Digitalization in Education: Innovating Value for Stakeholders

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Abstract

Digitalization and digital transformation have significantly influenced various sectors, reshaping the way organizations function, deliver services, create value and engage with stakeholders. Public institutions, including educational ones, such as universities, are increasingly being influenced by digital transformation. As technology continues to evolve, universities are at a critical crossroad where the adoption of digital tools and platforms is no longer optional, but a fundamental aspect of their operations. Digitalization offers an unprecedented opportunity to enhance administrative efficiency, improve the quality and accessibility of education, and facilitate more dynamic interactions between universities and their stakeholders, including students, businesses, local government and the broader community. By leveraging digital technologies, educational institutions have the potential to innovate and redefine the value they offer to their stakeholders. Using the existing literature on digital transformation within public institutions, specifically universities, this article explores how digitalization can serve as a catalyst for innovation in the value offered by public educational institutions to their stakeholders.

Keywords: digital transformation, higher education, value innovation, digital innovation, digital technologies, stakeholder engagement.

1. Introduction

In recent years, the terms “digital transformation” and “digitalization” have emerged as pivotal concepts, reflecting a fundamental shift in how organizations operate and deliver value; this transformation encompasses the integration of digital technologies into all areas of an organization, fundamentally altering how it engages with its stakeholders, processes information, and delivers services. As various sectors have embraced this shift, public institutions, particularly universities, are increasingly recognizing the necessity of digitalization to remain relevant and effective in a rapidly evolving societal landscape. The significance of digitalization and digital transformation in public institutions is profound, especially as these entities encounter mounting pressures to generate value for their stakeholders; in this context, digitalization acts as a pivotal enabler that transforms operational frameworks while promoting co-creation, a collaborative process in which institutions work alongside stakeholders to design and implement solutions that effectively meet the evolving needs of their communities.

Focusing on universities as a case study within the broader framework of public institutions undergoing digitalization is particularly pertinent for several reasons, one of which is that universities are not only centers of education and research but also significant contributors to societal development and economic growth, meaning their role in equipping individuals with the skills and knowledge necessary for the workforce is vital, and digital transformation can enhance their capacity to fulfill this mission.

Thus, this study seeks to address the following research question: How can digitalization act as a catalyst for innovation in the value offered by public universities to their stakeholders? Through a comprehensive analysis of existing literature, this study endeavors to contribute to a deeper understanding of the transformative potential of digitalization in the realm of public higher education, ultimately shedding light on how universities can leverage these changes to better serve their communities and fulfill their missions in an increasingly digital world.

2. Literature Review

Digitalization in Educational Institutions

The rapid evolution of digital technologies has ushered in an era of profound digital transformation that has fundamentally reshaped various sectors, including public institutions. Digitalization, a term often used interchangeably with digital transformation, has garnered significant attention in recent years, particularly as both public and private institutions seek to leverage technology to improve efficiency, drive innovation, and create greater value for their stakeholders. As Brennen and Kreiss (2016) describe, digitalization involves the reorganization of different areas around digital communication and media infrastructures, emphasizing the essential role that digital tools play in transforming processes and interactions within organizations. Conversely, digital transformation, as Vial (2019) argues, encompasses not just the adoption of these technologies but also the comprehensive rethinking of organizational strategies, structures, and cultures, with the goal of maximizing the potential offered by digital tools.

Within the context of educational institutions, particularly universities, this process involves the integration of information and communication technologies (ICTs) into the very core functions of the organization, ranging from administrative tasks to teaching, research, and even stakeholder engagement (Kopp et al., 2019). In this light, digital transformation represents a profound change that significantly impacts institutional identity, ultimately requiring universities to redefine their role in the digital age (Hess et al., 2016). Furthermore, literature underscores that digitalization is not merely about the application of technology, rather, it is recognized as a disruptive force that fundamentally alters the nature of value creation within institutions. For instance, Yoo, Henfridsson, and Lyytinen (2010) explain that digitalization blurs the boundaries between the physical and the digital, thereby opening new avenues for interaction and service delivery that were previously unavailable or unimaginable. This framework is particularly relevant for public institutions, where digital transformation can serve as a key enabler of more transparent, efficient, and responsive service models.

