

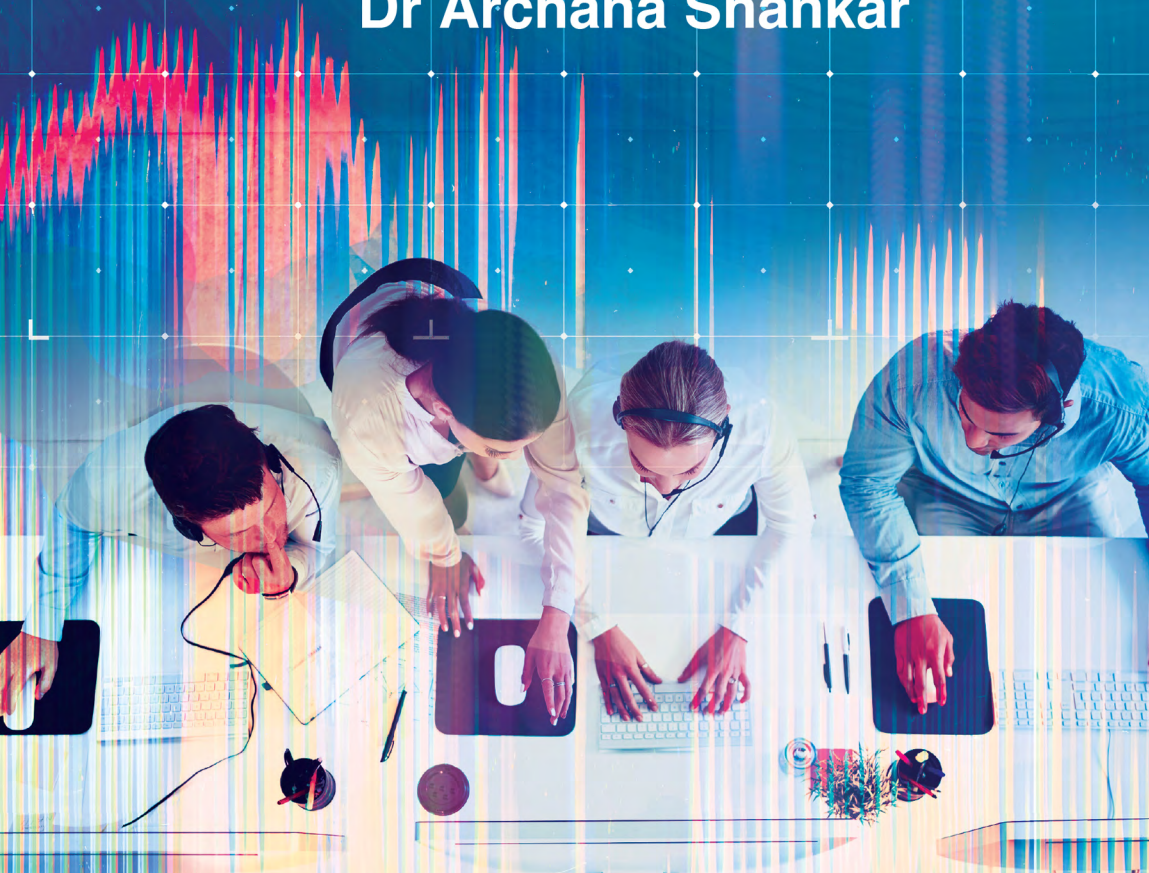
Digital Mentorship

Bridging AI-Human Divide
in the Era of Industry 5.0

+

Edited by

Dr Shikha Gera
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Digital Mentorship

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Digital Mentorship: Bridging AI-Human Divide in the Era of Industry 5.0

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INVESTOR IN PEOPLE

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Chapter 1

Role of Digital Leadership in The Transformation of Mentor–Mentee Relationships: Case of Slovenia

