for organizations to transform. It also highlights the multidimensional nature of digital transformation and the use of SPICE as a reference for maturity levels.
3. Relevance: The topic of assessing digital transformation landscapes and proposing a maturity model is relevant to the field of information systems and offers practical value for organizations undergoing digital transformation.
4. Summary of findings: The conclusion provides a summary of the main findings related to the development of the DX-SAMM model and its potential for measuring digital maturity across multiple dimensions.
5. Practical implications: The conclusion emphasizes the practical application of the model and its potential for guiding future strategies in organizations undergoing digital transformation.

Overall
evaluation

B. Weaknesses:

1. Lack of specific details about findings: The conclusion does not provide specific details about the nature of the dimensions and sub-dimensions identified or their implications for digital maturity assessment.
2. Limited discussion of limitations and future research: The conclusion briefly mentions the need for adjustments in different domains and the need for more empirical testing but does not provide a comprehensive discussion of other potential limitations of the study or a detailed plan for future research.

C. Decision: Revise

The paper has potential but requires revisions to address the identified weaknesses. The conclusion should expand on the findings, providing specific details about the dimensions and sub-dimensions, and their practical implications for organizations undergoing digital transformation. Additionally, it would be beneficial to include a more comprehensive discussion of the limitations of the study and a detailed plan for future research, including the need for adjustments in different domains and the specific domains to be targeted in further empirical testing. By addressing these issues, the paper will provide a stronger contribution to the field of digital transformation assessment and offer more practical insights for organizations seeking to monitor and improve their digital maturity.

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FINAL MANUSCRIPT 27 Juni 2023

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Seventh Information Systems International Conference (ISICO 2023)

Assessing the Digital Transformation Landscapes of Organization: The Digital Transformation Self-Assessment Maturity Model (DX-SAMM)

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Abstract

The increasing digitalization of business and society has brought major changes for organizations to transform in an effort to maintain their sustainability. Adaptation to technological developments that have an impact on various adjustments to strategies, business processes, and organizational structures has become an integral part of being able to transformation. This transformation effort is accompanied by monitoring and evaluation to ensure conformity of the transformation with digital transformation maturity level standards. This study proposes an independent digital maturity measurement model (DX-SAMM Digital Transformation Self-Assessment Maturity Model) that allows companies to classify the achievement of their digital maturity. The expansion of existing digital maturity measurement models to include multidimensional engagement that dominates Digital Transformation is the focus of the research objectives. Overall, seven dimensions and twenty-one sub-dimensions were defined to measure the maturity level of digital transformation in organizations. This digital maturity measurement application considers various dimensions related to Digital Transformation, namely Strategy, Organizational Structure, Technology, Employees, Customers, Business Processes, and Culture. The Digital Transformation maturity level standard used adopts SPICE. It is part of the ISO/IEC 3300XX family of standards that specifically serves as a maturity reference for established structures. Case topics as empirical tests of model implementation are presented in this paper.

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Peer-review under responsibility of the scientific committee of the Seventh Information Systems International Conference.

Keywords: Digital Transformation, Digitalization, Maturity Model, Maturity Level

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1. Introduction

Companies face major challenges due to technological, social, economic, and societal developments. Transformation as a form of response and adaptation to immediate changes is needed to maintain sustainability. Since the Industrial Revolution 4.0, technology has developed significantly. Although it brings great opportunities, disruptive challenges are inevitable, such as artificial intelligence, intelligence of things, and automation of various activities. Companies must be able to transform digitally. Digital Transformation (DX)[1]–[3] itself, as a form of continuous transformation, is complex and plays an important role in shaping the organization’s future [4]. DX is increasingly complex and involves various aspects[5]. A comprehensive viewpoint is required to embrace DX, which includes heterogeneous and complex processes of various dimensions[6], [7]. Therefore, over the coming time, both academics and practitioners will continue to strive to improve the efficiency of digital transformation accordingly through various digital integrations and consequent intelligence at both horizontal and vertical levels in organizations. On the other hand, organizations need to identify the state of development of digital transformation that has been carried out to link the transformation carried out with their strategy. Digital transformation involves various dimensions, methods, and tools that adopt dimensions related to digital transformation. In this study, a digital maturity model called the Digital Transformation Self-Assessment Maturity Model (DX-SAMM) was used. DX-SAMM is used to systematically assess the state of development of an organization's digital transformation in relation to its maturity level of digital transformation. The development of this maturity model has scientific and practical objectives. The scientific goal is to obtain precise data on the current state of an organization's digital transformation and DX achievement strategy. The practical goal is to enable organizations to monitor and rigorously evaluate their own digital maturity. Finally, digital maturity measurements can be used as a guide for developing future strategies. The structure of this paper includes, the first chapter discusses the Background, continued the discussion of Analysis of the use of the Maturity Index level, Calculation of the Maturity Index assessment score, Demonstrate Artifact, Evaluate Artifact and the implementation of the Digital Maturity Model Dashboard in several industry sectors and ends with a conclusion[8]

