

## DIGITAL LEARNING ECOSYSTEM AT EDUCATIONAL INSTITUTIONS: A 4-UNIVERSITY PERSPECTIVE

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### Abstract

*In today's era, universities operate within a highly interconnected global landscape, which is increasingly accessible via virtual platforms, decentralized institutions, and an information-driven economy. The capacity of a university to leverage its reputation, ranking, and networks plays a pivotal role in attracting and retaining students, researchers, staff, and industry collaborators. This underscores the significance of engaging with local, national, and global communities to achieve success. This article critically examines existing literature on the digital ecosystem within the realm of education. Various studies have explored aspects such as digital ecosystem dynamics, innovation, communication channels, technology integration, and human capital considerations, aiming to elucidate effective strategies for creating and operating within this evolving landscape. The analysis delves into key themes and focal points within the concept and practice of digital ecosystems, with particular emphasis on academic initiatives as catalysts for ecosystem development and relationship cultivation. Furthermore, the article addresses the challenges and opportunities associated with implementing digital resources in Iran, while highlighting initiatives undertaken by leading universities to foster digital ecosystems. Ultimately, it provides managerial insights into potential future trajectories in this domain.*

**Keywords:** *digital ecosystem, digital learning, academic initiatives, virtual platforms, technology integration*

### I. INTRODUCTION

Undoubtedly, the education system plays the most important role in the sustainable development of countries, and its optimization is the first measure that governments consider in their long-term plans. The leaders of this optimization are the Scandinavian countries, and one of the factors of the prosperity and stability of these countries today is this factor. Criticisms have been coming to the education system for many years that education is not based on the correct basis and the education system should be reformed. However, except for the studies that were conducted about ten years ago and stopped about six years ago, there has been no significant change in Iran's education system. They only changed the names of the classes and even the number of courses and the time a person must study to get to the university did not change. Digital education has become a common concept in today's world. The revolution we are facing has turned traditional and one-way education into interactive and constructive education. This development has been used in many public and private educational institutions and is considered a reliable solution. The educational and research mission of a university in the present century, effective interaction is both internal and more vital, more interconnection with the outside world, which brings sustainable growth to the university (Anderson, 2008; Anvari, Vilmanté, & Janjaria, 2023). Therefore, with all these interpretations and understanding the importance of ecosystem development and development of relations, we will proceed to the actions of selected universities in this area.

### II. REVIEW OF LITERATURE

To describe the new ecosystem of educational resources, it is necessary to mention some of the increasingly evolving learning and teaching methods.

#### A. The Main Trends in The Education Sector in Iran: Implications and Challenges

In the early 1960s, educational content was crafted and produced utilizing mainframe computers. By the 1970s, computer-based educational systems began employing small computers for instructional

purposes. The advent of these computers in the late 1970s and early 1980s provided professors and students with greater autonomy over the creation and dissemination of educational materials. When students participate in the design process of educational materials, the role of professors transitions from merely imparting information to facilitating its acquisition. Minicomputers played a transformative role in the development and delivery of educational materials, enabling professors to create course materials using writing systems and granting students the flexibility to learn at their convenience. Initially, computers in education were primarily utilized by the military for employee training, while educational institutions concurrently utilized televisions for educational purposes (Shirzad, Rajaepour, & Mahram, 2022). The emergence of microcomputers in the early 1970s marked a shift toward microcomputer-based learning systems. However, due to the disconnected nature of minicomputer systems, there were limitations in developing and sharing instructional materials, and they lacked support for features such as sound, video, and special effects. As educational technology progressed, teachers gained the ability to create learning materials more efficiently and with greater control. Until the late 1970s, traditional face-to-face classrooms predominated, after which instruction gradually transitioned to a more personalized format incorporating self-study assignments, videotapes, and software. With advancements in technology, group classes are increasingly evolving into individualized instruction. The convergence of internet and mobile technology has propelled e-learning into the next generation.

A generation that allows teachers to design and present educational materials for students who live in distant geographical locations or cannot attend schools for some reason. The processing power available in these technologies empowers teachers to better meet the needs of individuals (Shirzad et al., 2022).

