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Contents

Preface

Dear readers and contributors,

It is our pleasure to present to you the 27th issue of our esteemed scientific journal. This collection contains six professionally produced research papers, mostly contributed by our distinguished domestic scientists. Covering a broad spectrum within the natural sciences and humanities, these papers truly embody the interdisciplinary essence of our publication.

In this issue, we explore various topis topics such as optimizing human resources management through innovative information systems and artificial intelligence, online promotion strategies in the tourism industry, and comparing project management methodologies and their optimal application according to specific needs. We also provide economic analyses that shed light on the importance and role of fixed and working capital in the development of society, while psychological and pedagogical perspectives explore the adaptation of a child to preschool and the possibilities of applying the Berlin model in the Republic of Srpska. Lastly, we discuss the importance of optimizing the pharmaceutical waste management process and its impacts on the environment and health.

The first paper delves into the application of information systems and artificial intelligence in human resource management, focusing on monitoring and recording job satisfaction in Republika Srpska. It explores how business intelligence and modern technologies can enhance employee performance and organizational success.

In the face of intense online competition, the scond paper analyzes the crucial role of online marketing in the hotel industry. It examines service-centric marketing strategies and highlights the significance of a strong online presence to attract guests and achieve success in the digital age.

The third paper compares and contrasts two popular project management methodologies – Waterfall and Scrum. It evaluates their strengths and weaknesses, providing guidelines for selecting the most suitable approach based on specific project requirements

Analysis of Fixed and Current Assets in Economic Development examines the management of fixed and current assets for business effectiveness. It emphasizes the importance of optimal asset allocation and its impact on capacity utilization, efficiency, and overall financial health of an organization.

The fifth paper paper introduces the Berlin model for child adaptation to preschool and assesses its potential application in Republika Srpska. It calls for integrating an adaptive period into the Work Program of preschool institutions to ensure smooth transitions and positive early childhood experiences.

The last but by no means least important paper in this issue is "Optimizing Pharmaceutical Waste Management". Recognizing the increasing environmental concerns associated with pharmaceutical waste, this paper analyzes effective management strategies. It provides valuable insights into the social and environmental consequences of improper waste disposal and recommends technological solutions and collaborative efforts for improvement.

Looking ahead, our aspirations include raising the reputation of the journal and striving for categorization in the highest rank, in accordance with the criteria of the Ministry of Science and Technology Development and Higher Education of the Republic of Srpska. Additionally, we aim to achieve international indexation in renowned databases.

We warmly invite scientists, researchers, and academics to join us in advancing knowledge and significantly contributing to academic discourse. Your cooperation is integral to our unwavering commitment to persevere in our mission.

Sincerely,
Editorial Office

Original scientific paper
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MONITORING AND RECORDING OF JOB SATISFACTION WITH THE SUPPORT OF INFORMATION SYSTEMS AND APPLICATION OF ARTIFICIAL INTELLIGENCE IN EMPLOYEE MANAGEMENT

Helena Lajšić[1]

Abstract: *Human resource management in every business system is different from the previous one. It involves managing the organization's human resources coherently and efficiently to ensure maximum value and help achieve strategic goals. The increasing demands of human resources, government regulations, and microcomputers have led to the need and sustainability of information systems in human resources departments. Although LJR management was a little late in applying information technologies compared to other areas of management, in the late 80s, there was a wider application of various programs. Interesting findings can be obtained by researching and reviewing how human resources are managed in organizations in Republika Srpska. Business intelligence is a multidisciplinary field that includes managerial methods and techniques for collecting, sorting, transforming, structuring, and placing data in Data Warehouses and data marts. It helps to analyze data effectively and efficiently, generate online active reports, and implement advanced analytical techniques. Business intelligence improves the IT infrastructure of organizations and benefits the organization's business environment by integrating all organizational units into a common system, making the organization's IT structure more logical and easier to manage. Business intelligence is used in various business processes, such as human resources, sales and marketing, and financial services. The advantages of business intelligence include having a competitive advantage, better services, and a unique view of business. Successful human resource management (HRM) and performance are achieved by managing the organization's information resources, such as data, information, and knowledge. Modern technologies, which are being improved every day, provide new areas that need to be explored and examined, such as artificial intelligence. Employee attitudes and job satisfaction are crucial in all organizations. A satisfied employee will be more productive, which has a positive effect on the organization. Studies show that employee satisfaction is a key factor*

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in motivation and achievement, along with the employee's positive attitude towards the workplace. Work performance is the degree to which the work behavior of employees contributes to the achievement of organizational goals. Dissatisfaction at work can lead to various forms of behavior, primarily deviant behaviors of employees. A special challenge is to examine the state and possibilities of human resources development in profit and non-profit institutions in the Republic of Srpska. This scientific work aims to acquire missing information about managing certain human resources processes, such as monitoring and recording job satisfaction in the for-profit and non-profit sectors, viewed in the context of information systems.

Keywords: Information systems, artificial intelligence, business intelligence, human resource management systems, HRIS, human resource management, job satisfaction

1. INTRODUCTION, METHODOLOGY, HYPOTHESES AND OBJECTIVES OF THE RESEARCH

The scientific paper focuses on the implementation of modern information technologies and systems in business processes and human resource management. The research goal is to gather information about the use of modern information technologies and systems in monitoring and recording job satisfaction, as well as in managing human resources in organizations across several cities in the Republic of Srpska.

The research questions and checklist aim to address the problems in the empirical part of the study. The primary motive behind this research is to fill the gap of missing information about the content and application of modern information technologies in organizations and whether such technologies support business processes like job satisfaction monitoring and recording.

The following research questions and problems have been identified:

Q1: Does the organization possess and utilize information systems to aid business processes?

Q2: Does the organization possess and utilize information systems to assist in human resource management?

Q3: Are any of the information system modules or the business intelligence system used to support the process of monitoring and recording job satisfaction as a component of human resource management?

Furthermore, the following research hypotheses were formulated:

H1: In the organizations sampled for convenience, the use of information systems to support the human resources management process is not widespread enough.

H2: In the organizations sampled for convenience, the use of information systems (specifically business intelligence systems) for monitoring and recording job satisfaction is not widespread enough.

2. JOB SATISFACTION AND IMPACT ON WORK PERFORMANCE

Recognizing human resources as the most crucial asset of organizations leads to an increase and sustainability of competitive advantage. However, the precondition for this is the transformation of the business function of human resources management. Human resource management is a rapidly developing business function that is constantly changing its position and influence within organizations. The primary challenge facing modern human resource management is the process of transformation, assuming and maintaining the role of a strategic part of the organization.

Several findings indicate that employee satisfaction is a crucial factor in employee motivation and achievement and that it has the most significant impact on employees' positive attitude towards the workplace. Job satisfaction is a complex attitude that includes certain assumptions and beliefs about the job as a cognitive component, feelings towards the job as an affective component, and job evaluation as an evaluative component. Attitudes about work and job satisfaction are essential segments in all organizations. A satisfied employee will be more productive, which will have a positive effect on the organization. Each person can have numerous attitudes, but organizational behavior focuses our attention on a limited number of attitudes related to work. Attitudes about work are used as positive or negative evaluations of employees about some aspects of their work environment. The following types of job attitudes will be considered: job satisfaction, job involvement, commitment to the organization, perceived support from the organization, and employee engagement. (Robbins, S.P., Judge, T.A., 2010)

1) Job satisfaction: Job satisfaction represents a positive attitude about one's own job that results from an assessment of job characteristics. A person with a high degree of satisfaction has positive feelings about his job, and likewise a person who is dissatisfied with his job has negative feelings about his job.
2) Involvement in work: Involvement in work measures the degree to which a person identifies with his work, actively participates in it and considers work performance important for self-evaluation. Related to the term psychological empowerment - it refers to

employees' beliefs about the degree of influence they have on their work environment, competence, meaningfulness of work and perceived independence in work. Employees with a high degree of work involvement strongly identify with the work they do and care deeply about it.

3) Commitment to the organization: Commitment to the organization is a state in which an employee identifies with a certain organization and its goals, therefore wants to remain a member of that organization. A high degree of commitment to the organization means identifying with the organization in which the person is employed.

4) Perceived support from the organization: Perceived support from the organization is the degree to which employees believe that the organization values their contribution and cares about their well-being and well-being.

5) Employee engagement: Employee engagement is defined as a person's involvement in the work they do and their satisfaction and enthusiasm for that work. It is very important that the employee works hard in everything he does for his organization, and also that the organization knows how to appreciate it and thus motivate him additionally. All these attitudes are closely related. If people are strongly involved in their work, we can say that they love their work, that is, they are satisfied with their work. Also, if employees have high support from the organization, they will be committed to the organization.

Job satisfaction is closely related to the ability to satisfy the needs of employees and can refer to the following factors: co-workers, job content, superiors, salary, working conditions, working hours, promotion, education, recognition, status, success, responsibility, security and the possibility of development . The results of job satisfaction/dissatisfaction can be observed through the behavior of employees in the work environment. One can find a close connection between job satisfaction and work performance, organizational citizenship behavior, client satisfaction, absenteeism, as well as deviant behavior in the work environment. It is assumed that happy workers will be more productive workers. The fact is that the correlation between job satisfaction and work performance is quite strong. When looking at research and data on satisfaction and performance for organizations as a whole, it can be seen that organizations with more satisfied employees are more effective than organizations with less satisfied employees. Dissatisfaction at work foreshadows many behaviors, including attempts to organize a union, but also many deviant behaviors such as: theft at work, use of illicit drugs that cause addiction, inappropriate socializing at work, tardiness and severe absenteeism. Research shows that these behaviors are indicators of a broader syndrome that we call deviant behavior in the work environment.

Job satisfaction is one of the most important and researched variables in industrial-organizational psychology (Locke, 1976; Connolly and Viswesvaran, 2000). The reason for this is that it shows the association with variables important to the organization, the job and the individual. The results of numerous analyzes have shown that job satisfaction is highly related to life satisfaction (Bowling, Eschleman and Wang, 2010). Job satisfaction shows a negative relationship with employee turnover (Schyns and Croon, 2006; Griffeth, Hom and Gaertner, 2000), and a positive relationship with loyalty to the organization (Schyns and Croon, 2006; Taris, Feij and van Vianen, 2005).

3. MODERN INFORMATION SYSTEMS AS SUPPORT FOR BUSINESS PROCESSES IN ORGANIZATIONS

It is indisputable that the important capital of an organization, viewed in the context of strategic management and human resource management, is management-informational capital. There is a belief that information capital should be evaluated and developed so that it is adjusted to the requirements of the organization's strategy; that is, the requirements for the development of the organization's most important capital, namely human resources.

The information capital of an organization consists of two components: technological infrastructure and the application of information capital. There are many categories of IT and information capital. According to numerous authors, three categories of information capital applications have been identified: transaction processing applications (ERP systems, ...); analytical applications (systems and networks that improve analysis, interpretation and sharing of information and knowledge) and transformational applications (systems and networks that change the business model of the organization). The traditional approach and assessment of the value of information capital is no longer sufficient and should be replaced by a new one: by measuring how and to what extent information capital contributes to the achievement of the organization's strategic goals, especially critical processes, and above all human resources.

Business information system is a continuous process consisting of different methods and concepts for data processing with the aim of making business decisions easier and more successful. It is used in various business processes, from human resources, sales and marketing, financial services, etc. It is a very broad and multidisciplinary field that synergistically and complexly combines business processes, expert knowledge, technologies and applications in order to make better strategic and tactical business decisions. Organizations realize that the main advantage of implementing business information systems is better access to data, and this further aims at better information and better solutions. It is important to take care that business intelligent technology in the organization is easy to use, and that the information generated is simple and useful for decision-making.

Business intelligence can be integrated into a company's business processes in several ways (Eckerson, 2004):

- By integrating analytical applications with operational applications using the enterprise portal, so that both internal and external users can access the data;
- By incorporating analytical methods into operational applications in the application development process;
- Introducing a Web service that will dynamically integrate analytical methods with internal or partner operational applications to support joint business.

Business intelligence systems improve the IT infrastructure of organizations, providing benefits for the organization's business environment. These systems integrate all organizational units into a common system, making the organization's IT structure more logical and easier to manage. Modern systems also allow end users to run their own reports at any time, reducing organizational costs and leading to a more efficient workload for human resources.

Modern information systems provide various benefits to organizations, primarily by facilitating the decision-making process and increasing the speed of organizations' response to a changing business environment. However, organizations that decide to introduce these expensive and sophisticated tools may not anticipate how they will affect their business. It is challenging to accurately measure the impacts of information systems on the decision-making process. Additionally, organizations are often unprepared for the challenges that arise during implementation. Integrating complex solutions impacts both the organization's IT infrastructure and overall business processes.

Despite these challenges, numerous benefits can be reflected relatively quickly in a well-used information system. For small and medium-sized organizations, the list of benefits is just as long as for larger organizations. In the long run, the justification for introducing these systems stems from the benefits that proper implementation and use can bring to the organization.

4. BUSINESS INTELLIGENCE SYSTEMS - MEANING OF ROLE AND CONCEPT IN THE CONTEXT OF HUMAN RESOURCE MANAGEMENT

Business intelligence enables HR departments to become a strategic tool within the organization. She creatively, and extremely productively, helps to strengthen efficiency, both within the human resources management department and in the strategic domain of the organization as a whole, above all in making key decisions regarding employment, planning and budgeting to support strategic goals. The role of business intelligence is no less important in supporting tactical and operational decision-making.

Business intelligence is a multidisciplinary field, but if we focus on technology and applications, then we can say that they include managerial methods and techniques for planning, collecting, sorting, transforming, structuring and placing data in Data Warehouses and data marts for the most effective and efficient analysis. data, reporting, visualization, generation of online active reports and implementation of advanced analytical techniques of clustering, classification, segmentation and prediction. Data warehouses are databases of the widest scope, they include all the data of an organization, while data mart focuses on restrictive segments, organizational parts and/or processes such as the HRM department or the process of "Human resource management" (Kapoor, B., 2010). In order to provide a variety of strategic responses, HR personnel and management as a whole need key information obtained through appropriate technological processes and analytical tools.

A synthesized view of the role of business intelligence in the business process could be expressed in one sentence - from numerous and diverse data to integrated information. Integrated information can be derived from diverse data using appropriate metrics, analysis, methods and business intelligence techniques. Business intelligence solutions can enable departments to: (1) support their decisions and other managers in finding answers regarding the strategic goals and strategies of the organization, (2) make and implement some strategic decisions that specifically concern e.g. human resource management department.

In many cases, HR data is chaotic, leading to disorganized hiring, training, management effectiveness, and compensation processes. Organizations must collect and store large amounts of data about their employees, which needs to be managed and processed. The volume of such data grows year by year and reaches a high level in large organizations. The right technology to manage large volumes of data is the Data Warehouse, as the central, key component of the business intelligence system.

A Data Warehouse architecture allows data integration and is a large database served by one or more operating systems. The goal of such data organization is the integration of data and the realization of the possibility of observing an organization from an integral point of view and a multidimensional analytical view.

In modern human resource management, it is necessary to highlight the importance of performance measurement. This usually implies the systematic definition and selection (quantitative or qualitative) of measurable indicators, as well as obtaining their measures in certain time intervals, which can be followed over time to monitor achievements and progress in achieving previously set goals. Indicators allow the decision-maker in performance management to evaluate the progress in achieving intended achievements in the human resources management process.

It is important to note that in the visualization of the calculated performance indicators, as well as some reports, two methods, that is, procedures or techniques, are used in practice: (a) human resources indicator (result map) and (b) control panel (Dashboard). The scorecard and dashboard are part of a performance management system, which provides managers and other people in the organization with critical information about their performance in an easy-to-use format. These software visualizations create, manage, display and deliver organizational key metrics (for example: quarterly measurement of employee performance in achieving set goals, analysis of recruitment, retention and departures of employees, employee satisfaction, trends in wages and other costs, and the like) and present them using various symbols.

5. ARTIFICIAL INTELLIGENCE AND EMPLOYEE MANAGEMENT

The development of artificial life is also based on the idea that it is possible to reconstruct the logic of the human brain outside of the neural substrate. The idea of modeling neurons using algorithms was presented by Warren McCulloch and Walter Pitts in the article A logical calculus of the ideas immanent in nervous activity (McCulloch, Pitts, 2018). With this, they laid the foundation for the construction of artificial neural networks because, by reconstructing the way in which the brain produces complex patterns with interconnected neurons, they showed how every function of the propositional calculus can be achieved using a neural network. Artificial intelligence is a way of reasoning and acting on derivable conclusions, with complete reliance on logic, where this reasoning and action is not carried out by a human or any other biological organism, but by artificial entities.

Machines, both analog and digital, have been used over time to help workplace designers calculate the results of work and thus, in effect, replace work through automation. Through the integration of artificial intelligence tools and applications, some machines have new responsibilities and even autonomy, and are expected to display various forms of human intelligence and make decisions about workers themselves.

(Moore, 2020)

Artificial intelligence synthesizes science, engineering, computer science and robotics. Understanding and processing of natural and artificial languages, pattern recognition, automatic search, robotics, formalisms and knowledge representation methods are the most common areas of application of artificial intelligence. Artificial intelligence has found its widest application in expert systems in which in the narrowest field (and within the broader fields - medicine, management, military...) the information system successfully replaces a human.

The most important areas of research in artificial intelligence:

- Problem solving, planning and data retrieval – comprehensive problem solving of architectures based on ideas from cognitive spheres (gaming, robotics),
- Display of knowledge - for storing and manipulating information (logic and probability),
- Automatic reasoning/inference - to use stored information to answer questions and draw new conclusions,

- Machine learning – intelligence of data selection; adaptation to new circumstances and discovery and extrapolation of patterns,
- Natural language processing - communication,
- Computer vision - processing of visual information,
- Robotics - autonomy, manipulation, full integration of artificial intelligence capabilities.

