

DIGITAL TRANSFORMATION AND DIGITAL MATURITY
MODELS IN DIGITAL YOUTH WORK SECTOR:
A CRITICAL REVIEW

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Abstract

Digital transformation represents a new paradigm across various sectors of activity, but its implementation in the youth work sector is still at an early stage of research. This article is a critical review of digital maturity and digital transformation models, exploring popular theories, dimensions and methodologies from corporate, public and EU education sectors. The purpose of the review is to outline strengths and limitations of existing models when applied in the context of youth organisations. While we identified common dimensions addressed, such as strategy, culture, technology and data governance, current models are tailored for profit-driven environments and neglect challenges faced by youth organisations, for example: resource limitations, dynamic evolution, participatory governance and the need for ethical practices in digital world. Furthermore, emerging trends (such as AR/VR, AI, blockchain, etc.) are under-represented in conventional maturity frameworks. This having the potential to reshape digital youth work, in conclusion we emphasize the necessity of a forward-looking model that is tailored for youth NGOs. The findings of this review lay the theoretical foundation for designing such a model, which should not only evaluate current digital capacity, but also suggest ways to navigate towards a more participatory, secure, inclusive and innovative digital future.

Keywords: *digital youth work; digital transformation; digital maturity; digital maturity model.*

JEL Classification: O14; O32; O33.

1. INTRODUCTION

Digitalization is a process which requires changes in organizations, at different levels of information and interactions, with the goal of making the overall activity more efficient (reduce costs, improve processing times, raise the

impact), through technology integration (Parviainen *et al.*, 2017). One recent study showed that the main focus in the area of digital transformation is on ensuring security and on creating implementation strategies (Gartner, 2025).

Depending on the sector of activity for an organization, there is a need to adapt this process to the sector. In the field of youth work, there are no models dedicated to digital transformation, not even a strategy to approach this process (Stefan, 2022). This conclusion is extracted from a research at European level, which involved Erasmus+ National Agencies working in the youth field. At the same time, even though there are different interpretations or perceptions in youth work (Siurala, 2022), the term “digital youth work” refers to “utilising digital media and technology in youth work, as a tool, activity or as content, in online interactions, face-to-face or both” (European Commission, 2017).

Studies show that non-governmental organizations (NGOs) feel the need to adapt and shift their activity towards the space where youths already are, which is the digital space. In a study, 87% of the interviewed non-profit representatives consider online communication and online presence as important in achieving their organisations’ missions (Twilio, 2024). In this context, at European level, the adoption of technology to empower young people has been set as a strategic direction (SALTO, 2024). This will facilitate their access to information, to active citizenship and to opportunities for connecting/speaking out. However, achieving this goal depends on different factors such as access to digital tools or the development of basic digital competences among young beneficiaries/youth workers (Council, 2017), otherwise the risk is to deepen digital divide in society.

While there is an international push towards digitalization in the youth sector, there are gaps in terms of assessing and guiding the digital transformation itself. First obstacle is the lack of a digital maturity model tailored to youth organizations. In this sense, digital maturity is defined as how organizations systematically adapt to digital change (Kane *et al.*, 2017). It is also about the adoption of emerging technologies such as Artificial Intelligence (implicitly Big Data), IoT, Blockchain, 3D Printing (Ochoa-Urrego and Peña-Reyes, 2021), but a first challenge in their adoption in organizations through a digital transformation process is the assessment of the current level of digital maturity or development (Blatz *et al.*, 2018) (UPCORE, 2024). At this point, a digital maturity model is a conceptual framework that can facilitate an initial assessment (by comparison with other organizations or with defined stages in the model) (Berghaus and Back, 2016). It can also determine an action plan to guide the digital transformation process (Ochoa-Urrego and Peña-Reyes, 2021). Each model has its particularities, with different dimensions, which may or may not include development measures (Aslanova and Kulichkina, 2020). Therefore, this article will provide different examples of digital maturity models identified in the literature, with features and dimensions, together with a critical analysis of the features needed by youth organizations in order to propose a tailored model in the future.