- The educational system in Iran has evolved over time, initially following a different approach from what is currently observed. With the introduction of Western educational methods and the establishment of schools, a new system emerged where teachers became central figures. In contrast to traditional Iranian schooling, Western schools typically feature fixed classrooms, allowing students to easily locate their teachers according to a predetermined schedule. This setup offers several advantages, including the convenience for both students and teachers, as teachers can conduct their work and studies in the same space and have access to necessary resources. Consequently, teachers tend to invest more effort into maintaining and improving their classrooms, creating a conducive learning environment. This mirrors historical practices in Iran, where teaching often took place in the professor's residence, facilitating practical demonstrations, such as medical treatments. However, in modern Iran, where classrooms are student-centric, there's often a lack of student engagement due to disinterest in the schooling process. Lack of attention to new and new theories in the field of education- For several years, UNESCO has compiled a document in which it has classified people's intelligence in different ways, and it no longer measures a person's intelligence only with an IQ test. After that, literacy also has various forms. In this category, we see literacies such as: communication, emotional, financial, media, education and computer literacy, each of which is necessary and vital for life in today's age (Vágvölgyi, Coldea, Dresler, Schrader, & Nuerk, 2016).

- Neglecting emerging educational theories is evident in the realm of academia. Over the years, UNESCO has curated a dossier categorizing human intelligence diversely, moving beyond the sole reliance on IQ tests. Similarly, literacy encompasses a spectrum of skills, including communication, emotional awareness, financial acumen, media literacy, educational proficiency, and computer literacy. Each of these facets is indispensable for navigating contemporary life. Despite a 12-year English language curriculum, students graduating from theoretical fields often find themselves lacking practical skills. This deficiency hampers their ability to excel in university, where specialization is essential. Unfortunately, the courses offered in theoretical fields lack distinctiveness, highlighting broader issues of ineffectiveness within the education system (Shirzad et al., 2022).

#### B. What is Digital Ecosystem?

The advent of digital business brings about substantial transformations within organizational business ecosystems, rendering them more expansive and intricate, necessitating a refined digital strategy. Engaging in ecosystem activities enables organizations to adapt and thrive in an increasingly expansive digital landscape. To meet the escalating demands of customers, organizations have broadened their offerings of products and services to unprecedented levels compared to their historical operations (Jacobides, Lang, & Von Szczepanski, 2019).

In this manner, they've established partnerships with various organizations, including competitors, to form networks aimed at delivering more tailored offerings and services. These business ecosystems,

born from such collaborations, are poised to shape the global digital economy in the forthcoming era (Valdez-De-Leon, 2019). Securing a position within these ecosystems holds paramount importance for organizations, as it can yield significant value. In the coming decade, organizations will not define their business models solely by differentiation from traditional approaches, but rather by their efficacy within emerging ecosystems comprising diverse businesses across industries. As competition intensifies, numerous industries will increasingly forge new, expansive, and dynamic alliances within the evolving digital ecosystem. In this digital ecosystem landscape, the primary business model revolves around full customer orientation, enabling customers to enjoy a seamless experience accessing a wide array of products and services through a unified digital gateway without exiting the ecosystem (Li, Badr, & Biennier, 2012; Weill & Woerner, 2015). Digital ecosystems are composed of diverse actors offering multidimensional digital solutions that involve multiple industries and are accessible through digital channels. The trade relationship between contributors to the digital ecosystem is through paper or digital (or both) contracts. These agreements formally determine payment methods and other business considerations related to services provided, the rules governing the ecosystem, and how access to the data produced within it is determined. Strengthening relationships in ecosystems, in turn, makes it possible to better meet the growing expectations of customers. Organizations operating within digital ecosystems can enhance their services and customer experiences by collaborating with third-party firms to gather and analyze extensive customer data. This collaboration enables them to offer integrated digital experiences and a wider range of services to their customers within the ecosystem (Palmié, Miehé, Oghazi, Parida, & Wincent, 2022). Success in participating within these digital ecosystems hinges on the swift acquisition and development of requisite management skills and capabilities by organizations. The emergence of ecosystems has made changes in the market landscape in terms of forming unexpected alliances between organizations, discoloration of boundaries between different industrial sectors, and how business leaders manage communications within ecosystems (Schaffnit, 2020). In digital ecosystems, organizations can collaborate in cooperatives. Organizations' relationships to each other in a digital ecosystem can take many forms. Some of these relationships are transactional and informal, such as those based on Application Programming Interface (API) that allow systems to cooperate with each other to perform simple operations (Karhu, Botero, Vihavainen, Tang, & Hämäläinen, 2011). Other relationships are more formal and complex, and they conclude service-level agreements and agreements to secure sovereignty and other managerial matters. Some of these relationships may also be established with organizations that are in some ways considered rival to one another. To be successful, an ecosystem must offer an encouraging value that is relevant to various businesses operating on it, because creating multiple and complex connections in an ecosystem requires large amounts of energy and resources. Due to the many questions raised in collaboration with third-party companies in the fields of cybersecurity, intellectual property, data ownership, privacy, profit sharing, compliance with customer regulation and management, it is important to select the right teams in the organization to operate in ecosystem. These teams require people with technical skills and expertise in technology integration, infrastructure, applications, and digital services (Pipek & Wulf, 2009). Due to the importance of the role of API in ecosystems, some organizations have begun to create API centers. These centers oversee the design and development of API in the organization and how they connect to third-party companies. By establishing ecosystem communication management teams, organizations can monitor their performance within the ecosystem by measuring key performance indicators and indicators agreed upon by all organizations in the ecosystem. In order to develop the capabilities required for effective management of an organization's activity in an ecosystem, tools should be developed to create a balance between standardization of activities and flexibility in cooperation with partners in the organization. It should also be put on the agenda to promote the culture of cooperation through developing protocols, designing incentives and developing tools that encourage eco-organizations to work together to promote ecosystem development (Yamamoto, 2018).

