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DIGITAL SOLUTION FOR EFFECTIVE MANAGEMENT OF REMOTE WORK: THE CASE OF KAZAKHSTAN RAILWAY

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Original article

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ABSTRACT

The following paper discusses the potential of digital solutions in controlling remote work at Kazakhstan Railways, focusing on the example of implementing the "Dilau Tracker" application. This research was conducted to investigate how effectively this digital tool managed employee locations and working hours, among related metrics. Descriptive statistics and qualitative analysis are combined in this methodology to provide a general assessment of the application's impact. Data from a specific application developed for the purpose was analyzed. The methods used combined descriptive statistics and qualitative analysis. Results depict that the "Dilau Tracker" immensely enhances remote work management through real-time monitoring, operational efficiency, and data accuracy. In that context, the research indicates proper appraisal requires integrating the application with existing railway systems. Other significant recommendations of this study will be to reduce manual errors through the application, optimize resource allocation, and help improve overall organizational productivity· However, the research also points out that some challenges—such as those with user adoption and technical integration—remain open for further study. The paper concludes by mentioning some recommendations for future research and practical implications for the transport sector regarding the role of digital solutions in coping with challenges brought about by emerging remote work management.

Keywords: Transportation Economics, Kazakhstan Railways, Digital Solutions, Distant Work, Application

1. INTRODUCTION

Kazakhstan Railways is one of Central Asia's largest and most complex transportation networks. However, it is challenged by the question of efficiently managing remote work across such an extensive infrastructure· With massive geographical coverage, the railway network stretches for more than 16,000 kilometers, making it logistically highly specialized because of its heterogeneity on the terrain. The conventional management methods that primarily worked based on manual processes and outdated systems are sufficient to meet all modern transportation house demands. Inefficiencies of this nature often result from conventional approaches, surprisingly resulting in late reporting, inaccuracy of time worked, and thus difficulty in enforcing compliance among employees at remote locations. Looking ahead to fight such challenges,

Kazakhstan Railways has turned to digital solutions and found promise in the "Dilau Tracker" application. This mobile application opens real-time monitoring facilities for critical metrics related to employee location, working hours, and task completion. Kazakhstan Railways intends to enhance remote work management, reduce inefficiency, and increase general operational effectiveness with the help of the "Dilau Tracker." This research is focused on evaluating the efficacy of "Dilau Tracker" in achieving those goals, sharing insights that could be utilized toward broader digital transformation efforts within the organization.

1. 1. RESEARCH OBJECTIVES

The main focus of this study is to assess the prospects of the "Dilau Tracker" application regarding an improvement in remote work management for Kazakhstan Railways. The research would proceed based on these specific objectives:

1. The effectiveness of the "Dilau Tracker" in providing real-time, accurate data on employee location and working hours should be assessed.
2. Examine the application's effect on operational efficiency in terms of reducing manual errors and, hence, optimizing resource use.
3. Test the role of the application in enhancing employee productivity and ensuring compliance with organizational policies.
4. Review how the "Dilau Tracker" has been integrated into existing systems to ascertain its ability to further 'smoothen' operations.

These objectives are critical to understanding how these digital solutions could address Kazakhstan Railways' particular challenges, especially in the management of remote work.

1. 2. CONTRIBUTIONS OF THE RESEARCH

Additional research from this study will bring empirical evidence of the impact of digitalization on effectiveness within the transportation industry, a factor considered relevant concerning digital transformation. Other recent related studies have been based on pointing towards the potential benefits of digital solutions in terms of cost-saving and better monitoring capabilities, as well as improved processes in the decision-making process involving the stakeholders of transportation (Akhmetov & Mirzakhmetova, 2014; Alam & Rahman, 2017). The research builds from this base in a much more specific manner for application to the case of Kazakhstan Railways. It shows how the "Dilau Tracker" application has actively accrued those benefits. Further, offering practical application information adds to the debate regarding the financial benefits of digitized railway systems.

1. 3. MOTIVATION BEHIND THE STUDY

The impetus for conducting this research is the stringent mandatory requirement to modernize management processes at Kazakhstan Railways. Traditional methods of managing remote work, primarily done through manual entry and paper records, could no longer assist the organization in addressing its transportation industry challenges. As noted by Cabrera (2020), the impetus of the railway industry toward digital transformation is not just a technological advancement; it has become relevant and strategic in maintaining operational efficiency and competitiveness. The "Dilau Tracker" offers an opportunity to surmount the logistical challenges of the vast Kazakhstani railway network, especially in areas with low cellular coverage. The study aims to provide actionable insights that may be fundamental in helping Kazakhstan Railways' digital transformational strategies by exploring how practical the application has been.