Youth organizations, thus youth professionals too, although they share the need of digital transformation (Pazer, 2024), they operate in a context described by: limited resources, staff represented by volunteers or few in number and a mission based on non-formal education, social inclusion, civic participation, and less on profit or cost efficiency (as are most models studied and operationalized predominantly in large commercial or institutional contexts) - (RAY-DIGI, 2024). Thus, in the absence of a tailored framework, digital transformation in youth work depends on contextual factors or individual initiatives, emphasizing the need for a unified digital maturity model designed for the realities of the youth sector.

2. METHODOLOGY

For this article we had a systematic approach in finding articles, journals, analysis or relevant reports, in order to have a larger view regarding digital transformation and digital maturity. The results were correlated to the intersection of the youth sector and the digital sector (digital youth work).

We established the keywords for the searches, those being: *digital youth work, digital transformation, digital maturity, digital maturity model*. The research questions we formulated are: *1. What approaches are there in the youth sector regarding digitalization or digital transformation? 2. What such approaches from other fields of activity are suitable for the youth sector?* Initial results showed that there are no maturity models in the youth sector, therefore we proceeded to analyze in a critical way models from other sectors in order to identify traits, dimensions and levels suitable for the youth sector.

In order to identify the documents, keywords were used for searches on relevant platforms such as Scopus, Clarivate, Google Scholar and ResearchGate, filtering the results based on citations, availability and date of publication (last 20 years, to show recent evolutions and actual perspectives). Articles with no citations were excluded for relevancy reasons. Older studies were included to lay theoretic foundation, for example the ones about the first maturity models. Also, we consulted reports and studies from official European sources (documents from the European Commission, European Council, institutions working in the youth field, platforms such as SALTO or European Project Results Platform).

3. CONCEPTS RELATED TO DIGITAL TRANSFORMATION

The concept of digital transformation refers to the integration of technology across areas of an organization, generating changes in operations and value creation (Vial, 2019). Linked to this concept, there are 2 terms that are often confused and need to be differentiated: digitization (the conversion of information from analogue to digital format) and digitalization (the use of technology in redesigning activities or processes) – (Mikalef and Parmiggiani, 2022). While digitization and digitalization are initial technology-based steps, digital

transformation involves a strategic approach to drive change in the organization across multiple areas.

According to a definition found in the literature, "digital transformation is a process that improves an entity by triggering changes to its properties through combinations of information, computing, communication and connectivity related technologies" (Vial, 2019). It is not only about the adoption of technological tools, but it implies changes in structure, culture, strategy and decision-making. The digital shift can lead to new ways of working and redefining roles in the organization (Gimun *et al.*, 2011). Many organizations therefore have dedicated structures (digital transformation office, roles such as Chief Digital Officer, etc.) – (Jewer and van der Meulen, 2022). Another aspect is organizational culture. Organizations with a culture oriented towards collaboration, innovation, agility and data-driven decisions are more likely to leverage digital transformation - (Deep, 2023). Leadership has a central role to play. Although digital transformation is generally perceived as a linear process following a similar path across organizations, studies question this approach (Remane *et al.*, 2017), (Thordsen and Bick, 2023).

Sometimes, the concepts of digital transformation and digital maturity are used without considering the differences (Leipzig *et al.*, 2016). Digital maturity refers to the level of digital development that an organization has reached and, thus, to its ability to use technologies to achieve its mission. Although the views differ between authors, the concept integrates a holistic character, a multi-dimensional assessment (regarding technology, skills, processes, strategy, culture, etc.) and reflects a state of digital evolution at a certain point in time.

At this point, it is useful to distinguish digital maturity from other concepts often used together, such as digital readiness or digital capability. Digital readiness implies a forward-looking perspective and a willingness to change, assessing an organization's readiness to adopt digital technologies in its culture, strategies and operations, in order to be able to embark on the digital transformation journey. Digital transformation is the actual process of technology integration. Digital maturity focuses on the state achieved in the process. If readiness is about potential, transformation is about plan and action, and maturity reflects the cumulative outcome of digital efforts (Nasution *et al.*, 2018; Soomro *et al.*, 2020; Chounta *et al.*, 2024). Similarly, digital capability refers to the specific skills and resources (competencies, IT processes, infrastructure, etc.) that the organization has, indicating how these capabilities are organized and integrated for transformation / innovation (Khin, S. and Ho, T. C. F., 2019).