A 2019 comprehensive Boston Consulting Group (BCG) study, in which 40 digital ecosystems have been studied, identified four important factors that have changed how organizations interact with each other in new digital ecosystems:

- Geographical diversity of participants - Digital ecosystem partnerships include different actors from different locations, which means cooperation between organizations with large geographical distances and different languages.

- Focus on inter-industrial cooperation - In many ecosystems, the required expertise comes from different industries.
- Flexible trading structures- In digital ecosystems, more flexible trade structures are used than joint ventures and long-term alliances such as contractual communication and platform-based partnerships to enable faster response to changing preferences of customers, new technologies, emerging threats from competitors and changes in existing regulations.
- Creating value in reciprocal and continuous- In a strong digital ecosystem, the focus is on creating value on a continuous basis, and all participants benefit from the activity within the ecosystem and communication with each other.

In order to select an appropriate ecosystem, BCG has identified three types of digital ecosystems that organizations should focus on activities within an ecosystem that is appropriate to the organization according to their strategic objectives and capabilities. Three types of digital ecosystems identified by the BCG are: Digitizer network, Platform and Super platform (Moyer & Burton, 2016; Timokhova et al., 2022). Digital ecosystems are defined based on the depth and range of potential collaborations between the actor sets. Each participant represents part of the final solution designed in the ecosystem or provides part of the capabilities required to develop the solution. The power of the digital ecosystem is that neither participant alone needs to possess or work with all the components of the final solution, and that the value produced in the ecosystem is more than the sum of the value generated by each participant in the ecosystem. According to Gartner's 2017 definition, the digital ecosystem consists of a group of actors (organizations, people and objects) working with standard digital platforms to achieve mutual goals that benefit all (Yamamoto, 2018). They have recommended the following key things for organizations to develop or operate in a strategic digital ecosystem: Creating an open and cooperative culture; Welcome change; Business model redesign; Promoting digital technologies.

### C. Academic Initiatives in Digital Ecosystems

Today, universities are located in a complex and interconnected global environment that is becoming increasingly accessible through virtual events, decentralized institutions, and the information-driven economy. A university's ability to leverage its reputation, ranking and relationships is key to attracting and retaining students, researchers, staff and industry partners, and how local, national and global communities interact and perceive the university's ability to achieve success. The educational and research mission of a university in this century is the effective interaction of both internal communication and the more vital issue, more communication with the outside world, which brings sustainable growth for the university. Therefore, with all these interpretations and understanding the importance of creating an ecosystem and developing relationships, we will continue to discuss the actions of selected universities in this field (Feliciano-Cestero, Ameen, Kotabe, Paul, & Signoret, 2023; Godin & Terekhova, 2021; Koebnick, 2021; Shishmano, Popov, & Popova, 2021).

