
**BUILDING A DIGITAL HIGHER EDUCATION MODEL - AN INEVITABLE DEVELOPMENT
TREND TO HAVE DIGITAL HUMAN RESOURCES FOR
VIETNAM'S PRIVATE UNIVERSITIES**

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Building a digital university education model is an inevitable development trend of private universities in Vietnam. Developing a digital university education model is also a step forward for private universities in Vietnam to approach higher education in the world. Building a digital university education model in private universities in Vietnam today will reflect the real picture, advantages, difficulties, directions... of this private university system. Building a digital university model will help private universities in Vietnam shift from imparting knowledge to developing learners' capacity, increasing self-study ability, creating learning opportunities anytime, anywhere, personalizing learning, contributing to creating a learning society and lifelong learning. Learners with different knowledge backgrounds have access to open educational resources with appropriate lectures. With different learning conditions, learners can listen to lectures over and over again anywhere and at any time. In this article, the author also pointed out the basic elements of the digital higher education model, the need to build a digital higher education model at private universities in Vietnam today to solve the challenges of the 4.0 era in terms of digital human resources. The article also pointed out the obstacles that hinder the development of the digital higher education model at private universities in Vietnam today and also pointed out the factors that determine the success of the digital higher education model at private universities in Vietnam. The author also analyzed and emphasized that the digital higher education model is always "Three no's and One yes". The three no's are: there will be no lecture halls, no hard copy learning materials, no permanent lecturers; and one is: will achieve the highest quality with the least time... From there, the author of the article will propose some solutions to improve the effectiveness of building a digital university education model at private universities in Vietnam in the context of the current national digital transformation.

Keywords: Model; Digital university education; Digital human resources; Private universities; Vietnam.

I. Introduction

A private university that not only provides classroom education but also provides learning conditions on demand through digital means will be called a digital private university. Digital private universities are based on core professional knowledge in the field, common methodologies and are configured to meet all the needs of the university. In addition to the advantages of digital transformation, aiming to build a digital private university education model, it is impossible not to mention the limitations, mainly in the risk of losing

network information security. Hackers can attack and destroy data, disrupt online classes, take over administration rights, modify electronic grade books and change digital learning materials. However, it must be affirmed that digital transformation of higher education and building a digital private university education model is an inevitable trend that needs to be urgently implemented to fundamentally innovate higher education and integrate internationally. Digital private university is a new concept and model, but it is no longer a distant topic, but it is really an inevitable trend that exists in reality with the strong and daily impact of the 4.0 industrial revolution.

The remaining problem is that universities will have to have a comprehensive innovation strategy or partial innovation to transform and adapt in the current period. Building and developing a digital private university model in the context of today's rapidly developing technology along with the strong integration trend is really creating great opportunities but also bringing significant challenges to private universities in Vietnam. At that time, with a subject, not only students of one school will use it but will be used by students of many schools. Students of one school can learn from teachers of one school, of many schools. Lectures go beyond the borders of one university, moving towards our entire higher education system using lectures and subjects that can be shared. Currently, there is no widely agreed concept of digital university, but it can be simply understood that digital university is a higher education institution that brings all activities of the university, lecturers and students to the digital environment. And because of the complete transformation to the digital environment, the operating model of a digital university becomes flexible and overcomes many limitations of space and time that a traditional school encounters, leading to easier access to educational services, more training, cheaper costs, with the same minimum quality.

II. Overview of research problem

Author To Hong Nam with the article: "Digital transformation of higher education and building a digital higher education model in Vietnam" in the Journal of Information and Communication No. 5, May 2022 emphasized: "Digital higher education is a topic of special interest in recent times. Up to now, although there is no unified definition of digital higher education, but understanding digital higher education in any way, digital transformation, building a digital higher education model is still an irreversible trend, inevitably taking place in the near future in our country. The digital higher education model must be considered from a holistic perspective, in the mutual relationship between training institutions in a country, aiming at the international level through the digital environment - this will be a fundamental difference compared to the application of information technology, computerization in higher education in the previous period.

Author Vu Huy Tu - Pham Van Hieu wrote an article: "Developing Vietnamese higher education in the era of the 4.0 industrial revolution" (2022) emphasizing: Higher education has a direct impact on the quality of human resources, especially in the current context, people are always the core issue for developing science and technology, improving productivity, improving income, thereby affecting

the economic restructuring of the country. The article focuses on clarifying the viewpoints and policies of our Party and State, at the same time, there are proposals on solutions to ensure the development of education and training in the era of the 4.0 industrial revolution.

Author Thanh Thuy with the article: "Education 4.0: The inevitable trend of future higher education" (2021) stated: The emergence of new technologies has changed the production and service platforms, posing new requirements for human resources capacity, thereby requiring universities to innovate accordingly. Education 4.0 is considered an inevitable model of future education to meet the requirements of the 4.0 industrial revolution. The 4.0 industrial revolution affects all areas of society, including education. Accordingly, training and scientific research activities from universities will face new requirements for reform and competition. Because the "dizzying" changes of the 4.0 industrial revolution require education to provide learners with basic skills and knowledge as well as creative thinking, the ability to adapt to challenges and requirements of ever-changing jobs to avoid the risk of being eliminated.