In the specific case of higher education institutions, digital transformation has emerged as a critical priority, especially in the second decade of the 21st century, marking a natural and necessary evolution for universities that aspire to lead change and maintain competitiveness in their respective fields. Not only has digital transformation become a top priority for universities,

but it is also increasingly recognized as essential for numerous other types of organizations. This sense of inevitability is driven by the pressing need for institutions to address the multitude of challenges arising from the rapid and diverse changes in their external environments. However, it is important to note that digital transformation in higher education extends far beyond a mere technological shift, rather, it encompasses a much broader scope, seeking to anticipate and meet the evolving needs and behaviors of stakeholders. Additionally, it aims to offer education, research, and social services that align with user demands in a continuously evolving competitive landscape. This approach to digitalization requires the full integration of core services, the development of advanced digital skills among both academics and students, and the implementation of decision-support systems that are adaptable enough to respond to changing circumstances (Kuzu, 2020). Consequently, the impact of digital transformation on higher education goes beyond technical upgrades, influencing the very mission of universities as they strive to remain relevant and effective in an increasingly digital world.

Public universities, due to their integral role within society, must carefully consider the wider social and cultural consequences that accompany the process of digital transformation. According to the literature, public institutions are tasked with the challenge of finding a balance between pursuing efficiency and innovation, while simultaneously maintaining their commitment to upholding essential ethical principles (Misuraca & Viscusi, 2015). This challenge becomes particularly salient in the context of education, where the implementation of digital technologies has the potential to either democratize access to knowledge, ensuring it is available to a broader audience, or, conversely, deepen existing divides between those who possess access to digital resources and those who do not, known as digital divide, which has been center of attention in the last years (e.g. van Dijk, 2020).

A prominent theme that emerges from the literature on digital transformation is its significant capacity to enhance value creation within various types of organizations, including universities. In the context of public institutions, value creation refers to an organization's ability to deliver services that not only meet but also exceed the needs and expectations of their diverse stakeholders, which include students, faculty, government agencies, and the broader community (Bryson, Crosby, & Bloomberg, 2014). Digitalization presents several avenues through which

universities can create new forms of value. For instance, Sahu (2020) highlights how the adoption of digital tools has the potential to improve the efficiency of administrative processes, which, in turn, can free up valuable resources that may then be redirected toward more strategic initiatives, such as improving the quality of education or expanding research capabilities. Additionally, digitalization opens the door to new opportunities for research and innovation, as it facilitates more seamless collaboration between universities, industry, and government partners. As noted by Hailu (2024), digital tools have fundamentally transformed the way knowledge is produced and disseminated, enabling more interdisciplinary and cross-sectoral research collaborations. These collaborations, in turn, have the potential to drive innovation not only within academic institutions but also across the public sector and society at large.

3. Main directions for understanding Digital Innovation in Universities

As public institutions embrace digital transformation, they are also opening new avenues for digital innovation, which refers to the development and implementation of novel digital products, services, or processes that create fresh value for both the institution and its stakeholders (Nambisan et al., 2017). Digital innovation allows institutions to move beyond simply upgrading their current systems and explore new ways of engaging with their environment, fostering collaboration, and delivering value. For universities, this can manifest in various ways, such as the creation of new educational platforms, the use of big data and analytics for improved decision-making, or the development of online learning environments that expand access to education. The pandemic further accelerated the need for such innovations, pushing universities to embrace digital solutions to maintain the continuity of educational services and adapt to a rapidly changing global landscape (Peters et al., 2022). These innovative approaches allow universities to remain competitive and relevant while also addressing societal challenges through the use of cutting-edge technology.

The integration of digital tools and strategies is particularly significant in the public sector, where digitalization and digital transformation serve as mechanisms for enhancing service delivery, decision-making, and accountability. Public institutions are often under pressure to adopt digital solutions to reduce costs, increase transparency, and meet the growing expectations of

stakeholders, such as government bodies, citizens, and communities (Mergel et al., 2019). Universities, as a critical subset of public institutions, have embraced digitalization not only to improve administrative efficiency but also to enhance the learning experience, expand research capabilities, and increase the accessibility of higher education. Online platforms, digital resources, and data-driven decision-making are increasingly being utilized to improve learning outcomes, streamline university operations, and ensure that students, faculty, and other stakeholders have access to the resources they need to thrive in a digital environment (Gaftandzhieva, et al., 2023). In this way, universities are adapting to the digital age by leveraging the benefits of digitalization to enhance their core functions and improve the quality of their services.

Universities, as public institutions, have a unique role in society, as they serve multiple stakeholders, including students, faculty, government bodies, and the general public. Historically, their mission has centered on producing and disseminating knowledge, fostering critical thinking, and contributing to societal development through education and research. This public mission remains central to universities' identity, even as they evolve to meet the demands of a digital society. In this context, the integration of digital tools and strategies within universities must be aligned with their broader goals of serving the public good and ensuring that they remain accessible, equitable, and inclusive to a wide range of stakeholders. As public institutions, universities are expected to create value not only for their immediate stakeholders but also for society at large by contributing to economic, social, and cultural development.