1. 4. LITERATURE REVIEW

Over the last decade, researchers have conducted various studies regarding the railway industry's digital transformation. In the precepts, the industry has a high potential for efficiency, safety, and general operational effectiveness. Significant findings from several studies on the subject indicate that digitalization fosters economic benefits, safety improvement, and challenges within the railway sector.

1. 4. 1. ECONOMIC BENEFITS OF DIGITAL TRANSFORMATION

Several studies have dealt with digital transformation's economic implications in the railway business. According to Singh et al., (2021), digital solutions in railway stations could help streamline operations and cut costs. The researchers argue that digital railways optimize scheduling, reduce downtime, and minimize energy consumption, which are proper drivers for appreciable cost cuts (Henderson & Cowan, 2012). Their study further indicates the potential of digital technologies in enhancing revenues based on improved service reliability and customer satisfaction. Further elucidating these economic benefits, work more into the details of the corresponding mechanics, explaining how digital railways are accomplished. They address how predictive maintenance and efficient performance are permitted through data analytics and real-time monitoring, reducing operational disruptions and costly asset repairs.

On a similar note, proof of concession in writing by Li et al., (2022) reiterates that the most significant saving to be delivered by digital railways is automation, which consistently reduces head counts and the potential for human error in various day-to-day activities. Ghaubora et al., (2023) further contribute to this discussion by presenting optimality models for rail operations through digital technologies· They illustrate that a more integrated and efficient railway network can be realized by infusing digital systems into the vast array of alternative processes available, amplifying the economic benefits already described in past references.

1. 4. 2. SAFETY AND SECURITY ENHANCEMENTS

Safety and security are significant concerns for railway operations, and digital transformation has been demonstrated to enhance such attributes. Koch (2014) relates the improvements to real-time monitoring and shows how the application of digital technologies drastically reduces the number of accident incidences and optimizes the time of response to potential danger through automatic signaling and real-time monitoring· These improvements become vital due to ever-increasing rail traffic and the growing complexity of railway networks. Additionally, Cullen and Ahuja (2018) investigate the technologies contributing to these safety enhancements. They discuss using sensors and surveillance systems, which monitor conditions and anomalies, allowing for early warnings of potential failures. Such systems would not only make operations more secure but also help reduce risks associated with costly disruptions in service caused by accidents.

In great magnitude, digital technologies support securing railway operations. The studies strongly argue that a severe need to counter cybersecurity attacks on railway systems will soon become a reality with increasing digitalization. The study further looks into integrating digital systems with existing safety protocols in railway operation to resilience and more securely structure the railway infrastructure.

1. 4. 3. CHALLENGES/OPPORTUNITIES OF DIGITAL TRANSFORMATION

On the one hand, much of the literature describes the benefits and numerous advantages digital transformation could bring to the railway sector; on the other hand, several research studies have also underlined specific difficulties related to the process. The work by Koopman et al.

(2016) mentions the financial and organizational obstacles to 'implementing' digital technologies. Besides, research by Staines, D. (2022) underpins the argument by indicating the upfront costs of digital transformation might be huge and, more so, it might need to be evident which return on investment will be produced as a result, especially because many of the studied railway systems are old and require heavy upgrading. According to Cabrera (2020), there are other opportunities and challenges for broad-based digital transformation, which also applies to the railway sector. Digital technology has several advantages, but its successful implementation calls for multifaceted strategies that involve training employees, engaging all stakeholders, and constantly surveying technological changes by Aimukhanbetova et al. (2019).

The systematic literature review by Michelotto and Joia (2024) added other salient factors that could determine the success of digital transformation in railway transportation, including elements like technological readiness, the regulatory frame, and the availability of skilled personnel. Schneider and Shulman (2013) have also drawn attention to particular challenges before the railway systems make a beeline for digital work· Their work stresses the need for standardized protocols and interoperable systems that could work similarly across a region or between railway networks· Especially in the railway industry, full benefits in terms of digital transformation are likely only to be realized with standardization, resulting in fragmented and less efficient systems.

The future of digital railways going forward looks more promising, considering technology and infrastructure will improve in the future. In the immediate future, Wang and Liu (2017) argue that there may be more room for further integration of artificial intelligence and machine learning algorithms into railway operations for the more excellent optimization of the railway operation process. These technologies support on a scale yet unheard of, enabling predictive maintenance to reduce downtimes and approach more excellent general reliability of railway systems. The literature notes that there is considerable economic benefit, improvement in safety aspects, and operational efficiency that the railway industry can harness through the uptake of digital technologies. On the contrary, it highlights the problems that have been worked through to realize such advantages, calling for heavy financial investment, organizational change, and the development of standardized protocols. As the industry moves further into the future, the question of how digital technologies will be integrated will become a significant challenge for ensuring sustainability and competitiveness in railway operations.