4. MODELS IDENTIFIED

Numerous conceptual models have been proposed in the literature to assess the digital maturity of organizations. Based on their purpose, there are different types of digital maturity models (the ones we identified being in table 1):

- Descriptive: it assesses the current situation in the organization;
- Prescriptive: it can suggest improvements for evolution;
- Comparative: it can calculate a score and benchmark.

Table 1. List of identified models according to sector of activity and purpose

Sector/Area	Model identified	Purpose
IT software	CMM, CMMI	Descriptive, prescriptive
Research	TRL	Descriptive
Business / corporate	MIT-Capgemini, Deloitte, McKinsey Digital Quotient, MIT CISR, Gartner, KPMG, Forrester/PwC	Comparative, descriptive
Manufacturing	Industry 4.0	Descriptive, prescriptive
Telecom	Valdez-de-Leon Telecom Model	Descriptive
Public Administration	DGMM (Layne & Lee, PPR, Di Maio & Cannon)	Descriptive
Education	DigCompOrg, SELFIE	Descriptive
NGO / nonprofit	NDMM (Gooyabadi), Salesforce Nonprofit Digital Index	Descriptive, comparative

Source: own representation

Following a review of the literature, among the first digital maturity models to emerge is the Capability Maturity Model (CMM) in 1986. It is inspired by the *6 Stages of Growth Model* - initiation, contagion, control, integration, data management, maturity (Nolan, 1993), as well as by Watts Humphrey's principles in *Managing the Software Process*. The term "maturity" refers to the organization's ability to coordinate maintenance and development processes, through effective internal communication, constant planning and monitoring, and improvements based on cost analysis and testing (Paulk, Curtis and Chrissis, 1993). Thus, the CMM defines 5 maturity levels: 1 – initial, 2 – repeatable, 3 – defined, 4 – managed, 5 – optimized. In 2006, In order to unify the maturity models that emerged later (with different orientations in different sectors of activity), the Capability Maturity Model Integration (CMMI) model appeared, extending CMM to more fields of activity. CMMI keeps the 5 maturity levels coming from CMM, but also introduces the concept of process capability, with a scale from level 0 to 3 for each individual process, evaluated separately (0 - incomplete, 1 – executed, 2 – managed, 3 – defined). Thus, the organization has a general maturity level (with a set of processes at each level), but also a capability level in process areas, grouped by categories such as project management, process management, engineering and support (Constantinescu, 2007). This allows general evolution and flexibility to develop specific process capabilities.

Another model identified in the literature is Technology Readiness Levels (TRL), which proposes to assess technological maturity. Initiated in 1970 by NASA (Héder, 2017), it is widely used in different domains, including research projects. In 2012, it was introduced as a benchmark in European funded programs (Horizon 2020 or Horizon Europe) to indicate how ready a research product is for the market and what further steps it should take. Thus, TRL adds the dimension of technological readiness. In the context of youth organizations, this would translate into assessing the readiness of the organization to adopt a particular digital technology or innovation.

According to a study, over the time digital maturity models have received increased interest since 2011-2012, first due to practitioners from industry and consulting companies, later joined by a larger number of researchers from academia since 2016 (Teichert, 2019). The same author notes that today there are multiple models for different business sectors, but they come with a number of limitations: they provide descriptive assessments (telling the level at which the organization is at), but do not provide guidance towards evolution.

In the business sector, an example is the MIT/Capgemini model, which introduces the idea of assessing companies along 2 axes: digital intensity (technology adoption in operations and customer experience) and the intensity of change management (in leadership, culture, governance). These two axes determine 4 quadrants: beginners (management experimenting but reluctant about the added value of technology), conservatives (having a slightly shaped digital vision as well as various basic digital capabilities at a mature level), fashionistas (with many digital functionalities developed according to trends, but no clear coordination or vision) and digirati (with vision, clear governance, initiatives and digital culture in the organization) (Westerman *et al.*, 2011).

Several specific frameworks have been developed in the consulting sector, often with an emphasis on a strategic dimension. Deloitte's Digital Maturity Model identifies a series of 7 digital pivots or capability areas that companies need to develop (Deloitte, 2019): flexible and secure infrastructure, data analytics, digital interest and talent, ecosystem interaction, intelligent workflow, consistent customer experience, adaptive business model. Deloitte believes the development of the above areas in a business leads to increased maturity overall and improved performance. At the same time, from their observations they also note the increasing importance of factors such as strong leadership or the existence of a digital mindset, in order to grow digital maturity. At the same time, the McKinsey Digital Quotient model provides a quantitative analysis of practices in the organization across 4 areas: strategy, culture, organization and capabilities, resulting in a score that is correlated to financial performance (Catlin, Scanlan and Willmott, 2015).