In line with this, digital transformation in universities presents an opportunity to enhance their public mission by enabling them to expand access to education, improve the quality of learning, and create knowledge that is relevant to the evolving needs of society. Universities are increasingly using digital tools to deliver educational content through online platforms, integrate data analytics into their governance models, and develop digital infrastructures that enhance their research capabilities. By doing so, universities are better positioned to fulfill their role as hubs of innovation, where both students and faculty can contribute to societal development through research, education, and community engagement (Carayannis & Rakhmatullin, 2014). Furthermore, digital transformation allows universities to contribute to the development of

digital literacy and skills within the broader community, thereby preparing individuals to navigate the complexities of the digital age.

Stakeholders of Educational Institutions from the perspective of Innovation and Digitalization

Public universities, as essential societal institutions, interact with a broad range of stakeholders, each contributing to and benefiting from the university's core missions of education, research, and public service. Stakeholder theory, as conceptualized by Freeman (1984), defines stakeholders as any group or individual that can influence or be influenced by an organization's objectives. In the context of universities, these stakeholders include students, faculty, businesses, government entities, and the broader community, all of whom play distinct roles in shaping the institution's functions while expecting value in return.

Students, often considered the most immediate beneficiaries, seek knowledge, skills, and qualifications that will enhance their employability and personal growth. Alongside students, faculty engage in both teaching and research, contributing to the dissemination of knowledge while advancing their respective fields. Businesses, which increasingly rely on universities for research partnerships and access to a well-trained workforce, view these institutions as crucial collaborators for innovation and technological advancement. In parallel, government entities, responsible for funding and policy-making, rely on universities to foster social and economic progress, anticipating contributions to national development and societal well-being. Lastly, the community at large benefits from universities through outreach initiatives, cultural events, and public engagement activities, as these institutions play a vital role in enhancing the social and intellectual fabric of their environments.

Traditionally, universities have created value for their various stakeholder groups by fulfilling distinct roles that align with their historic missions, roles that have evolved over time but continue to reflect core educational and societal objectives. For students, universities have long provided structured educational pathways that culminate in formal qualifications, while also imparting essential knowledge and skills designed to prepare them for professional careers. The traditional academic model, which has historically been centered on in-person education, facilitated direct interaction between students and educators, thereby creating a well-defined

pathway toward both academic achievement and career readiness (Mindruta, 2012; Argandoña, 2011). This direct interaction, which was a hallmark of the traditional university experience, not only enhanced students' learning but also contributed to their personal development through the relationships they formed with faculty and peers. Faculty, on the other hand, found value in the intellectual freedom that universities offered, as these institutions allowed them to pursue both teaching and research in ways that supported not only knowledge generation but also the mentoring of future generations of scholars. Thus, universities served as hubs for intellectual exchange, where teaching and research were deeply intertwined, contributing to the ongoing advancement of knowledge.

For businesses, universities traditionally provided value not only by producing graduates equipped with relevant skills but also by facilitating research collaborations that translated into practical innovations. The partnerships between academia and industry were seen as mutually beneficial, where scientific research conducted at universities could be applied to real-world problems, thereby driving both technological advancements and economic growth (Perkmann et al., 2013). Moreover, these collaborations between universities and businesses helped bridge the gap between theoretical knowledge and its practical applications, creating a symbiotic relationship that benefitted both sectors.

Governments, too, viewed universities as essential to national development, perceiving them as key actors in the promotion of social mobility and the creation of a skilled workforce capable of addressing broader societal challenges. In this sense, universities were not only educational institutions but also engines of social and economic development, contributing to the overall well-being of society through their core missions (Boulton & Lucas, 2008). This dual role of universities, as educators of individuals and as contributors to societal progress, underscored their importance in shaping not just the economy but also the broader social fabric.

Finally, communities benefited from the broader societal contributions of universities, including cultural enrichment, public lectures, and other forms of public engagement that served to enhance the public good. Through these activities, universities positioned themselves as critical anchors within their regions, not only providing education but also fostering a sense of community and contributing to the cultural and intellectual life of the broader society

(Benneworth & Jongbloed, 2010). Consequently, the role of universities extended beyond their immediate educational mandate, as they became integral to the social, economic, and cultural vitality of the regions they served.