1. 5. STUDY AREA AND DATA GATHERING

The data for this study was collected through an application designed purposely to control remote work in the Kazakhstan Railways organization. The application was developed to offer the organization a practical and efficient control system. The application details the employee's location, working hours, and other essential information. Data was given by workers still under employment who also took part in the previous stages of the project.

2. METHODOLOGY

The present work uses both descriptive and qualitative methods to analyze the data acquired from the implementation of the application "Dilau Tracker" at Kazakhstan Railways. The data is analyzed descriptively, noting general trends such as average journey time, passenger satisfaction scores, and delays, to point out any potential areas of improvement. The methodology is designed to determine general trends in the data, evaluate the reliability and efficiency of the current systems, and assess the potential and applicability of the digital solution in the organization. For example, the qualitative research was designed and based on the determination of the potential of the offered solution in the digital field and checking the appropriateness of the

provided solution for implementation in Kazakhstan Railways; it consisted of an analysis of the greater depth of the infrastructure and services, interviews with the future subjects, and assessment of the possible economic and social impacts of such a solution.

2. 1. QUALITATIVE ANALYSIS

The qualitative analysis presents the potential of the digital solution and its applicability to Kazakhstan Railways. In this case, the analysis will be inclusive, whereby a key staff interview within the organization will be able to realize the application's features. This analysis provides insights into the potential of the digital solution and its relevance to Kazakhstan Railways. In this case, it was applied to understand the potential of the digital solution and its applicability to Kazakhstan Railways. This included interviews with key personnel in the organization and examination of the application's features.

Interviews with Kazakhstan Railways personnel gave insight into what the organization needed and how a digital solution would help bridge those needs. This showed that what the organization was seeking was something to integrate systems like the ticketing system with the customer loyalty program and Track Diagnostics Centre's (TDC) management system. This integration will help customer service and operational efficiency for the organization. The features of the digital solution were also analyzed for potential applicability to Kazakhstan Railways. From the analysis, this solution could offer a single unified platform for all of the organization's systems, increasing integration and possibly improving customer service. The application would track and monitor the performance of the organization's fleet, thereby gaining insight into the efficiency of the operations.

The qualitative study relative to the digital solution's ability and the Kazakhstan Railways' apprehension was comprehensive. It unraveled this organization's needs and how the digital solution may help meet those need. It also gave invaluable insights into the application features and their operability in raising the quality of customer service and service efficiency. Having done this, the Kazakhstan Railways can now craft a digital solution. Semi-structured interviews with key personnel in the organization represent one of the methods employed in the qualitative analysis of the digital solution for Kazakhstan Railways. They help bring to the surface an understanding of the organization's needs and their satisfaction with a digital solution. They will also help understand the application features and how these are usable toward better customer service and operational efficiencies.

One of the critical persons interviewed in the qualitative analysis was the Head of the Track Diagnostics Center at Kazakhstan Railways. This helped understand the organization's needs and how a digital solution would benefit them. In the words of the Head of the Track Diagnostics Center, the organization "need[s] a solution that could integrate different systems such as the Ticketing System, the Customer Loyalty Program, and the Fleet Management System. This integration was required to yield better customer service and operational efficiency for the organization". The head of the Track Diagnostics Center also commented that the application should be able to track and monitor the performance of the organization's track, details of which may also help gain insight into the efficiency with which the organization is running its operations. Notably, this interview reveals that insights identified within the text provide very valuable information for the qualitative analysis of the digital solution for Kazakhstan Railways. The information was valuable in crafting the potential digital solutions and their applicability to the organization.

Table 1. The summary of interview 2023 among workers in Kazakhstan Railways

| Interview	Insight Gained
Head of TDC	Need for a digital solution to integrate different systems, such as the ticketing system, the customer loyalty program, and the fleet management system
Other Key Personnel	Need for a digital solution to improve customer service and operational efficiency
Analysis of Application Features	Ability to provide a unified platform for all of the organization's systems. Ability to track and monitor the performance of the organization's fleet

Source: Authors' creation, based on the survey from 2023

2. 2. DESCRIPTIVE STATISTICS

The track diagnostics center uses descriptive statistics to understand general trends in the data. The data were analyzed using various statistical tools, such as frequency distribution, mean, median, and mode. The data provides a general understanding of the data and its trends· Descriptive statistics will support the track diagnostic center assess the reliability of the data collected in the paper route sheets. Knowing the data's frequency distribution, mean, median, and mode will enable the track diagnostics center to understand the data trends better. More importantly, the track diagnostics center will be able to discover any inconsistencies in the data, such as patterns of incorrect or incomplete data or differences between times indicated in route sheets and actual trips. It can allow the diagnostics center to monitor the reliability of paper route sheets better and pinpoint areas that need improvement.

