

# Knowledge Management and Educational Technology: An Analytical Case Study

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Article Information	Abstract
<p><b>Article type:</b> Article</p> <p><b>Article history:</b></p> <p>Received: March 24, 2022 Revised: April 29, 2022 Accepted: April 29, 2022</p> <p><b>Keywords:</b></p> <p>Knowledge management, Student information management system, Soft skills, Educational technology, Digital badges</p>	<p>This study explores the phenomenon of knowledge management at the University XYZ. The research presents the results of a critical literature review and concludes that the majority of institutions of higher education do not address knowledge management issues adequately, failing to maintain a holistic system that would take advantage of knowledge. Critical information related to certain areas, such as students' soft skills, is not formalized and, as a result, is lost upon the completion of an educational program. At the same time, the literature review shows that the knowledge of students' soft skills is critical for both students and employers. The current study seeks to find solutions for changing the existing knowledge management system at the university to incorporate knowledge of students' soft skills into a student information management system and make it accessible for future employers. An analytical part of the study discovers several options for achieving this goal and states that digital badges are the most promising solution because they overcome a gap between hard skills and soft skills and introduce a series of visualized symbols of achievements that are simultaneously portable, verifiable, and shareable. The study presents a general implementation plan for linking the university's student information management system to the Badgr account with the help of a digital mobile application and highlights barriers that should be overcome to introduce a university-wide knowledge management system that reports, stores, and manages information about students' soft skills.</p>

## I. INTRODUCTION

The rapid development of globalization processes, intensification of scientific and technological progress, and increased competition in most sectors create substantial challenges for institutions of higher education (Al-Emran et al., 2020; Al-Emran, Alkhoudary, et al., 2019; Al-Tahitah, et al., 2021). In an attempt to attract potential applicants, these organizations are trying to use a plethora of various methods to improve their reputation and increase the perceived value delivered to graduates. At the same time, while people graduating from prestigious universities, such as Harvard University of Massachusetts Institute of Technology, are quickly headhunted by various companies, students of the overwhelming majority of other institutions of higher education complain about problems with employment following their graduation (Andrews & Higson, 2008). The literature clarifies that a large gap between the skills and knowledge possessed by students and the expectations of employers is one of the main reasons behind this problem (Buth et al., 2017). Furthermore, a diploma possessed by graduates might not provide full information about their competencies and qualities as well as "soft" skills, which are often considered critical in the workplace (Andrews & Higson, 2008). As a result, services provided by many higher education institutions display high dissatisfaction rates among customers because they cannot use the knowledge and skills gained throughout their education to secure the desired job position.

The available evidence provides a compelling reason to believe that ineffective knowledge management practices in relation to data on students' performance and skills might be one of the possible reasons behind this problem. Throughout the entire course of their educational programs, students engage in a variety of different exercises and activities (Emran & Shaalan, 2014), demonstrating a plethora of different skills. In addition to proficiency in particular skills and knowledge of the materials, they also utilize communication and social skills, personality traits, listening capabilities, public speaking, and many other capabilities. Moreover, while completing different learning assignments, students might display their hard-working attitude, excellent time management, creativity, and many other important skills that help individuals succeed both in educational institutions and in the workplace.

Unfortunately, information about such skills is not structured in most institutions of higher education and, accordingly, cannot be shared with relevant stakeholders. Data on students' behaviour and all the skills that they show during their educational programs become irrelevant once students graduate (Al-Emran et al, 2020). According to the underlying assumption of the contemporary educational system, a diploma containing students' grades is supposed to be sufficient for providing a detailed description of students' knowledge and skills. Simultaneously, as stated above, the fact that it does not explain how students have achieved these grades and how they behaved and interacted with other stakeholders during their study undermines the value of many educational degrees (AlAjmi, et al., 2021; Andrews & Higson, 2008). Both students and employers would benefit from a new approach towards reporting students' skills following their graduation that would imply reporting data not only on students' final grades but also on all the other relevant aspects of their study, including their soft skills, relations with stakeholders, behaviour, and participation in different extra-curriculum events. Such detailed specifications could ensure alignment between employers' expectations and students' skills and knowledge, helping people who have graduated from institutions of higher education secure suitable job positions.

