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**Authors:** Abdul Qadeer, Brijbhushan S, Sharanamma

**Paper Title:** "An Experiment on the Properties of Concrete Replacing Fine Aggregate Partially by Iron Ore Tailing (Iot) and Cement Partially by Groung Granulated Blast Furnace Slag (GGBS)"

**Abstract:** The present project study is focuses on the behavior of iron ore tailing (IOT) and Ground granulated blast furnace slag (GGBS)Through partly replacing natural fine aggregate, at 10% 20%, 30% and cement at 5% 10% and 15% respectively. The (IOT) adopted for the project study is brought from kej minerals.The test was conducted on both fresh and hardened concrete in fresh state slump and compaction factor test is adopted and compressive strength, split tensile strength, flexural strength, respectively is measured in hardened state, cubes, cylinder, prisms is prepared. Water absorption test was conducted for durability studies. At 20 percent IOT and 10 percent GGBS, the optimal replacement was found

**Keyword:** GGBS, Iron ore Tailing (IOT), Super plasticizer

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**Authors:** Otakuziyeva Zukhra Maratdaevna, Bobokhujjev Shukhrat Ismoilovich, Aitmukhamedova Tamara Kalmakhanovna

**Paper Title:** Stages of Digital Economy Development and Problems of Use of Modern ICT on Uzbekistan Enterprises

**Abstract:** The article considers the stages of formation and development of the digital economy in Uzbekistan, as well as the problems of implementing information and communication technologies in the activities of enterprises in Uzbekistan. The development of ICT in Uzbekistan is characterized by several stages. Significant development has been received by the "Electronic Government" of Uzbekistan. In order to develop the DE in Uzbekistan, a number of laws have been adopted. Most of the republic's indices in the United Nations E-government ranking improved significantly. Currently, a dynamic expansion of the mobile communication network of Uzbekistan has been noted. Despite the growth and development of the field of information and communication, the main problems of ICT implementation in enterprises is the slow process of introducing

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electronic services, the lack of mechanisms for transferring documents from paper to electronic form, the presence of technical and organizational shortcomings, the difference in generations and social status, conservatism of employees.

**Keyword:** digital economy, digital technologies, digital infrastructure, digitalization, electronic business, electronic commerce.

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**Authors:** **M. Ayaz Ahmad, Syed Khalid Mustafa, Nataliya Belova, Vyacheslav Lyashenko**

**Paper Title:** **Tools for the Production of Plastic Products**

**Abstract:** The paper discusses the types of system elements of mold parts. The calculation method of design data tooling which can be used at design of injection mold is offered. This method gives the chance to provide the necessary accuracy of casting. Distinctive feature of the offered method is modification of the formalized shrinkage material description of a molding detail. The offered calculation method of design data tooling allows increasing the accuracy of the received plastic product because are considered: absolute and relative volume shrinkage; relative actual linear shrinkage of material; alleged linear shrinkage.

**Keyword:** injection mold, mold details, durability, accuracy, shrinkage, plastic.

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# Stages of Digital Economy Development and Problems of Use of Modern ICT on Uzbekistan Enterprises

Otakuziyeva Zukhra Maratdaevna, Bobokhujaev Shukhrat Ismoilovich,  
Aitmukhamedova Tamara Kalmakhanovna

**Abstract:** *The article considers the stages of formation and development of the digital economy in Uzbekistan, as well as the problems of implementing information and communication technologies in the activities of enterprises in Uzbekistan. The development of ICT in Uzbekistan is characterized by several stages. Significant development has been received by the "Electronic Government" of Uzbekistan. In order to develop the DE in Uzbekistan, a number of laws have been adopted. Most of the republic's indices in the United Nations E-government ranking improved significantly. Currently, a dynamic expansion of the mobile communication network of Uzbekistan has been noted. Despite the growth and development of the field of information and communication, the main problems of ICT implementation in enterprises is the slow process of introducing electronic services, the lack of mechanisms for transferring documents from paper to electronic form, the presence of technical and organizational shortcomings, the difference in generations and social status, conservatism of employees.*

**Keywords:** digital economy, digital technologies, digital infrastructure, digitalization, electronic business, electronic commerce.