Author Ho Tu Bao with the article: "Building a digital university needs to solve 3 problems" (2022) emphasized: Digital transformation is becoming an inevitable trend worldwide and is an important solution to help Vietnam develop quickly and sustainably. That context has posed great opportunities and challenges for universities in Vietnam in the process of converting to a digital university model, in order to improve the effectiveness of training high-quality human resources. Digital university is a new concept and model, but it is no longer a distant topic, but it is truly an inevitable trend that exists in reality with the strong and daily impact of the 4.0 industrial revolution. The digital university model is gradually taking shape in Vietnam. This model will overcome many physical limitations that a traditional school faces, educational services are more accessible, more training is provided, at lower costs, with equivalent quality.

Author Mai Lan Huong with the article: "Promoting the connection between universities and businesses in our country in the context of the fourth industrial revolution" (2019) emphasized: The 4.0 industrial revolution is taking place very quickly and strongly in many aspects of social life. In this trend, schools must be very flexible in changing their programs and training goals to suit the changes of economic and social life in general and employers in particular. To survive and develop in the increasingly fierce competition, schools not

only have the mission of training human resources to meet current needs but also must have a training strategy to anticipate development trends. To carry out this task, the connection of the business community and the orientation of functional agencies are indispensable.

Author Luu Xuan Cong - Vu Tien Dung has an article: "Digital University, Solving Challenges of Industry 4.0" (2023) stated: "Education is a priority area in the national digital transformation program. Innovation and development of education, especially higher education in the direction of digital transformation is inevitable and "Digital University" is predicted to become a big game between universities. It is necessary to clearly define the difference between digital university and university with information technology application. Digital university is not simply applying information technology to teaching and learning, putting lectures online. More importantly, digital university must be able to personalize learning, students leave electronic footprints on learning platforms and digital learning materials. From there, schools and lecturers find the most suitable way to impart knowledge and skills to students. In practice, although the construction of a digital university model in Vietnam has many advantages thanks to effective cooperation and international experience exchange in building and developing digital universities; the awareness, psychology and skills in using technology in higher education of lecturers and students are changing positively as well as the interest and promotion of digital transformation from the Government, ministries, branches and localities, there are still many difficulties and challenges.

III. Research Methods

1. Group of theoretical research methods

Research documents on world and Vietnamese experiences on digital transformation Journal of science and technology. Research Documents, Circulars, Directives, Resolutions...of the Party and State on digital transformation for Science and Technology Magazine. Research domestic and foreign books, newspapers and scientific conference proceedings on digital transformation for the Journal of Science and Technology

2. Group of practical research methods (Actual observation method; Questionnaire survey method; In-depth interview method; Expert method, Digital transformation product research method for scientific and technology)

3. Group of statistical methods, data processing using mathematical formulas (Excel). Use statistical methods to synthesize and analyze data and information obtained from the survey.

IV. Research results

1. Overview of digital private higher education

Depending on different perceptions, concepts and perspectives, there are many different ways to define the term "Digital Higher Education" in relation to terms such as University 4.0, smart university, or virtual university. There is a view that describes digital higher education as being associated with digitalization, applying digital technology at different levels (divided into 7 levels), the simplest digital university model is digitalization, using software to automate school management, the highest digital university model is personalized learning. Also discussed, to transform to a complete digital higher education model, it is necessary to go through 5 levels, while continuously providing feedback to the main subjects of the school such as students, teachers, staff, candidates, researchers and partners. In which, at level 1, there must be the participation of the above-mentioned "creators" of the school and level 5 is the application of digital technology at a high level to the entire university environment, for example, drone technology.

Or there is an opinion describing digital higher education as being built on a digital platform, without intermediation, without centralization and without materialization, meaning no lecture halls, no laboratories, no permanent lecturers, no hard copy learning materials, no paper textbooks. It can be seen that digital higher education is a broad concept, with many different concepts, definitions and models. The viewpoint of this article is that the digital higher education model needs to be considered comprehensively from both the perspective of a higher education institution and from the perspective of the entire industry. From a national perspective, digital resources and learning materials of higher education institutions must be interconnected, shared, and seamlessly connected with each other and with the industry-wide database, forming shared open learning material repositories, jointly built and jointly exploited (OER), forming platforms to provide massive open online courses (VMOOC), credits of online courses between educational institutions are mutually recognized; the industry-wide higher education database is interconnected with the management platforms of each higher education institution (ERP), each school, each teacher, each learner is identified and electronic records are stored to serve the administration and state management of education and training. From the perspective of a higher education institution, forming a school management platform that integrates a digital workspace, connects with an online teaching platform, connects data with the industry-wide database, with the OER

open learning material repositories and with the VMOOC platform, forming the school's digital transformation ecosystem. Regardless of how digital university is defined, digital transformation and building a digital higher education model are still inevitable trends, many contents must be calculated in the development strategy and digital transformation roadmap of each higher education institution.

The concept of the "digital university" model and the characteristics of the digital university model on a technology platform. Digital university is a new concept and a new model of the 4.0 technology era. This model has no precedent and has just been formed, so there is no model. However, it can be understood in the most general way: "Digital university is a new university model in which all teaching content and management activities of the university are brought to the digital environment through digital platforms and digital means". Thus, it can be seen that the core element of digital university is still the technology element, the development and perfection of digital university depends on the development and updating of technology elements. However, the difference of the University is not simply the application of information technology to teaching and learning, putting lectures online, but the University must be able to personalize students' learning, leaving electronic "footprints" on learning platforms and digital learning materials. From there, the school and teachers can find the most suitable way to impart knowledge and skills to each student. In other words, the University takes IT as a foundation but applies it to change the entire environment and method of teaching, exchanging and managing school activities.