Workers have always faced an organizational problem where the all-encompassing motive of business profit dominates the terms of the employment relationship, and workers strive to achieve their priority goals such as a decent and comfortable life, adequate material compensation for their work, which follows dedication to their employer. Artificial intelligence is today considered the most innovative and promising field for managing employees and workplaces. Most of the HR functions implemented worldwide in small and large organizations now use applications that are augmented with artificial intelligence. In organizations in our region, this branch of information technology is still in its infancy.

Human resource management practices supported by artificial intelligence can help managers gain a more objective and accurate picture of employees, even before hiring them, as long as management has access to data about potential workers, which has significant implications for adapting worker protection and preventing safety risks and health at work. Ideally, people analytics tools can help employers make the right hiring decisions. Artificial intelligence makes it possible to automate routine and monotonous work tasks, freeing up employees' time for jobs that require human creativity and intuition. It is the human resource management sector that is a good example of an area that can benefit significantly from the use of artificial intelligence, assuming that the organization has an open approach to change and that this type of modern technology is not understood as something that will replace people, but as an aid for easier performing daily tasks. The first function of human resources management where the assistance of artificial intelligence is first necessary is the process of hiring new employees, either by actively publishing ads or by various activities of searching for new and adequate candidates for a specific position. This is where artificial intelligence can help search the candidate database by trawling through relevant items in candidate profiles. It is also possible to set up a virtual assistant who helps candidates with the process of applying for an ad, providing guidelines for an adequate way to make a first impression, how to present your competences, and the like.

In key areas beyond recruitment, including onboarding, staff development, and job satisfaction monitoring and evaluation, AI can help talent teams free up resources, improve decision-making, and assist organizations in the complex process of attracting and retaining top talent. , harmonizing competencies and workplace requirements, where employees will provide their maximum performance through job satisfaction.

6. MODERN MONITORING AND RECORDING OF JOB SATISFACTION IN ORGANIZATIONS IN THE CITIES OF THE REPUBLIC OF SRPSKA

Information business systems and technologies, i.e. software products, are of great importance and it is necessary to highlight their role and importance in any support for processes in organizations, as well as in the process of human resource management. The research instruments are a questionnaire and a checklist, and in this way the research on the practice of organizational systems in several major cities of the Republic of Srpska will be approached: Banja Luka, Prijedor, Doboj and Gradiška.

The research problems in this empirical research are expressed by a set of research questions and hypotheses to which the research gave appropriate answers. **The research questions and research problems are:**

Q1: Does the organization own and use information systems to support business processes?

Q2: Does the organization own and use information systems to support human resource management?

Q3: Is the process of monitoring and recording job satisfaction as part of human resources management supported by any of the information system modules or the business intelligence system?

Cilj empirijskog istraživanja jeste sticanje informacija o načinu upravljanja u organizacijama, upravljanju ljudskim resursima i implementaciji informacionih sistema u tim procesima.

The objective of the empirical research is to acquire information about the way of management in organizations, human resources management and the implementation of information systems in these processes.

The following research hypotheses were set:

H1: In the set of organizations from which a convenience sample was taken, the application of information systems to support the human resources management process is not sufficiently widespread.

H2: In the set of organizations from which a convenient sample was taken, the application of information systems (business intelligence systems) for the process of monitoring and recording job satisfaction is not sufficiently widespread.

Method of research

Population and sample

The sample could not be random, because organizations are very changeable, therefore a convenience sample of organizations was resorted to and this sample included 18 organizations of different activities, profit and non-profit sectors and of different sizes, operating in the cities of Banja Luka, Prijedor, Doboj and Gradiška. In order to obtain more objective results and a more realistic picture in some organizations, several employees-respondents were examined. The cross-section of the state of application of certain functionalities of the information system was done taking into account the total number of organizations, and not only those that have IS, for the reason of obtaining data on the application of certain functionalities in relation to the total number of surveyed organizations, and thus a clearer picture of the situation. 46 respondents (sample of respondents) participated in the research.

Research instruments

In this empirical research, a research instrument was used - a check list.

The checklist contains a question about the existence of information systems, a question about the part of the organization in which the information system is applied, and a question about the existence of an information system for managing human resources in the organization, as well as an item about the functionality (module) of software to support monitoring and recording job satisfaction. Respondents answered by circling the answer 1 (YES) if an information system is used in a certain department and if the software they use in their organization has such functionality, or by circling 0 (NO) if it does not.

In this empirical research, a research instrument was used - a check list.

Checklist items:

- Does the organization own and use information systems in its operations?
- Which sector (application department) is supported by the information system?
- Is the monitoring and recording of job satisfaction supported by the human resource management information system?
- Software functionality (module) for:
- – Support for tracking and recording job satisfaction.

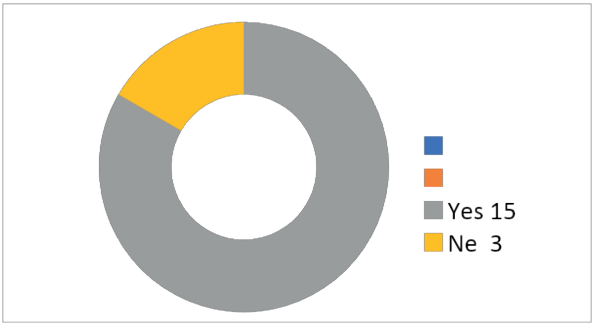
Data obtained through research

The data collected by surveying the respondents are presented in Annex 1. Graph and table of processed data - Processed data obtained from the checklist of departments and functionalities of the human resources management IS.

Interpretation of processed data - research results

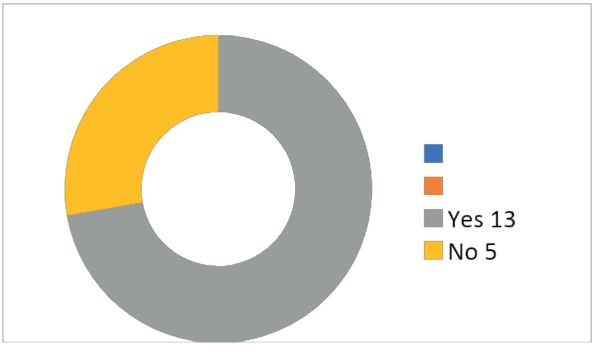
The obtained data, presented in tables and graphs, clearly and unequivocally indicate that in organizations in the cities of Banja Luka, Prijedor, Doboj and Gradiška, information systems and human resource management are applied in a very simplified manner, and that monitoring and recording of job satisfaction is almost not carried out at all. If we keep in mind the fact that human resources are the key to competitive advantage and a significant factor in socio-economic progress and development, then the conclusion is that this segment of business is significantly neglected and that it is managed in an outdated way. The data obtained from the research at first give optimistic information that as many as 15 out of 18 organizations have some of the information systems that support their business (Figure 1). However, further detailed analysis of the situation leads to the knowledge that information technologies and systems are used for some other processes, such as the calculation of employee salaries and other financial compensations, as well as for keeping employee records. They are most often used by accounting departments, and not by human resource management departments, which a certain number of organizations have in general.

Figure 1: Possession of an information system



Source: Author

Figure 2: Having an information system for human resources management



Source: Author

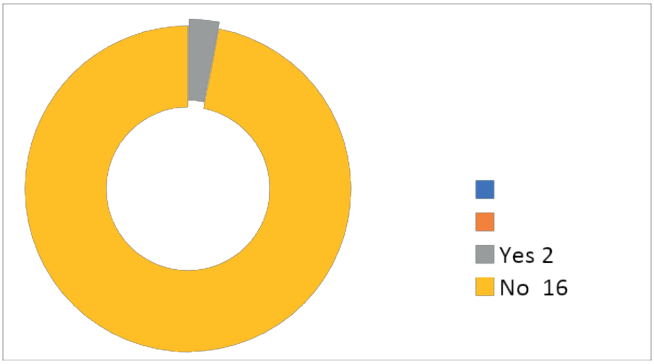
Table 1. To the question of which sector (application department) is supported by the information system, the following answers were received

Table 1. Seven important differences between tangible goods and services

Sector	Yes	No
Marketing	5	13
Finances	15	3
Planining	2	16
Logistics	7	11
Client management (customers)	8	10
Sales	9	9
Human resource management	13	5

Source: Author

Figure 3: Support of monitoring and recording work satisfaction



Annex 1: Graph and Table Table data
Data processed data obtained a check of the list of functionality of human resources management.

CONCLUSIONS

Increasingly extensive demands related to the sphere of human resources, government regulations and improved capabilities of microcomputers, helped to justify the need and prove the sustainability of information systems in human resources departments. The basic advantage of human resources IS is reflected in the potential of generating more accurate and timely available information from the domain of functioning, controlling and planning, compared to manual systems. The speed and accuracy of IS simply cannot be compared to manual systems.

The development of information technologies and information systems dramatically changes the management of all resources in the organization. Data and information are treated as the second most important source of business, next to employees. ERP systems, HRIS and DSS in BI (Business Intelligence) technology provide the organization with excellent support in the human resources management process and provide proactive solutions to employee issues. It is of great, invaluable help in talent identification, planning, recruitment and selection, cost reduction, talent retention, better and more reliable employee segmentation, monitoring and measuring employee satisfaction, and the like. The fact is that the main goal of information systems is to improve the timeliness and quality of information. Modern technologies allow departments to effectively and efficiently process transactional data, automate a large number of process activities, then generate various reports, conduct numerous analyses, which in turn supports the process of accurate, precise and reliable decision-making in the organization as a whole. IT technologies and software solutions developed in new technologies contribute to the creation of additional values in the organization and are in themselves a strategic value, i.e. a competitive advantage.

The correlation between satisfaction and performance is strong. Dissatisfaction at work foreshadows many behaviors, including attempts to organize a union, but also many deviant behaviors such as: theft at work, use of illicit drugs that cause addiction, inappropriate socializing at work, tardiness and severe absenteeism. Research shows that these behaviors are indicators of a broader syndrome that we call deviant behavior in the work environment.

Artificial intelligence is today considered the most innovative and promising field for managing employees and workplaces. Most of the HR functions implemented worldwide in small and large organizations now use applications that are augmented with artificial intelligence. In organizations in our region, this branch of information technology is still in its infancy.

Research problems in the empirical part of the work are expressed by a set of research questions and hypotheses to which the research gave appropriate answers. The answers to the research questions are clearly and unambiguously presented in the segment of the research results in this paper, and the obvious answer is that in the region of the cities of Banja Luka, Prijedor, Doboj, Prnjavor and Gradiška, modern business information systems are quite modestly implemented, and human resource management is incomplete. and insufficiently supported by the information system. In this scientific paper, the key results are presented, but a more detailed analysis has shown that information systems intended for comprehensive human resource management are mainly used only for payroll and employee records. Both hypotheses were confirmed: in the practice of the organizations from which the sample was taken, the application of modern human resources information systems is **not** widespread enough, **nor** is the application of information systems to support the monitoring and recording of employee job satisfaction widespread enough. The objective of the empirical research was to acquire information about the way information systems are applied in certain processes of human resource management in organizations of various spheres of business, which was realized in this scientific work.

PRAĆENJE I EVIDENTIRANJE ZADOVOLJSTVA POSLOM UZ PODRŠKU INFORMACIONIH SISTEMA I PRIMJENA VJEŠTAČKE INTELIGENCIJE U UPRAVLJANJU ZAPOSLENIMA

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Apstrakt: Upravljanje ljudskim resursima u svakom poslovnom sistemu postaje potpuno različito od dosadašnjeg. Cjelovito, koherentno upravljanje ljudskim resursima organizacije u cilju osiguranja maksimuma dodane vrijednosti i najboljeg pozicioniranja za ostvarenje organizacijskih strategijskih ciljeva. Sve obimniji zahtjevi vezani za sferu ljudskih resursa, vladine regulative i unapređene sposobnosti mikroračunara, pomogle su u opravdavanju potrebe i dokazivanju održivosti informacionih sistema u odjeljenjima ljudskih resursa. U odnosu na neke druge oblasti menadžmenta u menadžmentu LJR se malo kasnilo sa primjenom informacionih tehnologija, ali krajem 80-tih godina počinje šira primjena različitih programa. Interesantna su saznanja do kojih se dolazi istraživanjem i preispitivanjem načina upravljanja ljudskih resursa u organizacijama u Republici Srpskoj.

Poslovna inteligencija je multidisciplinarno polje ali ako je fokus na tehnologiju i aplikacije, onda se može reći da ona podrazumijeva menadžerske metode i tehnike za planiranje, sabiranje, sortiranje, transformaciju, strukturiranje i smještaj podataka u Data Warehouse i data martove radi što efektivnijeg i efikasnijeg analiziranja podataka, izvještavanja, vizualizacije, generisanja onlajn aktivnih izvještaja i sprovođenja naprednih analitičkih tehnika klasterizovanja, klasifikacije, segmentiranja i predikcije. Poslovna inteligencija i poslovno inteligentni sistemi poboljšavaju IT infrastrukture organizacija i omogućavaju koristi i za poslovno okruženje organizacije. Ovo se postiže zbog činjenice da se aplikacijama sve organizacione jedinice integrišu u zajednički sistem što čini IT strukturu organizacije, logičniju i lakšu za upravljanje. Činjenica je da se poslovna inteligencija koristi u različitim poslovnim procesima, od ljudskih resursa, prodaje i marketinga, finansijskih službi... Ključne oblasti gde se poslovna inteligencija najviše koristi su upravo ove navedene. Prednosti koje poslovna inteligencija omogućava organizacijama koje u svojoj praksi primjenjuju ove savremene informacione tehnologije su da imaju konkurentsku prednost, bolje usluge i jedinstveni pogled na poslovanje. Neki od neophodnih uslova za uspješno upravljanje ljudskim resursima (ULJR) i performansom se obezbjeđuju putem upravljanja informacionim resursima organizacije (podacima, informacijama i znanjima). Mogućnosti savremenih tehnologija, koji se svakim danom sve više usavršavaju, otvaraju sasvim nova područja koja treba istražiti i ispitati. Svakako, jednu od najaktuelnijih a moglo bi se reći možda i najinteresantniju oblast, predstavlja vještačka inteligencija.

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Stavovi o poslu i zadovoljstvo poslom su veoma važan segment u svim organizacijama. Zadovoljan zaposleni biće produktivniji, te će to uticati pozitivno na organizaciju. Mnoga saznanja ukazuju na to da je zadovoljstvo zaposlenih ključni faktor motivacije i postignuća uz pozitivan stav zaposlenog o radnom mjestu. Radna uspješnost je stepen u kojem radno ponašanje zaposlenih pridonosi ostvarenju organizacijskih ciljeva. Ona je višedimenzionalan konstrukt što znači da postoje različiti načini i ponašanja kojima zaposleni mogu doprinositi organizacijskim ciljevima. Nezadovoljstvo na poslu nagovještava razne oblike ponašanja ali prvenstveno mnoga devijantna ponašanja zaposlenih.

Poseban izazov je da se ispita stanje i mogućnosti razvoja ljudskih resursa u nekim profitnim i neprofitnim institucijama u Republici Srpskoj. Ovim naučnim radom pokušaće se steći nedostajuće informacije o sadržaju i načinu upravljanja određenim procesima ljudskih resursa, kao što je proces praćenja i evidentiranja zadovoljstva poslom u profitnom i neprofitnom sektoru, posmatranom u kontekstu informacionih sistema.

Ključne riječi: Informacioni sistemi, vještačka inteligencija, poslovna inteligencija, sistemi za upravljanje ljudskim resursima, HRIS, upravljanje ljudskim resursima, zadovoljstvo poslom

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ONLINE MARKETING AND PROMOTION OF HOTEL SERVICES

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Abstract: Intensifying competition in online business necessitates diverse marketing strategies for hotels. The dynamic tourism market demands adaptability in marketing and business approaches. Information and communication technologies (ICT) and hotel industry developments reshape marketing and sales strategies. Attracting guests becomes a paramount challenge amid competitive pressures. In the digital age, hotel marketing spans online platforms, necessitating a strong online presence. This paper explores the role of marketing services in hotels and restaurants, emphasizing a service-centric marketing concept. It analyzes Internet marketing's core aspects and its significance in the modern hotel industry. The three-part structure covers the foundational role of marketing in hotels, considerations in online marketing, and exemplifies marketing and online activities at Hotel Radisson Astana.

Keywords: online business, marketing strategies, tourism market, adaptability, ICT, hotel industry, digital marketing,

1. MARKETING IN HOTEL INDUSTRY

Social networks and other two-way communication channels that have developed under the influence of technology contribute to the fact that the selection of tourist destinations depends on what people who have already visited say about a certain destination. These people are able to post pictures, videos, their impressions with positive comments and criticism. A potential tourist has more confidence in the accuracy of that information and then forms a realistic image of a certain destination comparing to those from promotional materials where the tourist destination is called

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as ideal. Marketing plays a crucial role in helping businesses to maximize bookings and revenue. It is the main way in which those in the hotel industry are able to reach out to potential customers, conveying their unique selling proposition and brand values. The marketing concept has a dominant role in all of the hotel's philosophy and business. The essence of marketing in the hotel industry is in the definition that marketing is analyzing, organizing, planning and controlling potential sources of customers, which consist on satisfying the needs and requirements of the target segment of guests, and on this basis realizing a profit. The function of hotel marketing is to test the opportunities and conditions for placement of existing and future services, and sales arrangement, i.e., selection of services that are assessed to have a sale value on the tourist market (Batinić, 2015). According to Mihailovic research, it is necessary to develop a marketing approach that is suited to current trends in the hotel and restaurant, which also provides a significant marketing information base on incentive and restrictive factors of the development of the service sector, which can contribute to the optimization of business decision-making (Mihailovic, 2017). Marketing services are engaged in refining the basic philosophy of marketing, in order to enable them to be operational and efficient in the services sector. A lot of characteristics of the services are significantly different from the characteristics of the goods and have an impact on the manner in which the goods are introduced into the market. These characteristics are often described as intangibility, inseparability, variability, mortality, and lack of ownership. Accordingly, the management and marketing activities should adapt to the specifics of the service sector. Companies in the hotel industry, as well as other companies engaged in service activities, should be aware that service marketing requires much more than classic marketing for physical products. In service marketing, internal marketing is also developed, i.e., that type of marketing in which companies train and motivate their employees for contact with clients.