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Abstract

Digital mentorship, increasingly influenced by artificial intelligence (AI), is a transformative force in our contemporary world. It presents an interplay of benefits and challenges. However, this integration raises concerns about accurately assessing human mentors' competencies without AI tools. Our study identifies the primary driver of digital mentorship as the need to manage the voluminous tasks encountered in modern work environments. Employees are turning to AI tools to meet these demands, driven by the superior quality of outputs these digital tools facilitate. The COVID-19 global epidemic has significantly accelerated the adoption of digital mentorship in more traditional educational institutions. Mandated online study activities for all students and educators necessitated the incorporation of diverse online tools, practices, and approaches in otherwise traditional in-person classroom lectures and tutorials. In the past two years, the availability of different AI tools has created opportunities for their integration into the study process and enhanced interweaving of study goals and digital competencies. This has led to a major push towards Industry 5.0

described as ‘specifically putting research and innovation at the service of the transition to a sustainable, human-centric and resilient European industry’ (Industry 5.0) and Society 5.0, defined as ‘a society that is sustainable and resilient against threats and unpredictable and uncertain situations, that ensures the safety and security of the people, and that individual to realize diverse well-being’ (Society 5.0). The concept heavily relies on technology, especially XR and virtual environments as well as human-centred approach, marking the evolution towards an even more digital society.

Keywords: Digital mentorship; artificial intelligence; case illustration; leadership; technology; organizational culture

Introduction

Artificial intelligence (AI) significantly enhances efficiency within mentorship frameworks by automating routine tasks, thereby allowing mentors and mentees to focus on higher-level cognitive functions. This chapter explores the essential environment, personal characteristics, and tools for effective digital mentorship. Key attributes include adaptability to new technologies, a profound understanding of digital platforms, patience, and the competency to provide guidance and feedback remotely. A user-centric approach is crucial, ensuring that AI-enhanced digital mentorship solutions are tailored to real user needs and maximize usability and user experience (UX).

Moreover, while self-learning through abundant online resources remains valuable, formal certification in relevant fields can significantly enhance a digital mentor’s expertise and credibility. We anticipate a shift in mentorship dynamics towards predominantly digital interactions, emphasizing specialized knowledge and the ability to multitask, which are increasingly prized in corporate settings.

During the COVID-19 pandemic, the use of video meeting tools and simultaneous interactive graphic consultations provided a favourable context for the uptake and increased use of these digital applications.

In the following chapter, the word ‘application’ means software that enables the implementation of specific activities using tools in applications. During this period, the development of tools for remote communication has intensified and, as the frequency of updates of applications has increased, more and more customized intuitive UXs as well as additional tools have been introduced. Updates to these tools were based on user feedback and by mapping the real environment to the digital environment (e.g. implementation of the digital waiting room; whiteboard tool; self-adhesive slips). In general, the frequency of updates was on a 2 to 3 weekly basis, which we consider as active updating (application changes,

updates, bug fixes, upgrades, changes to the terms of use), see the example of the MS Teams application.

Theoretical Overview

Digital mentorship is a modern approach to providing guidance, support, and advice through technology. It leverages various digital tools and platforms to facilitate the mentor–mentee relationship, making it easier for individuals to connect regardless of geographical barriers. Here are some key aspects of digital mentorship: First, **Virtual Meetings**: Mentors and mentees can hold face-to-face meetings without needing to be in the same physical location using video conferencing tools like Zoom, Big Blue Button, Microsoft Teams, or Skype. Second, **Online Resources**: Digital mentorship often involves sharing a wealth of online resources, such as articles, e-books, webinars, and online courses, to help mentees develop their skills and knowledge. Third, **Digital Communication Platforms**: Communication can be maintained through emails, messaging apps like Slack or WhatsApp, and social media platforms. These tools enable ongoing support and quick information exchanges. Fourth, **Flexible Scheduling**: Digital mentorship allows for more flexible scheduling, accommodating different time zones and busy schedules, which can be particularly beneficial for mentors and mentees. Fifth, **Global Reach**: By removing geographical limitations, digital mentorship enables individuals to connect with mentors worldwide, broadening their perspectives and access to diverse expertise. Sixth, **Documentation and Tracking**: Digital tools can help document progress, set goals, and track achievements. Platforms like Trello, Notion, or Google Docs can be used to ensure that both parties stay on track. Seventh, **Accessibility**: Digital mentorship can be more accessible to a larger audience, including those who may not have access to traditional mentorship opportunities due to location, financial constraints, or other barriers.

