Chapter 1
Integration of the Higher Education Systems of Russia and the Republic of Uzbekistan in Training for the Digital Economy

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1.1 Introduction

In current conditions, the improvement of the educational system is closely connected with the introduction of new digital technologies to implement individually oriented learning. The Republic of Uzbekistan declared 2020 as the year of the digital economy. The government developed a set of measures to actively develop the digital economy by introducing modern information and communication technologies in all sectors and areas, primarily in public administration, education, and the health system (President of the Republic of Uzbekistan, 2020).

In order to improve the national system of higher education in the Republic of Uzbekistan, the government has set the goals to improve the quality of training for the digital economy. Personnel will possess advanced digital competencies and apply their knowledge to improve the efficiency of public administration, economy, and social sphere. In this regard, the Republic of Uzbekistan developed and adopted several normative legal acts.

The new law "On Education," approved by the Senate of the Republic of Uzbekistan on August 7, 2020, emphasizes the systematization of the educational process

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to ensure the acquisition of deep theoretical knowledge, practical skills, and professional competencies to perform professional tasks in accordance with the needs of the government and business (Uzbekistan Republic, 2020).

According to the "Concept of development of higher education system of the Republic of Uzbekistan until 2030," approved on October 8, 2019, the key objectives of improving the quality of education and meeting the needs of highly qualified personnel for the digital economy are the integration of science, education, and production, as well as the development of international cooperation between educational institutions (President of the Republic of Uzbekistan, 2019). Figure 1.1 presents the main priority areas of developing the higher education system in the Republic of Uzbekistan following the provisions of the concept (President of the Republic of Uzbekistan, 2019).

It is impossible to improve the quality of students' training without improving traditional training techniques and implementing advanced ones. This necessitates the use of new technologies in the educational process: information, telecommunications, and IT technologies, which are currently an integral component of training.

The development of science, education, and digital economy in Uzbekistan, as well as support for information and communication technologies, will be one of the
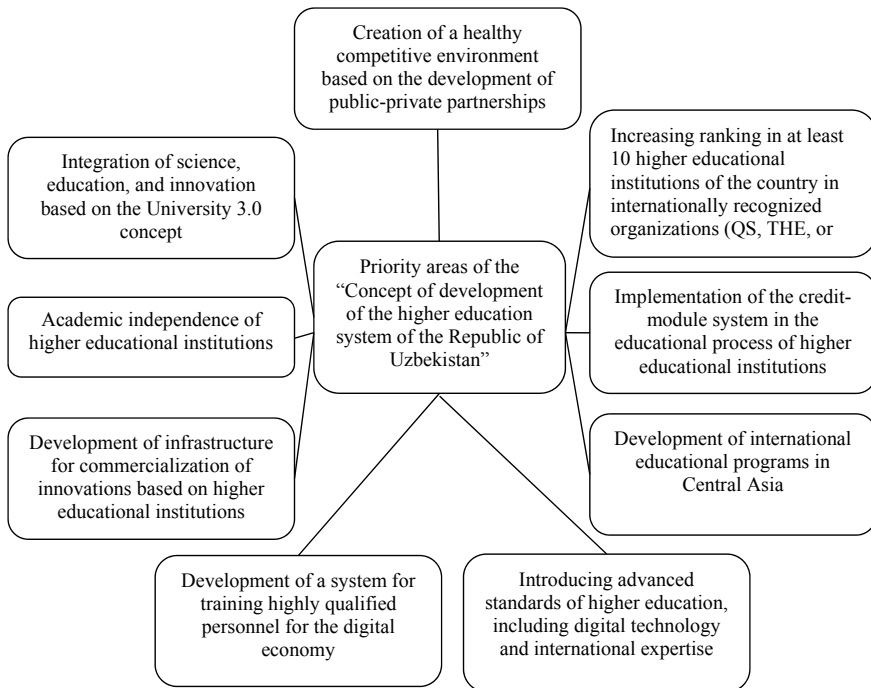