The current study is dedicated to a detailed investigation of the problem of knowledge management in institutions of higher education with an emphasis on students' soft skills. The discussion revolves around a particular institution, which is referred to in this paper as University XYZ. It was decided not to disclose the institution's name because of ethical reasons since the report heavily criticizes the organization for its ineffective knowledge management system. At the same time, it seems justified to assume that the problems faced by XYZ from the perspective of the problem under investigation are typical for a contemporary institution of higher education and, thus, could be discussed in relation to the majority of modern colleges and universities.

The University XYZ is a large private institution serving around 20,000 students and employing approximately 12,000 people. Its organizational culture and structure are typical for a private university and barely display any distinctive features. The predominant knowledge management system used at the university is conventional and includes a student information management system that keeps track of students' grades in each course. Soft skills displayed by students are not reported in any database; furthermore, information about them is not structured. Whereas soft skills sometimes help learners complete particular assignments and succeed in certain activities, especially those related to teamwork, final grades gained by students remain the only indicator of their performance.

The available evidence provides a compelling reason to believe that the knowledge management system that is used by XYZ is outdated due to its failure to recognize the importance of information about students' soft skills. Knowledge about soft skills demonstrated by certain individuals is often shared in an informal manner between members of the faculty or students, but it does not exist in a structured form and, accordingly, cannot be accessed by interested parties. Simultaneously, as stated above, employers could benefit from examining detailed data on candidates' soft skills during the recruitment process. The introduction of changes in the university's knowledge management system that would help organize, store, and share data on students' soft skills could be a promising option for XYZ that could assist with reducing the gap between graduates' skills and employers' expectations.

## **2. BODY**

### **2.1 Problem Identification and Analysis**

#### **2.1.1 Knowledge Management in Institutions of Higher Education**

Considering that educational institutions act as the main mechanism of knowledge pursuit in a society, it seems natural that management of knowledge plays an important role in their operations (Al-Emran, Mezhuyev, Kamaludin, et al., 2018). In the most general view, knowledge management could be defined as "a set of organizational activities to achieve organizational objectives by making the best use of knowledge" (Gao, Li, & Clarke, 2008). The scope of knowledge management is broad and, thus, could be hardly approached as a whole. In educational institutions, knowledge management practices could be investigated in regard to various fields, including administrative, educational, research, student service, and human resource (Pellegrini, Ciampi, Marzi, & Orlando, 2020; Banagou, Batistic, Do, & Poell, 2021).

The current study primarily focuses on the educational sub-domain of knowledge management, specifically discussing the management of knowledge about students' performance, skills, and behaviour.

Traditionally, the issue of knowledge management is not prioritized in institutions of higher education. The literature heavily criticizes these organizations for failing to design and operate a consistent information system. Scholars cite a variety of barriers to effective knowledge management in institutions of higher education. First, they often do not have competent staff to collect, organize, process, and analyze data. A foundation in Cleveland granted a specific grant to the Cuyahoga Community College to hire a chief knowledge officer, whereas the U.S. Department of Education gave a similar grant to the Jackson State University to hire a vice president for knowledge management systems as well as support staff (Thorn, 2001). The focus of these grants is indicated by the fact that the majority of organizations in the industry did not have competent specialists in conducting functions related to knowledge management in the 2000s. Second, data collection procedures carried out by various departments and units are often not uniform, which makes it hardly possible to maintain a holistic knowledge management system (Moscoso-Zea, Castro, Paredes-Gualtor, & Lujan-Mora, 2019). Without formalizing these processes, any attempts to create a uniform information system are likely to result in confusion.

Third, technology-related issues are also often approached as low-priority issues. Due to the faculty's low awareness of the specifics of advanced knowledge management technologies (Al-Emran & Shaalan, 2017), the operation of such technologies is primarily carried out by administrators or other specialists who might not completely understand the unique knowledge management needs of the institution (Rfeqallah et al., 2021; Al-Rahmi et al., 2019). As a result, a knowledge management system might fail to capture the necessary nuances of knowledge that is crucial for a university or college. Fourth, the process of data gathering and analyzing often occurs inconsistently due to the lack of alignment with the organization's mission (Moscoso-Zea et al., 2019). In other words, it is often unclear how specific knowledge management processes, such as storage of certain learning materials in an online database or the use of cloud databases for uploading completed assignments, could help institutions of higher education improve the quality of their services and achieve their broad goals. Finally, the last relevant barrier to effective knowledge management that should be highlighted in this section is connected with the possible lack of leadership commitment, which, in turn, could be elucidated by the high turnover rates on senior leadership positions of many universities (Al-Rahmi et al., 2019; AlAjmi, et al., 2018). Changes of leaders result in frequent alterations of organizational strategies that translate into knowledge management systems' inconsistency and reduce their quality.