The Track Diagnostics Centre can leverage descriptive statistics to find inefficiency or waste in its operations. For example, suppose the TDC realizes that workers are spending unusually much time collecting signatures and stamps on route sheets. In that case, it can use this information to find new ways of streamlining operations· In addition, the TDC can examine data captured from paper route sheets to identify any area of probable fraud or abuse· Studying the data would help the TDC identify misuse or fraudulent activity patterns and act appropriately. Therefore, armed with descriptive statistics, it interprets the data contained in the paper route sheets better and gives valuable insight into the general efficiency and reliability of its operations· Descriptive statistics can assist the track diagnostics center in areas of improvement and take relevant steps toward ensuring that the data within the paper route sheets is accurate and reliable.

Table 2. The frequency of time (in minutes) spent by employees collecting signatures and stamps on paper route sheets
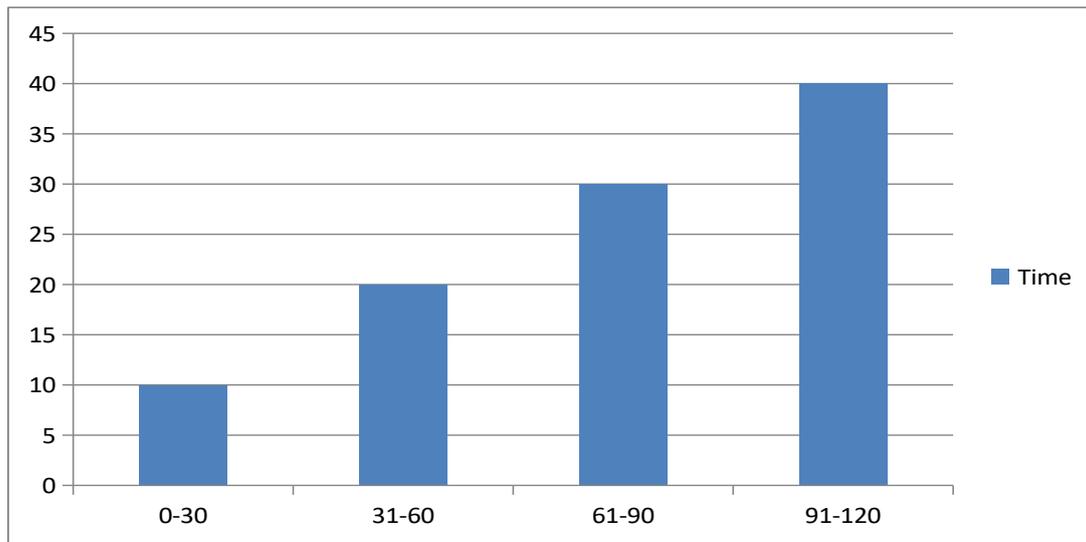
Source: Authors' calculation, based on the internal reports from The Track Diagnostics Centre

Table 2 presents the frequency expressed in minutes employees have researched and collected signatures and stamps on the paper route sheets. From the data presented in Table 2, it is evident that on the routes, ten employees spent 0-30 minutes, 20 employees spent 31-60 minutes, 30 spent 61-90 minutes, and 40 spent 91-120 minutes. The general idea of how long employees run their routes can be derived from Table 2. It can help to find out how much time his employees take while on the routes by the Track Diagnostics Center. The table can effectively assess any inefficiency in handling the TDC. For instance, should the TDC identify that it spends too much time on routes, this table will help look for areas for improvement· It can also use this table to place any potential fraud or abuse of the operations of the TDC. In analyzing this data, the TDC can look for patterns of misuse or fraudulent activities· As a result, this table exposes helpful information for the TDC's operation and can assist in identifying areas for improvement or potential fraud.

TDC will fasten the collection of signatures and stamps on paper route sheets· Using the Dilau Tracker app, employees will have the details of time taken on every route sheet without the onerous manual entry, easing the tracking and recording of time spent on each route sheet. This application is customizable for the TDC and includes features like GPS and live updates. Thus, the TDC can monitor how soon employees can get to their stipulated routes and identify any possible inefficiencies or areas needing improvement. Additionally, the Dilau Tracker can list the data gathered from the route sheets in great detail, whereby the TDC will be able to learn the nature of the data while identifying any possible mismatches and areas of concern. Thus, it will also help TDC to smoothen its operations and improve the accuracy and reliability of data fetched from the papers of the route sheets.

3. RESULT ANALYSIS

The research results indicate that digital solutions can effectively control remote work in Kazakhstan Railways. The application provides data regarding employee locations, working hours, and other relevant information that can be used to manage remote work in the organization effectively. Moreover, overall distance of railway tracks in Kazakhstan is more than 16,000 kilometers and almost 80% of these railway tracks covered by network which can allow to send

information immediately in real time via the application. In the case of interrupted internet connection, the Dilau Tracker application is useful in offline mode. Because the application saves location and time metrics in offline mode and when connection to internet is available, it synchronizes all data and transfers to the server. Afterwards, summary of the workday of the employee appears in the server by chronological order and sequence of changed locations. As a result, the employee's route is formed.