#### • University of Lincoln

In its digital strategy, the University of Lincoln introduced five areas that it operates under those areas. "Creating Digital Communities" is one of the key areas that is here sharing knowledge to ensure that everyone can benefit from developing expertise at the university. Establishing an open and flexible university that supports collaboration in different fields, regardless of borders, and uses existing assets and knowledge to promote education digitally is an approach in this strategic field.

The objectives of the university in this area are to encourage the staff and students to share their knowledge, methodology and achievements in the best interests of the university and the larger community as well as the enthusiastic participation of the staff and students in the scientific societies that are inspiring and capable. Also, given that the University of Lincoln's Strategy Document names strong partners and employee partnerships as a principle, it can be said that the University seeks to take advantage of local and regional opportunities which can play a fundamental role throughout the region. Creating an environment for graduates to work in jobs in the area after their studies, and even supporting new businesses, is one of the university's goals in this area.

Encouraging employees to move within the university and even exchange with the industrial sector informs the university that their training and research is up-to-date. Establishing a more important role in the life of stakeholders, strengthening relationships with industry and leading partners, and encouraging senior staff to interact with at least one local organization are the university's missions in this area. At the same time, the university created new opportunities for student engagement and research by growing international industrial collaboration.

Increasing the number of partnerships with businesses; increasing the number of global opportunities for staff and students through university and business partners; increasing the number of functional learning programs; increased income from consulting activities; increased presence in relevant organizations and organs; increasing university-affiliated companies; increasing the number of employees eager to move and exchange with industry.

One of the criteria for university success is to achieve the objectives of this field. Table 1 summarizes the University of Lincoln's digital strategy.

Table 1: Key Objectives in University of Lincoln's Digital Strategy.

| Strategic Area               | Key Objectives  |
|------------------------------|---|
| Creating Digital Communities | - Encourage knowledge sharing among staff and students  |
|                              | - Foster enthusiastic participation in scientific societies                                       |
|                              | - Establish strong partnerships with local and regional organizations                             |
|                              | - Create opportunities for graduates to work in the area after studies and support new businesses |
|                              | - Encourage staff mobility within the university and collaboration with the industrial sector     |
|                              | - Strengthen relationships with industry partners   |
|                              | - Increase international industrial collaboration for student engagement and research             |
|                              | - Increase partnerships with businesses   |
|                              | - Provide global opportunities for staff and students through university-business partnerships    |
|                              | - Expand functional learning programs   |
|                              | - Increase income from consulting activities  |
|                              | - Enhance university's presence in relevant organizations   |
|                              | - Increase university-affiliated companies  |
|                              | - Promote staff mobility and exchange with industry   |

**• University of Adelaide**

The University of Adelaide, in the technology strategy document, uses multiple columns to build its digital future. One of these pillars is “Managing Relationships and Interaction with Communities”. The University of Adelaide has a holistic view of every student, whether current or graduate students, or return to college as lifelong learners. The ability of communication management for the university provides support for current and future students, professional and academic staff, researchers, industry partners, alumni and university patrons. It also provides support for the university's Internal and External Relations Management Program from partnership, research interactions, industry services and future collaboration. On the other hand, the university strives to use its knowledge to connect its academic community with international graduates and to participate only in the future, regardless of its role on the world stage.

The primary objective of this column is to effectively manage relationships between industry and foreign stakeholders within the university context. It encompasses various groups such as students, researchers, employees, and foreign stakeholders, facilitating more personalized, efficient, and coordinated communication, marketing efforts, absorption processes, and other related activities.

Key actions undertaken by the university in this domain include (Table 2):

- Enhancing the capacity for managing relationships and interactions with academic, regional, national, and global communities effectively.
- Offering a holistic view of student information throughout their academic journey within and outside the university, thereby enhancing the university's understanding of diverse groups at all stages of education and upon graduation.
- Leveraging new technological capabilities to support campaign management, business development, opportunity identification, and targeted marketing for talent acquisition and employment.

These initiatives are integral to the university's efforts in this crucial area. Additionally, the university aims to gather accessible, searchable, and pertinent data at both individual and group levels to better anticipate the needs of students, researchers, and other internal and external stakeholders. The University of Adelaide's technology strategy, Digital Future, aims to provide technological solutions for future endeavors, emphasizing the importance of innovative, sustainable, and scalable initiatives aligned with the university's growth plans.

Moreover, the university's strategy not only addresses current community needs but also prepares for future challenges, opportunities, and expansion.