## I. INTRODUCTION

A vicious struggle for leadership in the field of digital technologies is taking place in the global economy, thus the lag in development seems to have far-reaching negative consequences for a single country. This was clearly expressed at the summit in Osaka, Japan, as well as Spain, Chile, the Netherlands, Senegal, Singapore, Thailand and Vietnam, in the adopted joint declaration on digital economy (DE), which states that digitalization irrevocably changes economies and societies, moreover it is also an important source of economic growth, and their effective use will lead to prosperity in all countries [1]. This document confirms that DE has been adopted as a strategic goal for the coming years in developed countries. In general, it can be noted that the modern national digital strategy of a particular country reflects the development of the economy, the creation of enterprises with

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**Z.M. Otakuziyeva**, Department of "Technology of postal communication", Tashkent University of Information Technologies named after Muhammad al-Khwarizmi, Tashkent, the Republic of Uzbekistan, [zukhra.otakuziyeva@rambler.ru](mailto:zukhra.otakuziyeva@rambler.ru),

**Sh.I. Bobokhujaev**, Department of "Oil and gas economics", sector manager Gubkin Russian State University of Oil and Gas (National Research University) in Tashkent, Tashkent, the Republic of Uzbekistan, [bobshuh@mail.ru](mailto:bobshuh@mail.ru).

**T. K. Aitmukhamedova** Department of "Technology of postal communication", Tashkent University of Information Technologies named after Muhammad al-Khwarizmi, Tashkent, the Republic of Uzbekistan.

innovative technologies, the growth of employment of the able-bodied population, and the formation of a highly efficient public sector. Therefore, for any country, the implementation of the strategy and the development of the DE will allow:

- 1) to create and implement new types of business processes that are included in international production chains;
- 2) to use new models for attracting investment in the country's economy;
- 3) to increase the efficiency of public administration, as well as in the field of healthcare, social, educational and other spheres.

Taking into account the current global trends, the intensive use of ICT in all spheres of society in Uzbekistan, as well as the general development of digital technologies, will become the driving force behind innovation and accelerated entry, as well as integration into the global economy. In order to accomplish this, intensive measures are being taken in the republic, however without a preliminary scientific basis and scientific research it is impossible to achieve high efficiency in these processes. The rapid changes occurring through the use of ICTs and the development of digital technologies are difficult to track for scientists from many countries of the world who conduct research in the field of DE. As in most countries, these scientific studies are relevant in the republic and are at an initial stage. Therefore, the issues of conducting scientific research on the formation and development of the digital economy in the republic, the problems of introducing modern ICT in the activities of enterprises, as well as studying world experience and its adaptation, are becoming important.

## II. THE DEVELOPMENT OF THE DIGITAL ECONOMY IN THE COUNTRIES OF THE WORLD

Nowadays, despite the short historical period for the development of DE, world practice shows that digital technologies are most used in trade and Internet services - electronic commerce, Internet banking, electronic payments, online advertising, online games, etc. [2]. Back in 2001, Thomas Mesenburg structured and ranked the following indicators as the main statistically assessed components of DEs [3]:

- 1) supporting the electronic infrastructure of enterprises (e-business infrastructure - hardware and software, telecommunications, networks, etc.);



- 2) electronic business (e-business - the implementation of activities and business processes using computer networks);
- 3) e-commerce (e-commerce - distribution of products and goods over the Internet);
- 4) the resulting increase in the value of traditional industries through the use of digital technologies (firm and industry structure);
- 5) the difference in the value of the labor force of the traditional and digital economy (demographic and worker characteristics);
- 6) accounting for the added value of products and services of the digital economy (Price behavior).

In general, taking into account the main trends in the development of DEs in the countries of the world, it can be noted that states are directing their efforts to developing infrastructure, removing and lowering barriers in the DE sectors, increasing the level of knowledge of digital technologies, training and retraining specialists, ensuring confidence in reliability, digital security infrastructure and risk assessment; development of the digital sector of the economy.