Overall, digital mentorship is an effective way to foster professional and personal growth by leveraging the convenience and connectivity offered by modern technology.

Online video communication applications are moving towards the active creation of an activated experience that connects the real and virtual worlds and seeks to fuse them into an immersive experience. The merging of these two experiences is more intuitive for the younger Generation Z and iGeneration than for previous generations and can be placed in the group of digital natives. The terms digital natives and digital immigrants were first coined by Prensky (2001). Complementing these theses, other additional names and explanations of generations follow, complementing the definition with the attitude and use of digital technology, thus names such as Gen Alpha or iGen (Weisman, 2023). In the field of generational considerations, there is a general agreement among researchers that the cohort classification of generation is too general and should be more specific and focused on individuals within a generation (Ghobadi & Mathiassen, 2020; Martins et al., 2023; Vodanovich et al., 2010). It is not just a relationship with technology, but a relationship with technology, as the development of applications and their tools demonstrates: the introduction of physical interfaces such as virtual reality (VR) goggles or kinetic gloves. This justifies the blended learning method, where the

traditional learning space overlaps with the digital space. The authors state that blended learning made students comfortable with the blended approach and increased their ability to work independently (Tong et al., 2022).

It needs to be emphasized that digital mentorship is suitable for Gen Z who needs regular positive feedback which means they expect a mentor to play the role of a ‘buddy’ – a friend at the workplace or learning institution to whom they can openly talk and discuss, share their fears, joys as well as development setbacks. Human resource experts advise leaders of Gen Z to take time for introductory talks and explain the process of work and ‘rules of the game,’ even for the easiest of jobs. Then, it is just as important for the leaders to hand the word to Gen Z to check their expectations and any potential dilemmas. A mentor, first, needs to be a person who actively directs and shares his/her knowledge and experiences (Dakić, 2024).

At the Faculty of Civil and Geodetic Engineering of the University of Ljubljana, the first steps towards digital mentorship started back in 2008 with introduction and implementation of the Moodle Web Classroom (Moodle, n.d.) to the faculties’ learning process. During the years, the educators were slowly incorporating more and more of their learning activities to the online workspace. In short, Moodle provided excellent access for the students 24/7 and complete overview of classes, digital sources within the classes, availability of the instructions and digital sources for completion of the tutorials as well as possibility of submitting work on-line with multiple ways for feedback. All this provided a good foundation and well-established digital environment up until the Covid pandemic struck and the lockdown measures were mandated (Ziuzep, 2020) and study and work from home via online resources were allowed. Within the Moodle, the Zoom (Zoom, n.d.) and Big Blue Button (*BigBlueButton*, n.d.) online conferencing software was added that provided the educators with an online meeting/lecturing environment. The transformation of the previously more traditional in person lectures was quite literally overnight. All lectures and tutorials were moved online in strictly on-line format: on-line lectures, meetings, tutorials, staff meetings, seminar presentations, thesis presentations, etc. During the epidemic, a survey was conducted on satisfaction with work from home conditions during Covid-19, mostly within the university staff (Čok, 2022). The results showed respondents were satisfied with the conditions of working from home which was surprising to the authors as well. A lack of adequate infrastructure was expressed – mostly additional room (33.7%) although most (45.6%) were satisfied with current conditions (Zavodnik Lamovšek et al., 2021).

Although the digital transformation of the curriculum was successful, the students and staff improved on their digital competencies. But with the abolishment of the distancing measures, the students and the teachers welcomed the return to the lecture rooms at the faculty. Most gains of the digital mentorship were put aside and all the classes returned to the traditional format. The main issue that was expressed was the lack of social contacts either with students, student groups or between teachers and students. The in-person narrative or feedback is still easier within the classroom as opposed to the on-line ones. The digital mentorship has been kept mostly for master thesis work since students complete their

work at home and some of the meetings or feedback can be done on-line where the digital mentorship is proving quite useful. This also speeds up and improves the final thesis completion for the students.