Fig. 1.1 Priority areas of the "Concept of development of the higher education system of the Republic of Uzbekistan". *Source* President of the Republic of Uzbekistan (2019)
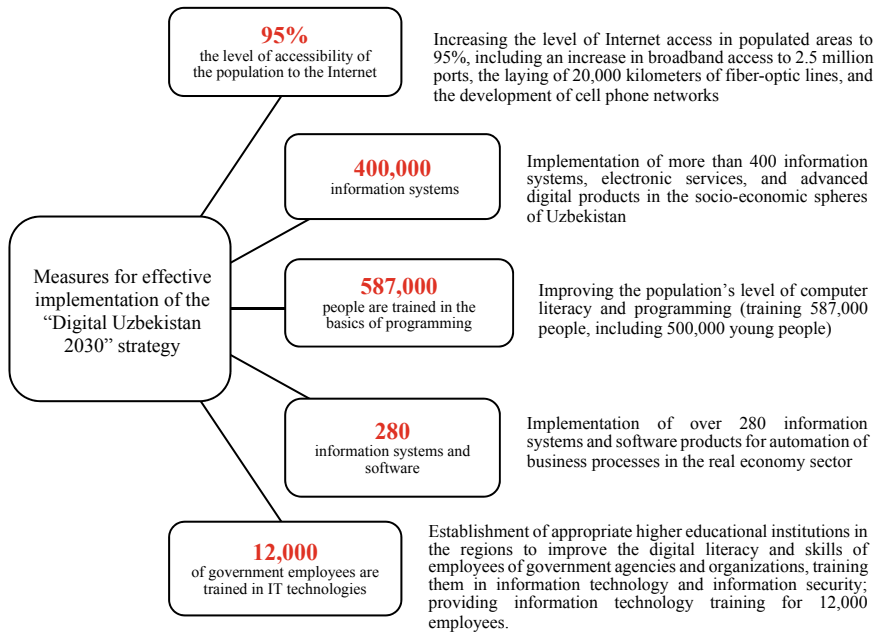
95% the level of accessibility of the population to the Internet	Increasing the level of Internet access in populated areas to 95%, including an increase in broadband access to 2.5 million ports, the laying of 20,000 kilometers of fiber-optic lines, and the development of cell phone networks
400,000 information systems	Implementation of more than 400 information systems, electronic services, and advanced digital products in the socio-economic spheres of Uzbekistan
587,000 people are trained in the basics of programming	Improving the population's level of computer literacy and programming (training 587,000 people, including 500,000 young people)
280 information systems and software	Implementation of over 280 information systems and software products for automation of business processes in the real economy sector
12,000 of government employees are trained in IT technologies	Establishment of appropriate higher educational institutions in the regions to improve the digital literacy and skills of employees of government agencies and organizations, training them in information technology and information security; providing information technology training for 12,000 employees.

Fig. 1.2 Comprehensive measures aimed at implementing the "Digital Uzbekistan 2030" strategy. *Source* President of the Republic of Uzbekistan (2020)

priority issues of state policy. The plan for the development of Uzbekistan for the near future includes provisions for implementing elements of e-government and support for the digital economy.

According to the "Digital Uzbekistan—2030," approved by the presidential decree on October 5, 2020, the implementation of comprehensive measures aimed at implementing new projects in the digital economy is envisaged within the digital transformation of regions and sectors of the economy (Fig. 1.2).

As noted by Uzbek scholars Ergasheva (2018) and Sharipov (2020), the training of highly educated and competent personnel for industries depends on the quality of the educational process, organized with the involvement of teaching staff possessing knowledge of digital technology and training for the digital economy. This is primarily determined by the correspondence of the system of vocational education with the needs of the policy of the Republic of Uzbekistan in the field of digitalization.

Following the established strategic objectives for the development of the digital economy, the leading university for training highly qualified personnel for the economy of Uzbekistan, Tashkent State University of Economics, introduced a credit-module system for undergraduate and graduate students implemented from the academic year 2020–2021. This system allows building an individual trajectory of students following the requirements of the business community and the new realities of the digital economy. Moreover, it attracts leading practitioners and educators from foreign educational institutions to conduct lectures and practical classes.

As part of the development of the partnership between Uzbekistan and Russia, the authors propose a new model for integrating higher education systems to prepare economists for the Republic of Uzbekistan with digital competencies. The proposed model is based on the network interaction between the Tashkent State University of Economics and the Ufa State Petroleum Technological University. This model allows implementing a joint master's program in the format of dual degrees.

1.2   Materials and Methods

Digitalization is one of the most striking manifestations of the transformation of society and business. Digitalization penetrates virtually all areas of activity. Digitalization is considered the main driver of the country's economic growth, and the digital economy is the main global trend.