**Table-1: DE development indicators in a number of countries [4]**

Country	Mobile subscribers, % of the population		Internet users		Active users of social media		Users of mobile social services	
	mil	%	mil	%	mil	%	mil	%
World	8842	115	4388	57	3484	45	256	42
Afghanistan	28,82	78	9,7	26	3,8	10	,6	9,8
China	1543	109	802	57	1007	71	007	71
Germany	107,8	131	79,13	96	38	46	0	36
India	1190	87	560	41	310	23	90	21
Iran	123,7	150	72,94	89	47	57	1	50
Japan	186,3	147	118,9	94	78	61	8	61
Kazakhstan	25,69	139	14,14	69	7,3	39	,6	19
Kirgizstan	9,38	152	2,49	40	1,8	29	,96	16
Mongolia	4,19	133	2,2	70	2,2	70	,1	67
Russia	248,2	172	109,6	76	70	49	7,75	40
Tajikistan	9,9	108	3,01	33	0,44	4,8	,24	2,6
Turkmenistan	4,48	76	1,06	18	0,042	0,7	,021	0,4
UAE	19,23	200	9,52	99	9,52	99	,8	92
Great Britain	71,67	107	63,43	95	45	67	9	58
USA	347,4	106	312,3	95	230	70	00	61
Syria	13,61	74	6,03	33	6,8	37	,49	35
Uzbekistan	24,84	76	15,45	47	2,0	6,1	,0	3,1

According to large-scale studies of digitalization in 246 countries of the world (as of January 2019), the development indicators of DEs in different countries have different trends (see Table-1). Despite the different indicators and ways of developing DE in the countries of the world, such common features as creating favorable conditions for the active introduction of innovations and a significant increase in investment in digital technologies and infrastructure are highlighted [5]. The turning point for Russia was 2017, when the digital economy program and the strategy for the development of the information society until 2030 were adopted. In July 2017, a program where the digital economy is represented by 3 levels was adopted [6]:

- 1) markets and sectors of the economy;
- 2) platforms and technologies;
- 3) an environment encompassing regulation, human resources, information infrastructure and security.

### III. STAGES OF DEVELOPMENT OF THE DIGITAL ECONOMY IN UZBEKISTAN

Today, the President, the government of the Republic of Uzbekistan pays special attention to the development of ICT and its mass implementation in all spheres of society. This is facilitated by the adopted Comprehensive Program for the Development of the National Information and Communication System of the Republic of Uzbekistan, designed for 2013-2020. The development of ICT in Uzbekistan is characterized by several stages [7]:

1. The initial stage of development (2000-2002) - the period of the phased implementation of ICT and improvement of public administration;
2. The second stage (2003 - 2007) - the period of adoption of the main legislative and regulatory documents and the widespread adoption of ICT;
3. The third stage (2008 - 2012) - the period of the active introduction of internal information systems and software products in government bodies, the provision of information and reference electronic services;
4. The fourth stage (2012 - present) - the period of further improvement of the structure of public administration.

Significant development has been received by the "Electronic Government" of Uzbekistan, which includes such components as a single portal of interactive public services (SPIPS); open data portal (data.gov.uz); government's sites, information systems such as "Tax", "Customs", "Education" and others, a virtual reception of the president and prime minister, as well as a portal for housing and communal services. The republic conducts centralized registration and accounting of state resources and information systems of state bodies, which form a single information space on the territory of the republic and organize information interaction between state bodies. A register of basic interactive public services providing a single point of access for citizens to various interactive public services is maintained.

### IV. LEGISLATIVE AND REGULATORY BASIS FOR THE DEVELOPMENT OF THE DIGITAL ECONOMY OF UZBEKISTAN

In order to develop the DE in Uzbekistan, a number of laws such as - "On Informatization", "On Electronic Digital Signatures", "On Electronic Commerce", "On Electronic Document Management", "On Electronic Payments" and others have been adopted. More than 25 rulings and decrees of The President of the Republic of Uzbekistan, as well as more than 35 government decisions on the development and implementation of ICT, interactive services, training and professional development of IT personnel have been passed. The latest legislative and regulatory documents are aimed at accelerated development of DE in the republic. The adopted strategy of action in five priority areas of the development of the Republic of Uzbekistan in 2017-2021 indicates the creation of a favorable ICT infrastructure, including the development of mobile communications and digital television, the accelerated construction of fiber-optic communication lines, comprehensive assistance in software development, improvement and the development of the Electronic Government system.



