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DIGITAL MATURITY CATEGORIES IN BUSINESS: INTEGRATING AND ASSESSMENT

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Abstract. In the context of rapid digital transformation, businesses need to align their organizational capabilities and expectations with technological advances in order to succeed. This study explores the interplay between organizational, customer, and technological digital maturity. The study emphasizes the challenges of integrating these different maturity levels, highlighting the importance of aligning technological investments with organizational readiness and customer expectations. By exploring this dynamic, this article offers insights on how to optimize digital transformation initiatives for long-term business growth.

Key words: organizational capabilities, digital organizational maturity (ODM), customer digital maturity (CDM), technology maturity (TM), data-driven decision-making.

Introduction. Successful digital transformation requires a strong approach that integrates organizational digital maturity, customer digital maturity, and the maturity of digital technologies. By understanding the interplay between these three categories, businesses can create strategies that enhance operational efficiency and meet the evolving expectations of customers. As organizations embark on their digital transformations, they need to continually assess and adapt strategies to align with technological advancements and market dynamics. Ultimately, the triad of digital maturity serves as the framework for businesses to thrive in the digital world.

This consideration is not just about having technology tools, but also about having the right attitude, processes, and structures to use technology effectively. Each company shows its level of digital usage and business success. Specific terminology exists to measure this: digital maturity and a digital maturity score.

Digital maturity refers to a company's ability to use digital technologies to achieve business objectives. Digital transformation entails identifying and solving challenges, creating opportunities, and decision-making in a digitally connected environment. The best tools for measuring digital maturity include those created by Deloitte, Gartner, Forrester, IBM, and Capgemini [1-3].

Digital maturity score is calculated by considering factors such as online presence, web analytics, marketing automation and technology in customer service. Businesses should conduct such an evaluation in order to:

- understand how the company uses digital technologies.
- identify areas for improvement;

– monitor progress over time;
– assess the impact of digital technology on business performance;
– identify risk factors and opportunities for growth.

Such an assessment helps companies understand their current digital state – to determine the organization's digital maturity level (Figure 1).

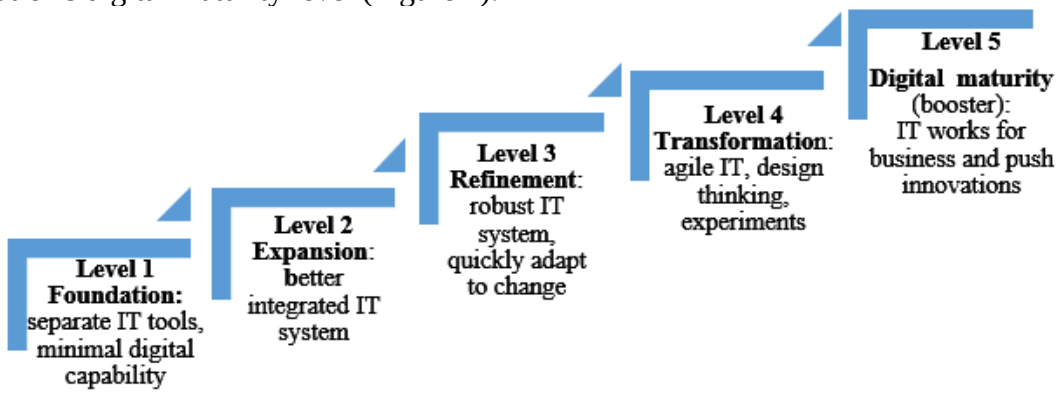

Figure 1. Five levels of digital maturity score (adapted) [3]

The described approach is not sufficient to judge the level of digital maturity because digital maturity is not a simple metric – it is a complex OKR for businesses. Therefore, the existing model has several disadvantages due to the difficulty in splitting and recognizing the sources and factors influencing business outcomes with greater power. To solve this problem, this article proposes an updated concept – to determine three main categories of digital maturity and calculate their weight in final business outcomes.

Analysis of the principles and basis for integrating three components of business digital maturity. The main task of a business under this approach is to combine three categories: organizational digital maturity, customers' digital maturity, and maturity of digital technology.