As the digital age progresses, stakeholders' expectations are evolving, and universities are being compelled to rethink how they deliver value in this rapidly changing landscape. The integration of digital technologies has introduced new dynamics that affect the core functions of higher education institutions, necessitating a shift from traditional, static models of operation to more flexible and innovative approaches. Universities are now expected to not only provide academic knowledge but also facilitate the development of digital competencies, foster innovation, and contribute to broader societal needs in a more dynamic, real-time manner. This transformation involves reimagining how institutions engage with their stakeholders, including enhancing communication channels, streamlining administrative processes, and leveraging technology to improve access to resources and services. Moreover, universities are increasingly being evaluated on their ability to adapt to technological advancements, making digital readiness a key factor in their continued relevance and success. The growing influence of data, automation, and artificial intelligence within academic settings further highlights the need for institutions to stay ahead of technological trends, ensuring that they can meet the emerging demands of both the knowledge economy and society at large. In this way, the digital transformation of universities is not only reshaping the relationships between these institutions and their stakeholders but also expanding the potential impact that universities can have on society at large.

Digitalization as a Catalyst for Innovation of Value Creation in Educational Institutions

Universities, as complex and multi-faceted institutions, serve a diverse range of stakeholders, including students, faculty, alumni, industry partners, and society at large. Traditionally, the value created by universities was seen as static and primarily transactional, revolving around the conferral of degrees, the production of research outputs, and engagement with external communities through rigid and formalized pathways. However, the advent of digitalization has profoundly transformed the mechanisms through which value is created and distributed. Digital tools and platforms enable universities to operate in a more dynamic, participatory, and

service-oriented manner, reshaping relationships with stakeholders and generating new modes of value creation.

In traditional higher education models, universities were typically seen as closed systems wherein value creation was linear, often flowing from the institution to its stakeholders, and this view largely corresponded to what Vargo and Lusch (2004) termed Goods-Dominant Logic (GDL), where education was treated as a product to be delivered and consumed. Degrees, diplomas, and certifications were seen as the main commodities through which value was provided to students, and this product-based model emphasized the one-directional transmission of knowledge from faculty to students, often measured by metrics such as exam performance, graduation rates, and research outputs. In this framework, students were positioned as passive recipients of educational content, with little opportunity for customization or participation in the development of their educational experience, while faculty, in turn, were evaluated based on research productivity, which was frequently assessed through publications, citations, and tenure-track success. Moreover, external stakeholders, such as industry partners and local communities, engaged with universities primarily through formal and structured partnerships, including recruitment fairs or sponsored research projects, and in this context, value was often perceived as static—a degree or certification conferred by the university was considered the ultimate product, and once delivered, the value creation process was regarded as complete.

Although this transactional view of value in higher education proved effective in certain contexts, it ultimately lacked the flexibility and adaptability needed to meet the evolving needs of modern stakeholders, especially in the face of a rapidly changing, knowledge-driven economy. However, the emergence of digital technologies has begun to challenge these traditional paradigms by fostering a more relational and co-creative approach to value creation in higher education, thereby positioning universities not merely as producers of knowledge, but rather as facilitators of value creation through continuous and dynamic interactions with their stakeholders.

Digitalization has become a driving force in transforming higher education, not only by introducing new tools and platforms but also by reshaping how universities interact with their stakeholders. By integrating digital technologies, universities have shifted from traditional,

product-centric models to more dynamic, service-oriented approaches that prioritize accessibility, personalization, and collaboration. This evolution has enabled universities to co-create value with students, faculty, industry partners, and society at large, positioning them as central actors in regional and global innovation ecosystems.

At the most general level, digitalization allows universities to extend their educational services beyond traditional boundaries, fostering greater inclusion and social participation. Digital platforms enable universities to offer free or low-cost online courses and resources to underserved communities, contributing to the democratization of education and promoting lifelong learning. These initiatives enhance universities' societal role by addressing educational disparities and promoting broader engagement through citizen science projects and community-driven research (Bonney et al., 2009).

As digital tools facilitate real-time collaboration and data sharing, universities' relationships with external stakeholders have become more interactive and participatory. Historically, universities maintained more formal and transactional partnerships with industry, government, and society, often limited to specific initiatives such as talent pipelines or applied research. However, the advent of digital platforms has transformed these interactions, enabling universities to collaborate more seamlessly with external stakeholders in co-creating solutions to complex challenges (Perkmann, Walsh, 2007; Becker, Eube, 2018). This shift has been particularly notable in open innovation, where knowledge flows in and out of organizations, promoting interdisciplinary partnerships and continuous value creation.