2. State of the arts of digital maturity models

Digital Transformation in various sectors has experienced unstoppable developments. Various organizations respond to digital transformation by adopting changes in their business processes to compete and survive. Digital maturity monitoring is part of a guide to determine the level of achievement of digital transformation that has been carried out. This also helps organizations formulate strategies in the future. The digital maturity model is often interpreted as an instrument for measuring and conceptualizing organizational readiness for certain conditions and targets. These digital maturity states are identical in capturing the initial conditions that initialize the later development. In short, digital maturity is defined as measuring achievement in a desired future state. Digital transformation is growing rapidly and massively, and will continue to be interesting in the future. Researchers and practitioners have conducted extensive research on digital transformations and maturity measurement models. However, these maturity models have diverse dimensions and cannot be applied to various sectors in general. Meanwhile, according to Gokalp and Martinez [4] and Ozkar and Demiror [9] in their work, the maturity model should have standard characteristics that can be widely applied in various sectors. Some of the pre-existing digital maturity models are presented in table 1.[1][2], [3][1][4][9][4], [9]

Table 1. Previous research

Model Name	Digital Maturity Assessment	Source
The DX-CMM, 2021	DX measurement dimensions: Capability and Process; Maturity level in the range of 0-incomplete to 5-innovating; used for all sectors; can be used independently; There is no digital maturity measurement device / application yet	[4]
Digital Maturity Model, 2020	Dimensions used: culture, customer, people, strategy, operations, technology, and the organization; Maturity level in the range of 1-Initiating to 5-Leading; can be used in various sectors, requires a third party to use it	[10]

A model for assessing the maturity of Industry 4.0 in the banking sector, 2019	Dimensions used: Products and services, Governance, Technology and Resources, Operations, Strategy and organization, Employees; Maturity level in the range of 1-Initiating to 5-Digital Oriented; specifically for banking; require a third party to use it	[11]
Deloitte's digital maturity model, 2018	Dimensions used: customer, strategy, culture, people, structure, tasks; can be used in various sectors, requires a third party to use it	[12]
Dreamy, 2017	Dimensions used: Organization, Process, Technology, Monitoring and Control; Maturity level in the range of 1-Initiating to 5-Digital Oriented; specifically for banking; require a third party to use it	[13]
Industry 4.0 Maturity Model, 2016	Dimensions used: customer, strategy, technology, operations, culture, people and the organization; Maturity level in the range of 1-Initiating to 5-Leading; manufacturing sector, requires a third party to use it	[8]
Impulse, 2015	Dimensions used: strategy and organization, smart operations, smart factory, employees, smart products, data-driven services; Maturity level in the range of 1-Top performer to 5-Insider; manufacturing, requires a third party to use it, tools available	[14]

The DX-CMM is a digital maturity model that can be used for a variety of sectors, but measurement tools or applications that can easily be used by organizations are still not available. The impulse comprehensively and in detail describes the dimensions, items, and value approaches. Impulse also has web-based tools that organizations can easily use to measure digital maturity. However, this maturity model is limited to the manufacturing domain, and cannot be used in other domains. Bandara et al. (2019) applied the level of digital maturity specifically to banking. In addition to being applied to specific domains, this model is not equipped with maturity measurement tools that can be accessed directly by users. Meanwhile, organizations need digital maturity monitoring as a guide for determining future strategies. Self-monitoring of digital maturity makes it easier for organizations to evaluate the achievement of digital maturity whenever needed. While various maturity models already exist, not all can be used independently by the organization (requiring a third party). In addition, existing maturity models more specifically measure digital maturity. Therefore, this study proposes a form of expansion of digital maturity measurement models and tools focusing on a multidimensional approach that can be utilized for general use. This measurement model is then equipped with digital maturity measurement tools that can be independently utilized through website-based digital maturity measurement services. [4][14][11][4], [9][15][10], [11][11], [14]