At present, the most modern IT platforms that universities can apply are Internet of Things (IoT), smartphones, cloud computing and artificial intelligence (AI)... To better understand these technologies in creating the foundation of the university model, let's analyze the applications that these technologies have brought to universities in general and to individual lecturers and students in particular.

First of all, about Internet of Things. This is a technology that allows each object and each person to be provided with their own identifier and all have the ability to transmit and exchange data information over the network without requiring direct interaction between people or people and computers. Therefore, with the application of IoT in universities, lectures in textbooks will be connected to websites with videos, illustrations and supplementary documents. This helps to enhance students' self-discovery spirit and increase their interaction with lecturers

or friends. Lecturers are more creative when they can focus more on the curriculum without having to worry about academic activities like in traditional teaching methods. Moreover, IoT can connect all schools and academies in the world to provide deeper experiences for learners; helping students combine theory and practical application. Students can learn at their own pace with means to communicate with friends and teachers.

Second, with smartphones, students can easily access electronic lectures, extended knowledge with countless integrated features. Along with that, the teaching method will also change when learners do not need to go to class but only need a phone with internet connection to be able to follow the lecture.

Third, with Cloud Computing, people can store all files, services and digital assets on virtual servers, and at the same time, can share with devices anywhere, anytime. The strongest advantage of cloud computing is the large-scale information storage service model. Therefore, with the characteristics of universities that need to use a large amount of databases for learning and research, cloud computing is a solution that provides lecturers, students and schools with a potential storage tool. Users only need to use a simple login system to easily make requests and use infrastructure almost unlimitedly. Therefore, the application of Cloud technology has been and is changing the form and method of education in many large universities in the world in a powerful way. In many countries around the world, there has been an initiative to use cloud computing to create online courses, virtual laboratories and provide effective support for the educational management of each school. Moreover, along with cloud computing, electronic learning materials, e-books have also been born, allowing students to carry their "library" with them. Mobile e-books can contain hundreds of books, countless puzzles, homework and related data files. Students will be more excited when watching videos, diagrams, images...e-books provide richer experiences, so they will expand learning opportunities for students.

Fourth, AI helps lecturers have more virtual assistants to enthusiastically guide them during the teaching process without necessarily having to be a lecturer as it is now. This application is now also available in software that integrates AI technology to teach users to learn foreign languages such as English, Chinese...by practicing listening, speaking, reading and writing right on the applications, which is very convenient and effective. Furthermore, each student's learning path will be personalized to suit each student's strengths and weaknesses, not all students have to follow a common path like the current traditional learning method. Meanwhile,

for lecturers, when AI is applied, everything is automated. Lecturers do not need to give tests to know the level of each student because AI will do the grading for them easily and quickly. When there are results on each student's level, lecturers will be able to use this technology to reset the learning method and learning path, helping students not to lose their foundation or drop knowledge. In addition, combined with Cloud technology, with a large amount of data collected, AI algorithms can also find limitations in the teaching process to help learners handle and improve their own individual problems.

2. The need to build a digital private university education model

The central subject of university education is the learner, the quality of training is linked to the existence of the university. In fact, young people are using digital technology every day not only for entertainment and study but also for most activities in life, ready to become digital citizens in a digital transformation environment (including digital government, digital economy, digital society). Therefore, training institutions need to quickly transform digitally, build a digital private university education model aimed at "target customers", adapt and "speak the same language" with them to be able to attract students to study.

Competition between universities is increasingly high, digital transformation, building a digital private university education model is a plus to increase the competitiveness of each university, improve the school's ranking in prestigious university rankings both domestically and internationally. The benefits and effectiveness show the reasons and motivations for accelerating digital transformation, building a digital private university education model, meeting practical requirements, and keeping up with the general trend of the world. Thanks to digital technology, information is fast and convenient anytime, anywhere, significantly reducing time, effort, and costs compared to direct forms (online meetings, emails are specific examples). Digital technology has solved the problem of storing, searching, statistics, and reporting with paper documents, which was very difficult for the previous generation; big data technology, analytics, and artificial intelligence (AI) also help collect complete data, analyze, and forecast the future. Deploying a digital workspace, no lecture halls, no paperwork, the entire processing process such as assigning work, making notes, and signing digitally can be done remotely through a digital platform, regardless of geographic location, anywhere. In the digital private university education model, teaching - learning, testing, evaluation, scientific research in

the direction of using simulation laboratories, vivid and intuitive digital learning materials increase the effectiveness of knowledge transfer, learning anytime, anywhere. With the support of digital technology, personalization of learning is carried out at a very high level, each student learns according to a learning material, a method, a schedule designed specifically, most suitable for their own conditions, abilities and unlike anyone else. Students can choose to study with the best professors, study 24/7 with the support of virtual assistants thanks to AI technology. Through digital technology, comments and assessments are expanded, teachers no longer evaluate students in one way as before, but students comment on students, students comment on teachers online (computerized adaptive testing), assessments to support learners and assessments as a teaching-learning activity, improving the effectiveness of learning guidance (shifting from assessing knowledge and skills acquisition to assessing cognitive and thinking abilities). It can be said that digital private university education helps learners access more information, narrows the space, saves time, and effectively supports learners to develop faster in cognition, knowledge and creative thinking. Digital technology supports reducing lectures to developing learners' abilities; learning anywhere, anytime conveniently creates a learning society. The transmission of knowledge will gradually be taken over by technology, virtual assistants, teachers focus on helping learners with methods, organizing learning in connection with practice, promoting talent development. Resources for building schools, paying regular salaries to permanent lecturers and service staff are focused on training programs, attracting good teachers, thereby improving training quality. The digital private university education model needs to be built first, as a basis for building sets of indicators and criteria to assess the level of digital transformation of higher education and building a digital private university education platform with specific functional and technical requirements. The world is becoming increasingly "flat", the pressure of international integration is increasing, digital transformation, building a digital higher education model to integrate with the global trend. The digital private higher education model is associated with sharing digital learning materials between domestic higher education institutions and internationally, helping to quickly update new knowledge of humanity, forming a shared open learning resource (OER); opening up opportunities to participate in online learning through globally shared massive open online courses (MOOCs) (such as Coursera or eDx) - a revolution in higher education that fundamentally changes the traditional training method. The digital higher education

