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EVALUATION OF EFFICIENCY OF DIGITIZATION OF HOUSING CONSTRUCTIONS IN KASHKADARYA REGION AND IMPROVEMENT OF MANAGEMENT MECHANISMS

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Abstract:

In this article, the digitization of housing constructions in the Kashkadarya region, efficiency evaluation and improvement of management mechanisms, and the indicators of effectiveness achieved by using gadgets in lighting are mentioned.

Keywords: Housing construction, motivation, performance evaluation, management mechanisms, gadget, intelligence model, infrastructure, brand, tracker, matrix, predict, ideal models, rumination, etc.

INTRODUCTION. The main goal of comprehensive reforms in the field of housing and communal economy of our republic is to fundamentally improve the living conditions of the population and provide high-level communal services.

Therefore, in order to improve the quality of living conditions of the population, provide services to the multi-family housing fund and fundamentally improve the mutual cooperation of industry organizations in this regard, as well as to improve the efficiency of the work of housing owners' associations (UJMSh) and ensure their financial and economic stability. Decree of the President of the Republic of April 18, 2017 "On measures to further improve the management of the housing and communal services system" No. PF-5017 and PQ-2900 "On the organization of the activities of the Ministry of Housing and Communal Services of the Republic of Uzbekistan" -, as well as Decision PQ-2922 dated April 22, 2017 "On measures to further improve the system of maintaining and using the multi-family housing fund in 2017-2021" was adopted.

The analysis of surveys carried out in the places shows that the control of the maintenance of the multi-apartment housing fund is not organized, and in many cases, the norms and requirements regarding the technical operation of the housing fund and the safe living of the population are being violated. The rules and standards for the repair and restoration of buildings and their deadlines are not being observed, demolition of old houses is being carried out at a slow level, sanitation and hygiene standards are not being fully observed in the areas adjacent to multi-storey buildings.

As a result of the introduction of free market economy relations and changes in ownership relations in the republic, opportunities for disposal of private property and its use for various purposes have arisen. In order to effectively use residential buildings, a system of digitalization of housing constructions was introduced. Digitization of housing construction processes allows for a significant increase in labor efficiency, which is confirmed by the results of relevant studies, which means that labor standards must also be updated in digital work conditions. In recent years, scientific works have begun to appear, reflecting the possibilities of digitalization of the processes of standardization of the work of employees of enterprises in various fields.

ANALYSIS OF LITERATURE ON THE TOPIC. Separately, we note that this line of research has become the focus of attention of practitioners and scientists, including people who combine these roles, because increasing labor through effective regulation of activities is impossible without scientific expertise of the developed approaches and standards. In particular, R. Kashapov (standardization of labor at an oil and gas production enterprise under automation conditions), M. It is worth noting the dissertations of Abrashkin (increasing labor efficiency through the prism of its standardization), P.Dmitriev (labor standardization in the gas industry), A.Miyadina (regulating the activities of management employees of industrial enterprises), I. Slastnikova (labor regulation in banks) and others. all the works were prepared in the 21st century, which shows their relevance to the modern requirements of the market economy.

It represents economy in the use of resources, laboriousness of human labor in material and non-material production. Labor efficiency is one of the most

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important economic categories describing the socio-economic development of national and enterprises. The nature and content of labor efficiency as an economic category can be analyzed in 3 directions: the first direction is the economic efficiency of labor or production in the subject of study. The role of this economic category in the system of economic sciences is of great interest, the interaction of labor efficiency with objective economic laws is studied, and many scientists are interested in the uniqueness of this economic category in various forms of production; second direction, it is related to the search for labor efficiency criteria and its quantitative standards, as well as efficiency indicators at different levels of the economy, studying the dynamics of efficiency; and the third direction is related to the research of the ways and means of increasing the efficiency of labor through individual influencing factors, as well as economic spheres.

New approaches to labor regulation in the digital economy should logically lead to the use of modern standardization tools, but according to researchers, business continues to use proven methods:

timekeeping, working time photography, current and newly developed standards, including trace elements.