The adopted resolution of the President of the Republic of Uzbekistan No. 3832 dated July 3, 2018 “On measures to develop the digital economy in the Republic of Uzbekistan”, states that the most important task for the further development of the digital economy in Uzbekistan are [8]:

- development of the turnover of crypto assets (including mining);
- development of the “blockchain” technology (distribution of the data registry);
- implementation and development of smart contracts (an agreement in electronic form);
- training of qualified personnel for the development and implementation of platforms;
- development of cooperation with international and foreign organizations in the field of development and implementation of platforms, as well as for joint implementation of projects.

At the end of last year, the President of the Republic of Uzbekistan Sh.I. Mirziyoyev in his message to the Oliy Majlis noted that “we should develop a National Concept for the Digital Economy, which provides updating of all areas of the economy based on digital technologies, and on this basis implement the Digital Uzbekistan– 2030. "The digital economy will ensure a gross domestic product growth of at least 30 percent and dramatically reduce corruption”[9].

## V. ANALYSIS OF THE DIGITAL ECONOMY OF UZBEKISTAN

As noted above, today it is very difficult to reliably quantify the DE, therefore, as in any country, the degree of formation of the DE in Uzbekistan can be characterized by the introduction and development of modern ICT, the knowledge-intensive economy, and the share of services in GDP. Over the years of the implementation of the Comprehensive Program for the National Information and Communication System Development, the contribution of ICT to GDP has grown from 1.9% to 2.2%. Most of the republic's indices in the United Nations E-government ranking improved significantly (see Table-II).

**Table-II: The volume of services provided by main types of economic activity (in billion sums) [10]**

Index	2008	2010	2012	2014	2016	2018	2018/ 2008
E-Government Rank	109	87	91	100	80	81	+28
E-Government Index	0,40570	0,44975	0,50991	0,46951	0,54335	0,62070	+0,21500
E-Participation Index	0,09090	0,31428	0,23680	0,47058	0,67797	0,75840	+0,66750
Online Service Index	0,27424	0,37777	0,49673	0,44881	0,68841	0,79170	+0,51746
Human Capital Index	0,90882	0,88830	0,82544	0,72640	0,69535	0,73960	-0,16922
Telecommunication Infrastructure Index	0,03811	0,08538	0,20748	0,23334	0,24630	0,33070	+0,29259

Currently, the service sector in the republic is one of the fastest growing field of the economy of Uzbekistan and is significantly ahead of the growth of material production. The share of the service sector in 2018 amounted to 36% of GDP

and was equal to 146836 billion soums (see Table-III) [11].

**Table - III. The volume of services provided by main types of economic activity (in billions of soums)**

Indicators	2012	2013	2014	2015	2016	2017	2018
Communication and information services	3219,3	3749,8	4541,3	5181,5	6306,8	8196,7	9744,1
Computer and household repair services of goods	944,1	1122,8	1388,4	1724,5	2187,9	2329,2	2628,0
Total services	42552,1	53650,2	65880,4	75356,8	92536,0	118811,0	146836,6

The volume of communication and information services in 2018 amounted to 9,744.1 billion soums or 6.6% of all services. Telecommunication services (wired and mobile communications services, the Internet, satellite communications services, etc.) in communications and informatization services occupied the largest part (84.5%), and the remaining 15.5% belong to other ICT services.

Currently, a dynamic expansion of the mobile communication network of Uzbekistan has been noted. The lion's share of mobile services is used by individuals, whose proportion is 97.5%. Currently, cellular communication services in the market of Uzbekistan are offered by companies - Unitel LLC (Beeline trademark), Universal Mobile Systems LLC (UMS trademark), RWC JV (Perfectum Mobile trademark), IP Coscom LLC (UDEll trademark) and UzMobile branch of Uzbektelecom JSC.