There are a number of digital maturity models that are domain specific. In Industry 4.0, which merges Internet of Things (IoT) technologies with the

manufacturing ecosystem, we identify a specific model for factories that embrace automation, computerization and smart connectivity. Another example that depends on the domain is the Telecom digital maturity model by Valdez-de-Leon in 2016. It identified 7 dimensions for telecom companies: customer experience, strategy, technology, operations, organization, ecosystem, and innovation, along with a scale of 6 maturity levels for specific industry descriptors (from 0 – not started to 5 – pioneer).

In the institutional public sector (in administration and government services) we identify digital transformation models, also known as *Digital Government Maturity Models* – DGMM (Waara, 2025). In this context, the focus shifts to the efficiency of public services and meeting citizens' needs. The need for digitalization stems from demographic limitations or society's expectations of fast online services and transparency. In the state education sector we identify some notable contributions such as the DigCompOrg framework, with a model for schools' digital capacity, but also SELFIE, a tool for self-assessment of maturity (European Commission, 2025). Focus here is more on digital learning support, but the structural approach is similar to models in business area.

In the non-profit or NGO sector we have not identified digital maturity models widely adopted in the sector, this field relying more on ad-hoc assessments through questionnaires, surveys or internal analysis. Recently, there has been growing awareness of the digital divide in the sector, and Salesforce.org has developed a tool to assess digital maturity index in nonprofit organizations. In 2022, only 12% of nonprofits had a high level of maturity, about 1 in 8 organizations (Salesforce, 2022). In this regard, knowing that digital tools are necessary for fundraising, service delivery and community engagement (CommunityForce, 2025), a model of nonprofit digital maturity, the *Nonprofit Digital Maturity Model (NDMM)* – (Gooyabadi *et al.*, 2022) – has recently been proposed. All in all, the models we reviewed are underneath (Table 2).

Table 2. List of identified models according to sector of activity and purpose

Sector/Area	Model	Short description
IT / Software	CMM	5 levels, process evaluation, rigid
Organizational	CMMI	Extends CMM, includes process capability, more flexible
Product research	TRL	9 technology levels, used in Horizon Europe
Business	MIT/Capgemini	2 axes: technology & digital leadership
Consulting	Deloitte	7 strategic areas, descriptive model
Consulting	McKinsey Digital Quotient	Score on strategy, culture, capabilities

Sector/Area	Model	Short description
Research	MIT CISR	4 dimensions: strategy, organization, processes, technology
Consulting	Gartner	5 dimensions, assessment and step by step progress
Consulting	KPMG	6 dimensions, holistic approach
Manufacturing	Industry 4.0	3 stages, factory specific
Telecom	Valdez-de-Leon (2016)	7 dimensions, 6 levels, adapted to the telecom industry
Public administration	DGMM (Layne, PPR, Di Maio)	3-5 dimensions, focus on public services
Education	DigCompOrg / SELFIE	Digital self-evaluation tool for schools
NGO/Nonprofit	NDMM (Gooyabadi <i>et al.</i>)	Adapted to non-profit environment
NGO / Nonprofit	Salesforce Nonprofit Index	Assessment tool

Source: own representation

5. COMMON DIMENSIONS AND LIMITATIONS

Despite the diversity of models, the literature highlights the recurring appearance of some dimensions addressed in digital maturity models. For the youth work sector, the most relevant common dimensions among the models discussed above are strategy, culture, technology and data management. For each we can name example of measure or activities related to youth work:

- Strategy and vision: the organizations have a digital strategy which aligns with the mission, therefore a dedicated plan for digital transformation and a leadership supporting it (or other empowered roles). Examples: digital plans for online communication, digitalized volunteers' management (with a platform and procedures), internal documents with the strategy of technology supporting social impact.
- Culture: the organization values innovation, it is open to change, knowledge sharing and continuous learning, such as in the agile principles. Examples: the team tests regularly new platform to attract youths, members are encouraged to participate in digital initiatives, constant networking and exchange of good practices are encouraged.
- Technology: this is related to the infrastructure needed to drive digital transformation or growth in digital maturity. It includes IT architecture and hardware (equipment, devices), software (applications, online platforms, management systems), but also cyber security. Examples: online platforms to coordinate members' work, tools for project-

management and internal collaboration, live-streaming from the youth events, safe storage of youth members data.