Working time photography uses the classification of individual procedures and actions of workers, which allows to understand the structure of time and its use in various operations according to the results of their generalization. Traditionally, the following categories are used:

* Preparation and final time (PZ) - briefing, filling in journals, studying and obtaining technical and planning documents (outfits, drawings, road sheets).

* Transfer to the workplace at the beginning and end of the shift; sensors, clocks, switching to reconciliation, switching to work.

* Work (main) - time to control the equipment, change its operating modes.

* Work (assistant) - bypassing equipment during maintenance, monitoring the progress of the technical process and product quality; transitions related to the production process (up to 1 minute).

* Workplace maintenance (ob) – go to pick up tools, etc. (more than 1 minute), clean, wash and lubricate equipment.

* Losses - waiting for a specialist to reconcile, waiting for a tool, equipment, talking to employees, distraction on the phone.

* Break-time of short rest and changes necessary to resume work.

* Lunch-the camera is off (about 1 hour), the rest of the time is to lose, etc.

Traditionally, determining the various actions of the employee and the time spent on them was carried out with the help of rationing. This is a very hard, regular work, which is done over time in a monophonic mode.

To evaluate work efficiency, it can be accompanied by the use of self-photographs of working hours, in which the employee independently records what activities he was engaged in during the day and how much time he spent on them.

In order to digitize the processes of labor organization and regulation in the process of housing construction in Kashkadarya region, I propose to use a system for monitoring the activities of employees using wearable gadgets.

The equipment used is a series of wearable gadgets (wristbands or smart watches) that are placed on the hands of the observed workers and used during the working day. Gadgets can be connected to a network, which provides the transmission of various human data, their analysis allows to identify interruptions in work, allocate the best workers, monitor operations, etc.

Each morning, the subject must plug in the wearables, use them on their hands, check that they work at the designated time, remove them at the end of the shift, and plug them into the charger. It is desirable that he does not use third-party gadgets (other bracelets, watches, phone, GPS-Navigator), does not use overalls with a certain level of moisture protection to eliminate disturbances. Employees A. They were aware of all aspects of labor organization and regulation using a system of wearable gadgets based on the principles established in Nikolsky's work.

Simultaneously with the collection, a data analysis system is implemented in the employee activity reports, which allows you to recognize elementary movements, general operations to change and change the functional state of the body.

The monitoring system allows you to record the absence of each employee during the entire working time, which allows:

- systematization and elimination of interruptions of an objective nature (no task, tool, briefing, etc.);
- identifying and managing absenteeism of a biased nature through employee motivation;
- the employee has the opportunity to independently choose the cause of failure in the application, realizing that inactivity is recognized by the system in any case. it organizes the regular collection of big data about the reasons for the absence of workers;
- the employee stands idle and understands that he is recognized by the simple system and affects his motivation.

If the objective reason is simple, the worker can select it from the drop-down list. It is not possible to make a choice, but the system will correct the inactivity

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in any case. Thus, the system allows all workers/teams to gather complete information about the facts and causes of absenteeism, to identify and eliminate systemic problems and planning errors.

The purpose of the article is to determine the downtime and optimize the number of maintenance workers using individual sensors (watches) and a system of in-depth analysis of the received data using a system for monitoring the employment of workers.

The project was implemented in 2020 (coverage - 20 plumbers-repairers of the copper electrolysis workshop and 15 plumbers-repairers of the centralized repair shop, 8 people at the same time), resulting in the optimization of the number of 3 plumbers-repairers in the centralized repair workshop.

The research project included 3 directions:

a) automatically collect information about the actions of workers in the workshop using a system of wearable gadgets;

b) high- and low-level activities of workers according to information received from wearable gadgets to train artificial intelligence model recognition; v) to determine directions for improving the organization of labor according to the information obtained from the system.

In general, project costs in 2021 amounted to 44.7 million soums: - the price of license, sensors and insurance (annually); 22.9 million soums. - costs of creating infrastructure and purchasing additional server equipment (one-time costs).