The product/service cannot simply enter the market competition. This requires an elaborate system of activities, and the function of marketing is to prepare everything necessary for the successful placement of products and services on the market, namely:

a) research the market
b) choose target groups of customers
c) organize sales channels
d) position the product
e) define the conditions of sale

f) organize promotional sales monitoring activities and control over events in the market environment (Galičić at al. 2005).

The beginning of every business, even in the case of a hotel, is with a marketing strategy. Discounts for off-season service are widespread in the tourism and hotel business. They consist on maintenance of tourist exchanges, workshops where tours are sold on preferential terms; providing special discounts to encourage the sale of new tourist products or last-minute offers; bonus discounts to regular customers; discount systems; organization of promotional trips. In foreign countries, and recently also in Russia, there are widespread programs to stimulate demand for the services of airlines, hotels and travel agencies. In Russia, the best known are bonus discounts, which give the right to receive a free or discounted ticket for regular customers. Among the most famous sales promotion systems is the Sheraton Club International (SCI) system, which is implemented in the Sheraton hotels in Moscow and St. Petersburg. The essence of this program is that a discount system is applied for regular customers, which is achieved with the help of glasses, which are called club miles. The number of club miles that the client receives depends on how much he spent on accommodation, meals, phone calls, washing and ironing of clothes, that is, a set of services provided in the hotel itself, after a certain amount for each dollar. spent, a certain number of club miles is awarded. The customer can use the accumulated club miles to get a "free night" at any Sheraton hotel or to receive bonuses for air travel with those airlines with which the hotel chain has entered into an agreement (sixteen airlines). There are currently 2.5 million SCI members in Europe, and in Russia in 1998, 1,400 guests became members of the club in St. Petersburg alone. Word of mouth is another very important form of promotional activities. It includes the transmission of relevant information between consumers, when it comes to a tourist product.

1. Market segmentation, customer / consumer analysis and target market

In their business, successful hoteliers apply the strategy of market segmentation and the creation of specific hotel products, which will satisfy the special requirements of selected narrow market segments.

Segmentation is the division of the market into parts - segments. Market segmentation is based on the assumption that no market is homogeneous, that consumers are different in their requirements and demand for products or services. It is the process of selecting a market and dividing it into submarkets in order to select a target market and create an adequate marketing mix for it. Hotel marketing refers to the various marketing strategies and techniques that hotels use, in order to promote their business and make a positive impression on customers. In the hotel industry for marketing two important key point exist: the brand message and key target market. It's important to know the target market to direct the marketing strategy and tailor the messages to potential customers.

Some of the traveler categories are:

a) Value seekers - want to get the best out of their trip. Often travelling with young children, they have a medium income and largely fall between the ages of 25-34. They rely heavily on reviews to help them find what they need, preferably a trip near the beach, and usually research on a smartphone.

b) Luxury travelers - are focused on enjoyment and willing to spend more to obtain it. They often travel in a couple aged 25-49. They seek cities that are hot and coastal and tend to look closely at online reviews.

c) social travelers - focus on sharing and engaging with others, usually travelling in friend or family groups. Their groups often include children so they appreciate babysitting and child services. While they have high to medium income, they put a lot of faith in word of mouth and recommendations from other travelers. They tend to fall in the 25-49 age group.

d) Independent travelers - like to have a lot of control over their trip and thus love to travel solo looking for adventure and cultural experience over any particular climate. They're usually low or high earners who are relatively young and quite likely to share reviews and engage with social media.

e) Researchers - maintain a very particular approach to booking their trips. They want to make sure their experience is as good as it possibly could be. They not only thoroughly research their destination and accommodation but also restaurants and activities. Given this, a lot of it is done on laptop devices. They're commonly higher earners travelling as a couple aged 25-49. Each stage of the journey is usually backed up listening to the voice of other consumers through sites like TripAdvisor.

f) Habitual travelers - look for simplicity and convenience by travelling to the same destinations repeatedly. They place more stock in relaxation than activities and are commonly in the 35-64 age bracket. Mostly male, they tend to be lower income travelers.

Understanding customer expectations is a prerequisite to provide quality services to hotels and restaurants.

The scope of their expectations can be displayed in five dimensions of services, each of which is equally important:

a) Reliability - Customers expect that service firms can provide the desired service accurately and consistently, which refers to keeping promises in the provision of services and safeguarding reputation;
b) Appearance - Physical appearance, looks like the equipment or employees, is one of the factors by which customers evaluate the service company. Material things influence the perception of quality of service by providing direct signal on the nature and quality of the service itself, and indirectly, by offering its physical aspects in the provision of services. Users expect that all these aspects are in line with the promise to have a certain level of quality.
c) Readiness - Users appreciate the enthusiasm of companies to provide services quickly and efficiently, as well as the responsibility, which means that it will inform customers about the characteristics of the service before, during and after purchase service.
d) Trust - This dimension of the service is the result of knowledge, courtesy, professionalism of staff, and ability to achieve trust among users.
e) Sensibility - Users want the service company to understand them. Therefore, they expect attention and communicate at a level that can be understood by the people who will listen to them.

Business people as market segment

Business trips are not only related to big cities and administrative business centers, but an increasing number of seminars, conferences, company trainings, etc. held in rural areas, mountain centers, seaside destinations, etc. Business travelers usually stay shorter compared to the average length of stay of all tourists, but their consumption per day is above average, on the basis of which this segment is classified as highly profitable. Business travelers have a lower elasticity to price changes. Also, they often travel to the same destinations or different destinations where the same hotel chains exist, which opens up the possibility of developing loyalty. It has been noted that business travelers are often attached to a specific hotel brand and that even in the case of trips that are not of a business nature, they choose hotels of the same chain.

Business travelers belong to the category of sophisticated tourists who have specific requirements and expectations when choosing a hotel. Specific requirements refer to various elements of the hotel's offer: room arrangement, type of furniture, staff relations in the process of providing services, availability of advanced IT devices and networks, choice and quality of food offered, availability of parking spaces at all times, etc.

Business travelers are a particularly important segment for hotel chains operating in urban areas where business trips are directed. Hotel chains, in addition to investing in attracting business travelers, strive to develop their loyalty and retain as many of them as possible in order to stay in hotels that belong to the chain, regardless of whether they are in the same or different destinations. For example, large hotel chains (Marriot, Hilton) still had a base of loyal travelers in 1990 that exceeded one million. Also, an increasing number of independent hotels, especially those located in administrative and business centers, are trying to attract business travelers and develop their loyalty. Independent hotels do not have the market potential to create a base that has a large number of loyal clients like hotel chains, but an increasing number of them implement various loyalty programs that are maintained at a profit rate growth of 5% to 85%. [3] Market segmentation is an important concept in tourism literature. Research has identified three demographic variables of market segmentation: age, gender and nationality. Despite the increasing interest in lifestyle or psychographic information among marketing practitioners, demographic variables are still considered the primary tool used to guide strategic decisions. Managers in the tourism industry need to consider the attitudes of certain demographic segments if they want to maximize perceived service quality. When it comes to the male market, the emphasis of the offer would be more on creating a social atmosphere, while for the female market, they should highlight the tangible things that the hotel / destination provides to guests. Similarly, social atmosphere matters to 15- to 25-year-olds, details and city connections to the 26- to 29-year-old group, and staff quality to the over-29 segment. Most marketing research and operational activities must be based on consumer analysis, so gathering information about them is the main task of marketing in the company. In other words, consumers are the main element of the market towards which the efforts of the entire company are directed. They are the starting point for all marketing goals, strategies, plans and actions. For this reason, it is necessary to study the process of forming needs,

3 Zečević, A., & Đorđević, A. (2020). Ključni faktori u izboru hotela od strane poslovnih putnika. Marketing, 51(1), 12-22. https://doi.org/10.5937/markt2001012Q

desires, attitudes, motives, gaining experiences among consumers, as well as environmental factors, such as social groups, layers, social mobility. It is very important for the company to have a customer base, to see who are its regular - loyal customers, which customers it has lost and which ones it has regained. Companies that want to attract repeat customers must periodically review the level of satisfaction of their customers, i.e., they have to follow the customer satisfaction index. It would be ideal to determine the target group of hotels even before the construction of the building itself, based on the type of destination, attractions and localities in the vicinity, location of the building, tourist demand, etc. In that case, the offer itself can be significantly adapted to the targeted market segments. However, as this is often not the case, the target group is determined subsequently on the basis of all the mentioned criteria, taking into account the offer, specificity and capacity of the facility itself.

1.1. Latest hotel marketing trends

In order to optimize hotel marketing, hotel need to be aware of the latest hotel marketing trends due to hotel marketing trends have also changed as a result of the outbreak of COVID. The COVID outbreak has had a major impact on the hotel industry, as hotels are forced to contend with new legal requirements, changing customer habits and behaviors, global travel restrictions and the economic fallout. Some of the main hotel marketing trends linked to the pandemic that are suggested in literature are.

One of the biggest trends within hotel marketing is linked to the increased need to highlight safety measures and hygiene within the marketing content and guest communications. After all, travelers need reassurances that the hotel takes the threat of COVID seriously and is taking steps to keep them as safe as possible. Hygiene measures and safety policies are at the very forefront of customers' minds when making booking decisions and how well hotel communicate the steps it had taken can easily be the difference between generating sales and failing to do so. The efforts need to be communicated on hotel website, on third-party platforms, in emails and elsewhere.

The literature suggest that the hygiene is the new marketing message for hotels. Some hotels focus much of their marketing efforts on business travelers, but the combination of travel restrictions, work from home policies, restrictions on mass gatherings and general uncertainty has meant many business events are being cancelled and overall business travel has been significantly reduced. The pandemic affected people and many needs for a break. Moreover, while travelers may be more reluctant to travel than in the past, demand for leisure breaks is still there. With this in mind, those in the hotel management may consider ramping up the focus on leisure-based marketing communication. Depending on location and facilities, the hotel can target different groups here, including couples, families, small groups of friends, or even a combination. It may also consider changing some of the channels that use, and creating package deals that are aimed at leisure travelers, in order to encourage more bookings. Another hotel trend to be aware of is an increased focus on local guests, as opposed to international ones. This has been primarily influenced by travel restrictions during the COVID situation, which has either prevented travel or enforced quarantine requirements on travelers to and from certain countries. Many hotels have responded by switching their marketing efforts to target local customers, or at least customers from neighboring countries. This may mean highlighting different aspects of the hotel, such as gym facilities, wi-fi access and the ability to carry out remote work from hotel rooms or from dedicated work areas. Some hotels have also explored services like food delivery.

With regards to customer service, one of the important things those in the hotel industry need to keep in mind is that COVID has created a lot of uncertainty. Customers could easily face the sudden imposition of new restrictions, or even test positive for the virus. Due to the economic realities arising from the coronavirus pandemic, many hotels find themselves in a position where they are unable to compete only based on price of hotel rooms. However, one can potentially compete based on value. After all, customers are usually happy to pay more for excellent facilities and high-quality customer service. The hotel may add value to the propositions, for instance, to create packages that add room service breakfasts, longer stays or extra services, such as massages or vehicle hire, flexible cancellations policy.

2. Future general marketing trends in hotel industry

Some of general marketing trends are applicable throughout the hotel industry, regardless of location or customer base are:

a) Customer experience marketing

Customer experience marketing refers to a collection of hotel marketing strategies that are based around the experience customers actually have when staying at a hotel, or interacting with a business. It is based on the idea that hotel customers do not really pay for products or services; they pay for experiences.

Hotels can improve the customer experience in a number of ways, such as through delivering excellent customer service, offering unique features in hotel rooms and providing a superior range of facilities for guests. By focusing on marketing efforts on the experience, hotels can really tap into the reasons people stay in hotels in the first place.

b) Voice search

In recent years, voice search has emerged as one of the most important hotel marketing trends and there are several hotel marketing strategies that can take advantage of this. For instance, using smart home devices, it is now possible for customers to book hotels entirely through voice commands and hotels should capitalize on this. Additionally, voice search possibilities can also be implemented within hotel rooms and then promoted as a way of attracting customers. This can be achieved by including smart speakers or smart hubs in hotel rooms, allowing guests to use them to obtain the latest tourist information, or to book hotel services from the comfort of their room.

c) Improve guest experience and satisfaction through chatbots

Customers tend to have high expectations when it comes to online customer service, anticipating swift replies to questions, and this is where chatbots can be of great value. A chatbot can be set up to answer common questions, push your key marketing messages, increase direct bookings and even guide customers through bookings. Some of the main benefits associated with chatbots include the ability to respond to customers even when staff are unavailable, as well as automatic language detection and communication in multiple languages. Chatbots can continue to communicate with guests throughout the customer journey too, including in the follow-up phase.

d) Artificial Intelligence (AI)

Customer service interactions form a major part of the modern hotel marketing mix, and artificial intelligence can play an important role here. For example, AI-powered chatbots are one of the best ways to ensure customers receive quick responses via live chat functions on hotel websites, 24-hours a day, eliminating slow response times. However, the use of artificial intelligence within the hospitality sector extends far beyond this. For example, AI can help hotels to segregate customers more effectively, assisting with personalization marketing efforts. It can also speed up data analytics, while AI-driven customer service robots can be deployed in hotels.

e) Influencer marketing

Influencer marketing refers to the practice of reaching out to individuals who have a significant online presence, and using their influence to get marketing messages out to a particular audience. Influencers tend to have established audiences, which may consist of a specific demographic, and their audience will usually respect their views.

In some ways, influencer marketing is similar to the celebrity endorsements work, with the audience trusting a business or brand, because of its association with someone else they trust or admire. Hotels might partner with influences to create video content, social media posts, written content, or other forms of online marketing.

f) User-generated content

In relation to the hotel industry, user-generated content refers to online content that is created and shared by customers, such are customer reviews and video blogs, hotel photos or holiday snaps. User-generated content is most commonly shared on social media, or via personal blogs. This kind of content has the benefit of coming from real customers, rather than from a brand, increasing audience trust. For hotel marketing strategies to truly harness the power of user-generated content, they must provide opportunities for it to be easily created and shared.

g) Personalization marketing

The idea behind personalization marketing is to deliver more targeted promotional content to individual users. It is a technique that relies heavily on the collection of user data, and the primary advantage of personalization marketing is that the promotional content that is seen by customers is more relevant to them as individuals. Personalization marketing can take a number of forms, including intelligent product recommendations delivered over the internet, or personalized email marketing campaigns. Content can be tailored by obtaining personal contact details, but can also be targeted towards specific users based on their web browsing habits and social media activity.

h) Video marketing

Video marketing is one of the most powerful hotel marketing strategies, helping to target marketing messages towards potential customers in a way that is convenient to them. Video content is especially popular on social media platforms, and it has the ability to combine visual and audio elements. The range of options available to marketers is almost endless, from live streams of hotel activities, to promotional videos highlighting hotel features, and interviews with customers, sharing their experiences. The growing prevalence of 360-degree video also opens up greater opportunities to fully immerse audiences.

i) Remarketing

Remarketing is a way for those in hotel management to reach out to users who have already visited their hotel website, or interacted with their brand on social media. Remarketing allows these users to be targeted with specific marketing messages, such as an image of the exact hotel room they were booking, reminding them of their interaction. A major advantage of remarketing over other forms of digital advertising is that hotels already know these users have shown some degree of interest.

j) Metaverse: an innovative hotel marketing trend

The metaverse provides several unique hotel marketing opportunities and can help to bring offerings into the modern age. Firstly, hotels have the option to provide a virtual or digital space, in which people can interact freely, without all needing to be in the same location. This may be especially useful for business customers hosting online meetings. However, the metaverse can also be used in fun and creative ways that allow the customer experience to be improved more generally.

II ONLINE MARKETING AND PROMOTION IN HOTEL INDUSTRY

Just as the travel industry and behavior of travelers have changed, so has the way we market tourism products and services. And this is where tourism marketing comes into play. Tourism marketing is a marketing strategy that uses specific marketing plan and techniques to promote touristic products and services such as destinations, hotels and transport services, etc. When we talk of tourism marketing, it makes sense to focus on digital marketing, as with tourism industry, more than any other sector, online communication becomes more important due to the specifics of the consumption process: customers are planning their trips being a great distance away from the service provider. Tourism marketing include plenty of techniques that are similar to traditional digital marketing, but it has its specifics. One of the biggest differences is the buyer's journey, or, in case of tourism marketing, the traveler's journey. Travelers use the Internet as the main tool before, during and after travel. These are the stages that a traveler goes through during the purchase process. Dreaming, planning and booking belong to the "before" of the trip, experiencing to the "during" and sharing mostly belong to the "after" the trip. By understanding consumer behavior, hotel will then be able to create quality content for each stage of the traveler's journey and attract its future clients. Before the trip - The latest figures point out that two out of three users purchase travel products and services exclusively online. There is a widespread belief that through the purchase on the Internet one gets the best prices for plane and hotel. But that is not all. The user also looks for information about destination, gastronomy, sightseeing's, must-see... Blogs and social media are often a great ally when it comes to preparing a trip. During the trip - the number of Internet connections through mobile increases every day. The foresight indicates that this year 75 percent of the people who will connect to the Internet will do so through a Smartphone. It means that the user will consume and generate information during his trip, anywhere and at any time. While a person enjoys his trip, he consumes content from websites with destination information such as museum schedule's, visit prices, markets, geolocation, transports ... And, at the same time, he generates content. Users take photos, videos and podcasts and upload them to the network to share them on social networks. They comment and share their experiences with the world on the spot.