model opens up opportunities for online training cooperation, recognition of training credits between universities, participation in online international scientific conferences, integration into the global digital higher education world.

Why is it necessary to switch to a digital private university?

On Learning: It promotes efficient and rapid learning through a flexible, scalable and easy-to-use Learning Management System;

On Assessment: It combines computer or paper-based exam management with digital assessment for faster results processing;

On Engagement: It improves student engagement through student notification, alert and feedback systems;

On Monitoring and Management: It manages leads, candidates, scheduling, advising, as well as programs and courses; The vast value proposition of Digital Private University includes a basket of solutions that create a comprehensive student management system using web, mobile and other advanced devices...It enables end-to-end digitization of the education value chain for seamless application management, registration, delivery and assessment of learning content.

On the results: It improves learning delivery, enhances user experience, and improves student outcomes. The digital private university will make the future of education more personalized. To stay relevant, higher education institutions must develop digital frameworks that place a premium on student engagement and speed to market. Private higher education has been forever changed by shorter technological innovation cycles, digitally-obsessed students, and democratized online courses, including free YouTube lectures. As a result, students are questioning the validity of traditional learning methods, marked by September start dates, travel to a physical location and increasingly exorbitant tuition and fees. Students increasingly expect on-demand, continuous and affordable learning opportunities. Given the sheer number of choices in the digital environment – and the speed at which they are emerging – students will increasingly need to seek the most efficient, affordable and easy-to-use ways to engage with their education providers. To keep up, private higher education institutions must deliver faster, more personalized and less expensive student experiences. Doing so will involve technological change through the SMAC Stack (aka social, mobile, analytics and cloud) and a new way of thinking about how to do business. To date, traditional higher education has been slow to embrace this changed environment. In

fact, according to international expert calculations, 79% of IT budgets are spent on “business as usual” operations, with another 15% spent on incremental upgrades, by recent standards. Only 6% is spent on innovation. In our view, this is completely inappropriate and does not serve the best interests of students or traditional universities.

Make education personal and relevant

Possibilities for educational innovation span the entire learner journey, including evaluating college options, applying and enrolling, engaging in learning experiences, planning careers and engaging with alumni. Today, schools can better leverage social media and insights gleaned from available data to target the most likely applicants and successful students. Consider the many online activities students engage in when choosing a college: spending time on student forums, seeking out peer feedback on Facebook and Twitter, watching relevant YouTube videos, browsing through ads and exploring college-specific websites and apps. In response, many schools simply send out information in the hope that their message reaches the right audience. However, with minimal investment, they can take a more active role. For example, using big data analytics, they can develop highly personalized promotions - even scholarships and grants - that target candidates who may have previously evaded notice, laying the groundwork for a relationship.

Schools can also offer virtual reality headset tours of campuses, as well as virtual lectures from professors. After enrollment, the options can continue. Schools can offer a variety of options based on students’ preferred learning styles, including highly rated approaches, distance learning, and personalized instruction if needed. Students can join online and offline student groups, collaborate online for assessments, use connected apps and services and choose e-textbooks over more expensive printed volumes. All of these capabilities offer a major operational advantage (in addition to cost savings) over the largely manual processes that many universities still use today. While it is not yet clear what new educational products and models will be used, it is clear that content and services for students will have to become more relevant, personalized, targeted and on-demand. The digital private university will continue to change with the technological innovation cycle. In this “digital game”, the university that becomes a digital university first will have the upper hand in student recruitment.

Digital private university model on the digital technology platform

Digital private university is a new concept, a new model of the digital age, unprecedented, without a model, being formed and not yet clearly defined. The content of the digital private university depends on the development of digital technology.

At present, there are technologies:

- IOT (Internet of Things). IOT allows each object, each person to be provided with its own identifier and all have the ability to transmit and exchange data information over the network without the need for direct interaction between people or people with computers.

- iPod smart phone. Using smart iPod, learners can easily find answers faster than any professor and at this time basic knowledge is not facts that need to be memorized. At that time, learners do not need to go to class but only need a phone connected to the Internet to be able to follow the lecture.

- Cloud Computing. These are large “server farms” managed by Amazon, Google and other companies, where a huge amount of data is stored so that users can retrieve it anywhere in the world. This is the combination of real world technology, virtual world and biological world that allows information, knowledge and wisdom of humanity to be regularly put on the “cloud” for anyone to look up.

- Artificial Intelligence (AI) is the fundamental foundation that creates the 4.0 industrial revolution. AI Chatbot is an educational innovation platform and can collect information about learners’ interests, habits and learning methods. Chatbot can be understood as an AI-based computer program that simulates human conversations... IOT, Smartphones, Cloud Computing, Artificial Intelligence... are the “bricks” that create the basic foundation for forming a Digital University.