In higher education, students have become direct beneficiaries of the digital transformation process, as digitalization not only enables personalized learning experiences tailored to their individual needs and preferences but also offers greater flexibility and access to a broader range of educational resources. Faculty members, likewise, have experienced a significant shift in their roles, as they are no longer merely knowledge producers but have become active facilitators within a collaborative knowledge ecosystem, where digitalization empowers them to engage more deeply in co-creating value with various stakeholders, including students, industry partners, and community members, through a range of activities such as applied research, consulting opportunities, and the implementation of innovative teaching methods.

In terms of industry partnerships, digitalization has significantly broadened the scope of collaboration between universities and companies. Previously, such partnerships were often limited to closed, proprietary projects with clear boundaries and objectives, but now, digital tools enable more open and continuous collaboration, breaking down traditional barriers to innovation. Open innovation hubs and virtual research centers have become crucial platforms for co-developing solutions to real-world problems, with companies and universities sharing data, expertise, and resources across digital networks (Perkmann, Walsh, 2007; Becker, Eube, 2018). These collaborative efforts extend beyond research and development, providing industry partners with access to upskilling and reskilling opportunities through online programs and micro-credentials, thus ensuring that their workforce remains competitive in rapidly changing markets (Oliver, 2019).

Moreover, universities are playing an increasingly active role in regional economic development through the establishment of digital innovation hubs and entrepreneurship incubators, which foster collaborations among entrepreneurs, startups, local businesses, and government agencies while offering access to university expertise, technology, and mentorship. (Carayannis & Rakhmatullin, 2014). These hubs serve as dynamic ecosystems where students, faculty, researchers, and external stakeholders collaborate extensively to transform academic research into market-ready solutions, thus contributing to both regional and global economic growth in a meaningful way.

4. Conclusions

In conclusion, the ongoing digital transformation of public universities represents a fundamental shift in how these institutions create and deliver value to their diverse stakeholders. As the landscape of higher education evolves, universities are moving away from traditional, static models of value creation characterized by a Goods-Dominant Logic, which treated education as a linear product to be delivered. Instead, the integration of digital technologies has fostered a more dynamic, service-oriented approach that emphasizes co-creation, collaboration, and real-time engagement with students, faculty, industry partners, and communities. This transition highlights

the university's role as a facilitator of knowledge and innovation rather than a mere provider of degrees.

The literature illustrates that digitalization has broadened the scope of collaboration between universities and external stakeholders, enabling more interactive and participatory relationships. By utilizing digital platforms, universities are now able to engage in open innovation, co-developing solutions to complex challenges alongside industry partners and government entities. This paradigm shift not only enhances the educational experience for students, who benefit from personalized learning and greater access to resources, but also empowers faculty to become active contributors within collaborative knowledge ecosystems. As a result, universities are positioned as integral players in regional and global innovation ecosystems, driving economic development through initiatives such as digital innovation hubs and entrepreneurship incubators.

Digitalization and digital transformation change the ways in which value is offered by universities to their stakeholders, as well as the value itself, prompting a fundamental reevaluation of what it means to educate and innovate in today's society. This shift transcends mere technological adoption, beckoning universities to embrace a more holistic understanding of value that encompasses not only the knowledge imparted but also the relationships fostered within and beyond their walls. As institutions evolve, they are called to consider the broader implications of their missions, recognizing that the pursuit of knowledge is intertwined with ethical considerations, social responsibility, and a commitment to the common good. As universities redefine their roles within this broader framework, they become vital agents of change, facilitating dialogue and collaboration that transcends disciplinary boundaries and fosters a culture of innovation. In doing so, they affirm their commitment to not just advancing knowledge but also to enhancing the collective well-being of society, ultimately enriching the very fabric of the communities they serve. Thus, the of value in higher education emerges not merely from the transmission of knowledge, but from the transformative relationships that universities cultivate through digital innovation.

Ultimately, the digital transformation of universities not only addresses the immediate needs of modern stakeholders but also equips these institutions to adapt to future challenges and

opportunities in an increasingly knowledge-driven economy. By embracing digitalization as a catalyst for innovation and collaboration, public universities can enhance their relevance, effectiveness, and contributions to societal progress, thereby reaffirming their mission as engines of education and economic development in a rapidly evolving world. As they continue to navigate this transformative journey, the potential for universities to redefine their value propositions and fulfill their commitments to diverse stakeholders is both significant and promising.

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