The key constructs that the university has envisioned in its digital future include connecting to the global world of ideas, attracting talent, future-shaping research, teaching fit for the contemporary century, and the beating heart of Adelaide. (Here, the heart of Adelaide means turning this university into a center for the social and economic growth of the city of Adelaide that brings development, creativity and innovation at the regional, national and global levels) digital experience, smart campus, teaching and learning and Research, communication management and interaction with society, data, analysis and insight, digital work environment and the key basis of technology such as cyber security and information technology infrastructure are among the enablers of this university. Each of these enablers covers the issues described below.

- Digital experience refers to the seamless interaction among various stakeholders within the university ecosystem, comprising present and prospective students, faculty, researchers, industry collaborators, alumni, and supporters. It entails easy access to customized technology via a unified and engaging platform. This enhanced digital experience encompasses all facets of student engagement—from enrollment to graduation and beyond, encompassing academic and professional staff experiences as well (Koh & Kan, 2020).

- Assessment, teaching and learning. Access without time limit to the content of the course in digital format Preparing students for the future work environment through technology-based, collaborative and experience-based approaches. Digital learning environments inside and outside the university campus with virtual classes and offers to support the culturally diverse student body around the world. Using technology to support providing more flexible and personalized choices to students and academics by designing and delivering curriculum, authentic, reliable, accurate and digital assessments as well as flexible academic timetables and calendars.

- Research Technology: This encompasses technologies and services designed to facilitate the attraction, support, and retention of skilled researchers in critical academic fields. It also includes tools and services aimed at managing and delivering research on a global scale, enhancing the overall researcher experience, promoting research collaboration, and optimizing implementation strategies. Additionally, it involves specialized, high-performance computing for research, effective research data management solutions, and secure research facilities. Furthermore, it includes technologies and tools intended to bolster business research and foster partnerships with industries.

- Data, Analytics, and Insights: This involves the provision of reliable, accurate, timely, and easily accessible data and insights to enhance evidence-based decision-making university-wide. For instance, it includes facilitating early intervention and responsiveness in areas such as student mental health and well-being as part of the university's holistic support framework

Data governance and analytics platforms provide a single view of stakeholders for decision-making and tailored marketing capabilities.

- Relationship management and interaction with the community. Strengthening the ability and effective management of relations and interaction with the academic, regional, national and global community. Providing a comprehensive overview of students' data across their academic journey both within and beyond the university, enhancing the institution's comprehension of diverse student demographics at various educational stages and upon graduation. Implementing new technological advancements to facilitate campaign management, business expansion, opportunity identification, and targeted marketing efforts aimed at attracting and retaining talent.

- Intelligent campus. Physical settings where human presence and technological infrastructure converge to deliver enriching experiences for the academic community. Emphasizing greater utilization of buildings, campus grounds, and online platforms for learning, interaction, and communication among students, faculty, and stakeholders at local and global levels.

- Digital workforce. Implementing technologies to actively engage and manage talent, streamline staff workflows, enhance collaboration and communication, and integrate with various systems and data sources to foster operational efficiency.

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- Improving the employee experience by enabling a flexible and fluid workforce, as well as fostering improved and easier communication and collaboration, freeing up more time for more important work.

- Technology infrastructure. Key platforms and technologies that provide a flexible, secure and sustainable foundation and can provide technological Alternative approaches like digital platforms for managing communication and enhancing user experiences aim to deliver interactive and worldwide technologies and engagements for students, scholars, faculty, staff, and external collaborators.

Table 2: Summary table of the University of Adelaide's digital strategy.

| Strategic Supports                                      | Key Objectives   |
|---|--|
| Managing Relationships and Interaction with Communities | - Facilitate personalized communication and support for students, staff, researchers, and stakeholders |
|   | - Enhance capacity for managing relationships effectively  |
|   | - Offer holistic view of student information   |
|   | - Leverage new technologies for campaign management and targeted marketing                             |
| Digital Experience                                      | - Ensure seamless interaction across various stakeholders  |
|   | - Provide easy access to technology via unified platform   |
|   | - Enhance digital experience throughout academic journey   |
| Assessment, Teaching, and Learning                      | - Provide digital access to course content   |
|   | - Prepare students for future work environment through technology-based approaches                     |
|   | - Support flexible and personalized learning options   |
| Research Technology                                     | - Facilitate attraction and retention of skilled researchers   |
|   | - Enhance research collaboration and global delivery   |
|   | - Provide specialized computing and research data management solutions                                 |
| Data, Analytics, and Insights                           | - Provide reliable and accessible data for evidence-based decision-making                              |
|   | - Facilitate early intervention in areas like student mental health                                    |
| Intelligent Campus                                      | - Utilize physical and online spaces for learning and interaction                                      |
|   | - Enhance experiences for students, faculty, and stakeholders  |
| Digital Workforce                                       | - Streamline workflows and enhance collaboration among staff   |
|   | - Improve employee experience through flexible work arrangements                                       |
| Technology Infrastructure                               | - Provide flexible, secure, and sustainable technological foundation                                   |
|   | - Implement digital platforms for communication and engagement   |