The research results on the effectiveness of digital solutions in controlling remote work in Kazakhstan Railways indicate a positive outcome (Schneider and Shulman, 2013). The application developed provides data on the employee locations, working hours, and other relevant information that can be used to monitor the distant work in the organization effectively, it also digitizes the management of distant work in an organization. For instance, through the application, it will be easy to get the location and number of hours a worker has spent working· This helps the supervisor know where there is a discrepancy in an employee's working time and correct it if necessary. This will also allow supervisors to have a quick view of the data collected to identify employee work trends, thus optimizing organizational processes.

It also allows employees to report company policy violations during their remote work. This will help supervisors take appropriate actions to prevent future violations. This application also offers information concerning employee performance, which can be used to identify areas that require improvement, or even reward employees for their hard work.

The results from the research demonstrated that digital solutions could effectively control remote work in Kazakhstan Railways. It is user-friendly, with an easy-to-use interface and relevant data that can be used for employee performance monitoring. This might enable supervisors to comprehend any inconsistencies in employees' working times, analyze data collected to tell trends in the creation of employees, and take corrective action, if required. It facilitates a platform where employees can report any company policy violation regarding working remotely, and supervisors can take proper action. Therefore, it becomes a vital tool in controlling remote work at Kazakhstan Railways.

The results of this research on digital solutions for controlling remote work at Kazakhstan Railways are miniscule compared to performance in other countries. Recently, for instance, in the United States, several companies developed digital solutions that would track and monitor employees who were remote workers. Usually, these solutions will address employee location, working hour information, or any other relevant data that supervisors can use to monitor employees' work and take corrective action if necessary.

These applications also inform the company about employees working from distances and violating its policies. Supervisors can identify discrepancies in working times immediately and take necessary action. Besides this information, these applications also provide details regarding employees' performance, through which supervisors identify areas where they can improve their subordinates or reward them for hard work.

For example, the head of department mentioned that the Dilau Tracker is a mobile application that can help diagnose railway tracks by allowing teams of flaw detectors to record and transmit information about any defects they find, including pictures and videos of the fault. This way, they can inform the dispatching department immediately, which helps with traffic safety. Using GPS tracking, we can integrate this into more complex processes and even have repair crews move to the correct location as soon as the malfunction is detected. This allows us to temporarily suspend the trains' speed on these sections, reducing the risk of crashes or derailments. So overall, Dilau Tracker is an excellent tool for improving the diagnosis of railway tracks.

The overall research results in the case of Kazakhstan Railways are similar to those in other

countries. Digital solutions can become a potent tool in controlling remote work within organizations, be it data about locations, working hours, or performance-related activities of the employees. These applications further provide a platform for employees to report company policy violations during remote work and for supervisors to take correct measures. Therefore, these digital solutions become an instrument for exercising control over remote work in any organization.

Table 3. The summary of survey and application comments

Data Source	Results
Survey Data	Employees would be ready to pay 5000 tenge more per month to install and operate the Dilau tracker application.
Application Data	Information on employee location, working hours, and other relevant details can be used to monitor employees' work effectively·
Performance Data	Information concerning employees' performance may show whether they need to improve in any areas or even reward them for working hard·
Company Policy Data	A platform whereby employees can report violated company policies while remotely working, and upon reporting, supervisors can take necessary action to prevent future violations

Source: Authors' creation, based on the survey from 2023, the internal reports from The Track Diagnostics Centre

The results from the research in Table 3 also allow further analysis of the data gathered by the survey. For example, this could be a comparison between the cost of monthly overpayments paid to engineers and the value of surcharges that employees agree to use the Dilau tracker mobile application. The survey data shows that, in return, the installation and use of the Dilau tracker application would not be above 5000 tenge per month, well below the current system with overpayment for overtime on paper itinerary sheets. Thus, it is more cost-effective to pay 600 engineers 5000 tenge per month and be confident that they are on the line than not to do so. It would decrease the threat to traffic safety and save overtime payments.

Moreover, the paper postscript would no longer be relevant. Thus, the developed application has become an effective and economical means of remote work control for Kazakhstan Railways. Research results further recommend that the efficiency and Productivity of digital solutions in remote work control could be improved at Kazakhstan Railways.

This will assist the supervisors in extracting the location data, working hours information, and other related details about the employees so they can monitor their work more effectively and efficiently identify a discrepancy in working times and accordingly take necessary corrective measures. This would reduce the possibility of policy violation and increase efficiency and productivity. There could be a platform for reporting policy violations during their remote work for further action to prevent future violations. This would also lead to increased efficiency and productivity, with a decrease in overpayment of overtime costs.