Organizational Digital Maturity (ODM). Organizational digital maturity refers to the degree of development of a company's capabilities, processes, and culture in order to effectively use digital technologies.

Vision and strategy – the presence of a clear digital strategy driven by leadership commitment.

Processes and operations – organizations must assess and optimize internal processes in order to become more efficient and responsive, through operational agility, which is the ability to adapt workflow and processes to include digital tools.

Talent and skills – human resources need to have the necessary digital skills and training to effectively use digital tools and adjust to changing business needs.

Data-driven decision-making – using analytics and insights to support strategic and operational decision-making.

Digital maturity is not just about adapting to technology, but about embedding digital thinking into the organization's DNA. For businesses undergoing digital transformation, reaching high organizational digital maturity is crucial to ensure that technology investments yield measurable results.

Customer Digital Maturity (CDM). Customer digital maturity reflects the evolving expectations and behavior of consumers in a digital world. Understanding customer digital maturity involves:

Digital literacy – the ability of customers to effectively use digital platforms and tools.

Digital engagement – customers are increasingly interacting with brands through digital channels. Businesses need to provide seamless experiences across these channels to ensure customers can easily interact with the brand.

Personalization – customers become more informed about digital products and services; they expect customized experiences tailored to their preferences and behaviors through

omnichannel experiences. Organizations need to leverage data analytics and customer insight to deliver relevant content and offerings to their customers.

Feedback and interaction – customers are not just passive recipients of marketing; they actively participate in conversations with brands. Businesses should embrace social listening mechanisms and feedback to evaluate customer experience and improve them.

Trust and security– organizations need to prioritize transparency and ethical data practices in order to build trust among their customers.

Adoption of digital services – the willingness of customers to switch from traditional to digital interactions (online shopping, mobile banking).

Businesses need to assess and address their customers' digital maturity in order to design solutions that meet their needs. This may involve educating customers, improving user experiences, or introducing advanced digital features.

Technology Maturity(TM). The final stage is when the technology has reached mainstream adoption with proven value and is ready for practical use. Businesses must evaluate the technology cycle stage to make informed decisions. For example:

– *emerging technologies*: technologies in early stages of hype cycle (generative AI, quantum computing) offer high potential, but come with significant uncertainty and risk (Figure 2).

– *stabilizing technologies*: technologies approaching plateau of productivity (cloud AI services, intelligent applications, computer vision) are more reliable and proven value (Figure 3).

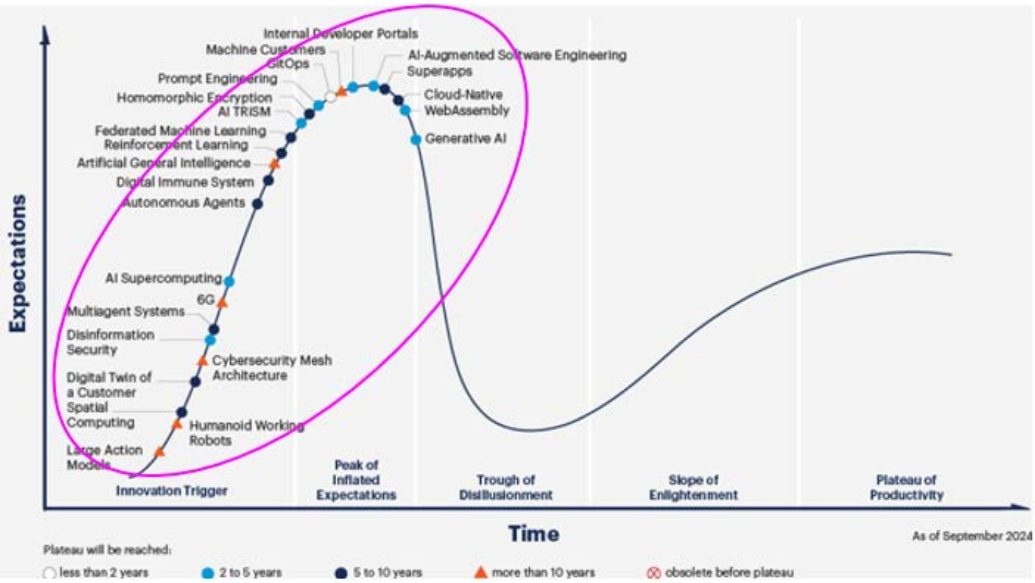

Figure 2. Gartner Hype Cycle for Emerging Technologies, 2024 [4]