Today, highly qualified ICT personnel are being trained in our country in higher education institutions such as the Tashkent University of Information Technologies named after Muhammad Al-Khwarizmi and Inha University in Tashkent. In particular, the Tashkent University of Information Technologies trains highly qualified specialists in such areas as: Computer Engineering, Software Engineering, Telecommunication Technologies, Economics and Management in the Field of ICT, Electronic Government and many others. The university has branches in Samarkand, Fergana, Nukus, Karshi and Urgench. The university has 11 training laboratories of various ICT companies, in particular, O'zbektelekom, ZTE and Huawei. Being established in 2014, Inha University prepares computer and software engineering specialists for the labor market of Uzbekistan. The center for Innovation and Industrial Cooperation, organized at Inha University, serves as an important platform for increasing the scientific, practical and innovative potential of the university, and also has an important role in the implementation of scientific developments of students.

## VI. MAIN INDICATORS OF THE DIGITAL ECONOMY OF THE REPUBLIC

Despite the fact that in Uzbekistan there is a development and growth of communication and informatization services indicators, according to some such indicators of DE, republic are inferior to such countries as Afghanistan and Syria, where military clashes take place (see Table IV).



# Stages of Digital Economy Development and Problems of Use of Modern ICT on Uzbekistan Enterprises

**Table - IV. Dynamics of quarterly changes in audience activity in social media networks (January 2018 / January 2019),% [12]**

№	Social networks	Number of users, million of people	Quarterly changes, %
1	Facebook	0,850	-13,0
2	Instagram	1,7	+42,0
3	Twitter	0,0376	+15,0
4	Snarchat	N/D	N/D
5	Linkadin	0,160	+6,7

Besides, one of the main areas of DE, like e-commerce, also has low indicators inferior to global average indicators (see Table -V).

**Table - V. E-commerce indicators**

№	Factors of financial availability	Uzbekistan, %	Other countries, %
1	Number of account holders in financial institutions	37	69
2	Number of credit card holders	0,6	18
3	Number of people having mobile money accounts	N/D	4,4
4	Make online purchases and / or pays bills	7,1	29
5	Number of women with credit cards	0,6	17
6	Number of men with credit cards	0,5	20
7	Number of women making online transactions	4	28
8	Number of men making online transactions	10	30

An analysis of other indicators of DE development shows an increase in pointers (see Table - VI), however, the republic is not listed in the list of countries actively developing the digital economy.

**Table -VI. Key indicators of de development in the republic of Uzbekistan [13].**

№	Indicators	2014	2015	2016	2017	2018
1	The number of mobile users (million)	19,6	20,1	20,6	21,4	22,8
2	Total amount of internet users (million)	4,9	10,2	12,1	14,7	20
3	The number of base stations of mobile communication (pieces)	14309	14921	16265	18194	22178
4	Digital TV Coverage (%)	45	54,4	68,6	95	100
5	Bandwidth International Data Network (Gb / s)	10	16,07	25,7	64,2	1 200
6	The total length of fiber-optic communication lines (thousand km.)	14,4	16,4	17,9	20,3	24,5
7	Total number of EDS keys (thousand pcs. )	696,582	719,614	1 430,1	1 720,2	2 946,938
8	Number of types of services at SPISS (pcs.)	96	260	265	302	302
9	Tariffs for Internet services (external channel) for providers (\$)	312,58	259,29	157,6	91,5	10,11
10	The number of types of services on my2.gov.uz (pcs.)	0	0	0	0	61

## VII. PROBLEMS OF ICT IMPLEMENTATION IN THE ENTERPRISES OF UZBEKISTAN

Nowadays, modern ICTs allow enterprises and organizations to effectively use and accelerate many production and other processes, as well as the provision of services. Taking into consideration the identified trends and advantages, enterprises and organizations are actively updating and using ICT. At the same time, scientific studies by scientists show mixed results on the use of ICT. For example, Robert Solow, Nobel laureate in economics in the 2000s, studied the impact

of the introduction of computers on productivity growth in American enterprises in various sectors of the economy and concluded that the introduction of computers in production did not lead to an increase in labor productivity in any field ... except computer manufacturing [14].