After the trip - Once the trip is over, the tourist commits the three most important actions for hotelier. He shares the experience, the feelings, impressions, moods although some have already done it in the previous stage, he values recommend the destination, the services, and the hotel in social networks, blogs, forums... Without a doubt, it is a key stage because the traveler becomes a promoter.

1. Digital (internet) marketing

Dynamic and rapid development of internet technology and marketing opportunities provided by modern digital technology, enabled the radical change in traditional marketing activities and opened the space for the development of internet marketing. Internet marketing has become an inevitable trend in the business, and its benefits are recognized by many businesses, regardless of their economic activity, with the aim of achieving better business results. Representatives of the hospitality and potential users of services and products are more frequently and increasingly getting their information on offers through the internet, and the marketing presentation of the overall offer via the internet is becoming an increasingly important success factor of each hotel as a business system. Internet marketing and online advertising, also called i-marketing, web marketing, online marketing, or e-marketing, is the advertising of products and services over the Internet. Internet marketing is the use of the internet and other digital technologies with traditional methods in order to achieve marketing goals. The basic features of internet marketing are as follows: consumer databases, interactivity, the ability of direct response to all forms of marketing activities and measurement of the effects of marketing activities. As the process of creating and implementing e-marketing is not simple, it is important to include all the elements that are an integral part of traditional marketing, starting from understanding consumer behavior to distributing content. A new trend in e-marketing concerns the use of social media sites, especially Facebook, which rely on online social connections to spread information and make real sales. Digital marketing is something no one can deny today, so much does digital media permeate the everyday lives of travelers. People now manage their interactions almost exclusively via smartphones, social media channels, and email. Reports suggest that the online bookings make up almost 60% of all bookings. Half of those who do book digitally do so from a mobile advice. The advantage of being online is that there are so many different ways hotel can engage with travelers. Because of the different platforms within digital media, hotel marketers may be much creative and connect with a lot more customers. It might be the only way to reach customers on the other size of the world or specific markets.

The most powerful and most effective Internet marketing activities, which can improve sales and attract new customers, include:

a) Internet marketing through the hotel website
b) Internet marketing via e-mail
c) Internet marketing through social networks.

Every hotel website, as well as being the most effective online marketing tool, must also be attractively thought out and designed. Marketing experts must come up with attractive websites, find a way to attract customers to visit the web site, keep them there for a while and make them frequently come back to their website. Each hotel website must contain: reliable information on the destination of the hotel, information about hotel products and services, the possibility of booking of hotel products and services without risk (booking system) ... The most cost-effective method is direct booking, since there is no payment of commissions to intermediaries. Therefore, every hotel should take care of its own website as the main sales channel. Daily updating of the website content with current events in the hotel, destination and hotel-tourist business, special deals and packages of services are just some of the ways that hotels can attract more potential customers to their own website. The use of email marketing creates the opportunity to offer any potential interested guest to arrive at the right time at the minimum cost, and the results of such activities must be measurable, which creates a basis for decisions on future marketing activities. Through direct contact with the existing and potential users of hotel products and services via email, hoteliers can achieve multiple benefits: attracting new users of hotel products and services, retention of existing users of hotel products and services, developing brand awareness and improving market position, access to research data related to all other business and marketing objectives, email marketing is cheap and efficient. E - mail marketing is an important marketing tool of direct communication that enables potential users to familiarize themselves with the hotel offer and a variety of special benefits. The main advantage of e-mail marketing is in its personalization - the message is made for a specific user, and if that person finds the offer interesting, it often results in the purchase without having to compare it with other competitors.

Social networks are “free online services” that enable different forms of communication with the world with the possibility of self-presentation. The most famous social networks like Facebook, YouTube, Twitter or FourSquare have become an important marketing “tool” of various economic entities. Advantages of hotel marketing through social networks can be multiple: relatively low cost of the campaign, quick feedback, increase of traffic to the hotel website, strengthening of the brand, simple and fast promotion of new hotel products or services, improving relations with customers.

2. The main channels and tools of tourism marketing

In the realm of tourism marketing, the predominant reliance on digital strategies underscores the unique nature of promotional efforts within the travel sector. A discerning approach is required, recognizing that the intangible essence of travel experiences demands a nuanced marketing philosophy. A cornerstone in this digital landscape is Social

Media Marketing, where users seek inspiration, recommendations, and reviews. The imperative for travel brands is to craft a compelling social media strategy that not only showcases products and services but also aligns with the expectations of an audience accustomed to engaging content. Email marketing remains a stalwart in the arsenal of marketing tools for the tourism sector, offering avenues for lead nurturing and loyalty programs. The power lies in its ability to sustain continuous communication with prospects and clients, fostering enduring relationships. Customer Relationship Management (CRM) tools emerge as indispensable in tourism marketing, providing a structured approach to database management and enabling targeted campaigns based on segmentation. Automation features, a hallmark of many CRM tools, enhance marketing efficiency while optimizing resources. Within this landscape, HubSpot stands out as a comprehensive solution for tourism marketing. It facilitates engagement through content creation, emphasizing an inbound marketing approach that adds genuine value to the customer. By integrating various functionalities like email, SEO, social media, and CRM, HubSpot streamlines marketing efforts. Lastly, the significance of website marketing cannot be overstated, especially in addressing the intangible nature of hotel services. A well-designed hotel website, rich in informative content, serves as a powerful tool for enhancing sales volume and shaping the overall reputation of the hotel in the digital realm.

III HOTEL SOCIAL MEDIA MARKETING

With social media becoming so important in the everyday lives of consumers there is no doubt that it presents a significant opportunity for hotels to capture the attention of potential guests. Scrolling through social media feeds has become part of the everyday for most people now, no matter where they are or what they're doing. Not all content will engage them but travel-related content likely will because it activates the guest's imagination. Used creatively, travel content on social media can have a transportive effect on viewers, inspiring them to go on their own journey. Social media also offers hotel business a range of options when distributing the content, meaning strategy and targeting uses become extremely valuable.

Video is becoming an increasingly popular medium with hotel guests. It's engaging, easy to digest, and easy to share with others. For hotel marketers, it should be looked at as a first priority when creating strategies to attract bookings. Regarding YouTube, one billion people watching more than six billion hours of video each month. The likelihood of the hotel site appearing on the first page of Google search results increases by 53 times by adding a video to the website. People are 10 times more likely to engage with and share video content. About 20% of users read text while 80% will watch a video with the same content, bookings are 67% more likely to happen when a video tour is available. travelers love to find inspiration through video, with around 65% of them watching video when thinking about taking a trip and choosing a destination, with a further 54% using video when choosing accommodation.

Independent hoteliers need to do everything they can to adapt their marketing strategies, and take a mobile-first approach to attracting global guests. Everything needs to start with a hotel's mobile website. The experience delivered to guests before they've even booked a room is so important and the way a hotel's website responds to small devices is the key to mobile marketing success. For good mobile experience: users don't have to pinch, scroll, or zoom to see information; font is legible and content is concise, the use of Adobe Flash and pop-ups are limited, click-to-call functionality is enabled, Google Maps is integrated so people can find their way to and from your hotel, hotel`s logo is linked so it's simple to return to the homepage, there's an easily accessible search bar and date calendar, forms are auto-filled for returning visitors. When it comes to mobile bookings, there are four key consumers 'moments' hotels need to be aware of. Hotels are advised to be present when inspiration strikes. By doing a search of common queries the hotel can see if object is in any of the results and optimise searching. In millennial groups, up to 50% say they've discovered a new travel brand while researching on mobile. Hotel should be liberal with the information displayed to mobile searchers. When a plan first begins to form travelers most often search for prices, hotel reviews and pictures, flight lengths, and available destination activities, with 69% of travelers worrying they're not finding the best price and second-guessing their choices. However, 85% say that information sourced on their smartphone helps them make decisions. Hotel can ease the worries of guests but giving them the ability to cancel mobile bookings without incurring a penalty. Around 85% travelers decide on their activities after they arrive and nearly nine out of 10 expect their travel provider or hotel to give them relevant information. They're looking for weather-specific information, public transport help, exchange rates, and traffic updates along with other relevant news.

Just as travelers can now plan their trip using the endless information offered online, including through Google, hotels can also look to take simple steps to plan for their guests' arrivals. Hotels should enter email marketing – one of the most viable, cost-effective methods for reaching guests and increasing direct bookings. Email marketing is crucial for the hotel industry: it's estimated to return $38 for every $1 spent, making it the channel with the best return on investment (ROI).

a) The first step in email marketing is to optimize the send lists. The hotel should:
b) Target repeat guests - Not only is it easier to target repeat business than to generate new leads, it's less expensive too; statistics show that attracting new guests can cost you five to eight times as much as retaining existing ones. In order to increase revenue, the hotel may offer return guests special package deals and time-sensitive reward program benefits
c) Take advantage of peak periods - Guests are more likely to look for rooms in the run-up to peak periods, so the hotel will remind them why they should book here with holiday-themed emails, special discounts and personalized incentives. It is during those peak periods that hotel is more likely to attract new guests.
d) Collect customer data - every customer who books a hotel room online provide their email address in order to receive their confirmation email and other important information from the hotel. The hotel will collect this data at the time of booking or check-in and use it to follow up with customers in a timely fashion. Personalization is essential.
e) Optimize sending times – Hotel should personalize and send emails that relate directly to the guests' needs and preferences, bur regarding of which time zone they're in and send emails when they're most likely to be receptive. Research shows that emails sent on Fridays have the highest click-through rate (CTR) and those sent on Mondays generate the most revenue.
f) Use a call-to-action (CTA) and encourage replies - The most effective marketing emails engage the reader with CTAs and incentives, for example: invitations to book directly on website in exchange for vouchers and other incentives, requests for feedback in exchange for discounts or the chance to win a prize.

2.2. Online platforms

When making a decision in choosing a destination, there have been two major changes during the last decades: 1) the development of websites and platforms for consumer information, which are used by millions of active users, 2) the development of internet services and social media, which are becoming technological tools and develop platforms where tourists can share travel stories, supplement content created by other users, thereby promoting tourist destinations and tourist products. Today, the use of the Internet is on everyday basis, and it represents the easiest and fastest way to get information. Tourists, before deciding to travel to a destination, generally check the experiences and opinions of people who have already visited it on the Internet. This makes it difficult for travel agencies to do business, because if a potential tourist comes across a few bad ratings by researching a destination on the Internet, the users who have been there form a negative opinion about it, and it is very difficult for the travel agency to change their opinion. As a result, tourists' interest in the destination decreases, and travel agencies must constantly be on the lookout for new and better tourist offers. As it is important for consumers today to be able to quickly and easily get certain information, social networks can be the right way to promote a tourist destination. By analyzing the trends of new technologies, consumers have become more flexible and easier to adapt, thus creating a new type of user - digital. Today, there are many forms of communication where consumers can search, share and interact with other users. Platforms have developed where users create content together, such as Facebook, Twitter, Instagram, Snapchat, TripAdvisor, travel blogs, web-sites that are directly related to tourism. Information relevant to potential tourists is collected and shared here. Today, these platforms are the dominant channels of communication, with which online experiences are personalized, and it is possible to find all important information in one place.

2.3. The situation in Kazakhstan

Although the hotel industry in Kazakhstan has been growing significantly in recent years, it is mostly still dominated by small and medium-sized companies, with the increasing participation of international hotel chains in Astana and Almaty. For many people, social networks have become the main source of information and the best way to choose their next destination. Instagram and Vkontakte are the most popular social networks in Kazakhstan. Thanks to them, a large number of unknown or lesser-known tourist destinations in Kazakhstan are discovered and gain popularity, creating a better image of the destination. Due to the Covid-19 pandemic, part of the local population decided to spend their vacation in Kazakhstan and visit the cultural and natural sights that our country has to offer. The number of Instagram groups where locals share their travel photos, impressions, tips and recommendations has grown. Adding Instagram hashtags to posts increases the visibility of the destination and the promotion of tourism in Kazakhstan. Thanks to the connection between social networks and Google Maps, users can mark the location where the photo was taken when publishing. In this way, all users who see the photo can quickly find out which destination it is. Thanks to social networks, information is available with just one click. The Covid crisis has opened the doors of the online (digital) world in Kazakhstan as well. When it comes to tourism, the domestic tourism industry is starting to slowly recover and is just catching up with new digital trends. Hoteliers and other accommodation providers were among the first to start online business. Some have introduced reservation and payment systems on their websites, while many have taken advantage of the Booking.com and Airbnb platforms. The situation with travel agencies is a little different and they are still slowly and cautiously entering the online world. The first online travel markets are appearing on the domestic market, in order to make online reservations and pay for arrangements to agencies that are not yet ready for such investments. On such sites, one can find arrangements for numerous destinations offered by a large number of travel agencies. Apart from the offer itself, there is also the possibility of direct online booking. On the site, one can search for a complete offer of travel to the selected destination in one place, sorted by travel dates, places of departure, type of travel (for young people, for families, for pensioners) or other criteria. The selected trip can be booked at the same place, with automatic calculation of all surcharges and insight into the final price of the arrangement, which is paid directly to the organizer. One of the first platforms on the Kazakhstan market is GrandeVoyage, which understood the importance of connecting supply and demand, that is, connecting travelers and organizers via the Internet. In this way, they not only increased the number of passengers and the number of packages sold, but also influenced the longer stay of tourists at the destinations, made it easier for foreign tourists to choose a location, an adventure in nature or a trip to one of our cities, and became promoters of Kazakhstan and the foreign market. The administrators of this platform pointed out that the largest number of clients who book trips through this platform are of an older age, dispelling the myth that this type of booking is practiced only by the younger population. Another online booking platform for travel arrangements abroad is poehalisnami.kz. The platform has combined the offers of domestic travel agencies that organize interesting trips abroad. Booking on the online platform is completely free and the price of the arrangement is identical to the price offered by the organizer. Like other similar platforms, these two domestic ones also offer clients the opportunity to rate each completed tour and write a comment that is displayed on the tour page itself. This gives future clients the opportunity to see the experiences and impressions of those who have already been on a tour and thus make a decision about choosing a trip easier. In this way, the organizers, instead of surveying at the end of the tour and possibly selective insight into the impressions of travelers, receive direct information from users about the level of satisfaction during the trip, which can be guidelines for improving their services.

In this part of work, it will be presented online marketing and promotion on example of the hotel Radisson in Astana. Hotel Radisson Astana belongs to the Rezidor hotel group, one of the fastest growing hotel companies in the world. The company's portfolio includes large, well-segmented hotel brands:

The company's portfolio includes large, well-segmented hotel brands:

a) Quorvus Collection – a new generation of luxury hotels inspired by the lifestyle of the modern world traveler
b) Radisson Blu – first-class full-service hotels that combine a contemporary approach to design with a culture of innovative thinking, designed to meet the diverse needs of guests
c) Radisson Red – a hotel adapted to a specific lifestyle, a completely new brand inspired by art, music and fashion
d) Park Inn by Radisson – a family-oriented hotel brand that provides a comfortable stay in a safe environment.

With over 440 properties, Rezidor has more than 96,000 rooms in 72 countries. Information technologies are of key importance for the business of this group of hotels and the main support for these complex tasks, as well as sales and propaganda. The common reservation system, management model and access to global marketing led to the improvement of business processes, raising the quality of services, all with the aim of greater profit. Accordingly, Hotel Radisson Blu Astana differs from the competition of other Astana hotels. Managing the business is in a consistent manner, paying special attention to details, marketing and promotion. Hotel motto "Yes I can!" is both a mission and a vision, presenting the very core of the entire business and defines the philosophy of providing services in this hotel. It was created as a result of the demand to satisfy the very specific needs of visitors and provide sophisticated services to the modern guest. This kind of attitude with a genuine positive attitude, which all employees adhere to, must be maintained towards every guest and partner.

The managers and management of the Radisson Blu Astana hotel strive to make the services of this brand recognizable. As a result of the need to improve business and raise the level of service, the 4-D (Develop, Delight, Drive, Deliver) strategy was developed. The rapid development of information technology has led the increasing use of the Internet for the needs of marketing activities and the increasing direction of marketing, and especially promotional activities, towards electronic marketing.

