

The maturity level of DX-CMF is refers to DX-CMM maturity level and described in Table 6.

Table 6. Description of The DX-CMM Maturity Level (Gokalp and Martinez 2021)

Maturity Level	Description
Level 0: Incomplete	The DT development has not yet started.
	There is no digital transformation initiative yet.
Level 1: Performed	The DT development has been started.
	The internal policy, strategic and planning of DT is developed.
	There is a work team responsible for DT.
Level 2: Managed	The DT is managed, where the creation of the digital shadow of physical objects starts.
	Standards, guidelines, procedures are established for the enterprise architecture of process, data, application and technology.
Level 3: Established	At this stage, DT is fully established.
	Vertical integration.
	Standardized qualification of digital transformation process.
Level 4: Predictable	It is established to have horizontal integration, which is the integration of networks at the organizational level.
	Data analytics and data driven decision making are applied.
Level 5: Innovating	Innovative business process.
	Continuous adaption.
	Self-optimization.

4.1 Weighting Criteria and Sub-Criteria using AHP

This study has four main criteria and twenty-four sub-criteria. The criteria and sub-criteria were derived from a literature review. Each criteria and sub-criteria is assigned a weight indicating its relative importance. Four experts completed a questionnaire with a Likert scale ranging from 1 to 9 to determine the weighting of the criteria and sub-criteria. AHP was utilized to determine the relative importance of each criterion and sub-criteria based on the findings of an expert survey. The results of the weighting calculation for each criterion and sub-criteria are shown in the Table 9.

5. Results and Discussion

Digital readiness can be defined as the propensity and willingness to utilize and adapt digital technology as well as the ability to generate new ideas with the potential to use this technology to assist people, companies, industries, and nations achieve goals more quickly and effectively (Nasution et al. 2018). Organizational preparedness for digitization (Soomro 2018) is another definition of digital readiness. Based on the definition of digital readiness provided above, it is possible to define digital audit readiness (DAR) as the ability and willingness to transition audit activities to digital technology, as well as the ability to develop new innovations in digital audit transformation that can optimize and improve the organization's processes. With specific scope adjustments in audit activity, the digital audit readiness model will be referred to as DX-CMF. The four aspects and fourteen processes in DX-CMF that are still of a general character will be defined in the context of the internal audit's coverage.

The four DX-CMF aspects that will be connected to DAR are described as follows: The first is internal policy and governance (IP), which consists of internal policies to control the execution of DX audit operations, such as strategic planning, a DX audit work team, and financial resources for DT audits. The second aspect is information and technology (IT). For the organization's migration to the desired future environment, an IT strategy that is compatible with the DX strategy should be created. For each DX audit process, the design, integration, governance, and maintenance of IT should be defined. The third component is called digital process transformation (DP), and it can be used to define the transformation of major or supporting operations in a digital audit process. And the last aspect is human resource management (HR). Before the transformation process starts, cultural change should be implemented. Development of human resources skills, management of organizational structure, sustainable learning, and organizational transformation

are all crucial. The improvement of auditor skills must be recognized in audit activities. For the digital audit transformation to be sustainable, top management support and auditor readiness are both required.