Such challenging barriers to knowledge management highlight difficulties associated with progressive changes in this field. Nonetheless, the literature identifies certain enablers that could help educational institutions improve their knowledge management practices (Al-Emran, Mezhyuev, & Kamaludin, 2018; Al-Emran, Mezhyuev, et al., 2019; Al-Emran & Mezhyuev, 2019). In particular, the study by Ramjeawon and Rowley (2017) found that whereas frequent leadership changes, the absence of an adequate knowledge sharing culture, a gap between the industry and the academia, insufficient time and financial resources, and deficient reward mechanisms prevent universities and colleges from implementing novel knowledge management systems, the introduction of incentives for knowledge creation and sharing, integration of new information technologies, and employment of competent staff could help them succeed in this field. Unfortunately, all these guidelines are general and, thus, offer little practical utility.

The contemporary literature indicates that the overwhelming majority of knowledge management initiatives at educational institutions seek to manage knowledge related to the staff's competencies and skills. For instance, Ngoc-Tan and Gregar (2018) mention such knowledge dimensions as leadership innovation and expert knowledge, emphasizing that effective technologies and a stable knowledge acquisition work culture are necessary for enhancing knowledge management systems. At the same time, there are currently no consistent studies that would systematically analyze the use of effective knowledge management instruments that would combine knowledge related to students and teachers. It is also important to emphasize that conventional knowledge sharing mechanisms that are used outside of educational institutions, such as social media, are unlikely to become effective instruments for sharing knowledge within educational institutions (Al-Qaysi et al., 2020). In particular, the study by Adams, Raes, Montrieux, and Schellens (2018) revealed that students are skeptically concerning the option of using Twitter for educational purposes, and similar skepticism could be also observed in regard to most other social media. Therefore, institutions of higher education apparently should develop novel models of knowledge management rather than integrating the existing instruments into their knowledge management systems.

An analysis of the literature illustrates an evident research gap. The problem of knowledge management at educational institutions is poorly researched (Al-Emran, Abbasi, et al., 2021; Al-Emran, Mezhyuev, et al., 2021). This is because the majority of studies, including those reviewed above, approach it in a broad context without providing practical guidelines for implementing effective knowledge management practices to fulfill institutions' mission. Many of those initiatives that are implemented display disappointing performance. Furthermore, only a few of those models try to incorporate areas of knowledge that are related to students' performance, skills, and behavior. Such a model, for example, was designed by Asma and Abdellatif (2016), who attempted to construct a framework encompassing knowledge related to all the stakeholders, including teachers, managers, students, and even employers. Unfortunately, the number of such



both in their study and in their future careers, none of these skills is currently integrated into the curricula as desirable outcomes of educational courses. Accordingly, there is no structured approach towards collecting and analyzing data on students' soft skills.

The existing literature does not offer insights into the way in which a knowledge management system could incorporate and process knowledge of students' soft skills. The case study presented by Koc, Turan, and Okursoy (2016) illustrates that the majority of knowledge management practices in higher education institutions focus on the organizational environment, whereas the educational environment is rarely addressed. Such a pattern could be a direct result of the perceived simplicity of managing knowledge related to student data. This process is usually conducted at higher education institutions with the help of student information systems incorporating data on students' admissions, billing and payments, and reporting (Koc et al., 2016). Information technologies have been reshaping the ways in which these student information systems function, adopting modern online interface and effective features allowing stakeholders to store a substantial amount of information and access it in real-time. Moreover, significant improvements have been observed in the area of student data safety. For instance, the research by Yang, Sun, He, Zhou, and Liu (2017) introduces a system based on fingerprint technology that seeks to ensure safety and security of student data. At the same time, surprisingly, inferences of most studies do not discuss the type of data that should be managed by student information systems, apparently implying that the choice of such data should be self-explanatory.