Considering that the first impression is the most important element of any website, the Radisson Blu hotel adapted its website to the marketing needs and everything that the target market of this hotel is looking for. The basic criteria, which are the most important for modern and good promotion through a website, have been met. The design of the site was done with special care, using the distinctive blue color, suitable typography and professional photos, high quality and selection, and which make a strong first impression on the user, who will want to visit the destination where the hotel is located. The design of the site makes an impression of the quality provided by this hotel. The content of the site is very interesting, inspiring and useful. On the site the hotel presents various offers and contents in an interesting and attractive way, with sound, animation and video. There is a possibility to choose up to 27 languages.It fully follows modern trends in the field of interactive internet marketing. Immediately in the main menu there is interactive content such as a video gallery and an interactive GIS map. In a prominent place on the front page, as well as at the bottom of the page, there are integrated options for social networks to enhance interactivity with guests and partners (Facebook, Twitter, Google plus, Pinterest, Instagram, You Tube, Blu Blog). In a prominent place on the home page (in the upper left corner) there is an integrated booking engine option, which is one of the standards regarding modern trends in Internet advertising. The Radisson Blu Astana hotel website consist on good organization of content and priority information, navigation on the website is easy, as well as the way in which the user can move through the pages. Pages and photos load quickly, which speaks of the compatibility of the applied technology and the good functionality of the website. Although the design of the hotel's website is designed to adapt to all devices (responsive web design), the optimization for mobile devices is satisfied in the best possible way by introducing the Radisson Blu One Touch innovative mobile application, which enables a wide range of services in a fast and efficient way. Hotel Radisson Blu Astana is present on today's most popular social networks: Instagram, Facebook, Twitter, Google Plus, Instagram, TripAdvisor, Pinterest, Youtube, FourSquare, Blu Partners. Instagram is certainly one of the most popular and massive social networks and an influential marketing tool. Photos, which in the case of the Radisson Blu Hotel are professional, unique and interesting, attract a lot of attention on hotel pages. The Radisson Blu Astana hotel page has been "liked" by a lot of Instagram users so far, and more than 5,000 have followed the page, which is a good result and comparable to the competition, taking into account the time of existence pages. The page contains up-to-date information about the hotel, it seems lively and maintained. The hotel's marketing department posts several posts daily about current events at the hotel, answers questions and comments, provides clarifications, because communication must always be two-way, discussion is encouraged, in order to constantly talk about the hotel. The communication is always in a professional way, but interesting and witty. In promoting the hotel, it is not only about the facility, but the focus is on the environment and events at the destination, interesting things, entertainment, discounts that the hotel offers (Advance Purchase): "Book a stay at the Radisson Blu Astana hotel twenty-one days in advance and save 20 %, by booking five days before arrival and save 15%, and if you book four days in advance you will save 10%"

CONCLUSION

In recent decades, the service sector is gaining in importance. In a good part of the developed world, its growth takes place very rapidly, and in some countries 60% to 70% of gross national income (GNI) in the services sectors, so that it far exceeds the percentage of industrial or agricultural production. At the same time, customers are increasingly demanding, expecting more value and profits of the services they purchase. In their relations with service companies are trying to gain greater influence on decision-making. Specifically, users are looking for a new relationship based on a new marketing, which is known as relationship marketing. His clear and characteristic feature is the creation and maintenance of long-term mutually beneficial relationships with a defined group of users. To develop and maintain customer loyalty in a competitive environment, hotels and restaurants now realize the need to improve services and service management.

Attraction and retention are the main goals in the profession of management relations and marketing in the hotel and restaurant. Retaining existing customers is the primary goal of relationship marketing. To achieve this goal, the service company must be prepared to timely notice and take notice of people who decide to no longer use the services of the company, and then to analyse their actions and plan future activities on the basis of available information and knowledge. In other words, the management of relationships with service users must pay attention to the specific causes that lead to the fact that some people "leave" the company. Managers are expected to ensure that the entire organization realizes the importance of customer retention. The introduction of incentives, planning and proper financing of business activities, it is necessary to encourage employees to minimize mistakes. More importantly, managers must use mistakes as a tool for continuous improvement in the quality of services provided to users. The key activities of marketing are to look for customers and determine their needs, so it is necessary to continuously design attractive products, promote them, and determine prices and deliver them to the requested place. Marketing management, i.e., analysis, planning, verification and supervision of designed programs are necessary in order to achieve the mentioned items. Concerning the social media, the hotels should focus on steps: correctly define hotel's audience, use the right content for that audience, target 'lookalike' audiences – those who have a similar profile to your existing audience, use retargeting tools, give leads top quality content. Since a friend's recommendation is more powerful (and less expensive) than any ad, the hotel should focus on word-of-mouth strategies first. Even giving a single traveller the best possible experience could result in more revenue if they're impressed enough to share the hotel around their social circles. This could be triggered from as little as one message or comment from hotel business to the customer that leaves them impressed with the service. Enticing customers with exclusivity can boost hotel volume of followers and engagement on Facebook, by treating hotel page more like a 'club'. It is helpful to offer promotions and deals that are only available to those that have liked hotel page.

Finally, the hotel should always interact with and reward loyal followers. All feedback, be it negative or positive, needs to be responded to. Moreover, the hotel should reply to comments and messages in a polite tone. Any new visitors will be looking at the way it deals with customer feedback and studying the reviews. A helpful way to handle this is to migrate the communications to Facebook messenger and encourage followers to also pursue this avenue of communication. That way, any negativity or hostility can be resolved in private. Achieving quality requires investment and has its price. In the long run it will surely ensure success and profit. One of the basic steps towards success is investing in promotion. That's why companies should pay special attention to promotion and all the communication elements that make it up, as well as to the creation of synergy between those elements, so that as a result, the unique message that the company broadcasts about itself is continuously and economically reinforced.

ONLINE MARKETING I PROMOCIJA HOTELSKIH USLUGA

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Sažetak: Intenziviranje konkurencije u online poslovanju zahtijeva različite marketinške strategije za hotele. Dinamično turističko tržište zahtijeva prilagodljivost u marketinškim i poslovnim pristupima. Informacijske i komunikacijske tehnologije (ICT) i razvoj hotelske industrije preoblikuju marketinške i prodajne strategije. Privlačenje gostiju postaje najveći izazov usred pritiska konkurencije. U digitalnom dobu, hotelski marketing obuhvata online platforme, što zahtijeva snažno prisustvo na mreži. Ovaj rad istražuje ulogu marketinških usluga u hotelima i restoranima, naglašavajući marketinški koncept usmjeren na usluge. Analizira ključne aspekte internet marketinga i njegov značaj u modernoj hotelskoj industriji. Trodijelna struktura pokriva osnovnu ulogu marketinga u hotelima, razmatranja u vezi s online marketingom i predstavlja primjer marketinga i online aktivnosti u Hotelu Radisson Astana.

Ključne riječi: online poslovanje, marketinške strategije, turističko tržište, prilagodljivost, ICT, hotelijerstvo, digitalni marketing,

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WATERFALL OR SCRUM METHODOLOGY - HOW TO CHOOSE ACCORDING TO THE SPECIFIC PROJECT?

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Abstract: This paper aims to perform a comparison of two methodologies used in project management and project work. It first describes the basic characteristics, strengths, and weaknesses of both methodologies to facilitate reaching certain conclusions. Then, it derives specific conclusions through a cross-comparison.

Keywords: Waterfall, Agile, Scrum, CBS, Product Owner, Gantt chart, Project Chart

I. INTRODUCTION

As an introduction, we will first briefly explain the concept of "project management." Project management is the process of planning, executing, and controlling activities with the aim of achieving specific goals within a defined timeframe, budget, and resources. Key elements of project management include: (R. Mulcahy, 2013)

1. Goal Definition: Setting clear and measurable project objectives to understand what needs to be accomplished.
2. Planning: Developing a detailed plan that includes tasks, resources, timelines, and budgets.

3. Execution: Carrying out activities according to the plan, monitoring progress, and addressing emerging issues.
4. Risk Management: Identifying and managing potential risks that may impact project success.
5. Monitoring and Controling: Regularly tracking project progress compared to the plan and properly managing changes.
6. Communication: Effective communication with team members, stakeholders, and decision-makers.
7. Project Closure: Assessing achieved results and closing the project once objectives are met.

Project management requires a balance between precision in planning and the ability to adapt to changes. Learning from experiences and continuous improvement are also critical aspects of project management. In this regard, it's essential not to limit oneself to a single project management methodology, but to explore various methodologies, as each has its strengths and weaknesses that come to the fore depending on the project type and its planning and execution circumstances.

In the following text, we will compare the previously dominant Waterfall (Natural, Traditional) methodology with one of the most well-known agile methodologies, the Scrum methodology. However, to do this, we will first introduce both methodologies, discuss their fundamental characteristics, strengths and weaknesses, mention the "Agile Manifesto," and then, through analysis based on a hypothetical scenario, arrive at a conclusion regarding when and how to use these project management methodologies.

II. BASIC CHARACTERISTICS OF THE WATERFALL METHODOLOGY

1. Project management in the Waterfall methodology is a traditional approach to project management that consists of sequential phases executed in order, with minimal backtracking to previous phases. The fundamental characteristics of this methodology are: (Project Management Institute, Inc., 2013)

- The project is divided into clearly defined phases, such as initiation, planning, execution, control, and closure.
- Each phase is executed sequentially, then proceeds to the next phase. Before moving to the next phase, each phase must have clearly defined objectives and specifications. This means that all

project requirements and goals are identified and documented in advance.
- The Waterfall approach is carried out linearly, meaning there is no going back to previous phases. Each phase must be fully completed before moving on to the next.
- Quality control activities are conducted in each phase to ensure that objectives are met, and results are satisfactory.
- Projects managed with the Waterfall methodology often require detailed documentation in each phase, including plans, specifications, analyses, and reports.
- The Waterfall methodology is most suitable for projects that can be fully planned in advance and where significant changes are not expected during execution.
- The Waterfall approach can be rigid and less flexible for projects that require significant number of changes or adaptations during execution.

The advantages of the Waterfall methodology can be summarized as follows:
- The Waterfall approach provides a clear structure and precisely defined phases, making it easier to understand and manage the project. Each phase has its specific objectives and tasks, ensuring precision in planning and execution.
- Phases in a Waterfall project often include quality control and verification activities. This allows problems to be identified and addressed in the early stages of the project, reducing the risk of unexpected issues later on.
- The Waterfall methodology requires detailed documentation, including plans, specifications, and reports. This documentation facilitates project progress tracking, communication with stakeholders, and a better understanding of project requirements.
- The Waterfall methodology works best for projects whose requirements and goals can be fully planned in advance and are not expected to change significantly during execution. This is particularly useful for projects with strict regulations, such as healthcare, aviation, and military projects.
- The Waterfall methodology simplifies project planning, monitoring, and management because everything is predefined. This is valuable for organizations that prefer structured processes and precisely controlled end results.

While the Waterfall methodology has its advantages, such as a clear structure and documentation, it may be less suitable for projects that change rapidly or require flexibility. In practice, this means that, for example, if you have a project that demands a highly developed user interface, the delivery of that interface, along with other parts of the software, will only occur during the execution phase. However, during the planning phase, the client did not have a clear plan for this interface, and ideas for improvements only emerged after receiving the finished product. This becomes problematic because there is no going back to previous project phases. The only solution is to open a new project, which introduces new problems, a new budget, additional time spent, and so on. This example is not exotic but something that occurs more frequently, especially with projects heavily involving information technology. Hence, other methodologies, such as agile approaches, have been developed to provide greater adaptability during project execution.

III. AGILE MANIFEST

Agile methodologies have been developed to enable rapid, flexible, and collaborative delivery of software projects and products. The core principles of agile methodologies are outlined in the "Agile Manifesto," which comprises 12 principles: (https://agilemanifesto.org/principles.html)

1. Customer Satisfaction: The primary purpose of software development is customer satisfaction. The agile approach focuses on delivering value to users.
2. Change Is Welcome: Agile teams welcome changes in requirements, even late in development. Agility means being able to adapt to changes to deliver greater value.
3. Frequent Deliveries: Software deliveries should be regular and frequent, with an emphasis on quickly delivering value. This allows users to see and use new features sooner.
4. Collaboration with Customers: Teams and customers should work together throughout the entire project. Open communication and collaboration are crucial.
5. Build Around Motivated Individuals: Provide individuals with the tools and support they need to get the job done. Motivated individuals make a difference.

6. Working Solutions Over Documentation: Agile teams focus on delivering software, i.e., work that brings value. This means less documentation and more action.
7. Maintain a Sustainable Pace: Establishing a stable work rhythm helps maintain productivity and quality. Work should be sustainable in the long run.
8. Technical Excellence: Technical excellence is essential. Teams should aim for high-quality standards and technological solutions.
9. Simplicity: The best way to convey information and solve problems is through simplicity. Avoid unnecessary complexity.
10. Self-Organization: Teams are responsible for planning and decision-making. Self-organized teams better understand and accept responsibilities.
11. Reflection and Adaptation: Regularly monitor team work and continuously adapt to achieve better results. This includes retrospectives and continuous improvement.
12. Team Spirit: Teams should collaborate, communicate, and act as a whole. Team spirit and unity are key to success.

These principles collectively shape the agile approach to software development and projects, enabling teams to be efficient, adaptable, and value-oriented. Reading these principles, it's clear that the aim is to have smaller, more flexible teams that are highly team-oriented and, as such, are flexible enough to deliver product increments during development, which can now be tested and adjusted in the early stages. It's evident that agile methodologies are highly adaptable for managing software projects.

IV. BASIC CHARACTERISTICS OF SCRUM PROJECT MANAGEMENT METHODOLOGY

The Scrum methodology relies on incremental and iterative development, where functionalities are developed in small cycles known as sprints. Each sprint brings additional functionalities and enables the team to rapidly deliver new, incremental value. The key characteristics of this project management methodology are: (K. Schwaber, J. Sutherland, 2017)

- Scrum methodology relies on self-organizing teams responsible for developing, testing, and delivering software products. Teams are typically small, self-organizing, and aim to be sufficiently trained to independently perform assigned tasks.

- In Scrum methodology, there is a role called the Product Owner who is responsible for defining priorities and product requirements. The Product Owner communicates with the team and makes decisions about what will be developed. From other side he communicates with stakeholders and he is some kind of interfaces between team and stakeholders.
- The team plans and conducts sprints, typically lasting 2 to 4 weeks. Each sprint begins with planning, where goals and tasks to be completed during that sprint are defined.
- Teams hold daily Scrum meetings to synchronize, share progress information, and identify obstacles. These meetings are short and direct.
- At the end of each sprint, teams hold retrospectives to identify what can be improved in the upcoming sprints.
- Teams use visual control boards (Scrum boards) to track progress and see what is currently in progress, what is completed, and what is remaining.
- The Scrum methodology places a strong emphasis on delivering value to customers after each sprint. The goal is to provide functionality that is usable and can be immediately utilized. Incremental value means that, with each sprint, all the functionalities that were delivered before are in working condition, plus new functionalities resulting from the observed sprint.
- The Scrum methodology allows changes in requirements and priorities during development, facilitating adaptation to changes in the environment.
- The Scrum methodology promotes a culture of continuous improvement and learning from experience to enhance processes and outcomes.

Scrum methodology offers several advantages over the waterfall methodology, especially for projects facing changes and dynamic requirements: (F. Heath, 2021)

- Scrum is highly flexible, enabling teams to adapt to changes in requirements during development. In a waterfall approach, changes are harder to accommodate and often require significantly more effort and resources.
- Scrum allows for early collection of user feedback because functionalities are delivered in short iterations. This helps in

identifying and addressing issues and changes before they become significant.
- Scrum focuses on delivering value to customers after each sprint, whereas the waterfall approach typically requires the entire project to be completed before users receive any value.
- Scrum promotes transparency in the project. All team members have insight into progress, priorities, and obstacles, making project management more efficient.
- Scrum encourages teamwork and shared responsibility. Each team member is accountable for delivering value, which fosters better collaboration and engagement.
- Risks are identified and managed early in Scrum. Teams work on risks in real-time, reducing the likelihood of serious issues in later project stages.
- Scrum enables faster delivery of functionality, which is particularly important in dynamic markets where rapid responses to changes are highly valued.
- Scrum strongly focuses on customer satisfaction. Teams regularly communicate with users and adjust products to meet their needs.
- Scrum fosters continuous process improvement and better results through retrospectives and iterations.
- Scrum allows for better cost and resource control as teams regularly estimate and adjust the scope of work.

Scrum is an agile methodology used for developing software products, but it can be applied to other domains as well. The primary goal of the Scrum methodology is to enable efficient project management and deliver value to customers in iterative cycles. While Scrum methodology has many advantages, it’s important to note that it is not a one-size-fits-all solution and may not be suitable for all projects. Some projects, such as those with strict and well-defined requirements, may work better with a waterfall approach. The choice between Scrum and the waterfall methodology depends on the specific project requirements and circumstances.

V. COMPARISON OF SCRUM AND WATERFALL METHODOLOGIES

It is clear from the above that for smaller software-oriented projects, agile methodologies, especially the Scrum methodology, have prevailing advantages over the Waterfall methodology. However, what happens when managing large projects with well-defined requirements and a heterogeneous composition of participants (meaning that project members are not only IT professionals)? In these situations, project management can be complex, and the choice between Scrum and the Waterfall project management methodology will depend on the specific needs and characteristics of the project. Accordingly, the following key factors should be considered:

- If the project requirements are tightly defined, and changes are not expected or are minimal, the Waterfall methodology may be appropriate. In the Waterfall methodology, all phases are meticulously planned in advance, which can be useful for projects with clear requirements.
- If there is a need for greater flexibility in the project, Scrum can be beneficial. Scrum allows for quick adaptation to changes and adjustments during development, which is particularly useful if the project faces uncertainty or changing requirements.
- In some cases, projects may use "hybrid approaches" that combine elements of both Scrum and Waterfall methodologies. For example, a project may use the Waterfall methodology for the planning and design phase and then switch to Scrum for the execution and testing phase.
- Projects with a heterogeneous composition and a large scope often carry higher risks. Scrum can enable better risk management because risks are identified and managed in real-time during iterations.
- It's important to consider the level of experience and training of project participants. Scrum requires a certain understanding of agile principles and practices, while the Waterfall methodology may be more familiar and easier to apply, especially for project members who are not from an IT background.
- Projects with a diverse composition often require good communication and collaboration. Scrum promotes this type of interaction, while the Waterfall methodology may require a stricter communication structure.

- Large projects require efficient monitoring and management. The Waterfall methodology can provide a clear structure for monitoring, while Scrum requires continuous tracking of progress during iterations.

In essence, the choice between Scrum and Waterfall for larger projects depends on the specific characteristics of the project, as well as the needs and preferences of the team and organization. It is possible to combine elements of both approaches to achieve the best balance between control and flexibility. It's important to thoroughly consider all factors and make a decision that best suits the project.