### • Bielefeld University of Applied Sciences

Bielefeld University of Applied Sciences is a medium-sized higher education institution with more than ten thousand students in five faculties and is the result of the widespread trend of the 1960s in West Germany towards training more engineers and middle-level managers. Factors such as the growth of the number of students, especially at the undergraduate level, the location of this university in a rural area and the growing ratio of first and second generation immigrants, lead this university to digitalization and internationalization (Kehm, 1999). The digitization strategy of this institution is currently focused on the main administrative structures and processes. In line with moving towards digitization and internationalization, this university has done the following: Digitization, which has

recently been considered as an important strategic goal in this university, its implementation is associated with the following:

University-wide approved macro goals. A multi-project approach to create digital capability and competency development centers (teaching and learning, management, internationalization, asset and facility management).

Decision making on priorities (at the department and department level) based on urgency and demand with an emphasis on faculty initiatives.

A framework for diverse projects overseen by a coordinated central platform.

The challenges facing digital transformation in this university are: Governance and coordination; transparency and mainstreaming of initiatives and processes in departments; advising and aligning efforts at all levels; also, this university considered two things before determining the priority in choosing digital platform tools:

Methods of purchasing software at the level of the European Union; and choosing between open-source software or commercial software. Finally, by specifying its challenges and priorities, this university has developed the following goals and strategies in different departments:

Goals, strategies and priorities; Optimizing communications; Speeding up certain processes; Increasing the transparency of operations; Efficient management of the student life cycle; Improving student services; Providing new benefits to users by providing sufficient information; Achieving quick wins and successes without risking losing dynamism and mobility by defining multiple multi-dimensional projects seems to be the rationale for setting priorities. Regarding new processes in the future, these things are controlled by coordination mechanisms.

• Marketing Strategies

This university has strong educational, research and transfer missions, but not just a region for itself. Marketing activities and channels include: Marketing for students and attracting international students applying for a degree is done through the national websites of this country and social media and advertising campaigns.

University website- The activity of this university in major international educational exhibitions.

Participation in the exploratory trips aimed at the country by the non-profit organization; management and processes.

The main processes of this university that are prioritized for digitization in the first wave:

- Student Lifecycle Management (Applications, Enrollment and Status) and Services (ICOMS Initiatives)
- Exams and course management
- Financial Management
- Asset management
- Document Management

The following table include the list of prioritized processes for this university:

Table 3: Prioritized Processes for Digitization at Bielefeld University of Applied Sciences

| Process                                   | Description   |
|---|---|
| Student Lifecycle Management and Services | Includes applications, enrollment, status tracking, and ICOMS Initiatives |
| Exams and Course Management               | Management of exams and course-related processes                          |
| Financial Management                      | Management of financial processes and resources                           |
| Asset Management                          | Management of university assets   |
| Document Management                       | Management of digital documents and records                               |

As mentioned earlier, the main focus is on the digitalization of classic administrative processes and specific functions. Education, learning management, research and transfer are moving towards digitization with a focus on e-learning, knowledge management, learning support and project organization. Structural and intersectoral changes in the main processes (for example, those connecting teaching and research with management) that prepare the university for overall digitalization seem to be assigned to the second stage of the reform.