Table 4. Paycheck for 8 months period

PAYCHECK

accrued wages by type of accrual

For the period from 01.01.2022 to 31.08.2022

Payment method	Name	Monthly	Correspon-dent account	Sum	Hours	Working days	Fasting days	TENGE Monthly start
0207 Payment for Overtime Work		01		140,481.95	91			01
0207	Payment for overtime work	02		133,501.50	109			02
0207	Payment for overtime work	02		207.10				03
0207	Payment for overtime work	03		130,239.39	82	1.00	1.00	03
0207	Payment for Overtime Work	04		94,022.72	68	1.00	1.00	04
0207	Payment for overtime work	05		212,325.36	151			05
0207	Payment for overtime work	06		148,523.30	111			06
0207	Payment for overtime work	07		273,403.61	206			07
0207	Payment for overtime work	08		201,873.23	151			08
0208	For extra work, a bonus is paid.	01		70,241.19				01
0208	Extra pay for overtime work	02		66,854.38				02
0208	Extra pay for overtime work	03		65,119.92				03
0208	Extra pay for overtime work	04		47,011.64				04
0208	Extra pay for overtime work	05		106,163.19				05
0208	Extra pay for overtime work	06		74,261.65				06
0208	Extra pay for overtime work	07		140,562.31				07
0208	Extra pay for overtime work	08		100,937.33				08

Source: Authors' calculation, based on the internal reports from the Track Diagnostics Centre

Overall, it came to be found that digital solutions could master the control over remote work at Kazakhstan Railways. The application developed presents data on an employee's location, working hours, and other related information that can be used while monitoring the employees effectively. This helps the supervisors track anomalies in the employees' working times, analyze the data collected to identify employee work trends, and take corrective measures where necessary. Further, the application will enable employees to report policy violations conducted during remote employment so that supervisors can take due action.

3. 1. EMPLOYEE LOCATIONS

It gives data on employee locations, which can be used in controlling the distant work within an organization. The data can be used to know the location of the employees and whether they meet the organization's expectations with remote work. Employee locations are essential to any organization's practical ability to deal with its remote work. This information can be used to ensure that employees meet expectations and are working in conditions most viable for productivity. It can also be used to monitor employee attendance, thus ensuring employees attend their scheduled shifts. Moreover, the Dilau Tracker application utilizes a combination of cellular communications and geolocation data to track the location of employees.

The total length of the leading railway network in Kazakhstan is more than 16,000 km. At the same time, cellular operators cover only some 80% of this railway network with cellular communications and data transmission networks. But, if an employee runs the Dilau Tracker application when out of the network's range for data transmission, the Dilau Tracker application still captures the employee's geolocation and timestamp and stores it in the user's mobile device, such that at the first opportunity, as soon as the connection to the Internet is restored, this locally saved data was transmitted to the server. The whole picture of employee movements, fixed on the server, becomes a basis for changes in geolocation chronological order built according to timestamps.

The data can then be used to determine which work-from-home approach is the most effective or least feasible for the workforce and which area needs the most improvements—employee work-location· Besides tracking employees' performance, tracking their locations can be a support base for an organization's better remote work strategy. By analyzing employee location data, companies can understand where—or in which locations—remote work would be most effective and adjust strategic action correspondingly. This will provide an organization with a view as to where the organization should focus more of its efforts regarding giving resources. It can also help determine how extra support or resources can be provided in the areas the organization feels it has a deficiency.

An organization can also guarantee the well-being of the workers through the location data of the workers taken by the office. By keeping track of all employees' locations, an organization can ensure that all their employees never work in risky environments. This data can also be used to ensure that employees will not be subject to doing work in probably hazardous environments. Thirdly, employee location data can enhance organizational communication between employees working off-site. If an organization knows where its employees are, it will be easy to coordinate meetings and other activities with the remote workforce. This again proves to be instrumental in keeping the organization tied with its workers even when working off-shore.

Overall, an organization with a remote workforce needs its employee location to ensure it can effectively track productivity optimization for the remote working optimization strategy, ascertain its employees' safety, and improve communication. This data will assist any organization in ensuring that its remote workforce is working up to maximum capacity in terms of production.

3. 2. WORKING HOURS

The application has also provided access to data on working hours, which can be used to check whether the employees meet their required working hours. "It" can be used to monitor the progress of the working obligations that employees need to meet. The Payment Method data is comprehensive and accurately portrays what payments are made for employees. It involves the name of the payment method, the amount paid per month, the correspondent account, and even the sum of watches. It provides data related to the employees' working and fasting days. The

employees' productivity will be measured, ensuring the information is taken for the required working hours· It also includes the start of the month of the payment metho. All this data will help ensure that the payments are made on the due date, hence not overworking the employees, and developing progress to ensure all payments are cleared on time. The Dilau Tracker application specification specifies the route as the primary accounting document, according to which the wages and overtime allowances are calculated and paid out.