During the implementation of the project, the following risks were taken into account:

1) failure of the equipment in conditions of strong electromagnetic interference, operation in an aggressive environment, etc.;

2) performing technical work on the server (outages on the server);

3) resistance to implementation by workers (refusal to wear sensors).

During the project, physical labor monitoring systems were adapted and adapted (filled with data) to recognize models for use in the specialty "locksmith-repairman".

The task was to recognize the following activities:

High-level (summary) activity:

* work;
* transfer;
* simple (breathing room).

Also, a basic model for recognizing several elementary movements was established in the experimental procedure:

* subclasses:
* work with a percussion instrument;
* working with electric tools;
* turning movements
* screwdriver, hand screws);
* key;
* using a smartphone;
* physical inactivity;
* walking;
* other actions.

Accelerometer and gyroscope indicators were primarily used for analysis and use in the field of labor organization.

Note that GPS, barometer and heart rate monitor can also be used in addition. According to the results of the project, recommendations were made to expand the possibilities of using gadgets, to provide opportunities for synchronizing their readings and video recordings.

In addition, the ability to determine the location of employees up to the zone has been developed. Next, it is recommended to use NFC tags to increase location accuracy.

Note that the system allows analysis of low-level classes and positioning. As part of the study, the staff did not confirm the accuracy of the work of low-level classes and the location of the system.

To determine which gadget is used, the study analyzed about 40 different variants of wearable devices from well-known brands (Samsung, Huawei, Xiaomi, Sony) and ordinary Chinese companies. The evaluation showed that only a few representatives of the trackers have official access to download and analyze gadget data, and some of them have limited use in the field. As a result, the choice is made in favor of Samsung wearable devices.

The model was able to "learn" to recognize and emphasize the following high-level criteria: work, movement and rest, that is, inactive movements.

Table 1
Summary data on the model (general), %

Indicator	September 28	September 29	September 30	Average
Including work	45.3	38.9	37.3	40.5
Transfer	21.3	19.2	21.7	20.8
Rest	33.3	38.4	41.0	37.6
Loss	0.0	0.0	0.0	0.0

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As a result of adapting the recognition model, the following recognition quality was achieved:

* High-level (aggregated) activity model – 90 to 95% accuracy for a mean of 93% (7% error) for the sample of workers provided.

* Low-level (elementary) activity model - 73 to 82% accuracy on average 79% (21% error) for sample of workers provided.

The specified percentages indicate that 100% of the shift time the classes were mixed with no more than the specified percentage of error time. The distribution of errors is shown in more detail in the example of the "error matrix".

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The 3x3 matrix is one of the high-level activity matrices (Figure 1).

The 6x6 matrix is one of the low-level motion matrices (Figure 2).

Activity classes are recorded in columns and rows:

columns – predict – model;

strings - true - valid values.

Each row represents the cases in which the model identifies a particular class.

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	precision	recall	f1-score	support
Передышка	0.93	0.93	0.93	60
Перемещения	1.00	0.97	0.98	97
Работа	0.91	0.96	0.93	51
accuracy			0.96	208
macro avg	0.95	0.95	0.95	208
weighted avg	0.96	0.96	0.96	208