Gartner's Hype Cycle for Emerging Technologies report (September 2024) outlines the technological innovations through the four core themes: autonomous AI; developer productivity; total experience; human-centric security and privacy [5]. These emerging technologies present big opportunities and challenges for businesses – affecting competitive differentiation and efficiency, transformational potential for business capabilities in various use cases, and conformity with organizational ability and strategy.

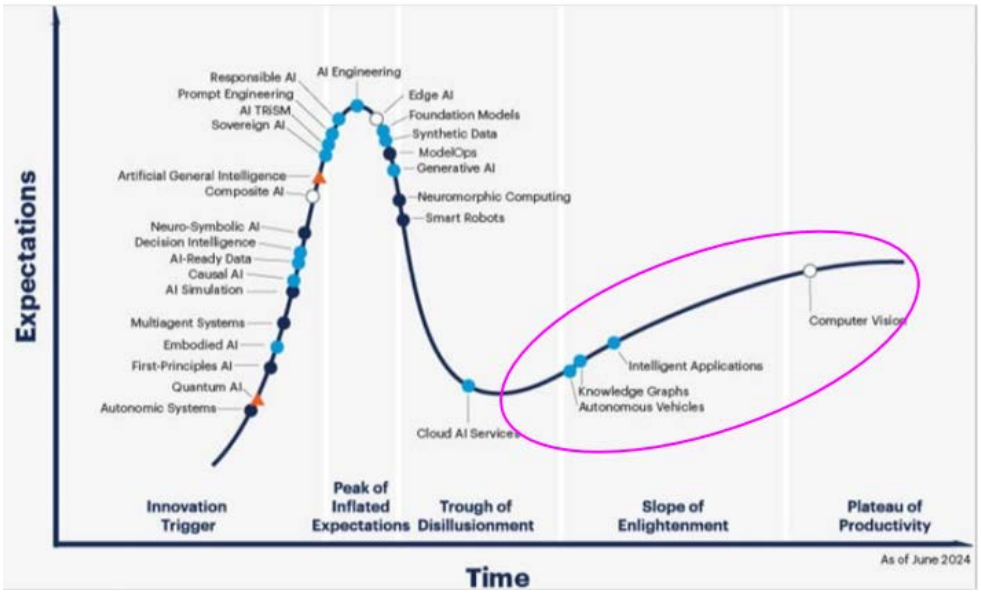

Figure 3. Gartner Hype Cycle for Artificial Intelligence, 2024 [5]

Difficult task for business is to determine company's strategy, design customer-driven marketing strategies and choose the right technology to find the best way of integrating business tasks with technology. To solve this issue, the concept of integrating three dimensions (ODM, CDM and TM) into one framework was proposed.

Concept of integrating three dimensions. The challenge of digital transformation lies in balancing these three aspects:

1 A highly mature organization with advanced technology may struggle to achieve ROI if their customer base lacks digital literacy to adopt new solutions.

2 Businesses with digitally mature customers might fail to take advantage of opportunities if their internal processes and culture are not aligned with digital objectives.

3 Introducing cutting-edge technology without considering its maturity level can lead to wasted resources and unrealized expectations.

4 Considering these facts, businesses should:

5 Regularly evaluate organizational and customer's digital maturity as well as relevant technologies' maturity.

6 Ensure that digital initiatives align both with internal capabilities and customers' readiness.

Aligning technology adoption with organizational and customer maturity ensures businesses invest in solutions that are not only innovative, but also practical and effective. The best way to achieve this is to assign specific criteria for each dimension of ODM (Organizational Digital Maturity), CDM (Customer Digital Maturity) and TM (Technology Maturity), with specific weights. This is achieved through weight coefficients based on these concepts:

ODM (40%). This relates to the core organizational processes and aligns with organization maturity models (CMMI Capability Maturity Model or ITIL – technology service model) that assess processes, governance and alignment with strategic goals.