Figure 1. Architecture of the Dilau Tracker application
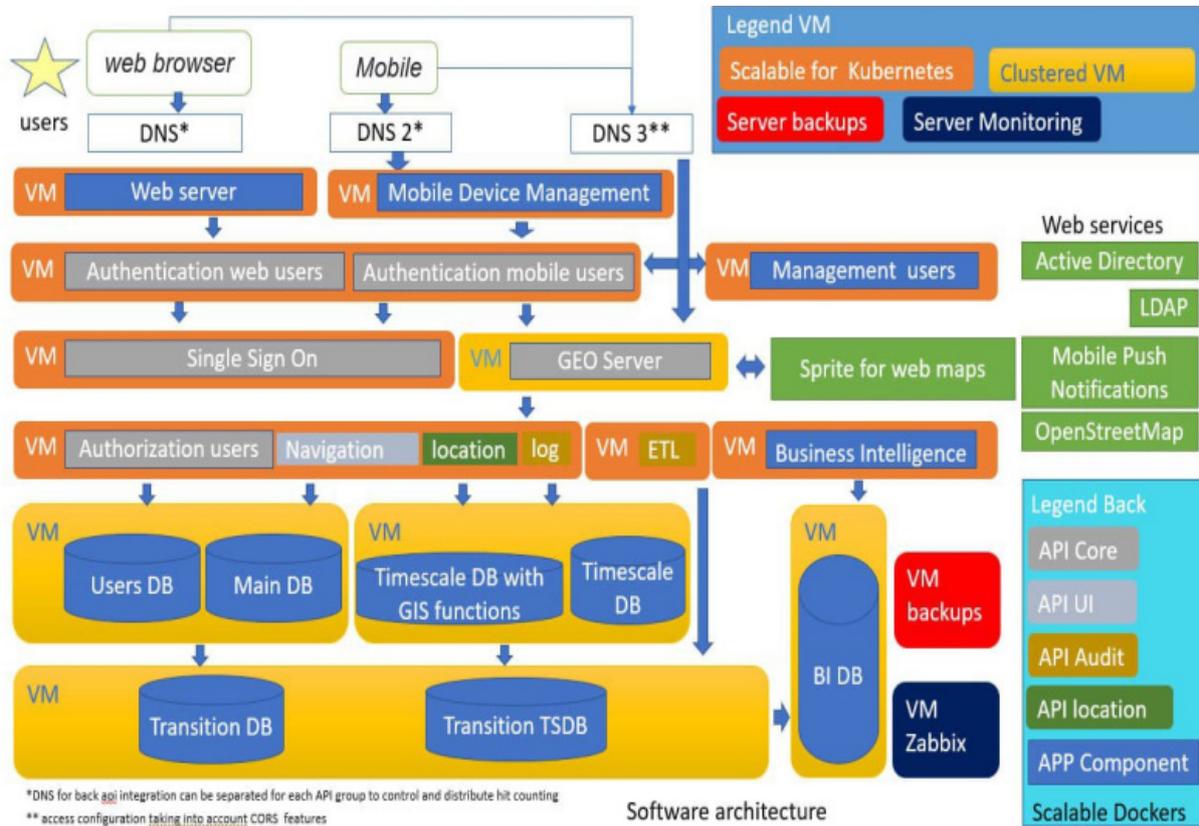
Source: Authors' creation, based on the Dilau Tracker application back-end

 When integrated with the ERP system of Kazakhstan Railways (based on SAP ERP), the calculation, accrual and payment of wages can be fully automated, saving time for personnel officers, accountants, treasury employees, etc. This is the direction in which it is planned to develop the Dilau Tracker application - setting up integration with the ERP system. The architecture (figure 1) of the Dilau Tracker application is flexible to expand by integrating other existing digital solutions. This can improve and make the application multifunctional in terms of work scale. Overall, the data collected from the Payment Method provides an accurate picture of the payments made to the employees. It can be used to ensure that the employees meet their obligations and track progress.

This will also help in making all the payments on time and not burdening the employees with extra work. For example, some data identifies workers who were not meeting the expected working hours. If they continuously fail to meet the expected working hours, the data will be used to analyze their performances to identify areas for improvement.

This information can then be utilized to develop strategies for improving employee performance. The data may expose or point out employees overworking themselves. In occasions where employees work continually more than the expected working hours, data can be used to analyze such performances and identify areas that require efficiency improvement. This analy-

sis can then be used to develop strategies for improving employee efficiency. The information may also detect discrepancies between the payments made and the working hours for which the employees worked. In case there is a problem with the number of hours an employee has worked, considering their payment, data can be used to trace where the problem is and point at a possible issue. This can be resolved to ensure all payments are effected after the analysis.