• Queen's University

This university was the first university in Canada to grant scholarships to its students. Queen's University presented a two-year framework for its digital transformation in 2018. This framework considers the following goals: provide perspective community participation and collaboration in



developing a shared understanding of digital opportunities. create an integrated and aligned view of needs and development across portfolios. creating a foundation implementation of key information technology enablers establish digital strategy governance. propulsion creation gathering information about digital needs and priorities creating a decision reference for digital investments (Zaki, 2019). The digital strategy defines the university's vision for its core mission of learning and research through a digital lens. This digital program includes digital research infrastructure, digital learning ecosystem and fundamental enablers including management and administrative systems. Digital planning is as much about technical infrastructure as it is about human resources, policies and processes. This framework refers to the following:

- Environmental Monitoring: The Digital Planning Project Group conducts environmental monitoring of digital strategies in higher education, identifying emerging and salient themes among the developing strategies in public and private organizations.
- Engaging Campus People and Agents: As an initial stage of engagement and engagement, in March and April 2018, the Digital Planning Group will support conversations to understand how digitization is happening in higher education, particularly at Queen's University, and clarify what principles, policies, processes, and processes need to be in place. and priorities to be considered in the university's digital review center.
- Development of guiding principles for Queen's Digital Strategy
- Creating a digital maturity model to position Queen's University in the digital journey

Identifying digital governance models

The guiding principles for the digital strategy of this university are stated below.

- Vision Alignment: Digital strategy goals and resource allocation should be aligned with the university's vision for the student learning experience and research priority, and the specific priorities of faculty members and the university.
- Community: The university envisions a digital future driven by the university community, one that enhances the human experience on campus and around the world.
- Transparency: Using digital opportunities, this university will offer learning and research opportunities to the world with privacy and ethics (Godin & Terekhova, 2021).
- Inclusivity: Our digital environment will be designed with diversity and equitable access in mind and will encompass the needs of all disciplines and fields of study.

Innovation: The University will capitalize on advances in technology with a digital strategy that is adaptive (changes) over time and the creativity that is evident in Queen's teaching and research.

## II. METHODOLOGY

This paper is a general literature review, with an informative purpose, that aims to explore recent and relevant literature in digital universities. There are very few studies that have investigated digital transformation in education in Iran. Therefore, we searched for universities that engaged in a digital planning process and examined a variety of issues such as access to data, artificial intelligence, and providing a high level overview of the digital landscape associated with universities.

## IV. CONTRIBUTION AND PRACTICAL IMPLICATIONS FOR ORGANIZATIONS

Advancing along the journey of digital transformation extends beyond merely employing digital technologies in work procedures; it necessitates a shift in mindset, the re-education of individuals, and a change in organizational attitudes (Anvari, Kumpikaitė-Valiūnienė, & Janjaria, 2023). Nowadays, beyond technological prowess, the prevalence of individuals possessing a digital mindset shapes an organization's digital progression. Consequently, fostering a digital mindset can be identified as the primary stride in the process of digitalization. To instill a digital culture among organizational leaders and key personnel, a tailored program for enhancing individuals' digital competencies is imperative.

## V. CONCLUSION AND FUTURE RESEARCH

Digital transformation has an umbrella approach in the organization and affects all departments and layers of the organizational structure. Therefore, it is necessary to consider digital transformation training courses for different departments and layers of the organizational structure with different and appropriate approaches. As evidenced in literature, a significant challenge within Iran's education sector is the inadequacy of delivering education that precisely aligns with the evolving needs of

society, thus hindering its efficiency and effectiveness. In another words, the need for macro view instead of micro view. There are many challenges to the implementation of digital resources. Some other problems in this section are given below: Lack of attention to the continuity of education and higher education; lack of strong relationship between higher education and industry; lack of relationship between higher education and society; the lack of relationship between higher education and skill development and work environment; the problem of escape and the need to attract and maintain brains; not handing over some units to the public and the private sector; the non-competitiveness of universities and the activities of professors in them; the selection of the professor and the illiteracy of some selected people and the failure of recruitment; rely on memory; lack of attention to information technology; lack of transparency and single policy for entering information in different departments; society's insistence through parliamentarians on the establishment of independent university units instead of paying attention to the establishment of branches affiliated to prestigious universities. Finally, the authors suggest future work need to be carried on actions of selected universities in the field of student digital experience and digital transformation and the business model of universities in Iran.