3. Methodology

This study proposes the development of a digital maturity model to independently determine the maturity level of digital transformation in organizations. The method used to develop the digital maturity model adopted Becker’s approach. This approach focuses on a maturity model that has a strong theoretical foundation. The development of maturity measurement devices in this study used the design science approach proposed by Hevner[16]. Based on the Becker procedure, model development is carried out with multiple methodologies, such as a systematic literature review and conceptual validation of the model and its testing. In this study, the development process was divided into several stages. The first stage is an understanding of the domain of digital maturity, and interviews with practitioners and researchers are conducted to help determine the problems and needs of digital maturity measurements. The next step is to conduct a literature review. The literature study was conducted using the keywords "digital maturity," "digital transformation" from various reputable scientific studies. This literature review produced dozens of models with hundreds of dimensions of digital transformation. [17][16]

Table 2. DX-SAMM Dimensions and Sub Dimensions

Dimension	Information	Sub Dimensions
Organization and Structure	The structure of the organization consists of internal organization and dynamic network collaboration. Organization can be defined as an input to DX. Management's readiness to change is needed in achieving digital maturity. Another requirement is continuous learning and restructuring of the organization's business processes in order to prepare for transformation.	Organizational Structure Management, Organization Change Management, Sustainable Learning Management

Technology	Technology represents the ability to effectively plan, deploy, and integrate technology to support digital business.	Information System, Infrastructure, Security Management,
Strategy	Strategy plays an important role in providing input to the organization in shaping organizational readiness to transform. He leads the vision, roadmap, and inspires how existing technology can create value in the future.	Strategy Development, Financial Analysis, Portfolio Management
Customer	Customer involvement in interacting with the organization's digital services provides an experience for customers. An easy user interface is required to support this activity. Good customer experience in interacting increases customer trust in the organization's services.[18]	Customer Engagement, Customer Experience, Customer Trust
Employee	The ease of adaptation of the organization to various changes is supported by continuous learning activities and change management. In addition, the willingness to learn allows for a better process of organizational adaptation.[10]	Awareness, Skills, Continuous learning
Culture	Technology does not add value to an organization until it has a culture in which employees trust the system, known and readily accept it[19][20], [21] .	Social Collaboration, Willingness to Change
Business Process	Process Transformation describes the extent to which processes are integrated through technology for efficiency. The integration referred to at the internal and external levels of organizational and business digitization processes. External integration consists of electronic data exchange with partners.[4][22][23][24][25][26]	Business Digitalization, Business proses Vertical Integration, Business Proses Horizontal Integration.

The results of the literature review were revalidated in relation to the relevance and suitability of the dimensions, resulting in 44 digital maturity models. This maturity model is considered for further analysis on the grounds that the work offers a relevant framework within which the maturity level assessment has been practically tested. From this work, relevant concepts were obtained for the structure of the digital maturity development model offered in this study, such as the maturity level. In general, there are five maturity levels, ranging from one as the lowest maturity to five as the highest maturity. The assessment form uses assessments of several dimensions. Assessment is performed independently or with a third party, and the models are visualized in numbers or graphs. All the validated models were rechecked to ensure the completeness and suitability of the dimensions. A comparative analysis of the digital maturity model was carried out to identify the dimensions of success of Digital Transformation, which were then evaluated for their application to the proposed digital maturity development model. Based on the literature test and comparative analysis techniques, a distribution of seven dimensions and 21 subdimensions was obtained, which supported the success of digital transformation. The next stage is to visualize the model as a practical tool that can be used to measure digital maturity. The proposed model is visualized in the form of an artifact, a digital maturity measurement application that can be independently accessed. Construction of this artifact using a design science research approach. The model validation phase used a case study approach. Case studies are a design evaluation approach that can be used to validate the models. In the end, a case study of a transport company is proposed to test the implementation of the development of a digital maturity model.[3][15][16][9]

4. Digital Maturity Measurement (DX-SAMM Digital Transformation – Self Assessment Maturity Model)

This study proposes the development of a digital maturity model that considers multidimensional involvement to facilitate the monitoring of digital maturity in organizations. Based on a comparative analysis, seven dimensions and 21 subdimensions were proposed for digital maturity measurement. Table 2 presents a general explanation of the proposed dimensions and their accompanying subdimensions. The digital maturity development model, which is called DX-SAMM in this study, is intended to measure digital maturity in organizations. The maturity level used in this study was adopted from the maturity level of SPICE. It is part of the ISO/IEC 3300XX family of standards, and is widely used as a reference model for maturity. In addition, SPICE has been widely adopted in maturity measurement in various domains, such as organizational agility measurement, automotive, governance, and cross-domains. The maturity levels range from level 0 to level 5. Level 0 is called incomplete, which describes the DX requirement to be

low. Level 1: Performed, indicating that the DX process had started. Level 2: Managed DX processes are well-managed. Level 3: Established Process, The Digital transition process has been carried out consistently in accordance with established standards. Level 4: Predictable and DX process quantitative techniques are applied. Level 5: Optimizing, DX process evaluation is carried out.[4][9][27], [28][29][4]