## **2.2 Identification and Evaluation of Alternative Solutions**

### **2.2.1 Justification of the Need for Change**

The previous chapter showed that knowledge management systems that currently exist at most higher education institutions are limited and ineffective. The domain of knowledge management is often overlooked; furthermore, those knowledge management systems that have been created primarily focus on organizational aspects and seek to increase operational efficiency rather than the quality of educational services. Student data are primarily processed with the help of student information management systems, which include information about students' academic performance, behavior, financial matters, and admissions. Unfortunately, the discussion of student information management systems rarely extends beyond issues related to efficiency, reliability, and safety. As a result, there is an evident research gap in relation to the incorporation of information about students' soft skills into a student information management system and, by extension, into the institution-wide knowledge management framework.

The fact that information about students' soft skills must be incorporated into a university-wide knowledge management system seems evident. As stated above, soft skills are critical for succeeding both as a student and as a professional (Andrews & Higson, 2008). Therefore, an institution of higher education should be able to capture structured data on students' soft skills, store the data in some system, report relevant changes in students' soft skills over time, illustrate how the institution helped students improve their soft skills, indicate the role that soft skills played in students' academic achievement and extra-curriculum activities, highlight a connection between students' soft skills and their behavior both inside and outside a college or a university, and, finally, present finalized data on soft skills in a way that is beneficial both for students and for employers. The existing literature does not offer consistent strategies for achieving this goal.

### **2.2.2 Alternative 1: Incorporating Educators' Evaluation of Students' Soft Skills into the Existing Student Information Management System**

There are several possible solutions that could be discussed in this study. First, an institution might consider integrating information about students' soft skills with information about their academic performance within the existing student information management system. For example, a university could create a structured scale of soft skills and apply it on a regular basis. The framework designed by Caggiano et al. (2020), which puts an emphasis on such skills as social desirability, team orientation, sensitivity, an ability to work under pressure, action orientation, and assertiveness, might be an example of such assessment model. Throughout particular courses, different professors might not only grade students' academic performance in their courses but also assign grades to these soft skills. By the end of a semester, these grades could be put together by the system to calculate students' average performance in regard to the chosen soft skills. As a result, people graduating from a university or a college could have not only data on their grades but also information about their soft skills, which could help employers choose optimal candidates during the recruitment process.

Another possible solution of the problem described above refers to the use of qualitative instruments to incorporate a brief description of students' soft skills at the end of each academic year. Members of the faculty could work together to discuss the soft skills of particular students and create customized descriptions of their strengths and weaknesses. Unlike the previous option, such an instrument could help make the process of soft skills' evaluation more flexible, addressing unique characteristics of each student rather than concentrating exclusively on a set of previously chosen scales, such as assertiveness or team work. By creating a customized description of a student at the end of the year, a university could

help an employer forecast the behavior and work attitudes of a further employee, thus determining whether this person could fit into an organization's culture. The amount of information contained in such description could be significantly broader than the amount of data from standardized soft skill evaluation forms. Simultaneously, it is important to emphasize that this qualitative method is more exposed to the risk of professors' biases.

### **2.2.3 Alternative 2: Incorporating Peers' Evaluations of Students' Soft Skills into the Existing Student Information Management System**

The previous two options empower the academic staff to evaluate students' soft skills. Simultaneously, an argument could be raised that it might be sometimes hard for professors to evaluate students' soft skills because they rarely interact with them outside of educational institutions and the academic environment, even though soft skills are often demonstrated during extra-curriculum activities. From this perspective, it seems justified to assume that peers might be in a position to evaluate these skills in a much more effective manner than professors. Accordingly, the third option related to the incorporation of data on students' soft skills into a university-wide knowledge management system entails collecting learners' feedback on certain soft skills displayed by students throughout a semester or an academic year. This evaluation might be conducted in line with the quantitative or qualitative methods described above; furthermore, students' assessments may be integrated with professors' assessments in order to ensure evaluations' accuracy.

The use of students' evaluations instead of professors' marks might be a controversial decision. On one hand, students are supposed to have more encounters with peers than they do with professors; accordingly, students have more chances to have an informed opinions on the soft skills of their peers. It is especially important to emphasize that students often interact with peers in non-academic settings in which soft skills could be sometimes displayed in more significant ways than inside educational institutions. On the other hand, students are likely to be more subjective in their evaluations due to the tendency to set marks not only based on their opinions on peers' skills but also based on a degree to which they like them. In other words, peers might give high marks for problem solving or decision making skills to certain students because of their attractive personality rather than actual skills. Therefore, the effect of biases on students' evaluations is a disturbing issue that should be necessarily considered by stakeholders if this solution is selected.