To delve deeper into this comparison, consider a situation where we want to convince the bank's management to support the replacement of the Core Banking System (CBS) with a newer one from another vendor, using the Scrum methodology, for example. Scrum methodology can be beneficial, although it requires a different approach compared to traditional Waterfall methodologies. One possible scenario could be:

1. Create a sprint campaign plan: Begin by defining sprint campaigns, i.e., sets of goals that will be achieved during each sprint. The goals should be focused on preparing for the replacement of the CBS and achieving concrete steps in the process.
2. Identify key functionalities and requirements: Think about the key functionalities and requirements of the new CBS and identify them in advance. This will help prioritize the development and implementation of these features.
3. Create a backlog: Create a backlog, a list of requirements and functionalities that will be implemented during the sprint campaign. This list will serve as the basis for planning and tracking work during sprints.
4. Assemble a Scrum team: Put together a Scrum team to work on the project. This team should be multifunctional and include members with different skills required for the implementation of the new system.
5. Sprint planning: Plan sprints with the aim of achieving concrete value and progress towards replacing the CBS. Decide how long each sprint will last and what the priorities will be for each sprint.
6. Regularly communicate with the bank's management: In Scrum methodology, transparency and regular communication are key. Therefore, regularly update the management on the project's progress and the achievement of goals defined in the sprint

campaigns. Organize Sprint Review meetings to present the progress made and engage in open discussions with significant stakeholders.

7. Adapt to changes: Scrum allows for quick adaptation to changes. If new information or changes in priorities arise during the project, the Scrum team can easily adjust the plan and priorities.
8. Continuous improvement: After each sprint, organize retrospectives to identify what worked well and what can be improved. These retrospectives enable the team to continuously enhance their work.
9. Documentation and risk monitoring: While Scrum promotes "less documentation and more action" it's still important to document key aspects of the project and monitor risks. This will help stay within the boundaries and be prepared to respond to possible challenges.

At first glance, it might be said that using Scrum can achieve better transparency, a faster response to changes, and a focus on delivering value during the CBS replacement process. It's essential to highlight the advantages of the agile approach, such as quicker adaptation to changes and continuous improvement, to convince the management of the benefits of this approach in such a project. However, in practice, management may demand precise indicators, particularly costs, employee engagement, duration estimates. Additionally, considering that more banking professionals are involved in the project than programmers, it raises the logical question of what to expect in such a case.

In such cases, the traditional Project Chart (Gantt chart) can provide more clarity and precision in project management compared to agile methodologies like Scrum. Taking this into consideration, we arrive at the following comparison:

1. Developing a Project Chart involves:

- Precision in planning: The Project Chart enables detailed planning and provides accurate estimates for each project phase. This is useful for budgeting and cost management.
- Defined deadlines: The Gantt chart allows for clearly defined deadlines for each project phase, aiding in time tracking and management.
- Easier communication with management: The Project Chart offers a visually clear representation of the project, simplifying communication with management and conveying critical information.

- Compatibility with the Waterfall method: The Project Chart aligns better with this approach as it provides a stricter plan and control.

2. Scrum methodology implies:

- Flexibility: As mentioned before, Scrum is flexible and allows for adaptation to changes. This is useful when it's challenging to predict all project elements accurately in advance. It's worth noting that for a project that is mostly well-planned but has some less certain parts, Scrum can be beneficial in such cases.
- Focus on value: Scrum concentrates on delivering value throughout the project's development. This can help in demonstrating progress during the early project phases.
- Improved interaction with end-users: Scrum enables regular interaction with users, which can enhance understanding of their needs and promote their involvement in the development process.
- Continuous improvement: Scrum encourages continuous process and results improvement, valuable for optimizing the team's performance over time.

The choice between a Project Chart (Gantt chart) and Scrum methodology depends on the specific needs and requirements of the project, as well as the preferences and expectations of management. In situations where precise costs, accurate deadlines, and a firm plan are of utmost importance, the Project Chart may be the better choice. However, Scrum can be useful in projects where there is a need for greater flexibility, faster adaptation to changes, and improved interaction with end-users.

Here, some of the characteristics of the Scrum methodology, which were not critical in the previous example, have been intentionally reiterated. We will attempt to further elaborate on the fact that the success of the Scrum methodology primarily depends on the ability of Scrum teams to independently perform their assigned tasks, be self-organizing, and act as a homogeneous team. Additionally, one of the tenets of the Scrum methodology is that the Developer team is structured in a way that eliminates titles and rankings within the team (to facilitate homogeneity) and that there is only collective responsibility for the work done. On the other hand, banks are traditionally organized hierarchically, which can pose a challenge when forming Scrum teams.

But first, let's consider the challenge of building a good Scrum team and what it takes to achieve that. Creating a highly-profiled, homogeneous team can be challenging, especially in situations where teams are new and have limited experience with Scrum. In such cases, it would be useful to do the following:

1. The first step is to provide team members with education on Scrum methodology and agile principles. Understanding the basics of Scrum is crucial for successful implementation.
2. Engaging mentors or Scrum experts can be helpful, especially in the early stages of team work. Mentors can share their experience and provide guidance.
3. It's important for team members to build trust among themselves. Encourage open communication and collaboration to create a positive work atmosphere.
4. Define clear goals and expectations for the team. Each member should understand what is expected of them.
5. Encourage team members to take responsibility for their work and contribute to the team's goals.
6. Teams without experience should receive ongoing support and learning opportunities. This may include regularly conducting retrospectives and identifying areas for improvement.
7. Help the team understand the focus on delivering value. Encourage them to concentrate on customer satisfaction and achieving project goals.
8. Scrum promotes continuous improvement. Encourage the team to identify and resolve issues to improve their work over time.
9. Developing a high-performing Scrum team takes time. Expect challenges at the beginning and be prepared to address them together with the team.
10. Creating a positive team environment is essential. Encourage the team to innovate, collaborate, and engage in continuous learning.

Developing such a team requires patience and dedication, but it can result in a highly efficient and productive team capable of self-organizing, self-managing, and successfully completing projects. It's important to support the team and work together to develop skills and capabilities.

Let's now consider the conclusion regarding the development of a Scrum team, which is patience and dedication. Does this mean that a bank looking to transition to a new program should first form Scrum teams, train them, and patiently wait for them to mature? How long would this maturation process take, and on the other hand, the bank is naturally impatient as it wants to renew its program to remain competitive in the market?

In such situations, there are several strategies that an organization can employ to expedite the maturation process of Scrum teams:

- As mentioned earlier, engaging experienced agile coaches can accelerate the learning and implementation of Scrum. They can work directly with the teams to provide guidance and support.
- An organization can consider a hybrid approach, combining elements of Scrum with some traditional methods to meet the need for quick responsiveness. For example, teams can use Scrum for software development aspects of the project while employing a traditional approach for other project aspects.
- Intensive training programs and mentorship can help teams quickly grasp Scrum and apply it. This involves working with experts who collaborate with the teams until self-organization, self-management, and high efficiency are achieved.
- The bank can hire experts in the banking industry who understand the specific needs and regulations of the sector. This can help teams develop solutions that align with banking requirements more rapidly.
- Defining clear and measurable project goals can help teams focus on delivering value as quickly as possible.
- Regular monitoring and evaluation of team progress are essential. This will allow the identification of project areas that need improvement and the opportunity for quicker adaptation.

It's important to note that there's no universal timeframe for the maturation of Scrum teams, and the speed of maturation will depend on various factors, including the current knowledge and skills of the teams, the resources available for training and support, and the complexity of the projects on which the teams work. Organizations aspiring to adopt an agile way of working should be aware that it takes time to achieve a high level of self-organization, self-management, and efficiency. In the meantime, organizations can use hybrid approaches to balance the need for rapid responsiveness with the development of agile teams.

Among the aforementioned tips, the one mentioning the adoption of a hybrid method is particularly interesting, especially in situations where there are many non-IT professionals involved in the project, as they are more challenging to train within Scrum teams. A hybrid approach can be an effective way to strike a balance between the need for agility and flexibility and the requirements for clear planning and control, especially in situations such as the replacement of the CBS in a bank.

A hybrid approach can be considered beneficial for several reasons:

- Flexibility in Implementation: A hybrid approach allows for selecting the best elements from different methodologies to meet the specific needs of a project. For example, it can involve using agile methodologies for software development while simultaneously applying the traditional Gantt chart for planning and tracking activities.
- Managing Complexity: Large projects, especially in the banking sector, are often extremely complex and require detailed planning and management. A hybrid approach can provide better management of this complexity.
- Incorporating Non-IT Team Members: Team members who are not from an IT background may feel unprepared to work in a fully agile environment. A hybrid approach can accommodate their needs and comfort.
- Regulatory Compliance: Banking is often subject to strict regulations. A hybrid approach can facilitate reporting processes and compliance with regulatory requirements.
- Balancing Speed and Control: A hybrid approach allows an organization to maintain a balance between the speed of delivery and project control.

It's essential for the organization to carefully consider the specific requirements of each project and adapt the methodology accordingly. A hybrid approach can be especially useful in situations where different team members have varied skills and constraints.

Given all these analyses, one proposed approach for the described case of replacing the CBS in a bank is as follows:

- Organize Scrum teams with IT professionals and banking technologists who have expertise in specific areas.
- Use the Waterfall methodology for other aspects of the project.
- Generally proceed with the Waterfall method, while handling critical tasks such as GAP analysis (which identifies differences between the existing and new CBS to support already sold products not covered by the new software solution) and the user interface development iteratively through small groups organized into Scrum teams.

This approach offers several key advantages:

- Rapid Value Delivery: By using Scrum teams for critical IT project components, software and technology aspects that are of paramount importance can be developed and delivered more swiftly. The mentioned GAP analysis can be carried out through Scrum teams, while parallel work is done on iterative user interface development, training, and more.
- Greater Adaptability: Scrum allows for quick adaptation to changes, which is valuable in the IT field where requirements often change, especially for user interface development, for instance.
- Precision in Traditional Aspects: The Waterfall methodology enables precise planning and control of other project segments, making it easier to organize team members who are not in Scrum teams.
- Clear Deadlines and Budget: Using the Waterfall approach allows for precisely defined deadlines and budgets, which are crucial for projects in the banking industry.
- Resource Optimization: Teams specialized in specific areas can efficiently leverage their skills and resources.
- Risk Mitigation: Combining agile and Waterfall methodologies can help reduce risks and facilitate project management.

The key is to carefully assess where Scrum and agile approaches best meet the project's needs and where precision and clearly defined control are necessary. A hybrid methodology can be a highly effective way to strike a balance between these requirements. It's crucial to involve relevant experts and adapt the approach to the specific characteristics of the project.

VI. Conclusion

Based on everything discussed, the conclusion would be as follows. For purely IT software projects, Scrum is the best solution. For well-defined large projects that require "military" precision, the Waterfall methodology emerges as the best solution. In other variations, especially when it's a mixture of IT and business, as in the case of replacing a CBS in a bank, it's best to go with a hybrid method.

For - Scrum (Agile Approach for IT Projects):

- Scrum enables rapid value delivery through iterations, which is useful for IT software projects where requirements often change.

- The agile approach allows better adaptation to changes in requirements.
- Regular interaction with users improves understanding of their needs and enhances user satisfaction.

Against - Scrum:

- Implementing Scrum may require changes in an organization's culture and practices, which can be challenging to carry out. For example, reconciling an extremely hierarchical approach in an organization (such as a bank or the military) with Scrum's logic of self-organizing teams where self-management and equality prevail.
- Scrum is less precise in terms of long-term planning and budgeting.

For - Waterfall Methodology (for well-defined projects):

- The Waterfall methodology allows detailed and precise project planning, which is useful for projects where requirements are well-defined in advance.
- The Waterfall methodology provides clearly defined deadlines and budgets, which are important in situations where precision is critical.

Against - Waterfall Methodology:

- The Waterfall methodology can be inflexible when changes in requirements are needed during the project.
- Long-term projects are susceptible to unforeseen issues, which can increase risk.

For - Hybrid Methodology (for projects that require a balance between precision and agility):

- A hybrid methodology allows balancing between agility (through Scrum) and precision (through Waterfall) according to project needs.
- Projects can be effectively managed by following agile principles for rapid delivery and precise methodologies for control and planning.

Against - Hybrid Methodologies:

- Requires effective management by experienced managers to ensure that both components (agile and Waterfall) work together and achieve the project's goals.

In the end, it's important for each organization to carefully consider the specific needs of its project and environment and choose the methodology that best suits those needs. Each of the mentioned methodologies has its advantages and disadvantages, and the right adapted methodology can help in the successful completion of the project. It's also important for the organization to be ready to adapt its approach to deal with changes during the project.

WATERFALL ILI SCRUM METODOLOGIJA - KAKO ODABRATI PREMA KONKRETNOM PROJEKTU?

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Sažetak: Ovaj rad ima za cilj da izvrši poređenje dvije metodologije koje se koriste u upravljanju projektima i projektnom radu. Prvo opisuje osnovne karakteristike, prednosti i slabosti obje metodologije kako bi se olakšalo donošenje određenih zaključaka. Zatim se izvode konkretni zaključci kroz unakrsno poređenje.

Ključne riječi: Waterfall, Agile, Scrum, CBS, Product Owner, Gantt chart, Project Chart

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ANALYSIS OF FIXED AND CURRENT ASSETS IN THE FUNCTION OF THE DEVELOPMENT OF ECONOMIC SOCIETY

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Apstrakt: Effective management of assets is crucial for the success of any business. Mismanagement of assets can lead to serious consequences such as loss of liquidity or financial losses. A company's assets include fixed and current assets, accrued assets, and unpaid registered capital which are all listed on the active side of the balance sheet. When analyzing total assets, it is important to focus on business assets such as fixed and current assets and accruals as they directly impact the financial result. Usually, a business should have a higher proportion of current assets than fixed assets since fixed assets constantly depreciate due to depreciation. However, in certain businesses such as transport companies or hydroelectric power plants, fixed assets are more dominant. Therefore, businesses should consider the specifics of their operations when analyzing their balance sheets.

Keywords: fixed assets, current assets, capacity utilization, asset efficiency, turnover ratios.

INTRODUCTION

Fixed and current assets represent a key point of focus for the company's management, given the huge financial resources invested in these two types of assets. The financial result of the company directly depends on high-quality and thoughtful investments in fixed and current assets, as well as on the efficient management of these resources. Within the domain of business asset analysis, some domestic authors use the term "operating assets" to describe fixed and current assets, although

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this term is not separated as a separate item in the balance sheet. Our perspective supports the use of this term, if the analysis focuses on the specifics of these segments. When conducting an analysis of business assets, it is necessary to analyze the loss that exceeds the capital in the evaluation of business assets. If the loss above the capital is recorded within the assets of the balance sheet, it indicates the unfavorable status of the company. In order to avoid bankruptcy, it is imperative to implement rehabilitation measures on the company, provided that the assumed criteria for implementing rehabilitation are met.

When analyzing fixed assets, it is crucial that the participation of equipment is dominant, given that modern equipment is essential for achieving profitable production. Technological progress leads to a shorter service life of modern equipment, which requires continuous modernization of production capacities. As an illustration, the Japanese car manufacturer Toyota requires between eighteen and twenty-four months to launch a new product, and artificial intelligence further accelerates these processes.

In the perspective of the future, the role of workers is becoming a subject of uncertainty, and companies are increasingly turning to joint operations with foreign partners through forms of merger (merger-fusion). Foreign partners bring the necessary knowledge and technology, while we provide an educated workforce and a stable raw material base. When it comes to current assets, special attention is directed to inventories, which usually make up a significant part of fixed assets. Supplies are engaged with both domestic and foreign capital. The optimal inventory composition should include finished products and partially unfinished products. In the context of inflation, higher stocks of raw materials can be useful.

Analysis of factors that potentially negatively affect fixed and current assets remains the responsibility of management. It is important to note that in this paper we did not investigate intangible assets in detail, which often make up the majority of the assets of many foreign companies. In highly developed countries, in the last fifteen years, significant investments have been directed towards intangible assets, which further emphasizes the dynamics and evolution of the modern business environment.

ANALYSIS OF FIXED ASSETS

Analysis of fixed assets includes: (4, p. 240)

- the structure of fixed assets,

• obsolescence of fixed assets,
• capacity utilization i
• efficiency of use of fixed assets.

The structure of fixed assets is determined based on the purchase and current value of intangible investments and fixed assets, viewed from the perspective of their purchase value. This structure is conditioned by the specifics of the company's activities, whereby, for example, buildings will prevail in commercial companies, agricultural land will dominate, and equipment, tools and inventory will dominate in industrial companies. When the current value of a fixed asset is low, it may indicate its dilapidated or written-off status, which is a signal for the need to purchase new fixed assets. Terminology such as "fixed assets" or "fixed assets" may still be encountered, but all these designations refer to fixed assets.

The structure of fixed assets (in 000 KM) can also be shown as follows (Table 1):

Table 1. Structure of fixed assets

Number	**Position**	**Value**			
		purchase	**% parti-cipation**	**current**	**% of pa-rticipa**
1	**Intangible investments**	-	-	-	-
	Founding investments	-	-	-	-
	Investments in development	-	-	-	-
	Concessions, patents, licenses, etc. Rights	-	-	-	-
	Goodwill	-	-	-	-
	There are no others. investments	-	-	-	-
2	**Land, forests and higher plantations**	2,017	99.50%	987	99.00%
	Land, forests and more. plant	12	0.50%	12	1.20%
	Construction objects	-	-	-	-
	Equipment	1,963	97.00%	957	96.00%
	Tools and inventory	42	2.00%	18	1.80%
	Other fixed assets	-	-	-	-
3	**Long-term financial placements**	-	-	-	-
	Participation in the capital of related and other legal entities	-	-	-	-
	Long-term loans to legal entities and other long-term loans	-	-	-	-
	Long-term HOV	-	-	-	-

	Other long-term placements				
4	**Investments in real estate**	10	0.50%	10	1.00%
	Investments in buildings owned by	-	-	-	-
	Investment in lease. construction of facilities	10	0.50%	10	1.00%
	Investing in land development	-	-	-	-
	Other investments	-	-	-	-
5	**Deferred tax assets**	-	-	-	-
6	**Fixed assets (1+2+3+4+5)**	2,027	100.00%	997	100.00%

Source:Authors

The observed company is profiled in the sector of felling forest trees and construction of forest roads, which implies that the dominant category in the structure of fixed assets is equipment. The value of construction facilities is negligible, considering that forest barracks are used. Tools and inventory, although present, occupy a symbolic role in the total value of fixed assets.