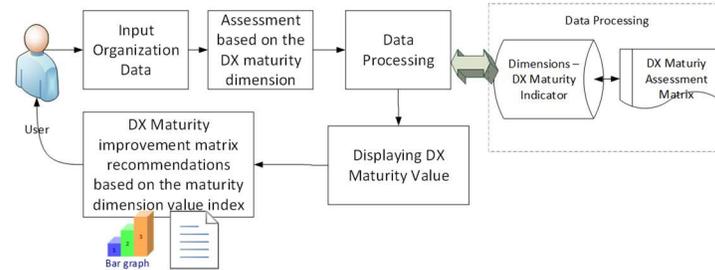


Fig. 1. Digital Maturity Measurement Process[1]

The stages of DX-SAMM digital maturity measurement are presented in figure 2. Digital maturity assessment was measured through the dimensions and sub-dimensions of digital transformation using questionnaires. One dimension was measured through several sub-dimensions, while each sub-dimension was measured through several question items in the form of questionnaires. Each question’s answer was mapped on a Likert-type scale. To be able to answer questionnaires correctly and accurately measure digital maturity, user understanding of the meaning of digital transformation and the business processes that occur in organizations is very important. Therefore, a management group discussion session is required to complete the DX-SAMM assessment. Responses to the questionnaires served as data inputs to calculate and represent maturity levels. The next step was data processing by processing the values of the input results of the questionnaire answers. The calculation process was carried out according to the formulas presented in formulas 1, 2, and 3 (Eq. 1, 2, 3). From the results of this calculation[1], [8], [26], the maturity level was obtained in accordance with the score limit[26]. Level 0 limits the maximum score 0.2, level 1 with a maximum value of 0.8, level 2 with a maximum value of 1.6, level 3 with a maximum value of 2.4, level 4 with a maximum value of 3.2, and level 5 with a maximum value of 4.0

$$J_{(d,a)} = \frac{\sum_{q \in Q_{da}} \frac{\sum_{r \in R} H(r,q)}{|R|}}{|Q_{da}|}; \quad M_{(d)} = \frac{\sum_{a \in A_d} J(a,d)}{|A_d|}; \quad M_0 = \text{Min}(M_1, M_2, \dots, M_D)$$

(eq. 1, 2, 3)

M: Maturity; A: Average value of the attribute; Q: Question; H: The result of the value of the Likert scale; D: Dimension; R: Respondents; A: Attributes.

Generally, maturity models tend to fail when they are too complex. Therefore, the level of detail for developing this model was adjusted to the needs of various domains in general, as explained earlier. DX-SAMM aims to make it easy for organizations to measure their own digital maturity achievements independently. The results of the data processing were then presented by the system in the form of a dashboard on the website. Representations of the overall maturity achievements and details per dimension are also presented. Evaluations to test the practical use of DX-SAMM are conducted with organizational case studies discussed in the next chapter.[8]

5. Case-study

Case studies evaluating the use of DX-SAMM were conducted in financial sector organizations with more than 200 employees and several branches. To ensure the accuracy of the results, organizations that had undertaken digital transformation efforts were selected. A management group session was formed to assist in the completion of the assessment. Furthermore, the system processes the input results according to the answers in the form of Likert scales for each question. In figure 2 (fig.2) the maturity levels of the seven dimensions are visualized.