CDM (30%). Focusing on customer-centric outcomes. It reflects principles from customer-centric frameworks (Lean Startup, Design Thinking) and outcome-based metrics (NPS, CSAT).

TM (30%). Draws on technology maturity assessments (ITIL, DevOps) and digital transformation metrics.

CDM: 40%, ODM: 30%, TM: 30%

The 40 -30 -30 weighting formula and composite score are not universally standardized, but are a customizable approach to prioritizing organizational needs. The formula is a simple linear

aggregation commonly used in multi-criteria decision analysis (MCDA). If an organization prioritizes customer outcomes over technology, weights can be shifted.

In addition, to calculate the score inside each model, it is recommended to use a checklist with a scoring system from 1-5 (Table 1).

Table 1. Checklist for digital maturity assessment. Scoring: 1 (Low) to 5 (High).

Criteria	Questions / checklist	Score
Organizational Digital Maturity (ODM) Objective: Assess the organization's readiness to adopt digital processes		
Digital Process Automation	1. Do they use ERP/CRM systems for core processes? 2. Is IoT integrated into operations?	
Data Utilization	1. Do companies leverage data analytics for decision-making? 2. Do they employ predictive analytics?	
Digital Culture	1. Do employees use digital tools confidently? 2. Is training on digital skills provided?	
Ecosystem Integration	1. Have suppliers / partners been connected via digital platforms? 2. Are collaborative tools used?	
	Average:	
Customer Digital Maturity (CDM) Objective: Assess customers' readiness to engage with digital services.		
Digital Channel Adoption	1. Do customers use online portals / mobile apps? 2. Is preference for chat bots / self-service used?	
Personalization Readiness	1. Do customers expect tailored experiences? 2. Do they use of preference settings in apps?	
Expectations from Digital Services	1. Do customers prioritize speed / convenience? 2. Do they concerns about data privacy/security?	
Trust in Digital Platforms	1. Willingness to share data for personalized services. 2. Satisfaction with digital support	
	Average:	
Technology Maturity (TM) Objective: Evaluate technology adoption using Gartner's Hype Cycle		
Gartner Hype Cycle Stage	1. Is technology in the "peak of inflated expectations" or "plateau of productivity"?	
Technology Accessibility & Cost	1. Are technologies scalable and cost-effective? 2. Availability of skilled resources	
Adaptability to Needs	1. Can the technology align with customer/organizational goals? 2. What about customization options?	
	Average:	
	Total:	

Finally, using formulas, sub-criteria, and scoring, the concept was created for practical application in businesses. The concept of integrating three digital models into one framework is described in Table2.

Table 2. Framework: digital maturity evaluation and maturity score calculation

Category		
Category 1: Organizational Digital Maturity (ODM)	**Category 2: Customer Digital Maturity (CDM)**	**Category 3: Technology Maturity (TM)**
Measures the organization's readiness to adopt and integrate digital processes	**Assesses customers' readiness to engage with digital channels and services**	**Evaluates the stage of technology adoption using Gartner's Hype Cycle**
Sub-criteria: - **Digital Process Automation (ERP, CRM, IoT adoption).**	**Sub-criteria:** - **Digital Channel Adoption (use of online ordering, mobile**	**Sub-criteria:** - **Gartner Hype Cycle Stage (Peak of Inflated Expectations,**