A series of scientific publications led by Prof. E. G. Popkova (Popkova & Gulzat, 2020; Popkova & Sergi, 2020; Popkova et al., 2021) is dedicated to the forecasts of economic development until 2030, mainly related to the "smart" economy and digitalization. These scientific publications consider the stages of the transformation of society and business through digital technology, which significantly impact future business strategies, business models, and business processes. In the context of global digitalization, companies, organizations, and financial institutions are already experiencing an urgent need for specialists with a new type of thinking, formed digital competencies, readiness to perceive innovations, and the ability to retrain rapidly.

The analytical report of the Corporate University of Sberbank, compiled on the materials of the III International Conference (Katkalo et al., 2018), discloses the models of digital conferences, including user and professional skills of working with software and tools.

These aspects significantly impact the application of modern learning models and the transformation of the education system, involving digital technologies and distance learning. Thus, a group of Russian educators suggests using a competency-based model of in-service training in the enterprise (Sekerin et al., 2018). In the research led by Prof. L. I. Vanchukhina (2019), the authors propose a new training format—the dual degree model. This model provides students with the opportunity to study two programs at the same time.

The above principles form the basis for developing the master's program "Financial Technology in the Digital Economy" with the dual degree model. In 2020, students of the Republic of Uzbekistan will have a unique opportunity to simultaneously enter two universities—the Tashkent State University of Economics (TSUE) on the master's program "Accounting (by industry and field)" and the Ufa State Petroleum Technological University (USPTU) on the program "Financial Technology in the Digital Economy." An important feature of the master's program is that it is intended for university entrants with no special training in information and IT technology who want to master digital competencies. Table 1.1 presents a set

Table 1.1 Competencies of a future economist acquired during the dual-degree master's program "Financial Technology in the Digital Economy"

Digital skills	Soft skills
Use modern information systems to manage a company	Develop projects based on company requests
Collect, structure, and process accounting information	Public speaking and defending projects
Work in "1C: Enterprise" and SAP ERP programs	Develop systematic, critical, and analytical thinking
Process and analyze large amounts of data (big data)	Develop strategic vision and perspective thinking
Develop technical specifications for the design of software for managing business processes in companies	Solve the tasks set
Analyze and forecast the production and financial performance of companies	Make decisions and evaluate them critically
Draw up management and analytical reports of companies	
Develop software modules and add-ons in software products based on SAP ERP, SAP 1C, and blockchain technology to solve management problems in companies	
Model and analyze business processes in companies using ICT tools	

Source Compiled by the authors

of two groups of competencies acquired during the dual degree program "Financial Technology in the Digital Economy."

Within the framework of the master's program, it is planned to study the profile disciplines focused on the following:

- Operations with big data ("Analysis of unstructured data (Big Data) in the digital economy," "Development of databases and databank in economic information systems," "Cloud technologies in the digital economy");
- Latest financial technologies ("Asset storage using blockchain technologies");
- Modern information systems ("The use of ERP systems in the digital economy," "Electronic document management system");
- E-business organization systems ("Digital business strategies and e-commerce technologies").

It is planned to implement a unified curriculum, the disciplines of which are distributed between the two universities. Figure 1.3 schematically presents the model of training in the format of dual degrees in the master's program "Financial Technologies in the Digital Economy."

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                              ┌─────────────────────────┐
                              │        Training          │
                              └─────────────────────────┘
              ┌────────────────────┐          ┌────────────────────┐
              │     First year      │          │    Second year      │
              └────────────────────┘          └────────────────────┘
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| In the first year, students learn some of the disciplines of the educational program in full-time format at TSUE, and four disciplines assigned to USPTU are studied in online format on the USPTU digital platform | In the 3rd semester, training is carried out in full-time format at TSUE, and, in the 4th semester, TSUE students come to USPTU to study specialized disciplines in the field of the digital economy |

D I S C I P L I N E S T A U G H T A T U S P T U

Philosophical problems in science and technology	Information technology in economics
Communicative technologies of intercultural interaction and self-development	Using ERP systems in the digital economy
Organizational and managerial decisions in professional activities	Analysis of unstructured data (big data)
Fundamentals of Basic Economic Science	Digital business strategies and data protection
	Designing information systems in the digital economy
	Accounting and analytical support for management decision making in the digital economy