Fig. 2. Maturity Measurement in Financial Organizations

Based on DX-SAMM measurements, this organization is at level 3, namely, the established process with a digital maturity score of 2.37. Digital maturity in each dimension included $M(\text{organization Structure}) = 3.30$, $M(\text{technology}) = 3.80$, $M(\text{strategy}) = 3.23$, $M(\text{employee}) = 2.83$, $M(\text{Customer}) = 2.37$, $M(\text{Business Process}) = 3.00$, and $M(\text{culture}) = 3.40$. The value of each subdimension is shown in Figure 3. A Customer Score of 2.37 is the lowest score of all dimensions. This is mainly because service users and customers are still not fully involved in digital services, lack experience using services with technology, and low customer trust in technology. This is confirmed in management group sessions, namely, the practice of helping customers when using services is still common. Some of the reasons are the difficulty of customers in using the system and the hesitation of the customer in processing services using technology rather than manually. The technology dimension score was 3.8, which is the highest score for all dimensions in the organization. This is because, in the process of its work, the organization has utilized technology requirements on DX projects, including development, integration, business processes, and infrastructure. Technology has been used for application development, data processing, and IT security management[4][10][30]. The organization and its branches have been equipped with computers, computer networks, and connection services to the Internet, including the use of fixed and cellular broadband or other fixed connections. [Click or tap here to enter text.](#) Projects and activities related to digital transformation were identified, evaluated, and prioritized. Infrastructure and skill improvement programs were provided to support transformation. Various digital transition activities have been conducted consistently. Organizations have also made changes to existing business processes by digitizing technology. In addition to providing digital maturity measurement results, DX-SAMM also provides recommendations for improvements to the next maturity level and necessary improvements to the current level. Based on ISO/IEC Assessment-SPICE, it is recommended that the customer dimension needs to be optimized for maturity level. The customer dimension consists of the Customer Engagement sub-dimension which is associated with customer engagement in digital services, Customer Experience which is associated with customer experience in interacting with the organization, and customer trust, which is customer trust in technology services provided by the organization.

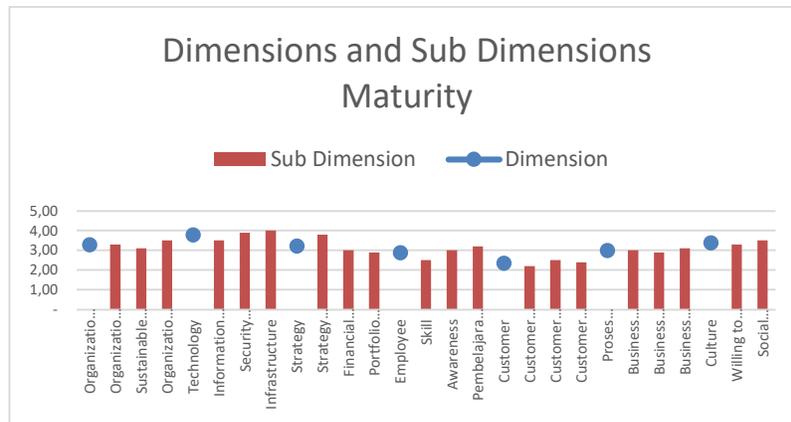


Fig. 3. Dimension and Sub Dimension Score in Case Study

These suggested improvements relate to DX requirements that provide space for customer engagement in interacting with the organization through an easy-to-use user interface. Customer involvement enables the creation of customer experience. The reliability of the services increases customer trust. The results of the confirmation in the organizational management session showed that customer independence in using technology-based services was minimal. Generally, customers depend on employee assistance when interacting with services. The next improvement is that organizations need partnerships to build a digital ecosystem, digitization in customer service delivery, and digitization of contacts. The utilization of Internet (mobile) technology as an intermediary in direct access to customers is necessary to offer full transparency and the possibility of innovation in new types of services [10][8][11] [31][32].

6. Conclusion

In this study, a digital maturity measurement model called the DX SMM was developed. He is intended for monitoring digital maturity measurements in general to be utilized by organizations in assessing their digital maturity independently. The model in this research was developed using several approaches, including literature review, comparative analysis, design in the development of measurement tools, and empirical validation with case studies. In this study, SPICE was adopted as a reference for maturity levels in various domains. Unlike other digital maturity models, DX-SMM emphasizes digital maturity measurements that involve multi-dimensionality, can be used in various domains in general, and can be used independently. Digital maturity measurements can also be practically applied. Case studies show that organizations can use the results of their digital maturity assessments as a guide to formulate future strategies. This study contributes to the literature by adding references for digital maturity measurements that can be implemented in general. The main dimensions that affect the success of transformation are identified through comparative analysis, namely seven dimensions with 21 sub-dimensions. Although the development of the DX-SMM model has resulted in maturity measurements that can be used in various domains, the differences in characteristics between the domains are not generalizable. Therefore, dimensional and subdimensional depth adjustments in different domains cannot be ignored. Future research is needed to empirically test this with more cases from various domains. Finally, DX-SMM is a practical alternative for organizations to be able to monitor the achievement of the digital transformation process independently, and the measurement results can be used as a baseline to achieve a better level of maturity.

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