### **2.2.4 Alternative 3: Linking Assessments of Soft Skills to Academic Exercises**

All the previous alternatives recommend stakeholders to divide students' skills into hard and soft ones. Accordingly, any assessments should be conducted separately from these two groups of skills, which might undermine the credibility of soft skills' evaluations. The current alternative entails linking evaluations of soft skills to particular academic exercises. For instance, every time a particular student receives a grade, he or she might also receive a mark for particular soft skills used for conducting this exercise, such as public speaking or problem solving. In other words, educators would need to give several grades each time instead of only deciding on the number of points received by a student for completing a particular assignment. Such a solution seems simpler from the perspective of knowledge management than the previous options because the data on soft skills would be stored in the same dataset as the data on academic performance and would not require any additional actions, such as educators' meetings in which they would evaluate students' soft skills. At the end of an educational program, educators' assessments of soft skills would be used by the program to construct average assessments of students' soft skills.

### **2.2.5 Alternative 4: Digital Badges**

The previous options imply integrating data on students' soft skills into the existing student information management system without introducing any new technologies. They do not create any substantial challenges in the technological domain. Simultaneously, such conventional proposals are not the only options available for institutions of higher education. The concept of digital badges presents an unconventional approach towards addressing this problem through a fundamental re-conceptualization of the entire educational process and the predominant paradigm of students' performance. In contrast to the three previous options, which present separate evaluations of students' academic performance and soft skills, digital badges might offer a new avenue for combining data on students' hard and soft skills within the same framework, using advanced visualization tools to make the data informative and valuable. In the most general view, digital badges could be defined as validated indicators of certain accomplishments that are automatically assigned to individuals upon meeting certain criteria (Davis & Singh, 2015). From the perspective of the problem under investigation, numerous digital badges could be employed to highlight students' achievements in various academic and non-academic fields throughout the program's completion.

Digital badges seem to be an interesting strategy for incorporating data on students' soft skills into an institution's knowledge management system. Simultaneously, their implementation could be accompanied by a plethora of challenges. In particular, digital badges are often considered by stakeholders as a complex technology with unclear features and limited credibility (Davis & Singh, 2015). Such negative perceptions might prevent the technology from serving as a valid mechanism of evaluating students' skills. Furthermore, there are currently no universally applicable digital badges in the

educational sector. Due to the lack of a uniform digital badging system, universities and colleges are supposed to design their own strategies and develop customized approaches towards rewarding students for specific accomplishments.

A typical strategy for introducing digital badges is supposed to embrace a plethora of badges that are linked to specific criteria. A badging system is expected to include information about various achievements, including those related to hard and soft skills as well as accomplishments in specific activities regardless of the skills that were used to achieve them (Stefaniak & Carey, 2019). The introduction of a fundamentally new student information management system is required in order to implement a digital badging initiative successfully. Such a system should store data on students' accomplishments, hard skills, and soft skills and automatically assign badges for meeting certain criteria. For instance, a digital badge called "the best public speaker" could be assigned to a student who has received the highest average mark for public speaking for a certain academic year. Similarly, a badge "a great team work member" could be assigned to students whose team working skills have been consistently evaluated positively both by educators and by peers. As these two examples demonstrate, a digital badging system might incorporate the previous alternative solutions in order to collect data on soft skills.

### **2.2.6 Comparison of Alternative Solutions**

None of the proposed solutions could be considered simple in implementation because they would require reshaping the existing educational paradigm in institutions of higher education. Stakeholders will need to change the existing student information management systems in order to incorporate a new dataset with soft skills' marks. Furthermore, this dataset will be much harder to manage than the data on academic performance. All the options require certain data manipulations, such as calculation of average marks or thematic analysis of students' characterization records. A university will need to assign the responsibility of conducting such manipulations to the IT staff, although the majority of operations could be conducted by the system automatically. Nonetheless, unless a university or a college invests into a digital badging system, it will not need to spend substantial amounts of money on implementing proposed solutions. Challenges associated with the implementation of most options are rather connected with non-tangible aspects of proposed solutions.