Educational practices and internships take place at TSUE in the 2nd and 3rd semesters.
Pre-diploma practice is held in USPTU in the 4th semester.
At the end of the 4th semester, students defend their master's thesis once at the site of one of the universities, while the examination committee of the other university participates in the work of the commission in a remote format.
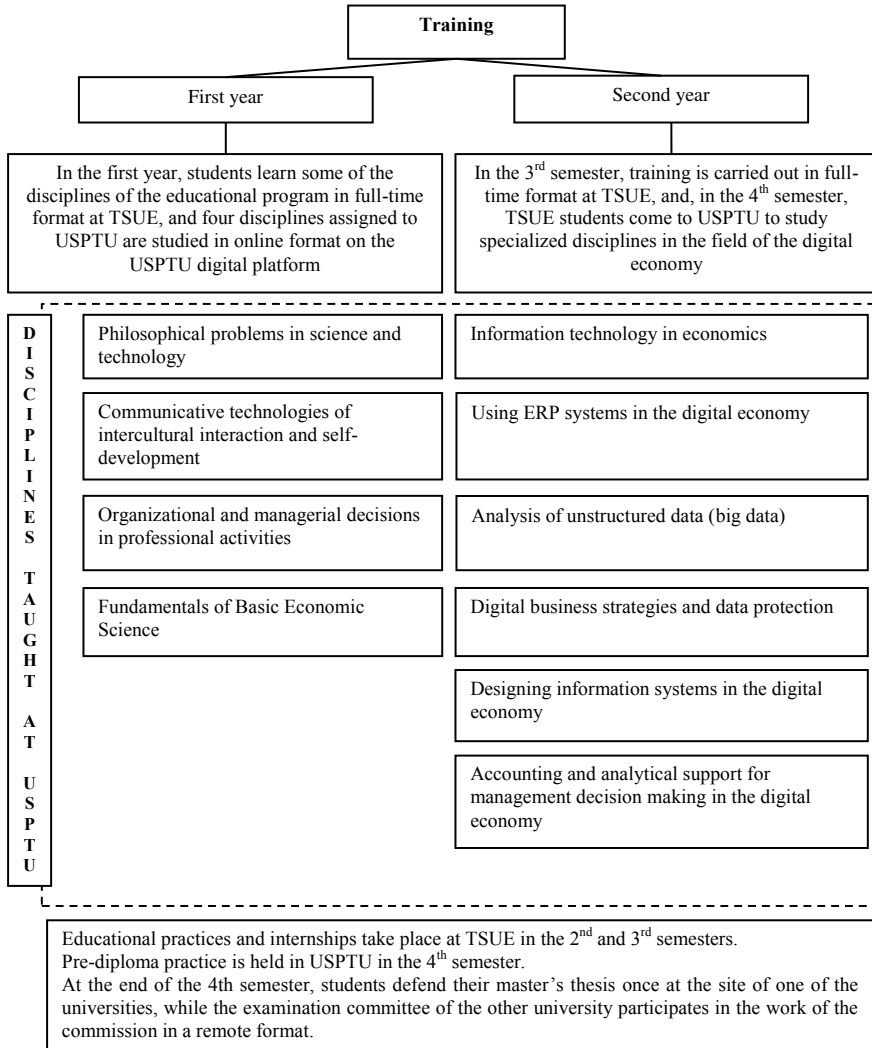
Fig. 1.3 Scheme of implementing the model of training in the format of dual degrees in the master's program "Financial Technologies in the Digital Economy." *Source* Compiled by the authors

In the first year, students learn some of the disciplines of the educational program in full-time format at TSUE, and four disciplines assigned to USPTU are studied in online format on the USPTU digital platform. In the third semester, training is carried out in full-time format at TSUE, and in the fourth semester, TSUE students come to USPTU to study specialized disciplines in the field of the digital economy.

Educational practices and internships are held at TSUE in the second and third semesters, and pre-graduation practices are held at USPTU in the fourth semester.

The master's thesis is written under the supervision of professors from TSUE and USPTU. At the end of the fourth semester, students defend the master's thesis in USPTU and once again in TSUE after they return to Uzbekistan (it is also possible to defend the thesis once at the site of one of the universities, with the examination committee of the other university involved in the commission in a remote format).

When graduating, Uzbek students will receive two diplomas of the Russian and Uzbek universities in the field of "Economics."

1.3 Results

The Ufa State Petroleum Technological University has considerable experience in training personnel for the digital economy. The Institute of Oil and Gas Business successfully trains master's degree students in Economics, profile "Financial and Information Technologies in the Digital Economy." Students in this program defend real projects for the digitalization of certain processes in enterprises and companies in the real economy and create software products for management decision-making based on digital platforms.