Therefore, it can be defined in the most general way, a Digital Private University is a new university model in which all teaching content and management activities of the University are brought to the digital environment through digital platforms and digital means. Building a digital environment around students in a Digital Private University. To form a Digital Private University, the first thing is to bring all lectures of lecturers and all activities of the University to the digital environment.

AI, cloud computing, smartphones, IOT... are not only tools but also become agents and digital environments. Just like fish can survive thanks to the water environment, private digital universities exist thanks to the digital environment. Building a digital environment is to create a digital ecosystem revolving around students. Each student, lecturer, service department, tangible objects (lecture halls, classrooms, laboratories...), intangible objects

(timetables, digital libraries, digital learning materials, test schedules, exam schedules...)...are provided with their own digital identifier.

Thanks to IOT (Internet of Things), all of these digital identifiers are capable of transmitting and exchanging data information with each other. Once a digital environment with a digital ecosystem is formed, all learning, teaching and educational management activities are carried out in the digital environment. Since each student has a digital identity, all student activities in school can be carried out via a smartphone or smart iPod. Students sitting at home can connect and interact with the entire training process (timetable, learning progress, library, digital learning materials, internships, tests) and services at the School (dormitories, canteens, parking lots, sports areas; utility services, part-time jobs, etc.). Smart interactive boards, digital learning materials, digital learning management for online learning (E-learning), etc. can be used to increase learning efficiency.

Students use digital identification codes to check which class they are in today, which room, which subject, who the lecturer is, register for courses, register for re-exams, etc. Sitting at home, using identification codes, connecting to the smart iPod app, students perform procedures and services for online teaching and learning, etc. They can borrow books, or check if they have paid their tuition, what dishes are available at lunch, how much they cost, what the cafeteria serves in the evening before the evening class, can pre-order and pay online, etc.

When all activities have been brought to the digital environment, students become the center of the training service process. Students will no longer be bothered, no longer be made difficult when doing admission procedures, graduation procedures, etc. In particular, it will minimize negative phenomena of service staff towards students throughout the entire course. Thanks to that, students have the opportunity to focus more time and energy on their studies etc.

Digital private universities put an end to traditional teaching methods. Lecturers become virtual lecturers and inspire students. Digital private universities are a step forward for Vietnamese private universities to participate in global super universities.

3. Opportunities and challenges in building digital private universities today

Digital transformation is becoming an inevitable trend worldwide, contributing to promoting rapid and sustainable development in all areas of social life. This trend is directly affecting the education sector, especially higher education. That context

has posed great opportunities and challenges for private universities in Vietnam in the process of transforming to a digital private university model to improve the effectiveness of training high-quality human resources and competitiveness in the integration environment.

Regarding opportunities

First, international cooperation and exchange of experiences in building and developing universities are becoming more convenient and easier for Vietnam. Based on the fundamental achievements of the 4.0 industrial revolution, the smart university model is being built and developed based on a shared governance model to form an ecosystem with three core characteristics: digitalization, research and innovation. These achievements and technologies are opening up opportunities for many universities in the world as well as in Vietnam to develop to a new level without necessarily going through the existing development process or following traditional practices. In other words, Vietnamese universities can shorten the gap and take shortcuts in building and developing universities.

Second, the State always prioritizes education development and digital transformation in education, in which higher education is a special priority. Higher education - as an environment that directly trains high-quality human resources for society - is also considered one of the focuses for transformation. These are important legal bases for digital transformation in education in general and the development of universities in Vietnam in particular.

Third, the awareness, psychology and skills of using technology in education of lecturers and students of universities have changed dramatically. Thanks to the implementation of management activities and organization of online training, online training as well as other forms related to the management of training cooperation with foreign countries in recent years, managers, lecturers and students have changed dramatically in awareness and have been equipped with many learning skills in a technology-based environment. In particular, the long period of social distancing due to

COVID-19 has created a huge “push” for Vietnamese universities to promote distance learning, online training and digital transformation to maintain the learning pace for millions of students. According to data from the Ministry of Education and Training, in just a short time when the COVID-19 pandemic appeared in Vietnam, the whole country had about 110/240 higher education institutions implementing online training at different levels. Many schools have piloted a number of online subjects combined

with face-to-face. This sudden change is considered an opportunity for Vietnamese education in general and higher education institutions in particular to promote digital transformation and equip lecturers and students with the necessary skills for research and learning in a digital education environment.

Fourth, the technology infrastructure for universities has had initial investment.

Talking about universities does not only refer to the transformation of teaching methods, but also importantly, it is necessary to build a system of digital learning materials and basic databases to serve educational management in the digital environment. Realizing this, from 2018 to now, the Ministry of Education and Training has put into use a national database on education in general, in which for universities and colleges alone, it has digitized information of nearly 400 schools with 2.5 million students and more than 120,000 lecturers. The Ministry has also connected with educational platforms and national reporting systems, announced the opening of the identification code system, when the data of the Digital Vietnamese Knowledge System has also been developed with a very large database. With a large database and learning resources, it has helped increase the effectiveness of online training in particular and digital transformation in the field of higher education in general, especially in the context of higher education institutions and students having to take a long break from school to ensure safety against the Covid-19 epidemic since the beginning of 2020...