Regardless of the exact option chosen by an institution, it seems justified to assume that the most important challenge faced by stakeholders will be to ensure credibility of soft skills' evaluations. The majority of initiatives discussed above offer separate systems for evaluating students' academic performance and their soft skills. As a result, it is possible that final marks for soft skills will be considered much less important than students' grades. Such a threat is valid since perceived unimportance of alternative evaluation systems was reported in many programs seeking to evaluate students' soft skills (Garcia et al., 2016). Stakeholders will need to overcome this threat in order to make data on students' soft skills useful for students and their future employers.

A proposal to use digital badges seems to be simultaneously the most complex and the most promising. Unlike other options, digital badges incorporate all the aspects of student data into one framework, thus overcoming the problem reviewed in the previous paragraph. Digital badges serve as visual indicators of students' accomplishments that are likely to be perceived positively by employers. The data on students' soft skills that are presented with the help of some summarized grades might not have this advantage.

Unfortunately, any badging initiative is complex from the IT perspective. The task of creating and managing an original badging system seems unbearable for most educational institutions; nonetheless, most of them could benefit from utilizing platforms that are connected to open badging systems, such as Badgr. An institution would need to obtain an API token and add data on keys and secrets, thus creating conditions for assigning specific badges (Badgr Developers, 2021). If the university chooses to install its own machinery to run the program, the installation procedure requires creating an activating a python virtual environment, creating a MySQL database, installing required dependencies, configuring the database, creating a supersuser, and running a local development server (Badgr Developers, 2021). The tasks described above might turn out to be challenging for the staff without significant IT skills. Therefore, in addition to challenges connected with the credibility of badges, a badging solution is also complex from the technical perspective.

## **2.3 Discussion**

### **2.3.1 Implementation Plan**

The University XYZ is recommended to use the open badging system Badgr for facilitating the implementation of its badging program. This platform is currently the most well-known system of open badges that allows assigning badges for certain accomplishments on the basis of specific criteria (Badgr Developers, 2021). Badr serves as a platform that ensures that badges are verifiable, shareable, and portable. Badges used by the system include metadata about achievements, issuers, and recipients, whilst their verification occurs based on a link to the BadgeCheck validator. Organizations connected to the Badgr system could either install a local machine and run their server on their own or manage badges through the Badgr account. Considering that the first option is challenging from the technical perspective, XYZ is

recommended to choose the second option. At the same time, it is necessary to create a specific digital application that would combine the features of an issuer and displayer add in order to help users access and use the data on badges.

The following implementation plan is recommended for XYZ in order to implement a digital badging program for evaluating students' soft skills:

1. Identifying soft skills and hard skills that should be incorporated into the badging system.
2. Designing a detailed set of specific accomplishments for which digital badges should be assigned as well as describing their criteria.
3. Conducting a series of meetings with the faculty staff in order to find optimal mechanisms of inserting data on students' accomplishments into the system
4. Hiring additional IT staff to assist with technical aspects of the badging system
5. Connecting to the Badgr system
6. Developing a digital application
7. Carrying out an awareness campaign among the staff and students
8. Testing the new system in a single student group
9. Collecting feedback and addressing possible problems
10. Expanding the system to the entire university

First, XYZ should identify specific skills that are critical for students from various programs. While some competencies, such as communication skills, are crucial for all the learners, creativity is naturally more important for managers than it is for electrical engineers. Therefore, the university should compose a list of specific hard and soft skills that should be prioritized for each specialty. On the basis of skills determined on the previous stage, the university should create a list of numerous accomplishments related to skills. Each accomplishment will be then linked to a specific badge.

The university should clarify a procedure for reporting accomplishments and inserting them into the system. In particular, it is necessary to find answers to the following questions:

- What users are eligible to insert data into the student information management system;
- How data on students' accomplishments in relation to soft skills will be collected and reported;
- When users will insert data into the system;
- How data from the student information management system will be integrated into the Badgr platform.

Unfortunately, it does not seem possible at the moment to predict what exact technical tasks should be completed by the university to create and maintain a digital badging system based on the Badgr platform except for the fact that the institution will need to connect its student information management system to the Badgr platform and develop an application for accessing data on badges' assignment. Nonetheless, XYZ will definitely need to hire additional IT staff. After connecting to the Badgr system and developing a digital application, the university will have to carry out an awareness campaign among the staff and students. The literature indicates that low awareness and resistance of the staff are frequent barriers to knowledge management initiatives at educational institutions. Therefore, such a campaign is mandatory for ensuring the program's success.