Table 7. Definition Process of DX-CMF for Digital Audit Readiness

DAR Aspect	Indicator Process	Definition
Internal policy and governance (IP)	IP1: Internal Policy of DX Governance	Developing internal regulations to serve as a legal framework for the digital audit.
	IP2: DX Strategic and Planning	Establishing a defined strategic and plan of action for how digital audit may help the organization compete and prosper.
	IP3: Project Management	There is an organization or team that is responsible for implementing the digital audit.
	IP4: Financial Resources	The development of digital audit is supported by a budget.
Information and Technology (IT)	IT1: Requirement Definition	The information and technological requirements for digital audit are described in specifications in detail.
	IT2: Enterprise Architecture Development	Establishing an enterprise architecture (EA) or conceptual design that explains the entire digital audit process.
	IT3: Infrastructure Management	Monitoring technical and operational components, such as system, network, and storage management of digital audit.
	IT4: Data Governance	Maintaining the digital audit data's availability, usability, integrity, and security in accordance with internal data standards.
	IT5: Software Development	Designing, creating, testing, and maintaining different software applications for digital audit transformation.
	IT6: Enterprise Architecture Integration	Prepare the architecture for the integration system of the digital audit transformation.
	IT7: Data Analytics	Using data analytics to conduct a digital audit.
	IT8: Enterprise Architecture Maintenance	Prepare the architecture for the maintenance system of the digital audit transformation.
Digital process transformation (DP)	DP1: Digitalization business process	Establish a business process for auditing digitalization.
	DP2: Vertical Integration	Applying vertical integration to the system of the digital audit.
	DP3: Horizontal Integration	Applying horizontal integration to the system of the digital audit.
	DP4: Data-Driven Decision Management	Audit outcome are based on the data stored in systems.
	DP5: Quantitative Performance Management	Quantitative evaluation of audit performance is conducted, and the criteria for evaluation, reward, and punishment are all well-defined.
	DP6: Integration toward life-cycle	Establishing a sustainable audit
Human resource management (HR)	HR1: I HR Skill Development	Possible to develop auditor skills by completing the proper education and training, according to data on existing capabilities, desired skill needs, and plans.
	HR2: Organizational Structure Management	Establishing job desks and amounts auditor as well as managing the current organizational structure.
	HR3: Organizational Change Management	Ascertain that the organization is prepared to accept the changes brought about by the implementation of digital audit transformation.
	HR4: Sustainable Learning Management	Internal training programs for auditors who have not been trained by auditors who have completed certificate programs can be used to carry out continuous learning.

On the basis of discussions with experts, criteria have been established and validated for every prospective aspect that may be divided up in each process. Since there has been a start to the transformation of the digital audit in the case study, maturity level 0 (incomplete) is determined to be inappropriate for use in this evaluation. Setting criteria therefore begins at level 1, as shown in Table 8.

Table 8. Criteria for Each Aspect of Evaluation

DAR Aspects	Maturity Level	Criteria
Internal policy and governance (IP)	Level 1	Digital audit transformation strategies, work plans, and budgets are created ad hoc.
	Level 2	Digital audit transformation strategies, work plans, and budgets have been created but not yet fully implemented.
	Level 3	Digital audit transformation strategies, work plans, and budgets have been created on a regular basis and be valid to all divisions. It considered the stakeholder needs analysis.
	Level 4	Digital audit transformation strategies, work plans, and budgets have been created and evaluated.
	Level 5	Digital audit transformation strategies, work plans, and budgets have been created It considered the findings of the evaluation.
Information and Technology (IT)	Level 1	Designing, building, testing, and maintaining a digital audit transformation system has not yet been developed.
	Level 2	System for the digital audit transformation have been developed, but not yet been built, tested, and maintained.
	Level 3	System for the digital audit transformation have been developed and built, but not yet been tested and maintained.
	Level 4	System for the digital audit transformation have been developed, built and tested, but not yet been maintained.
	Level 5	System for the digital audit transformation have been developed, built, tested and maintained.
Digital Process transformation (DP)	Level 1	Business process of digital audit transformation has been created.
	Level 2	A vertical integration has been used to implement a digital audit transformation system.
	Level 3	A horizontal integration has been used to implement a digital audit transformation system.
	Level 4	Data driven decision and quantitative performance for digital audit transformation has been used.
	Level 5	Sustainable auditing practices have been developed for digital audit transformation.
Human resource management (HR)	Level 1	There is already a mapping of auditor needs and competencies to support the implementation of digital audits.
	Level 2	The mapping of needs and competencies of auditors has been used as a consideration for recruiting and training auditors.
	Level 3	An analysis of the organizational structure has been done to evaluate the implementation of digital audit is appropriate.
	Level 4	All personnel who will be affected by the implementation of the digital audit transformation have been adequately trained by the organization.
	Level 5	Sustainable learning management have been developed for digital audit transformation.

It is important to convert it in order to view the digital readiness level because the evaluation procedure uses DX-CMF, which outputs a maturity level. The digital readiness level is meant to refer to the capability level on a scale of 1-3 (performed, managed, defined). The change from capability level to digital readiness level on a scale of 1–3 (not ready, almost ready, ready).