Some challenges:

First, the technological environment for university operations is not yet complete. The university model requires promoting the comprehensive application of IT in management, teaching and research, becoming the goal and means in the management and operation of universities. Meanwhile, the technological platform to meet these needs at universities in Vietnam is still relatively weak and lacking, except for a very few schools that are receiving large investments in technology to serve as models in university development such as: Hanoi National University, University of Posts and Telecommunications Technology... Most universities in Vietnam mainly stop at applying IT with separate, separate programs and software. Meanwhile, in the university environment, all these separate technologies and learning materials must be compatible, connected to each other and integrated on the same platform. This platform will allow teaching, management, learning, testing, assessment, examination, student and teaching management activities, as well as all interactions between lecturers and students and the

school to be carried out on the same system. This also requires the internet connection to be stable so that these platforms can operate smoothly. These are major challenges for most Vietnamese universities today when the conditions for IT equipment and application are still limited.

Second, the old thinking and skills in the traditional teaching and learning methods of lecturers and students. In the university environment, all learning materials are uploaded to the digital ecosystem, so that students can choose to study anywhere, anytime. This will gradually change the old concept of the role of teachers and learners in the traditional way. For students, although they have matured and are more self-aware and proactive than at lower levels, studying in a digital environment is not enough, but also requires them to have soft skills and other technological skills to be able to proactively catch up, master and confidently exploit materials to effectively serve their studies. As for lecturers, the University also requires them to completely change their thinking, working methods, teaching methods, and change the way they convey knowledge and skills that are most suitable for each student to attract learners in a truly smart learning environment. This is posing huge challenges for each lecturer to adapt and master digital technology in order to be able to:

- (1) Proficiently use interactive boards, design and regularly apply e-learning lectures in teaching;
- (2) Exploit and contribute to the open teaching data warehouse;
- (3) Know how to use simulation software, practice software, and virtual experiments in teaching;
- (4) Apply new teaching methods, especially integrated teaching methods;
- (5) Participate in online teaching and learning; organize final exams, end-of-course exams, periodic tests on computers or personal handheld devices that learners do not need to go to class to do...

Thirdly, the training programs and regulations of schools have not changed strongly. Talking about universities is not just about technological factors, but the core of higher education must still be providing knowledge and skills effectively and keeping up with the trend of world knowledge. Therefore, the training program, regulations and operating rules for universities must also be improved and developed in a smart direction. Accordingly, the training program must be updated regularly; the content of knowledge must ensure interdisciplinary and always be updated and changed according to the development of science and technology, equipping skills to meet the requirements of the country's production, economy, culture and society. However, in general, the training programs at universities

today still focus on providing academic knowledge, lacking practicality and application, so there is still a situation where every year many students graduate but the employment rate is still low because it does not meet the requirements of the labor market.

Regarding the method of training human resources in the 4.0 era, the focus is on personalized training methods, focusing on learners. Learners have the right to design their own learning path based on their own personal goals. Meanwhile, currently, universities in Vietnam still mainly apply mass training methods focusing on providing a lot of knowledge to learners. Therefore, the way of managing and evaluating students in schools is still heavily influenced by traditional administrative styles. This requires schools to learn from the management experience of universities around the world and take advantage of the advantages of technology to innovate their training regulations and assessment methods.

Fourth, the digital learning resources of universities have not been invested in commensurately. For universities, the information system - library plays a very important role in supporting the research and learning of lecturers and students. This is also considered one of the important elements that form the foundation of a smart university. The digital library system of the smart university model is not only a place to provide rich, diverse and convenient digital learning resources, but also must truly be a center to support, stimulate and inspire creativity in research, study, knowledge discovery as well as foster the lifelong learning consciousness of lecturers and students. At the same time, the digital library system also plays a role in spreading the values of intellectual quintessence, promoting research, teaching and learning activities of managers, lecturers and students. The development of digital learning materials (e-books, e-libraries, test banks, e-lectures, e-learning software, simulation application software) in universities is still spontaneous, not yet systematic, and difficult to control quality and learning content... This reality requires universities to really pay attention and have a strategy to invest in and develop a digital library system in a systematic way, increase the application of advanced digital technology and deploy smart, mobile, user-friendly and easy-to-use digital learning materials management software on many different platforms and devices.

4. Solutions to develop a digital private university education model to develop digital human resources

Building a digital private university education model is an inevitable trend in the context of people constantly wanting and needing to improve their

capacity. Currently, universities produce about 50,000 IT engineers each year, but in reality, the market needs about 500,000 engineers in this field. This is an example of the shortage of digital human resources. It is estimated that in the future digital economy, the workforce will shift and change. In order to have human resources to meet the needs of digital transformation and move towards a digital economy, it is necessary to focus on building digital private universities. Accordingly, digital private universities will personalize the curriculum, students will learn according to their abilities and learn according to their interests. In fact, technology is increasingly developing, allowing people to interact with each other more and more effectively. Increasing the speed of cloud and mobile usage creates speed in learning and training. Therefore, the government needs to redesign policies and investment mechanisms for higher education, instead of investing in facilities, prioritizing the development of infrastructure related to technology, as well as related to digitalized learning programs and equipment transmission lines...The challenge for digital universities is the process and people, not the technology. We cannot bring the entire traditional training program to the digital platform, but the current reality shows that places are applying traditional training programs, leading to pressure on lecturers, parents and students.

Solution 1: First, apply new forms of certification. For example, currently famous global companies such as Amazon Web Services (AWS), Google or Microsoft have successfully built technical and digital training programs. Therefore, Vietnam should also integrate programs that have been recognized by global organizations, governments of countries as well as large enterprises around the world.