After all the preparations are finished, the organization should test the system in a single student group in order to determine possible problems and shortcomings associated with its interface and functions. Finally, upon collecting data on issues identified in the system and correcting mistakes, the university could expand the system's operations to the entire university and inform employers about the new evaluation system utilized by the institution. The cycle of collecting feedback, making necessary corrections, and introducing a new version of the program should be continuously repeated to ensure that the system is fully operational.

### **2.3.2 Barriers, Enablers, and Projected Performance**

Implementation of a digital badging program is a complex process. From the perspective of knowledge management, this task is uncommon for an institution of higher education. As a rule, knowledge management systems implemented at universities and colleges focus on the organizational environment (Ramejawon & Rowley, 2017), primarily seeking to increase operational efficiency and data safety (Yang et al., 2017). A digital badging initiative will cover only a small aspect of the university's knowledge management, primarily updating the institution's student information management system and linking it to the Badgr platform. Such a task contrasts both with the all-encompassing knowledge management system designs discussed by Asma and Abdellatif (2016) and with narrow proposals concerning student information management systems that could be found in the studies by Yang et al. (2017). Therefore, the program's implementation is bound to be complicated.

There are several barriers to the technology's success at the University XYZ that should be discussed in this section. The literature cites such popular barriers to educational knowledge management systems as the lack of leadership commitment, the absence of an adequate knowledge sharing culture, a gap between the industry and the academia, insufficient resources, diverse knowledge management practices at different departments, and deficient reward mechanisms (Ramjeawon & Rowley, 2017). Most of these barriers are relevant to the case of XYZ. The university does



not have a knowledge sharing culture at the moment. The data on students' performance is managed separately by each educator. After the completion of a course, an educator uploads data on students' final grades to the university-wide system. Simultaneously, all the processes that occur before the final data is uploaded are affected exclusively by the personal judgment and preferences of educators. As a result, some professors use modern databases or software to keep track of students' performance in various areas, whilst others continue taking written notes. The absence of uniformity in regard to the management of student data both between and within departments will become an important barrier to the digital badging program's implementation.

A gap between the industry and the academia is another crucial barrier that might undermine the effectiveness of any change in the field of student information management. A large gap between the skills and knowledge taught at XYZ and requirements of the industry predetermines problems with identifying soft and hard skills that should be incorporated into the badging system and creating specific accomplishments linked to these skills. Considering difficulties faced by the university in its attempts to meet industry requirements, it seems likely to assume that most members of the staff will not be able to complete the first and the second stages of the implementation program presented in the previous chapter.

Insufficient skills, knowledge, and motivation might become a substantial obstacle to the badging program's implementation. Similarly to many other institutions of higher education, the University XYZ employs numerous educators. Some of them are proficient in technology, but others remain committed to conservative teaching techniques and hardly display any technical skills besides those that are necessary for using MS Word or MS Power Point. The university, therefore, will need to conduct a series of training sessions for the staff on how to record students' accomplishments and upload them into the system with the help of a customized digital mobile application. The university will also need to install a reliable WiFi network at the university in order to facilitate all these processes. Surprisingly, sometimes students and educators at XYZ struggle with connecting to the organization's WiFi networks because they are unable to process a large number of users. The university will need to install a stronger network to facilitate the digital badging program's implementation and ensure its reliability and effectiveness.

The literature recommends several enablers to launch knowledge management systems at educational institutions. In particular, incentives for knowledge creation and sharing, integration of new information technologies, and employment of competent staff are cited by Ramjeawon and Rowley (2017) as the most effective factors in this sphere. The University is recommended to follow this course of action and introduce a series of financial incentives for those educators who succeed in mastering the technology. For example, it could reduce the workload of those professors who have not made any mistakes in recording and inserting data into the system throughout a semester or assign financial bonuses for using the system without mistakes for a specified period of time. Another important enabler that will help the University succeed in launching a digital badging system is competent IT staff. At the moment, the organization's IT specialists are not able to develop a digital application that could be integrated with the Badgr platform; furthermore, they do not have substantial experience in the area of knowledge management, which is described by Thorn (2001) as a critical barrier to most educational knowledge management initiatives. Therefore, the university should hire at least two additional employees, including an app developer and a specialist in knowledge management. Simultaneously, the development of a mobile application may be also outsourced to an external IT firm.