Obsolescence (wear and tear) of fixed assets is measured by the ratio of the correction of the value of fixed assets and the purchase value of fixed assets, i.e.: (4, p.235)

$$\frac{\text{Value correction}}{\text{Purchase value}} \times 100 \quad = \quad \text{Obsolescence of fixed assets}$$

In our example, the depreciation of fixed assets is 51.06% (1.030/2.017 x 100 = 51.06%).

Based on the current data, without a deeper analysis, it could be concluded that the moment is right to initiate the process of acquiring new fixed assets. It is crucial to carry out a precise evaluation of the degree of wear and tear of each category of assets in use. It is possible that some assets were recently acquired, while others have already reached the stage of obsolescence and require replacement. It is important to note that in this sector the equipment often remains in use even after it has been fully depreciated. Full depreciation does not necessarily indicate that the asset is so worn out that it can no longer be effectively used.

Capacity utilization

The basic resource in the reproductive process can be subjected to complete or incomplete use. Full exploitation means 100% utilization of the capacity of the basic asset, and only in such conditions can a rational use of it be achieved. On the other hand, incomplete exploitation indicates the use of the fixed asset below its maximum capacity, which results in a financial result below what is potentially possible.

It is important to point out that it is not possible to measure the degree of capacity utilization for all types of fixed assets. Such measurements can only be carried out for assets whose exploitation is directly linked to a measurable effect. For example, in the food industry it can be the volume of processing of basic raw materials or the production of finished products, while in the case of tractors, bulldozers and other machines, which we analyze in our example, parameters such as the number of working days or working hours are relevant.

It is especially emphasized that, since it is not possible to measure the degree of capacity utilization for all types of fixed assets, it is recommended to first allocate those assets for which such measurements can be carried out, after which these assets are classified in groups according to the measurable effect that assesses the degree of capacity utilization . Capacity can be technical, optimal, real, even planned. Technical capacity represents the theoretically possible performance of a fixed asset. Real capacity is the actual performance that can be achieved given the current state and readiness of the fixed asset. In practice, the planned capacity is often mentioned, which is usually lower than the real capacity. Capacity planning in the analyzed company depends on weather conditions, while factors such as work intensity and staff availability can lead to the planned capacity being significantly lower than the real one.

If we take the example of the analyzed company, where the annual roundwood harvesting of approx. 450,000 m3 was planned, and approx. 360,000 m3 was cut, then the percentage of real capacity utilization would be 80% (360,000/450,000 x 100 = 80%).

During the calculation, we used the formula used by most of our authors: (6, p.168)

Percentage of real capacity utilization = (achieved production volume/ production volume that rejects real capacity) x 100

Technical equipment (efficiency of using fixed assets) is measured by the ratio of equipment used and the average number of employees, according to the form: (4, p.249).

((Purchase value of equipment according to the opening balance + Purchase value of equipment according to the closing balance) / 2) / Average number of employees

In our specific case, when analyzing the financial parameters, the initial purchase value of the equipment, as shown in the opening balance, is 974.00 KM, while the final purchase value of the equipment according to the closing balance is 957.00 KM. In parallel with that, the average number of workers is 95. Applying the appropriate formula, we get a result of 10,163. This value practically represents the measure of the use of equipment per one production worker.

In the interpretation of this result, the high number of 10,163 indicates the efficient use of equipment per employed worker. In practice, a higher value of this parameter suggests improved technical equipment, which, as the rule dictates, has a positive effect on work productivity. In other words, higher technical equipment usually results in higher productivity, while the reverse is true if the value is lower.

ANALYSIS OF CURRENT ASSETS, STRUCTURE AND TURNOVER COEFFICIENT

Current assets[3] are a part of business assets that, as a rule, suddenly transmive its value to the product of new usable value (Table 2).

Table 2. Current assets of the company

Number	Position	Ammount	% participation
1	**Inventories, fixed assets intended for sale and advances**	**114**	**10.81%**
	material	85	8.06%
	finished products	3	0.28%
	unfinished production	-	-
	advance payments	26	2.46%
	goods	-	-
	other	-	-
2	**Short-term receivables and placements**	**798**	**75.64%**
	customers	420	39.81%
	claims from specific relationships	315	29.86%
	other claims	63	5.97%
3	**Cash and equivalents**	**143**	**13.55%**
	cash	143	13.55%
4	**Current assets (1+2+3)**	**1,055**	**100.00%**

Source: Authors

As we analyze the current assets of the company we are following, it's evident that the item of short-term receivables is the largest. This is logical, as the company produces goods for sale. A favorable structure

3 Some authors use the term liquid assets.

of current assets is indicated by cash, which accounts for 13.55% of total current assets. This information means that the company is liquid.

For companies engaged in production, inventories are the largest item and require special attention. If the stock of materials is large, it is essential to break down the materials into related groups, such as raw materials, auxiliary material, lubricant, fuel, small inventory, etc. Then, determine the group in which the disturbance occurred and break it down further by type to identify the material that caused the disruption in the inventory structure. The causes that led to the disorder are examined. Production in progress is broken down into semi-finished and unfinished products to determine where the disruption occurred. If it's the semi-finished product, further analysis is carried out by type (e.g., food industry) to identify the type causing the overstock. Production in progress is broken down by activities: primary, secondary, and auxiliary. Within activities, the breakdown is done by narrower organizational units to determine where there was a disruption in the inventory structure.

When it comes to finished products, it's necessary to identify which product has the worst sales, especially if the company produces multiple products (e.g., different types of juices or jams in different packages and weights). This is most easily determined by more frequent analysis of the inventory of finished goods. Possible causes of poor sales of finished products can be high prices, poor quality, the appearance of substitutes, etc.

When analyzing the position of short-term receivables and placements, the key focus should be on customers, regardless of whether they are related legal entities or other clients. Every company produces results with the aim of selling them. A delay in the settlement of obligations by customers, according to the agreed terms, results in a decrease in current liquidity. For this reason, it's extremely important that sales and marketing functions have a comprehensive understanding of current and potential customers.

The efficiency of current assets is measured through the turnover ratio, which essentially represents the number of days tied to inventory, accounts receivable and total current assets. In professional literature, the term "coefficients for determining quality in economics" is often used. However, we believe that this term is more appropriate, as it provides more comprehensive information. It includes the capital turnover ratio, which is related to inventory, accounts receivable, suppliers and total revenue. It also includes the ACID test, which, in addition to current assets, also includes short-term liabilities.

The company that we have analyzed so far cannot sufficiently present everything that has been said about current assets, so we will take the example of a company from the food industry.

Inventory turnover ratio = Cost price of realized production / Inventory

In the year "X", the cost price of the realized production was 6,100.00 KM, and the value of the stock was 3,990.00 KM, so according to the above, the turnover ratio would be 1.52.

There are authors who believe that the inventory turnover ratio can be obtained as the sum of the cost of goods sold and the purchase value of the goods sold, so that sum is divided by the sum of the average inventory at the opening balance and the average inventory at the closing balance. Likewise, in our professional literature, there are different opinions regarding the inclusion of depreciation when talking about inventory efficiency. Some authors believe that depreciation should be excluded from the effect of total current assets, others suggest that realization should be taken at the selling price, others think that only tax should be excluded from realization. We share the opinion of those authors who say "Yes, if theory and practice agree that depreciation is not excluded from the mass of total current assets, why should this be the case when measuring inventory efficiency".

The turnover ratio of receivables from customers is determined from the ratio of total income and receivables from customers (7, p. 186).

The company had a total income of 6,100.00 KM, while receivables amounted to 848.00 KM. According to the report, the trade receivables turnover ratio would be 7.19. In order to complete the accounts receivable ratio, we will also calculate the average collection period. It is obtained from the ratio of the number of days in a year and the ratio of receivables from customers. The number of days in a year can be taken as 365[4], so the average collection period, according to the boiler, would be 51 days. The data on daily sales is also interesting, which is obtained from the ratio of income generated from sales and the number of days in a year. In our example, the average amount of daily sales is 16.71.

The current ratio is obtained from the ratio of current assets and short-term liabilities. The standard ratio is 2:1 in favor of working capital, but it depends primarily on the branch in which the company operates (9, p. 212). In our example, current assets are 4,926.00 KM, while short-term liabilities are 3,448.00 KM, so the current ratio is 1:1.42.

The result of the ACID test is obtained from the relationship:

4 This is the number from which non-working days (Sundays and holidays) can be subtracted.

(current assets - inventories) / short-term liabilities

We can conclude that the analyzed company's current assets are 4,926.00 KM, stocks are 3,933.00 KM, while short-term liabilities are 3,448.00 KM, so the ACID test would be 0.28 (its normal value is 1 and more than 1). We do not dispute that these data could be obtained using other formulas, but depending on the authors who present them in the professional literature, we have decided on these simplest ones. We are sure that they correctly present the presented issues.

ASSET EFFICIENCY ANALYSIS

The efficiency of total assets is measured by the asset turnover ratio and the asset payback period. The effect of total assets is the total income which is quantified as follows when preparing the income statement according to the method of total costs with the statement of the change in the value of the stock of effects on the income side: (4, p.268)

1. Business income (income from regular activity according to the new balance sheet scheme)
2. Reduction in the value of stock of effects
3. Increasing the value of stock of effects
4. Income from sales (1+2-3)
5. Financial income
6. Non-business and extraordinary income (other income according to the new balance sheet)
7. Total income (4+5+6)

Asset turnover ratio: (6, p. 136)Total income / ((Fixed and current assets according to the opening balance + Fixed current assets according to the closed balance)/2)

Number of years of property recovery: (6, p.138)

(Fixed and current assets according to the opening balance sheet + Permanent current assets according to the closed balance sheet) / (2 / Net annual flow from operations)

A company from the wood processing industry for business 200X. year had the following data, from which we calculate the turnover ratio.

Table 3. Revenues of the Parents of Woodcore Industry

Number	Type of income	Ammount
1	income from regular activities	1,370.00
2	reduction in the value of stock of effects	-
3	increasing the value of stock of effects	-
4	sales revenue (1+2-3)	1,370.00
5	financial income	19.00
6	other income	10.00
7	**total income (4+5+6)**	1,399.00

Source: Authors

According to the formula of the asset turnover ratio, the turnover ratio for the observed company would be:

$$\frac{1{,}399.00}{\frac{1{,}783.00 \quad + \quad 2{,}052.00}{2}} = \quad 0.73$$

The payback period is calculated from the ratio of average assets and net cash flow from operations. Net cash flow from operations is determined as follows: (9, p. 230)

1. Depreciation and amortisation
2. Costs for long-term provisions
3. Net gain
4. Net cash flow from operations (1+2+3)

Neto novčani tok iz poslovanja za naše preduzeće se utvrđuje na sledeći način:

Table 4. Net cash flows from business

Number	**Cash flow**	**Amount**
1	Depreciation	192.00
2	Costs for long-term provisions	-
3	Net gain	220.00
4	Net cash flow from operations (1+2+3)	412.00

Source: Autohors

The number of years of return (property return) according to the numbers presented is 2.47 years, and we got 1,017.50 / 412.00. The lower the number of years of return on the asset, the higher the efficiency of the asset.

CONCLUSION

Fixed assets, also known as permanent assets, are a crucial part of a company's balance sheet. This category includes real estate, plants, equipment, and investment property, forming the basis for every production process. Although the term "permanent assets" is used in the balance sheet, the term "fixed assets" is commonly used. With the introduction of International Accounting Standards (IAS), terminologies were harmonized with Western standards while retaining certain local words. Companies are required to maintain a system of records of fixed assets, which include general ledger, inventory book, analytical cards of fixed assets, and the reverse ledger of fixed assets. A yearly analysis of fixed assets is performed to assess their importance. For instance, if fixed assets make up 70% of total assets, that percentage indicates their significant contribution. The analysis of fixed assets provides insight into the basic constituents of assets and the relationship between fixed assets and current assets. Efficient circulation of current assets is crucial for achieving business goals. Models for monitoring and analyzing fund flows have been developed. Companies determine the required size of current assets and procurement dynamics with the annual business plan, elaborated in detail on semi-annual, monthly, and even weekly levels for adaptability. Finally, the analysis of business assets requires the consideration of key criteria such as the direction of investment, dynamics and intensity of investment, and the expediency or rationality of investment. These criteria are essential for the sustainability and success of business operations.

ANALIZA STALNE I TEKUĆE IMOVINE U FUNKCIJI RAZVOJA PRIVREDNOG DRUŠTVA

Slobodan Pešević[5], Zoran Đuričić[6]

Apstrakt: Adekvatnost raspoložive imovine i efikasno upravljanje istom predstavljaju ključne faktore u postizanju uspešnosti poslovanja privrednih društava. Neracionalnost u upravljanju imovinom može imati ozbiljne posledice, uključujući ugrožavanje likvidnosti preduzeća ili nastanak gubitaka. Stalna i tekuća imovina, zajedno sa aktivnim vremenskim razgraničenjima i neuplaćenim upisanim kapitalom, čine poslovnu imovinu privrednog društva i nalaze se u aktivnoj strani bilansa stanja.

Analiza ukupne aktive naglašava značaj poslovne aktive (stalna i tekuća imovina. aktivna vremenska razgraničenja) budući da samo poslovna aktiva direktno utiče na finansijski rezultat. Tipično, preduzeće bi trebalo da ima veći udeo tekuće imovine u odnosu na stalnu imovinu, s obzirom da stalna imovina kontinuirano opada zbog otpisa amortizacije. Ipak, postoje delatnosti, poput saobraćajnih preduzeća ili hidroelektrana, gde je stalna imovina dominantnija. Stoga, pri analizi poslovanja, važno je uzeti u obzir specifičnosti delatnosti u kojoj privredno društvo posluje.

Ključne reči: stalna imovina, tekuća imovina, iskorišćenost kapaciteta, efikasnost imovine, koeficijenti obrta.

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ADAPTATION OF THE CHILD TO THE PRESCHOOL INSTITUTION - THE BERLIN MODEL AND POSSIBILITIES OF ITS APPLICATION IN PRESCHOOL INSTITUTIONS IN THE REPUBLIC OF SRPSKA

Maja Trifunović[1]

Abstract: The paper discusses the Berlin model of adapting a child to a preschool institution and its potential application in preschools in the Republic of Srpska. The current Law on Preschool Education in the Republic of Srpska, as well as the Preschool Education Program, do not address this important issue. This work aims to highlight the necessity of planning the adaptive period and its integration into the Work Program of preschool institutions in the Republic of Srpska.

Keywords: adaptation/adjustment, preschool education and education, Berlin model

INTODUCTION

The all-round development of a child's personality is one of the priority goals and tasks of both the family and all educational institutions and society. The first contact with the social environment outside the family is made by the child when he goes to a preschool educational institution, i.e. nursery school or kindergarten. The pre-school institution organizes, encourages and monitors the entire process of early learning and the formation of the child's personality until starting school. The first meeting of a child (and parents) with a preschool institution greatly affects the child's integration into the nursery or kindergarten group, his motivation to cooperate with the group and the teacher, and the cooperation of parents with the institution.

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In the Republika Srpska, the organization and functioning of preschool educational institutions is regulated by the Law on Preschool Education (Government of the RS, 2015) and other by-laws. One of them is the Preschool Education Program (Government of RS, 2022), which does not deal with the topic of adapting a child to a preschool institution.

ADAPTATION MODELS

In FR Germany, until the 80s of the last century, the period of adaptation was carried out according to the feelings of educators, which has remained with us to this day. Currently, in that country, the adjustment of children is carried out based on different models: Berlin, Munich, peer group model and participatory model, and the obligation of each educational institution is to include in its work program the model according to which the adjustment of children is carried out in the institution.

In the practice of kindergartens in Serbia, three forms of adaptation are mentioned: easy adaptation, adaptation of medium difficulty and difficult adaptation (HAPPY KIDS, 2019, 5).

Easy adaptation refers to children who have a normal reaction to a change in the environment and have achieved a secure and stable emotional bond with their parents. In this case, adaptation lasts 10-15 days (6). Children who need up to a month to stop refusing to come and stay independently in kindergarten go through a moderately difficult adaptive period (7), while difficult adaptation involves several months, as well as "...persistent and long-lasting reactions and behavioral disorders at coming to the collective...". This form of adaptation is encountered very rarely in practice (8).

Regardless of the model of adaptation, both in the Republic of Srpska and the region, as well as abroad, it is necessary for parents to discuss kindergarten with their children before starting kindergarten and to adapt the child's daily rhythm to that of the preschool institution in order to avoid additional stress. for a child.

THE BERLIN MODEL OF ADAPTATION

The Berlin model is a method used to help young children adapt to preschool. The model is designed for children aged 6 months to 3 years old who are starting nursery. It's also used for children who are starting kindergarten, regardless of whether they've attended nursery before. If a child has not attended preschool before the age of 3, it's expected that they'll go through all 5 phases of the adaptation process. For children who have been in a nursery group already, adapting to kindergarten will be much quicker.