Solution 2: Multi-channel and unlimited learning helps students have more choices, especially borderless learning programs, combining with famous schools around the world to create unique programs and create competition in the environment. The connection between schools and businesses is also very important. Changing the way of training and training programs must be linked to the business development plan in digital transformation. Businesses place orders and schools train on demand. There needs to be a combination of parties such as technology companies, training centers and universities as well as government support.

Solution 3: To build a training program, it is necessary to have a market research strategy, research market trends, customer needs and then build a training program that is suitable for actual needs.

The training program needs to have a combination of university lecturers and the experience of successful entrepreneurs from different industries. Learners need to have a combination of learning, life and work experiences. This is a close combination that is increasingly developing strongly. Therefore, building a set of skills for students is very important.

Solution 4: Support and connection from alumni who have graduated and now return to share practical experiences with university students. To form a digital university, the first thing is to put data - including all lectures and activities of a basic university - into the digital environment. This is a digital ecosystem that focuses on students, digitally identifies students, lecturers, infrastructure, teaching equipment, etc. and uses IoT to transmit and exchange data information with each other. Through smartphones and smart devices, students can sit at home, connect and interact with other subjects throughout the entire training process, as well as monitor data to evaluate and improve learning efficiency. Lecturers and administrators can monitor the training process and manage students completely in the digital environment in a convenient and transparent manner. Digital university is not a "Virtual University". The school still organizes teaching activities in real space. The interaction between lecturers and students, between students is real interaction. However, the school will exploit the strength of using shared information resources by building unified data integration, shared resources, developing digital science materials warehouse, shared open learning materials; research materials, shared laboratory systems. At the same time, apply the central operating system, classroom monitoring system, security monitoring system, smart classroom, connection application for lecturers and students via smartphone. All procedures, exams, assessments, learning materials, electronic libraries, etc. are digitally transformed to ensure the criteria: "paperless, cashless, touchless". According to experts, the barriers in the process of building a digital university are the technology gap between generations and the readiness of the teaching staff. Decision No.146 also sets the primary goal of implementing digital transformation in education as raising awareness.

Not technology, but processes and people are the challenges. In reality, places are currently applying traditional training programs and putting them on digital platforms without customization, putting pressure on lecturers, parents, and students. Another barrier is the issue of credit recognition. Currently, the recognition of credits by schools is very limited, making open online courses only a reference channel. Meanwhile, financial and copyright issues also need to be properly assessed.

Solution 5: Focus on perfecting mechanisms and policies to promote the development of a shared, shared private digital university education model, specifically applying specific mechanisms for participating universities, increasing the proportion of online training; increasing enrollment targets. Develop and issue documents to operate the system (finance, technical processes, regulations on online training/IT application, professional standards/ credit recognition, etc.).

Solution 6: focus on building a mechanism for cooperation and sharing among universities; improve the capacity of lecturers, managers and technical staff; building an evaluation mechanism, encouraging higher education institutions to participate in developing digital higher education... It can be affirmed that the digital higher education model helps many learners access a larger amount of information and is not limited by space and time. Therefore, in the context of people constantly wanting and needing to improve their capacity, building a digital higher education model is an inevitable trend.

At the same time, this model is also a plus point to increase the competitiveness of each university, improving the school's ranking in the rankings.

V. Discussion

Digital private higher education is a topic of particular interest recently. Up to now, although there is no unified definition of digital private higher education, but understanding digital private higher education in any way, digital transformation, building a digital private higher education model is still an irreversible trend, inevitably taking place in the near future in our country. In the era of the 4.0 industrial revolution, learners can collect information from a variety of different sources, not only from schools, the explosion of information leads to schools being unable to teach; besides, occupations also change rapidly (some jobs will be lost, new jobs will be created), requiring professional capacity to constantly change accordingly. The characteristics of the 4.0 Industrial Revolution era require education and training, especially private higher education, to fundamentally and comprehensively change to adapt to the new context. The contents related to digital private higher education will continue to be discussed from many different perspectives, there will be a unified definition of digital private higher education. However, no matter how digital private higher education is understood, digital transformation and the development of the digital private higher education model is still an irreversible trend that will inevitably take place in the near future in our country; many contents must certainly be calculated in detail in the digital transformation

roadmap of private higher education institutions. The digital private higher education model will be considered from a comprehensive perspective, in the mutual relationship between training institutions in a country, aiming at the international level through the digital environment - this will be a very fundamental and developed difference compared to the application of information and communication technology and computerization in private higher education in the previous period. The focus of digital private higher education must be interconnection through digital space, sharing of digital resources, mutual recognition (such as credit recognition) between domestic and international private higher education institutions. This leads to a series of other activities being expanded in the digital environment, including academic exchanges for students, international lecturers, researchers, and scientists.

Digital private universities are not just about teaching through video conferencing applications, but are a synthesis and combination of digital infrastructure, digital platforms, digital data, digital learning materials, service applications, digital lecturers, and digital students. To build a digital private university, the first thing that needs to change is the content of education and training, then the change in the operating process, that is, changing the teaching and learning methods, and finally the people (teachers and students).