The emergence of advanced communication and interaction technologies, such as extended reality (XR) and virtual worlds/virtual environments (VW/VE), focusing on human-centred approach, has further enhanced the experience and blended the possible ways of interactions between the real and digital environments. These technologies have been furthermore identified as of critical importance for the EU (EU Web4&VW, 2023).

Extended Reality (Jerald, 2015) encompasses a spectrum of immersive technologies including VR, Augmented Reality (AR), and Mixed Reality (MR) and has the capacity to generate synthetic environments or augment the physical world with digital overlays, offering transformative potential across various domains. Within the realm of digital mentorship, XR and virtual worlds/environments are increasingly leveraged to enrich learning experiences, foster engagement, and facilitate personalized education. Virtual environments using XR technologies present digitally constructed spaces that simulate physical presence in real or imagined worlds. These environments are typically accessed through VR headsets or AR/MR devices, which track the user's motions and adjust the perspective, accordingly, creating a sense of immersion. For digital mentorship, such environments can mimic real-world settings like laboratories, workshops, or office spaces, or they can create entirely fantastical educational realms. The immersive nature of these technologies allows learners to engage with content in a hands-on, experiential way, which can significantly enhance understanding and retention (Bierema, 2022).

Human-centric design in XR focuses on tailoring experiences to meet specific user needs and capabilities (Stanney et al., 2021). In digital mentorship, this means creating environments and interactions that adapt to individual learning styles and paces. For example, AI-driven avatars can be used as mentors or guides, providing personalized feedback and adapting their teaching strategies based on real-time analysis of the user's performance and engagement levels. UX in XR is paramount, as it directly influences the effectiveness of learning and the comfort of the user. Good UX design ensures that virtual environments are intuitive and accessible, allowing users to interact naturally and effortlessly with virtual elements. This involves considerations like ergonomic interface design, responsive interaction models, and the minimization of latency to prevent disorientation or motion sickness. Attention to detail in these areas helps maintain the user's focus on learning objectives, rather than the mechanics of the technology. Gamification elements can also be integrated into XR-based mentorship, using rewards, badges, or progress tracking to motivate learners and make the learning process more engaging and competitive. These elements, combined with the immersive and interactive nature of XR, can lead to higher levels of user engagement and better learning outcomes.

There are still some technological challenges when introducing XR-based solutions to a broader audience. One of them is cybersickness (Tian et al., 2022), which refers to a condition like motion sickness that can occur when engaging in virtual environments, particularly in VR. Symptoms include nausea, headache,

dizziness, and disorientation. It arises from a disconnect between what the user's eyes see and what their body feels, especially when the virtual movements are not mirrored by physical motions. This sensory mismatch confuses the brain, leading to the unpleasant symptoms associated with cybersickness. Addressing cybersickness is crucial in VR design, involving strategies like optimizing motion dynamics, reducing latency, and providing stable reference points to improve user comfort and extend VR sessions.

Digital mentorship can be explained as a mentoring approach where the mentor is physically separated from the mentee and uses different communication tools, which can be synchronized (at the same time) or asynchronized (with delay). Motivating mentees can be quite a challenge in digital mentorship due to the lack of a full nonverbal component of communication (Kocbek, 2024). Remote work changes work and technology. In digital mentorship, interpersonal skills are very important, connected with emotional intelligence and communication. The mentor needs to be trained to recognize the emotional component of messages. In digital mentoring, it is hard to establish identification with the mentor due to the lack of daily face-to-face interaction. It is necessary to accept a clear and dedicated agreement regarding digital mentorship responsibility (Kocbek, 2024). Mentor needs to communicate with respect and also the consequences of not respecting agreements. All communication needs to be respectful and tolerant. It needs to convey understanding and care for all involved. The digital mentor needs to be a role model, »*walk the talk*, « and have the same standards for him/herself as for the mentees. With well-planned, regular, and individualized (digital) communication, a mentor can deepen relationships with his/her mentees (Kocbek, 2024).