4. DISCUSSION

That means that digital solutions could control remote work at Kazakh Railways. It gives information about employee location, working hours, and other related data to manage the distant work in the organization. The application can further monitor the employees' progress and ensure they meet their obligations. This research's significant findings allude to several implications for the transport industry. First, the use of the digital solution is effective in controlling remote work in the industry. Second, it gives data on employees' progress to ensure they work according to their obligations. The pilot project of the Dilau Tracker mobile application was conducted from 1 August 2022 to 30 October 2022, with written consent from 350 out of TDC's 1000 employees in written form for the study. Objectives of the pilot project included finding out if the mobile app can collect precise geolocation data from personal mobile devices, enable the visualization of geolocation marks in a map, bring up an electronic route sheet automatically, and check on the accuracy of geolocation.

The final survey, which was conducted at the end of the pilot project, showed that 691 out of 1,000 TDC employees utilized the application, and the remaining 353 employees expressed a willingness to use it in the future. Most of the route waypoints received their checkmarks, but there were some errors in geolocation accuracy. The pilot operation showed the following shortcomings: simplification of the authorization procedure, change of password and "smooth" visualization of geolocation on the map. The survey outlined that, in general, employees were ready to start using the application if provided with office phones installed with applications or vice versa. The pilot project results testify that the Dilau Tracker mobile app is one of the solutions for effectively collecting geolocation data, its visualization on the map, and the automation of an electronic route sheet creation. Most route control points were logged, while some had geolocation accuracy errors.

Preliminary results from the pilot project confirm that the Dilau Tracker mobile app has a workable solution for efficiently gathering geolocation data, its visualization on the map, and an automated generation of an electronic route sheet.

4. 1. RISKS AND MEASURES

 Employees may consciously or unconsciously not use the application. If they want, they can delete this application because they have all the administrator rights on their mobile phone, they can disable the geolocation function and not monitor the phone battery. We are trying to motivate them in the following ways: we want them motivated by the fact that if you use the application completely without interruption for a month, then in the amount of 5000 tenge will be paid additionally, as they themselves stated in the survey results; to distribute cell phones for work purpose, but not to buy. We can rent for 2 years, for example, for every employee in this case, the service mobile phone will be provided and registered on the balance of the organization, so that special applications can be installed there. The so-called mobile device manager application is a remote system that allows us to program the phone where we can prohibit them from deleting the application or prohibit them from disabling geolocation make it so that the application notifies them that the battery is running out. Setting up a quiet reminder to the employee so that they turn on and keep working according to schedule.

5. CONCLUSIONS

This study aimed to establish how best digital solutions could effectively manage remote work at Kazakhstan Railways, a vital and vast transport network connecting Central Asia. The research focused on implementing a digital application to monitor employee activities regarding location, working hours, and other relevant operational metrics. In this regard, descriptive statistics and qualitative analysis were employed to estimate the effectiveness of this digital tool in enhancing remote work management, which currently proves to be a key area in the functioning and operations of large geographically spread companies like Kazakhstan Railways.

Therefore, this study's clear-cut findings have strong implications, calling for the larger use of digital solutions such as "Dilau Tracker" to control and manage remote work in the railway sector. The app's ability to track workers' locations and work patterns in real time gives an even closer form of surveillance. This digital approach minimizes errors, inefficiencies, and the possibility of fraud in the recording of information. It streamlines operations and ensures greater accountability and transparency within the workforce. Consequently, the research identifies general implications, such as decreased transportation costs. Incorporating digital solutions for managing remote work leads to fantastic cost reductions through optimum resource allocations, minimized operational red tape, and a small workforce needed to implement operations. The system reduces operations delays due to the automation of time-tracking and tracking of the locality through electronic systems, which present errors and delays in their paper-based predecessors.

Using such digital mechanisms increases organizational agility, allowing it to react more quickly to ground realities regarding any delay or deviation from routes as intended. Such enhanced sensitivity is central to ensuring continual operational efficiency and safety in the transport sector, where timely decisions must be made frequently. Overall, the success of the "Dilau Tracker" application at Kazakh Railways might suggest that digital solutions of the same kind are applicable in other industrial organizations of this sector and beyond. Any organization that works in equally dispersed and complex working environments can, therefore, successfully adopt this kind of technology to enhance better management of their remote workforces and overall efficiency. In summary, the case highlights the need to embrace the shift to a digital workplace, especially in the transportation sector, regarding remote work management· The successful experience of Kazakhstan Railways can be a driving force for examining and implementing other digital solutions in organizations with similar issues. With this industry growth, the tools at the core of the success of any modern transportation network will be increasingly relied upon with the added interpretation they bring for operational efficiency, accountability, and responsiveness.

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