Accordingly, teaching and learning methods in a digital environment will include blended learning (harmonizing classroom teaching and learning with digital technologies and digital learning materials including online teaching and learning, project-based learning, flipped learning, adaptive learning (analyzing learner data and instantly adjusting learning materials and assessments, using data analysis and AI to support teaching and learning) and personalized learning. In addition, the role of teachers and learners in the real-digital environment also changes. In which, learners play a central role, learn proactively, self-direct, increase self-study ability, learn anytime, anywhere. Learning is associated with problems, skills, modules, situations and participates in creativity, knowledge seeking. And teachers follow new methods and play the role of "coaches". This will lead to changes in the culture of education and training. The core of digital transformation in general and private university digital transformation in particular is not just the use of information and communication technology, upgrading information and communication technology infrastructure, but also changing the way of life, the way of working when using information and communication technology and any private university that strongly transforms digitally must

develop a strategy and implementation roadmap. In particular, the process of digital transformation implementation needs to be done well on 3 basic factors: people (digital awareness and capacity); institutions (legal and institutional environment), technology (digital infrastructure).

Digital transformation is a great opportunity for developing countries and a priceless opportunity for Vietnam to develop. This can even be considered the last opportunity, because major changes in technology only happen once every few decades. We have missed the previous 3 Industrial Revolutions. The 4th Industrial Revolution is characterized by the fact that countries without an industrial tradition can also do digital transformation, which is the determination to change themselves with opportunities in the digital environment. And with the construction of digital private universities, we will solve the problem of increasing human resources while still ensuring quality.

VI. Conclusion

Developing according to the digital private university model is a popular trend of higher education institutions in the world today to meet the requirements of training high-quality human resources in the context of the 4.0 industrial revolution. The construction of digital universities for Vietnam will also have many favorable opportunities with support, cooperation in transferring models and experiences from leading countries. However, due to being relatively new in

practical conditions in Vietnam, the implementation of building and developing this model also faces many difficulties and challenges that universities in Vietnam need to proactively take advantage of opportunities to overcome. And, whether they like it or not, digital universities will still be an inevitable trend of a new education - education 4.0.

Vietnamese universities are facing great challenges in terms of autonomy, competition and deep integration with world higher education. With limited resources and even being divided by fierce competition among higher education institutions, including vocational education institutions, Vietnamese universities need to accelerate the digital transformation process towards a digital university model to maximize existing resources to meet the increasing demand for human resource training of society in both quantity and quality. Although this is considered necessary, there is no precedent, there is no standard digital university model for universities in the country, or even in the world. Therefore, Vietnamese universities can be said to be doing and researching to perfect the model. This article focuses on this issue and proposes a digital university architecture model for Vietnamese universities. Accordingly, this digital transformation model is based on three pillars: digital governance - digital services - digital community, verified through practical implementation at the Vietnam - Korea University of Information Technology, showing its effectiveness in governance, improving training quality and student satisfaction.

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XÂY DỰNG MÔ HÌNH GIÁO DỤC ĐẠI HỌC SỐ - XU THẾ PHÁT TRIỂN TẤT YẾU ĐỂ CŨNG NGUỒN NHÂN LỰC SỐ CHO CÁC TRƯỜNG ĐẠI HỌC TƯ THỰC CỦA VIỆT NAM

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TÓM TẮT:

Xây dựng mô hình giáo dục đại học số là xu thế phát triển tất yếu của các trường đại học tư thực của Việt Nam. Phát triển mô hình giáo dục đại học số cũng là bước chuyển mình để các trường đại học tư thực của Việt Nam tiệm cận với giáo dục đại học trên thế giới. Xây dựng mô hình giáo dục đại học số ở các trường đại học tư thực của Việt Nam hiện nay sẽ phản ánh được bức tranh hiện thực, những thuận lợi, khó khăn, hướng đi... của hệ thống đại học tư thực này. Xây dựng mô hình đại học số sẽ giúp các trường đại học tư thực của Việt Nam chuyển từ truyền thụ kiến thức sang phát triển năng lực người học, tăng khả năng tự học, tạo cơ hội học tập mọi lúc mọi nơi, cá nhân hóa việc học, góp phần tạo ra xã hội học tập và học tập suốt đời. Những người học có nền tảng kiến thức khác nhau được tiếp cận kho tài nguyên giáo dục mở với từng bài giảng phù hợp. Với những điều kiện học tập khác nhau, người học có thể nghe đi nghe lại bài giảng ở bất cứ đâu và trong bất kỳ thời gian nào. Trong bài báo này, Tác giả cũng đã nêu được các thành tố cơ bản của mô hình giáo dục đại học số, nhu cầu cần xây dựng mô hình giáo dục đại học số tại các trường đại học tư thực của Việt Nam hiện nay để nhằm giải quyết những thách thức của thời đại 4.0 về nhân lực số. Bài báo cũng nêu những vướng mắc cản trở sự phát triển của mô hình giáo dục đại học số ở các trường đại học tư thực của Việt Nam hiện nay, bên cạnh đó cũng nêu những nhân tố quyết định thành công của mô hình giáo dục đại học số tại các trường đại học tư thực của Việt Nam. Tác giả cũng đã phân tích và nhấn mạnh, mô hình giáo dục đại học số luôn là "ba không và một có". Ba không là: sẽ không có giảng đường, sẽ không có học liệu bản cứng, sẽ không có giảng viên cơ hữu; còn một có là: sẽ đạt chất lượng cao nhất với thời gian ít nhất... Từ đó tác giả của bài báo sẽ nêu ra một số định hướng giải pháp để nâng cao hiệu quả xây dựng mô hình giáo dục đại học số tại các trường đại học tư thực của Việt Nam trong bối cảnh quốc gia chuyển đổi số hiện nay.

Từ khóa: Mô hình; Giáo dục đại học số; Nguồn nhân lực số; Các trường đại học tư thực; Việt Nam.