Today in the republic, information systems and databases are gradually being implemented in such areas as healthcare, social protection, education, public services, tourism, etc. In the field of education, the use of modern pedagogical and information technologies has allowed the formation of new integrated training technologies, including distance learning through Internet technologies. It is planned to continue work on expanding optical broadband access networks and building fiber-optic communication lines, further installing nationwide EDVO, 3G and 4G LTE base stations. Moreover, foundation of studios to provide multimedia services to the corporate sector, centers of information and reference services, data storage and processing, as well as storage of frequently used data (caching centers) are considered. Modern ICTs are actively being introduced into the activities of enterprises and organizations of Uzbekistan. At the beginning of 2019, about 213 thousand out of 323.5 thousand operating organizations and enterprises of Uzbekistan in the services sector were involved. It constitutes 65.8%. As for the current organizations and enterprises involved in information activities and providing communication services there are 7400 of them[15]. In general, there has been an increase in the number of enterprises and workers in the field of communications and informatization from year to year (see table 7.)

**Table - VII. The dynamics of the number of employees in "Information and communication"**

Year	The dynamics of the number of employees in the "Information and Communication", thousand people	Number of registered / active Enterprises, in thousands
2010	53,1	N/D
2011	54,7	N/D
2012	56,3	N/D
2013	58,0	N/D
2014	59,8	N/D
2015	61,7	N/D
2016	63,6	N/D
2017	64,3	6800/6400
2018	N/D	7400

## VIII. CONCLUSION

Despite the growth and development of the field of informatization and communication, the main problems of ICT implementation in enterprises are the slow process of introducing electronic services, the lack of mechanisms for transferring documents from paper to electronic form, presence of technical and organizational shortcomings, the difference in generations and social status (not all employees can equally use electronic services) and conservative employees. In order to change the situation, enterprises need to have employees with relevant professional knowledge, make agreements with leading technology providers and use the most modern and effective software development.



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## AUTHORS PROFILE



**Z.M. Otakuziyeva**, Associate Professor, Ph.D., associate professor of the Department of Postal Technology of the Tashkent University of Information Technologies named after Muhammad al-Khorazmiy, Uzbekistan. She received a Ph.D. in economics (Ph.D.) from the Tashkent Automobile and Road Institute. He has 25 years of teaching experience in the field

of microeconomics, macroeconomics, information (digital) economics. She has published 10 scientific articles in various international journals and has presented more than 58 articles at various national and international conferences. She participated in lectures at conferences in Moscow, St.

Petersburg (Russia), Minsk (Belarus). She is the author of two books (Macroeconomics, Information Economics). She organizes, participates in various national seminars. She received the "Certificate of Merit of the Uzbekneftgaz National Holding Company in 2015 and the "Gratitude of the Faculty of the University of Information Technology named after Muhammad al-Khorazmiy" in 2017. She is the scientific adviser of Sh.I. Bobokhujayev and manages projects, works actively with students in the scientific field.



**Shukhrat Bobokhujayev**, Associate Professor, since September 2012 he has been working in the Branch of the Gubkin Russian State University of Oil and Gas (NRU) named after I.M.Gubkin in the city of Tashkent as a Associate Professor of the department "Economy of oil and gas". The author of 213 scientific publications, 2 monographs and 5 teaching aids. He published scientific works, including in

publishing houses of such countries as the USA, Germany, Switzerland, Russia, South Korea, Vietnam, Belarus, Kazakhstan, etc. He participated in a number of international and national projects. Since 2015, he is a member of the International Association of Scientists, Teachers and Specialists Famous scientists. Since 2016, he has been an expert in the Food and Agriculture Organization of the United Nations (FAO) Expert Group on Agricultural Trade in Europe and Central Asia. In 2017, Sh.I. Bobokhujayev was included in the 13th volume of the Encyclopedia of famous scientists (Scientists of Russia). He is a laureate of the "Gold" medal and certificate of participation in a number of international and international Frankfurt book exhibitions (Frankfurt am Main, London, Paris, Hong Kong, Moscow, etc.).