rocauc: 0.99320

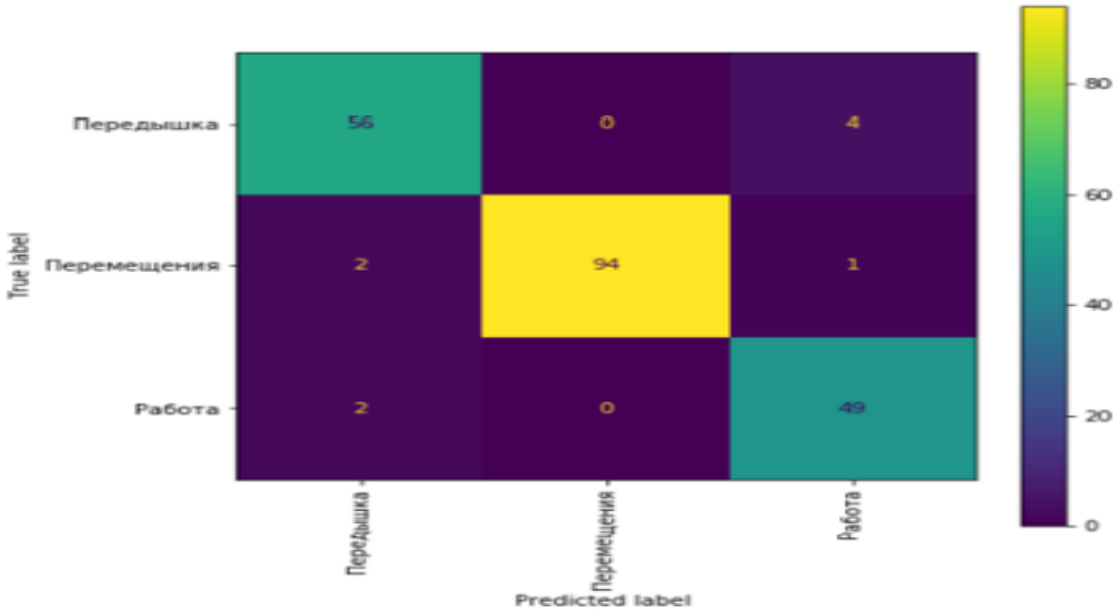

Figure 1. Example of a 3x3 error matrix in a used model.

For example: 56 times the model correctly identified the deadline (first row, first column), 4 times the model incorrectly recognized "deadline": 2 times when the correct answer was "action" and 2 more times when the correct answer was "work". The model did not confuse the movement with anything and correctly recognized the work 49 times.

For an ideal model, it should be a diagonal matrix (that is, the numbers are only on the diagonal) and the other cells should contain zeros. It should be taken into account that there are no ideal models, there are always mistakes. In this case, diagonals are visible in both matrices (a large number of intersections are separated by color), the higher the level, the better, which makes sense, because the quality of the model is

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much better at the moment. It can also be seen where improvements are needed, for example, "turning movements" and "other movements" are not yet well separated.