- Data management: this dimension is related to collecting, storing, protecting and analyzing data. Examples: databases with members and beneficiaries of the youth organization, monitoring indicators during the project, CRM instruments for managing human resources, internal policies regarding access, protection and usage of personal data collected.

At the same time, models identified have limitations when reported to the youth NGO environment. Those limitations are included in Table 3.

Table 3. List of limitations of the models analyzed from youth sector perspective

Limitation	Models affected	Comments
Financial/profit performance orientation	MIT/Capgemini, Deloitte, McKinsey Digital Quotient, MIT CISR, Gartner, KPMG	Focus on <i>customer experience</i> , profit, financial efficiency, inconclusive for NGO social impact
Assume large organizational size	CMM, CMMI, Industry 4.0	It needs dedicated departments and small budget or volunteering NGOs can't afford
Voluntary nature of the workforce	CMMI, MIT/Capgemini, Deloitte, NDMM, Salesforce Nonprofit Index	Lack of indicators on retention, training and digital competence of volunteers
Lack of sector specificity	CMM, CMMI, MIT/Capgemini, Deloitte, McKinsey, MIT CISR, Gartner, KPMG, TRL	It doesn't cover specificities of youth NGO, such as digital communities or participatory governance
Neglecting the participatory dimension	DGMM (Layne, PPR, Di Maio), DigCompOrg / SELFIE	Direct involvement or participation of beneficiaries / members in decisions are not measured

Source: own representation

6. CONCLUSIONS

The youth sector is developing a more clear vision regarding digital transformation. Recent EU policy frameworks such as Smart Youth Work which sets out the role of digital for youth empowerment (Council of the European Union, 2017), or digital capability self-assessment initiatives are emerging (only as a questionnaire for the time being) - (SALTO, 2023). Without a digital maturity

model recognised as a standard, it is difficult to assess a youth organization which wants to develop a digital transformation project or initiative. When applying for funding, such a recognised framework would be needed, for organizations and for funding entities. For example, European Commission could benefit from a more efficient and structured way to allocate project funding if organizations come already with a standard assessment.

This critical review revealed that the maturity models for corporate, public and other environments provide valuable examples, but do not exactly fit the ecosystem of youth organizations. On the one hand, they share a common core of dimensions – strategy, culture, technology, data – which are the pillars of any digital transformation. A clear digital strategy and an organizational culture supporting innovation are necessary for both an NGO and a company. On the other hand, the strengths of existing models can become limitations as the context changes: the corporate area focuses on profit and efficiency, and it does not reflect the mission and social impact of youth NGOs; governmental models risk ignoring direct youth beneficiary consultation or participation; educational models require institutional infrastructures that small NGOs do not have. In addition, being general in their approach to innovation, the models suffer from a lag in keeping up with new technological realities (AR/VR, AI, blockchain, etc.), which may lead organizations to embark on a digitization path in aspects that are already technologically outdated.

Therefore, the need for developing a youth NGO sector-specific digital maturity model emerges, a conclusion supported by other reports identified during the research. This model should have a bottom-up building approach, starting from the realities and objectives of the youth and the youth organizations. Also, the proposed future model should take into account the following principles that can be extracted as a result of the analysis: participative approach towards digital transformation (youths being co-creators), adaptation to scale and resources (the model being flexible for small youth NGOs or big federations), constant evaluation of perceived impact and innovation (with indicators for how quick they learn to use a new technology or integrate new trends) and online safety (while also inspiring digital ethics).

Future research is needed in order to establish if a new maturity model is more suitable to be tailored on the NGO sector or the more specific youth sector. Variables such as age, gender, interests, cultural heritage or others need to be analysed to find out if they represent differentiators in such a model.

As digital transformation goes on in society, the youth sector has the opportunity and the responsibility to follow this trend. A sector-specific digital maturity model would act as a roadmap for this journey, helping organizations to realistically assess where they stand and plan development on key dimensions needed for the future.

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