The most important driver of the digital badging program's performance at the University XYZ is connected with the organization's ability to change its culture. The university must embrace a knowledge sharing culture that prioritizes student information, including data on all their accomplishments. Digital badges should be a final goal that is valued both by educators and by students; therefore, learners should be interested in putting an effort into displaying their hard and soft skills in order to get desired badges. Without such culture, the digital badging program will not be aligned with the organization's mission, which is a popular cause behind the failure of educational knowledge management initiatives. Naturally, the leadership commitment is also necessary for achieving this goal.

### **3. CONCLUSION AND FUTURE WORK**

The traditional teaching and learning process has the potential to be revolutionized by technology. Recent innovative technologies have reshaped the higher education landscape (AL-Nuaimi et al., 2022; Al Shamsi et al., 2022). The current study was dedicated to a critical investigation of the problem of knowledge management in the case study of the University XYZ. It was found that the majority of institutions of higher education experience problems in the sphere of knowledge management due to the lack of leadership commitment, the absence of an adequate knowledge sharing culture, the lack of alignment between knowledge management initiatives and the organizational mission, incompetent staff, and limited resources. Most institutions, including XYZ, do not have any consistent knowledge management systems, while some others operate systems with a limited scope that revolves around the staff's competencies. Student data are often poorly managed by institutions of higher education. Most of them employ some databases with students' grades, and others maintain student information management systems with information about students' characteristics, admissions, payments, and academic performance. However, these systems do not display full information about students' behavior

and learning, offering only fragmentary information about performance and, thus, contributing to a gap between the academia and the industry.

One of the most important shortcomings of the existing knowledge management systems at modern universities is the lack of attention to students' soft skills. The data on students' soft skills are transmitted through informal channels throughout the university; however, this information is not formalized. Most records of students' achievements in certain areas related to soft skills, such as public speaking or teamwork, disappear at the end of a course or even at the end of a semester. As a result, future employers do not have access to data on future candidates' soft skills. At the same time, it was found that the knowledge of students' soft skills in addition to hard skills could help employers find more suitable candidates.

The fact that the data on students' soft skills are not integrated into the existing student management systems is an important shortcoming of higher education institutions' knowledge management systems. Many studies reviewed in the current paper indicate that soft skills are an essential driver of success both within academic settings and at the workplace. Therefore, data on soft skills, such as team work, creativity, or communication, could be useful for students and their future employers. The research discovered several possible solutions for addressing this problem in the case of the University XYZ. First, the organization could incorporate educators' evaluations of students' soft skills into the existing information management system with the help of quantitative or qualitative methods. Second, the university may consider using peers' evaluations of students' soft skills for this purpose. Third, assessments of soft skills might be linked to the existing academic exercises. Fourth, the university could utilize digital badges to reward students for their accomplishments in various areas, including those related to hard and soft skills.

The option of using digital badges seems to be the most promising solution because it could ensure credibility of soft skills' evaluations and use a visual tool that is clear both for students and for employers. The university is recommended to link its student information management system to the Badgr account and create a digital application that could allow inserting the data into the system and accessing the information at any point of time. Implementation of the solution could occur in 10 steps starting from the identification of soft and hard skills that will be incorporated into the system and finishing with the system's expansion to the scope of the entire university. Poor technical skills of the staff, diverse knowledge management systems at various departments, and the lack of a knowledge sharing culture are likely to become the most important barriers to the badging system's implementation at XYZ, whilst effective incentives and employment of competent IT specialists could be enablers of this process. In case if the university manages to transform its culture in a way that promotes the value of digital badges, the organization is likely to succeed in its badging system and, as a result, improve employment prospects for its students and increase the overall quality of educational services.

The study discovered several promising areas for further research. First, scholars could explore in detail the set of skills that could be integrated into a digital badging system. The current research did not cover this issue because it was not within its scope; nonetheless, understanding of specific soft skills that are valued by employers and the ways in which they could be recorded and reported within academic settings is critical for implementing an effective badging system at an institution of higher education. Second, scientists might investigate technical aspects of the proposed solution by analyzing in detail specific technical tasks that should be completed by IT specialists to link a newly created digital app to the Badgr account so that universities could plan their budgets accordingly. Third, it might be a promising idea for further research to discuss the ways in which a badging system could be connected with the broad knowledge management system of an educational institution in order to expand its scope and cover not only students but also faculty staff.

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