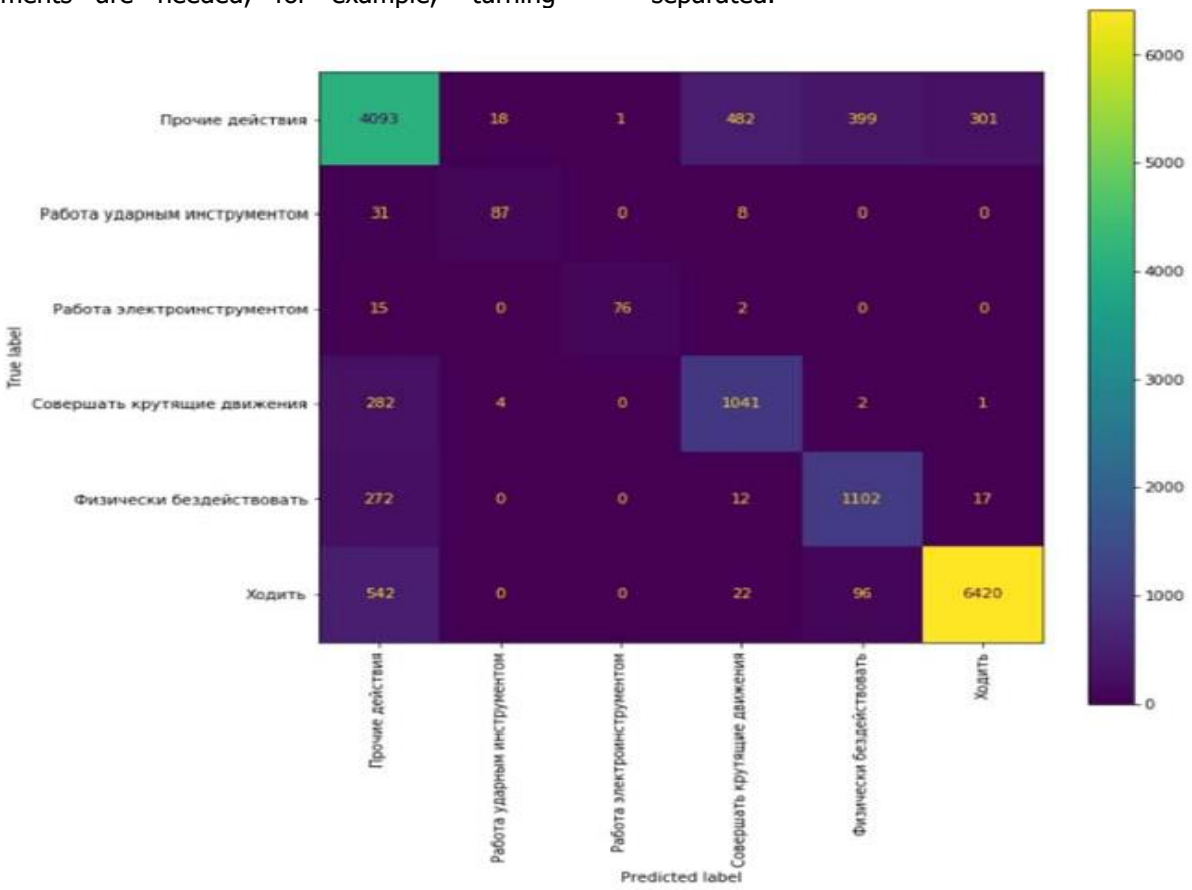

Figure 2. Example of a 6x6 error matrix of the model used.

General conclusions on the results of using the model:

1. Errors in the model are divided into two types:

1.1. Inaccuracy of such recognition (mixing, misclassification). In this case, the model is structured in such a way that it makes an error in the "benefit" of the employee, for example, he often takes a break for work and not vice versa.

1.2. Not always ideal logic is inherent in the model at first, for example, the transportation of objects should be recognized as work and not as movement (or two classes of "work with movement"), despite the obvious component of "walking" in recognized movement. Errors of this type can be corrected by retraining the model based on the correct production logic in consultation with customer services.

2. The technology is suitable for use in the enterprise. Further training of the model can be done at the first stage of deployment of the monitoring system in the enterprise. This includes the introduction of new specialties, the step-by-step training sample for the model, as well as the coordination of the correct business production recognition logic with the enterprise units.

3. The current quality of recognition of low-level (elementary) movements is not sufficient to make the model widely available. This is due to the very short duration of the project and the insufficient training sample (the list of initial activities is wider and more diverse than the list of high-level activities). Nevertheless, the first approach showed that even with a small amount of data, in the process of implementation, with further refinement of the initial action model, it is possible to achieve an acceptable and business-critical quality of low-level activity recognition.

4. During the project, a closed space system was tested, which allows to optionally complement the labor monitoring system. Calculations have shown that a more detailed study of the technology is needed to the point where it will allow analysis of low-level classes and positioning.

In such projects, you should pay special attention to the cleanliness of the data, because they may contain various gaps, anomalies, waste, etc.

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In any case, such work requires further understanding and use. The larger the sample size, the data set, the variation in worker performance, the better the model is formed, and then:

- it will be possible to exclude waste at the initial analysis stage;
- it will be possible to find objects with controversial symbols at the stage of model development;
- at the stage of setting up the model monitoring in industrial operation, it will be possible to determine the moments of significant changes in the data compared to renination.

To evaluate the performance of the model, as well as to make a decision on further expansion of the pilot project in the enterprise, a comparison of the model data with the expert assessment of the employees on the video surveillance data was carried out.