- **Data Utilization (data analytics, Big Data, predictive insights).** - **Digital Culture (employee skills and adoption of digital tools).** - **Ecosystem Integration (collaboration with suppliers/partners via digital platforms)**	**apps, chatbots).** - **Personalization Readiness (preference for tailored digital experiences).** - **Expectations from Digital Services (speed, convenience, security).** - **Trust in Digital Platforms (willingness to share data for personalized services)**	**Plateau of Productivity).** - **Technology Accessibility and Cost (availability, scalability, cost-effectiveness)**
Scoring: 1 (Low) to 5 (High).	Scoring: 1 (Low) to 5 (High).	Scoring: 1 (Low) to 5 (High)
Total Score Calculation: Sum scores for **ODM** , **CDM** , and **TM** Total possible score: **15** (5 points per category)		
Weight (depend on company priority)		
40%	**30%**	**30%**
Maturity Clusters: Leader (12–15): high maturity in all areas. Moderately Mature (7–11): some strengths but gaps exist. Low Maturity (0–6): critical improvements needed		
Formula: Composite Score=(0.4×ODM)+(0.3×CDM)+(0.3×TM)		

Integrating three dimensions (ODM, CDM, and TM) provides a clear description of the most important components of a framework in terms of a model. In this context, each component can be considered as part of the framework, and is used for evaluating maturity – the ability to achieve business goals and calculate a digital maturity score for improvements.

The concept of integrating the ODM, CDM and TM components of digital maturity is based on a structured formulation of four core principles that support this concept from the perspective of maturity (Table 3). These principles ensure cohesion, flexibility, and actionable insights.

Principle 1: Systematic integration of maturity dimensions. Maturity cannot exist in isolation in any one dimension; progress in one aspect amplifies or limits progress in others.

Principle 2. Dynamic balance of priorities. The weights of maturity (40% ODM, 30% CDM, and 30% TM) must adapt to the organization's strategy, industry environment, and market demands.

Principle 3. Maturity as an iterative journey, not a final destination. Maturity evolves through feedback loops and small improvements in each dimension. It is very important to follow the CMMI regulation (capability maturity model integration) – which is an advanced framework designed to improve and integrate processes across various disciplines such as software engineering, systems engineering, and HR management.

Principle of Data-driven alignment of outcomes. Maturity indicators must be measurable and aligned with business outcomes (e.g., revenue, customer retention, innovation).

Table 3. Summary: concept' principles and their linkages

Principle	ODM focus	CDM focus	TM focus
Systemic integration of maturity dimensions	Processes enable CX/tech	CX drives org priorities	Tech scales processes/CX
Dynamic balance of priorities	Adjust weights for strategy	Align with market demands	Adapt to innovation cycles
Maturity as a journey, not a destination	CMMI levels, process rigor	CX evolution, personalization	Tech adoption, scalability
Data-Driven Alignment of outcomes	Audit scores, efficiency	NPS, CLV	Uptime, AI accuracy

The proposed concept could be adapted to different industries. In this case, it is necessary to know industry standards and specific requirements. To adjust this concept to the semiconductor industry (as an example), it is necessary to understand that there are unique challenges.

Semiconductors are capital-intensive with long development cycles, high-precision equipment, and strong requirements for technology. Key aspects include research and development, supply chain complexity, advanced manufacturing processes, and stringent quality control. Customer demands for smaller, faster and more energy-efficient chips are constantly increasing. Furthermore, industry-specific frameworks like SEMI standards should also be considered. An example of the application of integrated concepts in the semiconductor industry can be seen in Table 4.

Table 4. Integrated principles and their linkages for semiconductor

Principle	ODM focus	CDM focus	TM focus
Systemic integration of maturity dimensions	Yield optimization.	Customer co-design (foundry)	AI/ML for process control.
Dynamic balance of priorities	Precise product design. Process rigor. Lean.	Time-to-market. Cycle time.	Advanced node investment.
Maturity as a journey, not a destination	SEMI compliance. Design thinking. Agile.	Six sigma. Defect prevention	Smart factory adoption.
Data-Driven Alignment of outcomes	Cycle time. SEMI metrics VSM (value stream map).	NPS. CSAT Defect density.	IT platforms. IaaS Business Ecosystem

Conclusion. Success of digital transformation hinges on effective integration of organizational digital maturity, customer digital maturity and maturity of digital technologies as outlined by the Gartner Hype Cycle. Understanding and harmonizing these dimensions is essential for business success in a competitive market.

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