Figure 3. illustrates the relationship between digital readiness level and maturity level. In other words, if the organization is at maturity level 1, it is not ready to conduct digital transformation. With maturity level 2, she is almost ready. And for maturity levels 3, 4, and 5, the organization is ready to transform digital auditing.

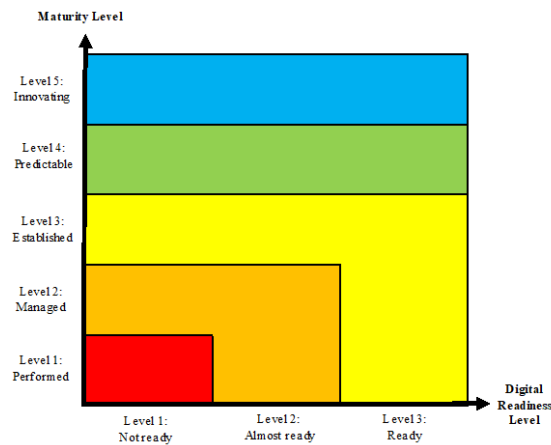


Figure 3. The relationship between maturity level and digital readiness level.

Based on the study of the literature, the evaluation framework had four main criteria and twenty-four sub-criteria. Following the calculation, five chosen experts who were in charge of choosing and evaluating the weight of the assessment criteria and sub-criteria received questionnaires to validate the criteria and sub-criteria. The results of the weighting of the criteria and sub-criteria to be used are shown in Table 9.

Table 9. Weight of criteria and sub-criteria

Goal: Determine the digital audit readiness level in public sector.						
No	Criteria	Weight of Criteria	Sub Criteria		Weight of sub criteria	Global weight
1.	Internal policy and governance (IP)	0.301	IP1	Internal Policy of DX Governance	0.196	0.059
			IP2	DX Strategic and Planning	0.153	0.046
			IP3	Project Management	0.175	0.053
			IP4	Financial Resources	0.476	0.143
2.	Information and Technology (IT)	0.291	IT1	Requirement Definition	0.138	0.040
			IT2	Enterprise Architecture Development	0.087	0.025
			IT3	Infrastructure Management	0.131	0.038
			IT4	Data Governance	0.172	0.050
			IT5	Software Development	0.116	0.034
			IT6	Enterprise Architecture Integration	0.122	0.036
			IT7	Data Analytics	0.172	0.050
			IT8	Enterprise Architecture Maintenance	0.062	0.018
3.	Digital Process transformation (DP)	0.286	DP1	Digitalization business process	0.137	0.039
			DP2	Vertical Integration	0.091	0.026
			DP3	Horizontal Integration	0.073	0.021
			DP4	Data-Driven Decision Management	0.256	0.073
			DP5	Quantitative Performance Management	0.254	0.073
			DP6	Integration toward life-cycle	0.189	0.054
4.	Human resource management (HR)	0.122	HR1	HR Skill Development	0.301	0.037
			HR2	Organizational Structure Management	0.149	0.018
			HR3	Organizational Change Management	0.291	0.036
			HR4	Sustainable Learning Management	0.259	0.032

Based on the weighting of the criteria and sub-criteria, it was determined that internal policy and governance had the highest weight of criteria (0.301), with financial resources being the most important sub-criteria, followed by the internal policy of DX governance, project management, and DX strategic and planning. Information and technology is the second-most important criteria, with the weight of criteria is 0.291. The two most significant sub-criteria are data governance and data analytics, whereas enterprise architecture maintenance is the least important. With a weight of 0.286, digital process transformation is the third most important criteria. These criteria consist of six sub-criteria, with data-driven decision management being the most important and horizontal integration being the least significant. Human resource management is the criteria with the lowest weight, with the weight of criteria is 0.122. This criterion has four sub-criteria, the most important of which is HR Skill Development and the least important of which is Organizational Structure Management.

In table 9, the results of the criterion weighting are shown in descending order from highest to lowest. To make it easier to see the overall weight values in Figure 4, the global weight for each sub-criterion is given in descending order of importance.