Note that the human factor was taken into account during the project, for example, turning the clock "backwards". This point was taken into account when modeling data from wearable gadgets: the classification model accurately determines that 90% of employees are wearing a watch correctly. In the case of poorly worn wristbands, a linear transformation of the raw data allows the use of the same activity detection models.

During the experiments on the search for anomalies, the state of intoxication at the workplace was detected: anomalies appeared in the worker who was intoxicated during the time period related to the movement.

As a result of the data comparison, the following was determined:

1. The model includes rest time - a lunch break (does not apply to working hours), regulated breaks for rest and personal needs, loss of working time for organizational and technical reasons, as well as a number of activities with low physical activity (studying documents, inspection of equipment without moving, etc.).

2. Movement time in the model includes the entire movement time of the employee (from the workplace to the dining room, going around and checking the equipment, going to the locksmith's workshop, moving between the equipment during work, etc.).

The categories (breathing, moving, working) in some cases did not exactly correspond to the video, and sometimes these categories seemed to be displayed in a chaotic manner.

During the pilot project, employees of the Director of Construction Personnel Services conducted photographic surveillance of the workers participating in the pilot project. The results are presented in Table 2.

The results of the comparison of model data, standard photographic observation data and video viewing data by factory experts are presented in Table 2.

Table 2
Photographic tracking information

Indicator	August 20	August 21	Average
Work including:	67.2	88.5	77.9
Main	54.4	68.6	61.5
Assistant		- 4.6	4.6
Preparation and final time	6.0	4.5	5.3
Technical service to the workplace	6.8	10.8	8.8
Moving holiday	15,	1 3.4	9.3
Loss	14.5	8.0	11.3
Work including:	3.1	0.0	1.6

Table 3
Analysis of pilot project data (total), %

Indicator	**Standard Tracking Information (August 20)**	**System Information (09/28–09/30)**	**Video surveillance information (28.09–30.09)**
Work including:	77.9	40.5	66.1
Main	61.5	0.0	39.4
Assistant	4.6	0.0	19.1

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Preparation and final time	5.3	0.0	1.4
Technical service to the workplace	8.8	0.0	6.1
Moving holiday	9.3	20.8	9.9
Loss	11.3	37.6	10.0

Also, the company's specialists prepared a calculation of the economic efficiency of the introduction of an automated system for monitoring the work of repair service workers based on the analysis of data from the sensors of wearable devices (Table 4):

Table 4
Economic efficiency (an automated system of monitoring the work of workers of the benefit service on introduction

Name of indicators	Units	Variant indicators	
		main	new
Capital expenditure	thousand soums.		40.00
Operator's workplace (monitor + personal computer + card reader)			40.00
Server systems		-	-
Costs in the basic version:	thousand soums	8,513.08	
The number of workers servicing equipment in the workshop	person	11	
Workers of IHF + YaST Central Repair Workshop	thousand soums.	8 183.1	
Expenses for work clothes, personal protective equipment, milk	thousand soums.	330.0	
Costs in the new option:	thousand soums.		10,888.20
Number of workers servicing the equipment	person		10
Workers of IHF + YaST centralized repair shop	thousand soums		7 439.2
IHF + YaST (additional number of employees for project implementation – 3 people)	A thousand soums		2 849.04
The cost of research is one thousand soums.			
Samsung Galaxy Active ZM-P500 watch with contactless charger (2 pieces per worker)	thousand soums.		300.00
Work clothes, personal protective equipment, milk costs	thousand soums		300.00
Increase costs	thousand soums		-2 375.12

- data from wristbands worn by employees should be received in opera mode (with a delay of no more than 1 day), and employees should not be video-monitored, and employees should not wear video cameras (this situation was not observed during experimental work within the pilot project).

- it is necessary to introduce additional rates in the amount of 3 to 5 people in the information technology and automation department, as well as in the labor department. (to continuously monitor the project). If the project spreads to other professions, the need for an additional number will increase, because videography and time tracking, processing of the received data (marking, systematization, etc.) will be needed to train the model for new professions.