The graduation of masters in 2020 showed that the graduates of USNTU mastered the offered disciplines and became qualified users and developers of software solutions and products.

Interest in graduates of this master's program on the part of employers is confirmed by the fact that during the period of study, almost all master's students were hired by large companies, including companies engaged in IT. Ruslan Ismagilov, one of the graduates of the master's program "Financial and Information Technology," says the following: "Having received a bachelor's degree in economics from USNTU in the 'Finance and Credit' profile in 2018 and working as an intern at the company—SIBUR PJSC—I decided to get a master's degree in the new program—'Digital and Information Technologies in Economics.' Such terms as 'digital economy,' 'artificial intelligence,' 'big data,' 'neural network,' 'blockchain,' etc., were commonly used, and I had no idea what they meant. However, I understood that the labor market was changing and that certain technical skills give great opportunities for career growth. Additionally, a master's degree was required for some management positions. It is hard to combine work and study, but when I look back at my successes and activities, I realize that the years of graduate school are not only 'wonderful' but also a productive time. Getting the master's program, I have allocated the direction in which I want to develop—data analysis. While receiving certain knowledge in the university, the student must also study himself. I can confidentially say that the knowledge, experience, and skills gained in graduate school allow me to become a better professional. If I could go back in time and go to graduate school again, I would surely do it again. Studying on the bachelor's degree, I understood that my bar in data analysis is the analysis of the accounts of about 10 companies; on the master's degree, this number reaches 2 million."

Given the new demands and requirements of the business community for specialists, the authors of the article developed a curriculum for the master's program "Financial Technologies in the Digital Economy," the structure and content of which are presented in Table 1.2.

1.4 Conclusion

Thus, the proposed model of integration of higher education systems of Uzbekistan and Russia based on implementing a joint master's program for Uzbek students will allow them to receive two state diplomas simultaneously. Moreover, this program allows students to become skilled users of corporate information systems and developers of software solutions and IT products based on digital technologies (big data and blockchain).

Table 1.2 Curriculum of the master's program "Financial technology in the digital economy" in the format of dual degrees

Discipline	Distribution by courses and semesters															
	First year								Second year							
	First semester				Second semester				Third semester				Fourth semester			
	Lectures	Practical classes	Practicum	Credits	Lectures	Practical classes	Practicum	Credits	Lectures	Practical classes	Practicum	Credits	Lectures	Practical classes	Practicum	Credits
Disciplines for universal competencies																
Philosophical problems in science and technology (DLD*)					8	28		3								
Corporate management					6	26		4								
Communicative technologies of intercultural interaction and self-development (DLD)	4	26		3												
Foreign language of business and professional communication (DLD)						24		3								
Disciplines for general professional competencies																
International accounting practice and its regulation					6	26		5								
Quantitative research methods in accounting	8	38		4												
Management accounting (advanced level)	4	18	20	4												
Organizational psychology									6	26		3				
Fundamentals of basic economic science (DLD)	8	26		3												
Analysis of financial statements					8	26		4								
Provision of the reliability and authenticity of corporate reporting	6	24		4												
Disciplines for professional competencies																
Corporate financial reporting	18	26		3												
Methods of qualitative evaluations					18	26		5								
Elements of market accounting research									8	26		3				

(continued)

Table 1.2 (continued)

Discipline	Distribution by courses and semesters															
	First year								Second year							
	First semester				Second semester				Third semester				Fourth semester			
	Lectures	Practical classes	Practicum	Credits	Lectures	Practical classes	Practicum	Credits	Lectures	Practical classes	Practicum	Credits	Lectures	Practical classes	Practicum	Credits
Information technology in economics (1C)													4	18	20	**4**
ERP systems in the digital economy													8	46		**5**
Interdisciplinary perspectives on accounting									18	26		**3**				
Analysis of risks and their solutions									18	26		**3**				
Analysis of unstructured data (big data) in the digital economy													4	18	20	**4**
Digital business strategies and data protection													8	26		**3**
Designing information systems in the digital economy													18	26		**4**
Accounting and analytical support for management decision making in the digital economy													18	26		**4**
Internship and research work																
Educational practice (technological)							6	**6**								
Internship (technological)												**6**				
Pre-graduation practice (if needed)																**6**
Academic research work				**3**								**6**				**3**
State Final Examination																**3**
Total				**24**				**36**				**24**				**36**

*DLD—distance learning discipline

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