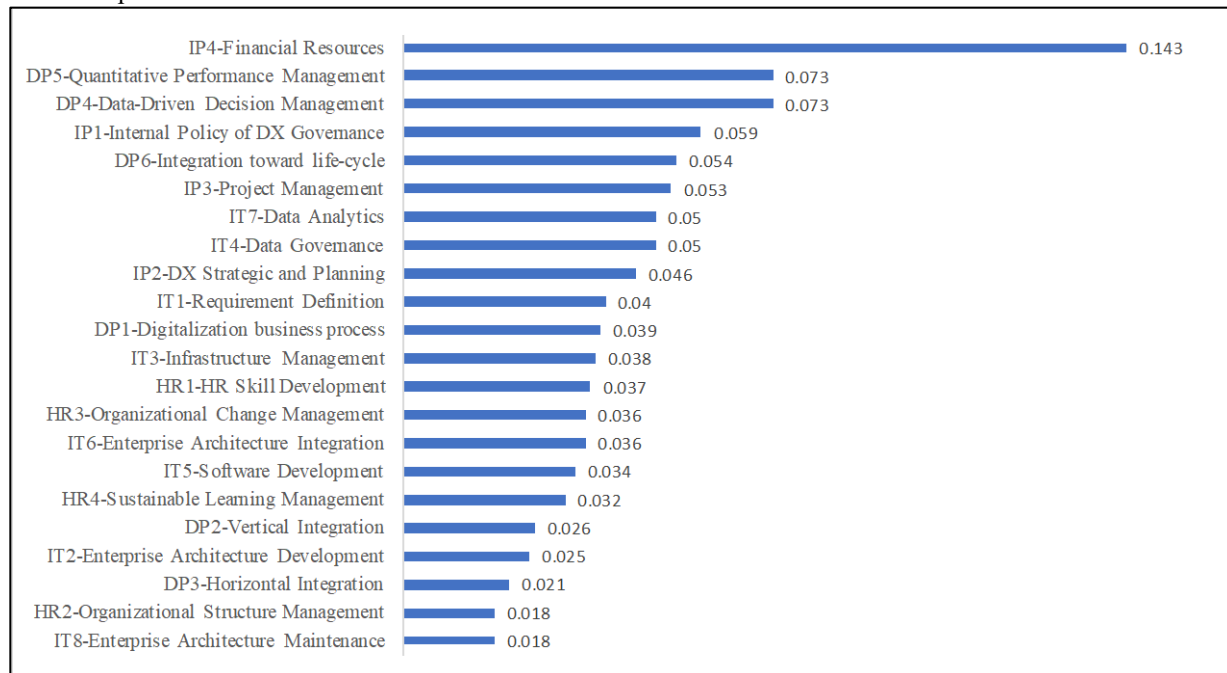


Figure 4. Global weight of sub criteria

Based on the global weight, the order of priority or level of importance that affects the assessment is: first, financial resources with a global weight of 0.143; second, quantitative performance management and data-driven decision management with a global weight of 0.073; third, internal DX governance policy with a global weight of 0.059; and the lowest global weight is in the organizational structure management and enterprise architecture maintenance sub-criteria with a global weight of 0.018.

6. Conclusion

The development of an integrated digital audit must be followed by digital readiness. In this study, capability maturity models or frameworks are used to assess digital readiness. The capability maturity frameworks combine the DX-CMM and Indonesian regulations. This model is the "digital transformation capability maturity framework" (DX-CMF), which has four aspects: internal policy and governance (IP), information and technology (IT), digital process transformation (DP), and human resource management (HR). Using established standards that have been approved by professionals, maturity is evaluated. The final outcome of the maturity assessment will be used to determine levels of digital readiness. The organization's digital readiness to adapt its auditing procedures to include digital ones can be assessed.

Based on the results of weighting using AHP, the highest criteria weight is Internal Policy and Governance (IP), followed by Information and Technology (IT), Digital Process Transformation (DP) and the lowest is Human Resource

Management (HR). Whereas the most significant weight in terms of global weight is at financial resources (IP4) and the lowest is organizational structure management (HR2) and enterprise architecture maintenance (IT8).

For a future study to find out if digital audits are ready, a maturity level assessment will be done. The evaluation results will subsequently be used to formulate a strategy for digital audit transformation.

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