According to the results of research and proposals, it is planned to launch a monitoring system for the activities of workers in 2021. At the main site (including 700 people at the same time), the expected decrease in the number of 15-20% (150-200 people),

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annual personnel costs (FZP including insurance premiums) - 60-80 million soums.

The novelty of the project is not only the automation of the collection of information about the actions of employees through the use of wearable gadgets, but also the use of machine learning to monitor human activity.

IN CONCLUSION, IT SHOULD BE NOTED THAT, By digitizing housing constructions in Kashkadarya region, at least 15% efficiency was achieved by only analyzing actions and providing feedback to the employee. Performance evaluation was carried out according to the recognition guidelines, as the average value of one worker in 1 day. The accuracy was considered to be 50% in the opposite time interval.

The ability to identify ways to optimize construction processes through constant monitoring of the actions of colleagues, which can have a huge economic and organizational effect at the organization level, has been confirmed. For example, there may be options for optimization - changing the logistics processes of repair, optimizing (increasing or reducing) the number of people in the crew to increase labor productivity, and other factors of labor organization.

At the same time, any optimization should be methodologically justified in terms of opportunities for increasing labor efficiency, which is discussed in detail in the work.

LIST OF USED LITERATURE:

1. Decree of the President of the Republic of Uzbekistan dated February 7, 2017 No. PF-4947 "On the strategy of actions for the further development of the Republic of Uzbekistan". // lex.uz/.
2. R.I.Nurimbetov, B.R.Ibrohimov, S.N.Normurodov, Study of the state of housing fund management based on a sociological survey //Scientific electronic magazine "Economics and Innovative Technologies", 6/2022, November-December, (No. 00062),http://iqtisodiyot.tsue.uz/journal.
3. S.N. NormurodovThe system shows the highest efficiency and quality of communal-communal economy //International on-line scientific-practical conference on the topic "Innovation, integration, economy in the sphere of architecture and construction" May 5-6, 2021.
4. Decree of the President of the Republic of Uzbekistan dated March 31, 2017 No. PF-4996 "On the establishment of the State Committee on Investments of the Republic of Uzbekistan" // lex.uz/.
5. S.N. Normurodov., R.A. Rafikov, Digitization of housing construction in rural areas and improvement of management efficiency //World Economics & Finance Bulletin (WEFB), Available Online at:https://www.scholarexpress.net, Vol. 19, February 2023, ISSN: 2749-3628.
6. Sh.Yuldosheva, S.N.Normurodov, Improving the mechanisms of formation and development of housing and communal economy cluster //Agroeconomics scientific-practical agroeconomic journal 2022 special issue website www.ooqxssrtxm.uz andhttps://t.me/agroiqtisodiyot.
7. N.M. Rasulov, improving the efficiency of the development of enterprises on the basis of improving the economic mechanisms of corporate management (in the case of the materials of industrial enterprises of the Republic of Uzbekistan)-i.f.n...dissertation abstract.-T.:TDIU, 2010.
8. O. Mansurov, problems of improving corporate management in the conditions of market relations. i.f. doctor ... dis. autoref. - T.: TDIU, 2010.
9. V. Yodgarov, D. Butunov "Economy and management of housing and communal economy". Textbook. Tashkent. "Publisher" publishing house. 2012 year.
10. B. Kh. Rakhimov, S. T. Kasimova, A. S. Gritsenko. "Technology of construction and repair works". T., 2008.
11. R.I. Nurimbetov, S.N. Normurodov,Quality management of construction and assembly works //"Biznes-Daily Media" Exchange Economic newspaper is published on Tuesdays, Thursdays and Saturdays. #74 2549www.biznes-daily.uz.
12. N.F.Imomov "The right to housing". Textbook. Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan. Tashkent State Legal Institute. Tashkent: NMIU named after Cholpon. 2013.
13. M. Mirakhmedov, N. Bozorboev, F.N. Bozorboev. "Technology of repair and reconstruction of buildings and structures". T., 2008.