Let's define a generation of mentors. Universities have a tiered distribution of staff involved in the learning process: demonstrators, tutors, assistants, and professors. In addition to these institutional staff, invited external experts, critics, and consultants are more actively involved in the educational process. All of them are involved in the learning process and have their own defined mission and carry out measured mentoring tasks as part of the learning process. The role of demonstrators and tutors is understood as a horizontal generational support to students. Tutors enable the learning process to be carried out outside the scheduled formal study time (tutorials, lectures, seminars, etc.).

At the Faculty of Architecture, we have recognized that the involvement of external participants, called critics, in the learning process is a positive activity. They are involved during the working process and then at the end of the assignment and assessment. The way they are involved has a constructive effect on students and tutors, a mirror effect for the tutor and a learning from practical experience for the students. The architectural projects, the final master theses, are based on theory with verification of the chosen site by methods from architectural practice and supplemented with the latest current knowledge of external critics. The critics have direct experience in the architectural field and are familiar with the labour market and the ways of communicating with clients.

Mentoring can be defined as a matrix where the candidate and the mentor are two separate parts. Each is engaged in three basic activities or phases: the preparation, the active part, and the final part of the phase.

Traditional Mentoring

Phase I: Preparation

Candidate role:

- Making the working material look paper-friendly (text size, size of graphic material, colour shades of the elements used).
 - Preparation of digital content and file delivery via email or large file providers. Requirements: digital certificate to access the online environment (e.g. E-Classroom, Moodle, etc.).
 - Paper print.
 - Arrangement with mentor: consultation meeting (date, time, location).
 - Waiting for a meeting to be prepared, changes to working materials after submission for consultation are harder to track or require more work.
 - Arrival at the consultation site.
-

Mentor role:

- Receipt of material for review (conventional mail or delivery).
 - Storage of received materials: digital archive for tracking progress and verifying content.
 - Reading and studying digital materials (via the digital interface).
 - Make notes on the material received (written notes on sheets; if digital: using keywords search, antiplagiarism tools, etc.).
 - Paper print (whole or selected parts).
 - Arrangement with candidate: consultation meeting (date, time, and location).
-

Phase II: Consultation meeting

Candidate role:

- An overview of printed material (contents).
- An overview of printed material (technical aspect).

Mentor role:

- Additional written notes on the sheets.
 - Verification of interim results.
 - Discussion.
 - Body language and other non-verbal communication.
 - An instant direct relationship between thoughts and the hand with the pen that makes the comments.
 - Visual inspection for subsequent uses of the material (use of graphics on posters, use for digital presentations, etc.).
 - Verification of the suitability of the final media and print technology (paper, other).
-

Phase III: End of the interim phase

Candidate role:	Mentor role:
<ul style="list-style-type: none"> • Departure from site. • Taking notes and transferring them to digital format (doc, jpg). • Postproduction: Entering and checking footnote citations using online sources (linking citations to published references, using online tools for editing references). 	<ul style="list-style-type: none"> • Archiving notes in a document system (physical, digital). • Record of corrections made a notification to the candidate and mentor.

A note to the last phase, the various activities are called post-production, which is known in the creative industry and in the research community. Each material must be processed, checked, and organized, following at least general bibliographic principles, such as checking sources and verifying authorship.

Digital Mentoring

Phase I: Preparation

Candidate role:	Mentor role:
<ul style="list-style-type: none"> • Recommended creation of presentation files and other materials for discussion. • Preparation of digital content and file delivery via email or large file providers. Requirements: digital certificate to access the online environment (e.g. E-Classroom). • Verification of access to remote communication applications (application updates, passwords, logins, etc.). • Providing your own space to work from home or from a remote location. • Adequate internet connection (network stability, security). • Use of other tools to communicate with the mentor (mobile apps such as Viber, WhatsApp, etc.). 	<ul style="list-style-type: none"> • Proficient user of web applications (Zoom, MS Teams, etc.). • Experienced mobile app user for instant communication. • Schedule the invitation for the online meeting and send it to the participants.