## REFERENCES

- Anderson, T. (2008). *The theory and practice of online learning*: athabasca university press.
- Anvari, R., Kumpikaitè-Valiūnienė, V., & Janjaria, M. (2023). *Determinants of Digital Governance in the Development of Smart Cities*. Paper presented at the 2023 IEEE European Technology and Engineering Management Summit (E-TEMS).
- Anvari, R., Vilmantė, K.-V., & Janjaria, M. (2023). *How Colleges and Universities Are Driving to Digital Transformation Today: Conceptual Model of Digital University (Designed for the University of Georgia)*. Paper presented at the 2023 IEEE European Technology and Engineering Management Summit (E-TEMS).
- Feliciano-Cestero, M. M., Ameen, N., Kotabe, M., Paul, J., & Signoret, M. (2023). Is digital transformation threatened? A systematic literature review of the factors influencing firms' digital transformation and internationalization. *Journal of Business Research*, 157, 113546.
- Godin, V. V., & Terekhova, A. (2021). Digitalization of education: Models and methods. *International Journal of Technology*, 12(7), 1518-1528.
- Jacobides, M. G., Lang, N., & Von Szczepanski, K. (2019). What does a successful digital ecosystem look Like? *Boston Consulting Group*.
- Karhu, K., Botero, A., Vihavainen, S., Tang, T., & Hämäläinen, M. (2011). A Digital Ecosystem for Co-Creating Business with People. *Journal of Emerging Technologies in Web Intelligence*, 3. doi:10.4304/jetwi.3.3.197-205
- Kehm, B. M. (1999). Higher education in Germany: developments, problems and perspectives.
- Koebnick, P. (2021). *Digitalisation and Business Model Innovation: Exploring the Microfoundations of Dynamic Consistency*.
- Koh, J., & Kan, R. (2020). Students' use of learning management systems and desired e-learning experiences: are they ready for next generation digital learning environments? *Higher Education Research & Development*, 40, 1-16. doi:10.1080/07294360.2020.1799949
- Li, W., Badr, Y., & Biennier, F. (2012). *Digital ecosystems: challenges and prospects*. Paper presented at the proceedings of the international conference on management of Emergent Digital EcoSystems.
- Moyer, K., & Burton, B. (2016). Three styles of digital business platforms. *Gartner research*, 12.
- Palmié, M., Miehé, L., Oghazi, P., Parida, V., & Wincent, J. (2022). The evolution of the digital service ecosystem and digital business model innovation in retail: The emergence of

- meta-ecosystems and the value of physical interactions. *Technological Forecasting and Social Change*, 177, 121496.
- Pipek, V., & Wulf, V. (2009). Infrastructuring: Toward an integrated perspective on the design and use of information technology. *Journal of the Association for Information Systems*, 10(5), 1.
- Schaffnit, M. (2020). Digital ecosystems. *Digital Business Development: Die Auswirkungen der Digitalisierung auf Geschäftsmodelle und Märkte*, 53-71.
- Shirzad, Z., Rajaepour, S., & Mahram, B. (2022). Explaining the Challenges of Iran's Higher Education System Facing Globalization) A Phenomenological Study. *Journal of Management and Planning In Educational System*, 15(1), 105-128.
- Shishmano, K. T., Popov, V. D., & Popova, P. E. (2021). *API Strategy for Enterprise Digital Ecosystem*. Paper presented at the 2021 IEEE 8th International Conference on Problems of Infocommunications, Science and Technology (PIC S&T).
- Timokhova, G., Kostyukhin, Y., Sidorova, E., Prokudin, V., Shipkova, O., Korshunova, L., & Aleshchenko, O. (2022). Digital transformation of the university as a means of framing eco-environment for creativity and creative activities to attract and develop talented and skilled persons. *Education Sciences*, 12(8), 562.
- Vágvölgyi, R., Coldea, A., Dresler, T., Schrader, J., & Nuerk, H.-C. (2016). A review about functional illiteracy: Definition, cognitive, linguistic, and numerical aspects. *Frontiers in Psychology*, 7, 187726.
- Valdez-De-Leon, O. (2019). How to develop a digital ecosystem: A practical framework. *Technology Innovation Management Review*, 9(8).
- Weill, P., & Woerner, S. L. (2015). Thriving in an increasingly digital ecosystem. *MIT sloan management review*, 56(4), 27.
- Yamamoto, S. (2018). *Enterprise requirements management knowledge towards digital transformation*. Paper presented at the IT Convergence and Security 2017: Volume 1.
- Zaki, M. (2019). Digital transformation: harnessing digital technologies for the next generation of services. *Journal of Services Marketing*, 33(4), 429-435.