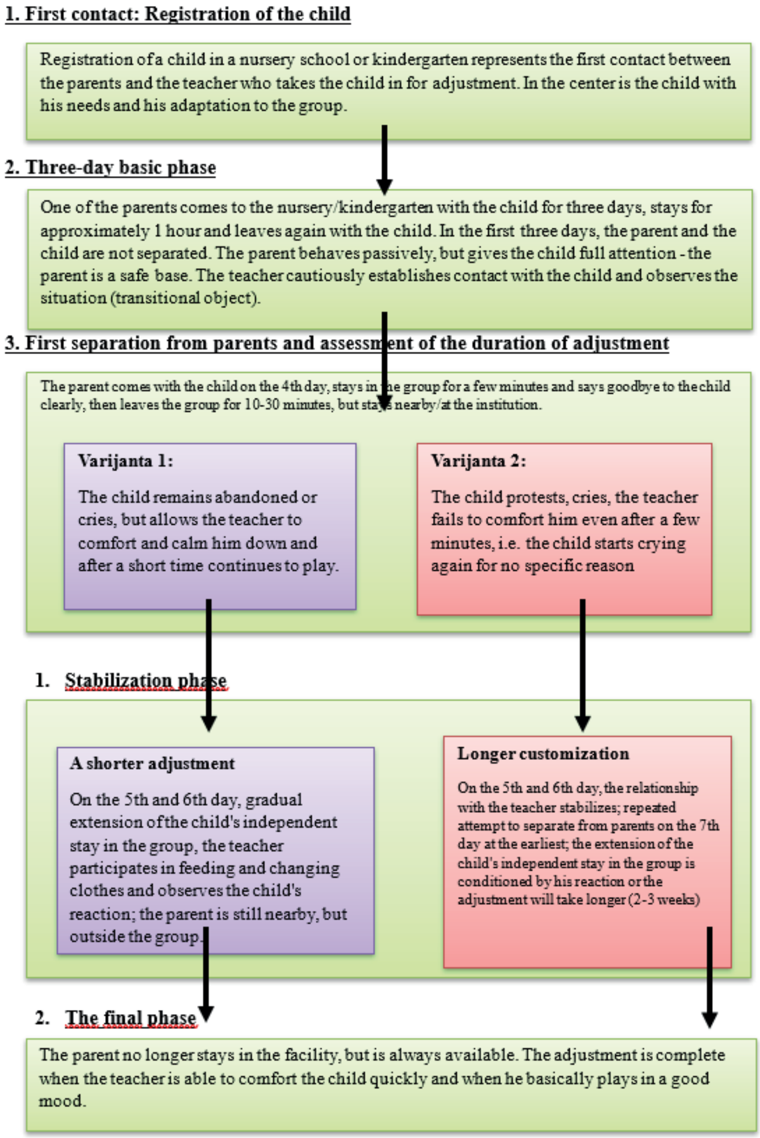
The model is based on John Bowlby's attachment theory and focuses on the quality of the child's attachment to their parent. Depending on this quality, the child's adjustment can take between one and three weeks. However, if the child is extremely attached to their parent, the adjustment process can take longer. The length of the adjustment period is determined by the child's behavior and how they respond to the new environment. The goal of parents and educators is to ensure that the child is happy and satisfied during this process.

The Berlin model provides a framework for the challenging period of child independence that comes with starting preschool. Every child is different and has their own pace of development. Starting preschool is often the first time a child is separated from their parents, which can be stressful for both the child and parent. It's important for the preschool to provide a stable and predictable routine that can help alleviate some of this stress. The daily routine can help children deal with new stimuli, such as smells, noise, and other children's habits. During the adaptation period, unusual activities should be avoided, and children should be allowed to bring their favourite toy or object to provide a sense of security.

The preschool should provide a room for parents to stay in during the first few days of separation. The room should be close by but not visible from the group room. Parents should be familiar with the rules of the preschool, such as taking off shoes, wearing slippers, and putting away coats and umbrellas.

Schematic representation of the Berlin adaptation model in five steps

Figure 1. The adaptation model according to Infans



Source: The adaptation model according to Infans (Institut für angewandte Sozialisation Forschung/ Frühe Kindheit e.V[2], see: www.kindertagespflege-remscheid.de) involves five steps (Figure 1)

POSSIBLE APPLICATION OF THE BERLIN MODEL OF ADAPTATION IN PRESCHOOL INSTITUTIONS IN THE REPUBLIC OF SRPSKA

A child's adaptation to preschool is not and should not be just a letter on paper. This is supported by the research carried out in the 80s of the last century, which highlights the negative consequences of not implementing the adaptive period. In the first seven months after starting preschool, children who did not go through the adaptation period with their parents were on average four times more sick than other children. Also, these children were not in a situation to make maximum use of the potential that the preschool institution offered them and had more pronounced anxious behavior (Laewen, Andres, & Hédervári, 2006; cited in Braukhana and Knobeloch, 2011, p. 4). In addition, these children showed a lower level of development in the research and more often reacted irritated in bonding relationships, which was especially pronounced in children up to two years of age (the same).

The results of this research were precisely the reason for the development of the Berlin Adaptation Model by the Institute for Applied Socialization/Early Childhood Research (Infans).

Despite the differences in standards and the organization of the educational process of preschool institutions in SR Germany and Republika Srpska, the possibility of applying this adaptation model in kindergartens in Republika Srpska should not be completely ruled out.

We are aware of the fact that the standards and key of the number of employees to the number of children in the group are one of the important factors that influence the organization of the process in preschool institutions. The fact that in one daycare or kindergarten group in SR Germany, only one educator may never stay, implies a higher number of employees per group of children compared to the number of employees in preschool institutions in our country. This means that during the adaptation period there is always a teacher in the group who will devote his attention only to that child for as long as the child needs it. One or more other educators work with other children at the same time.

In addition, the kindergarten and nursery groups in German preschool institutions are always age heterogeneous, i.e. there is only one nursery age group with children aged 6 weeks/1 year - 2 years and 9 months, i.e. 3 years, and one group of children aged 3 years. until starting school. The situation in preschool institutions in the Republic of Srpska is significantly different when it comes to the way groups are formed. They (in city kindergartens) are homogeneous in age, and a mixed group is formed only in those institutions where it is not possible to do otherwise.

As far as the number of children per group is concerned, there are no significant differences and in kindergarten groups in the Republic of Srpska it amounts to 21-25 children, a mixed group up to 23 children, in FR Germany that number is up to 25 children. Crèches are more specific and for them in SR Germany the number must not exceed 12 children per group, while in the Republic of Srpska that number for a mixed crèche group is 14 children.

CONCLUSION

It is clear that applying the Berlin model of adaptation in preschool institutions of the Republic of Srpska is more challenging but not impossible. To follow the Berlin model's steps of adaptation, it is possible to arrange for parents to be present with their child in the group, even when only one teacher is present. This can help the child feel secure and gradually become comfortable with the teacher. Having fewer employees per group can be an advantage because the child only needs to get used to and adapt to two adults rather than 3-5, which can speed up the adaptation process.

It is also possible to arrange for parents to stay in the kindergarten but outside the room where the child is when trying to separate. In most preschool institutions, there are rooms that can be adapted for this purpose. The institution's rules are usually displayed on the notice board, so parents can become familiar with them during their first visit.

Since most preschool institutions have nursery and kindergarten groups under the same roof, it would be necessary to spend the adaptation period only once. The group often remains the same, and only the teacher changes. When a child stays with a group of peers, adapting to a new situation only involves getting used to new teachers.

In conclusion, applying the Berlin model of children's adaptation to preschool in one of its variants would not only be possible but also desirable. It can help avoid negative effects on children by separating them from their parents in the first few days of being in a new environment, a new group, or a new situation.

ADAPTACIJA DJETETA NA PREDŠKOLSKU USTANOVU – BERLINSKI MODEL I MOGUĆNOSTI NJEGOVE PRIMJENE U PREDŠKOLSKIM USTANOVAMA U REPUBLICI SRPSKOJ

Maja Trifunović[2]

Rezime: Rad se odnosi na prikaz Berlinskog modela adaptacije djeteta na predškolsku ustanovu i mogućnosti njegove primjene u predškolskim ustanovima u Republici Srpskoj. Zakonom o predškolskom vaspitanju i obrazovanju Republike Srpske kao i Programom predškolskog vaspitanja i obrazovanja nije obuhvaćeno ovo veoma značajno pitanje. Upravo ovim radom cilj nam je da skrenemo pažnju na neophodnost planiranja adaptivnog perioda i njegovo uvrštavanje u Program rada predškolskih ustanova u Republici Srpskoj.

Ključne riječi: adaptacija/prilagođavanje, predškolsko vaspitanje i obrazovanje, Berlinski model

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OPTIMIZATION OF THE PHARMACEUTICAL WASTE MANAGEMENT PROCESS

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Abstract: The paper aims to analyze the management of pharmaceutical waste through relevant literature and to provide knowledge to improve understanding of the problems caused by improper management of pharmaceutical waste and its impact on the environment. The increasing use of drugs and pharmaceutical products poses a challenge for society and the environment, making the management of this waste complex and requiring cooperation between pharmaceutical companies, health institutions, the government, local communities, and the public. The methodology used in this study includes methods of analysis, where complex analysis is divided into content elements, and reproductive synthesis, which involves the simple collection and unification of facts, concepts, or knowledge into one whole. This study identified social consequences accompanied by an increased risk for health and the environment, various technologies suitable for the treatment of specific types of hazardous pharmaceutical waste, and recommendations for improvement.

Keywords: process management, pharmaceutical waste, environment, treatment, disposal

INTRODUCTION

The world's population reached over 7 billion people in 2017, and is predicted to reach 9.7 billion by 2050. This means that more pharmaceuticals and drugs will be required to address the growing economic and public health burdens of human diseases. However, this

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increase in drug consumption will also lead to a rise in pharmaceutical waste from various sources such as manufacturers, pharmacies, hospitals, health centers, and households.

Improper disposal of unused medicines is becoming a significant issue all around the world. Less than one third of the countries that adopted the World Health Assembly's resolution of 2019 have representative data on basic medical waste management, according to a global analysis of waste by the World Health Organization.

The healthcare industry faces many challenges, especially during the COVID-19 pandemic and similar crises, such as a sudden increase in the amount of pharmaceutical and other types of medical waste, improper separation of waste at the source, and procurement or donation of supplies with a short shelf life. With the increase in the total amount of medical waste, the amount of pharmaceutical waste during and after vaccination and immunization has also increased significantly. One in three healthcare facilities worldwide does not manage medical waste in a safe manner, according to the World Health Organization.

Pharmaceutical products can be biodegradable, but some remain resistant and end up in water and soil, which can have negative effects on the environment. Painkillers, paracetamol, ibuprofen, antibiotics, and other pharmaceutical products have been found in fresh and seawater, which can cause potential harm to aquatic organisms and ecosystems. Hospital wastewater contains pathogens and antibiotic-resistant bacteria, which pose a potential risk.

Sewage overflows from municipal sewage systems can lead to the discharge of hospital wastewater into receiving waters, increasing the potential risk of spreading resistant bacteria and pathogens. Pharmaceutical waste can also reach the environment through effluents from the production processes of pharmaceuticals and medical institutions. Moreover, very few people return unwanted medicines to pharmacies, and most of the unused medicines are disposed of with household waste in landfills.

PHARMACEUTICAL WASTE

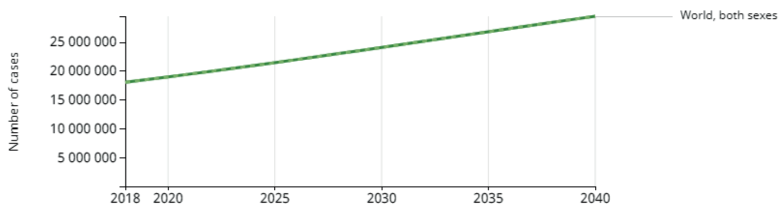
According to the definition of the World Health Organization in the Manual for the Safe Management of Medical Waste (WHO, 2014 and 2017), pharmaceutical waste includes expired drugs, unused, spilled and contaminated pharmaceutical products, prescribed and protected drugs, vaccines and serums that are no longer necessary and due to their chemical or biological nature, they should be disposed of carefully. The category also includes discarded items that are heavily contaminated during the handling of pharmaceutical products, such as bottles, vials and boxes containing pharmaceutical residues, gloves, masks and connecting tubes. Pharmaceutical waste also includes genotoxic waste, which is very dangerous and can have mutagenic, teratogenic and carcinogenic properties. The handling of genotoxic waste poses serious safety problems, both within hospitals and after disposal, and should be given special attention. Genotoxic waste can include certain cytostatics and cytotoxic drugs (about 1% of all medical waste in oncology clinics is genotoxic waste).

According to the Guidelines of the Secretariat of the Basel Convention, we can divide and define pharmaceutical waste as follows:

- Pharmaceutical waste - The term "pharmaceuticals" includes many active ingredients and types of preparations. The spectrum ranges from teas to disinfectants containing heavy metals to highly specific medicines. Waste management therefore requires the use of a differentiated approach. This category of waste includes drugs that have expired or drugs that are unusable for other reasons.
- Cytotoxic pharmaceutical waste - It is waste that can arise from the use (administration to patients), production and preparation of drugs with cytotoxic (antineoplastic) action. The potential health risk for people who handle cytotoxic drugs is primarily the result of the mutagenic, carcinogenic and teratogenic properties of these substances. Consequently, this waste is hazardous and presents a hazard, and the measures to be taken must include those required by occupational health and safety provisions. Examples of such waste: Visible liquid residues of cytotoxic concentrates, cytotoxic drugs after the expiry date as well as materials that have been proven to be visibly contaminated with cytotoxic drugs and which must be disposed of as cytotoxic pharmaceutical waste.

Cytotoxic (chemotherapeutic or antineoplastic) drugs, the main substances in the genotoxic waste category, have the ability to kill or stop the growth of certain living cells and are used in cancer chemotherapy. Cytotoxic drugs are most often used in specialized departments, such as oncology and radiotherapy units, whose main role is the treatment of cancer. Their use in other hospital wards and outside the hospital in clinics and elsewhere is also increasing. According to research by the International Agency for Cancer Research (IACR), the number of cancer patients is increasing year by year, and Figure 1 shows the estimated number of patients from 2018 to 2040. Through the increase in the number of patients, the need for cytotoxic drugs also increases, and thus the amount of this type of waste increases.

Figure 1. Estimated number of patients from 2018 to 2040, all cancers, both sexes, all ages (Globocan, 2018)



Source:Authors

Due to the danger that the waste generated from these medicines carries, and the need for safe storage and disposal, this type of waste should be given special attention. Therefore, even the waste catalog has a separate code about the pharmaceutical waste it belongs to.

According to the European Environmental Protection Agency (EPA, 2008), pharmaceutical waste is not a single waste stream, but many different waste streams that reflect the complexity and diversity of chemicals that make up pharmaceutical products. Pharmaceutical waste is potentially generated through a wide range of activities in a healthcare facility, including but not limited to intravenous (IV) preparation, general mixing, spills/breakage, partially used vials, syringes, and infusions, discontinued, unused preparations, unused dose repack unit, patients' personal medicines and obsolete medicines.

Sources of pharmaceutical waste are various types of healthcare institutions (hospitals, health centers, clinics, laboratories, pharmacies, medical research centers, etc.). Also, there are diffuse sources of pharmaceutical waste such as households and other sources (small health facilities, medical offices, veterinary clinics, etc.) within which the amount of waste generated due to home care and treatment increases. It should be noted that pharmaceutical waste generated in the veterinary field has been increasing rapidly in recent years, and the waste management system is the same as for waste from human medicine.

Classification of pharmaceutical waste

The classification of pharmaceutical waste should be carried out in accordance with the classification established by national regulations, and the legislative and political framework for the management of hazardous medical waste should be established in accordance with the conventions:

- Basel Convention - specifically refers to (I1) Clinical waste from medical care in hospitals, medical centers and clinics, (I2) Waste from the production and preparation of pharmaceutical products and (I3) Waste pharmaceutical products and drugs;
- Stockholm Convention - on persistent organic pollutants (POPs) is a global agreement on the protection of human health and the environment from persistent organic pollutants (POPs).

In the Republic of Srpska, according to the Rulebook on Medical Waste Management (Official Gazette 74/22), pharmaceutical and cytotoxic waste is defined in Article 4; (21) pharmaceutical waste is waste that includes drugs whose use-by date has expired, drugs with changed organoleptic properties (appearance, color, taste, smell), drugs with damaged packaging, as well as drugs that have been determined not to meet the prescribed quality based on laboratory control , and medical devices that are no longer in use and defective medical devices and primary packaging of drugs; (23) cytotoxic and cytostatic waste is hazardous pharmaceutical waste, which includes cytotoxics and cytostatics, i.e. waste generated during the use, transport and preparation of drugs with a cytotoxic and cytostatic effect, including primary packaging and all accessories used for the preparation and application of such products. According to Article 23 of this Rulebook, chemical, pharmaceutical, cytotoxic and cytostatic waste is treated by incineration in facilities that have a permit for the treatment of these categories of waste in accordance with the regulation governing the thermal treatment of waste.

The classification or list of waste is based on the Catalog of Waste (“Official Gazette of Republika Srpska”, number: 79/18), the European List of Waste (LoW) and the valid document of the BiH Statistics Agency for this area (Determining the Waste Code according to the waste list). According to the list, each type of waste has a classification number or its own code that consists of 6 digits and is defined based on the following three criteria:

1. Origin of waste, i.e. defining the industrial branch or sector from which the waste originates (first two digits, health sector – 18).

2. The process during which waste is generated (the other two digits - waste generated during the provision of health services in maternity hospitals, from the diagnosis, treatment or prevention of diseases in humans - 18 01 or in animals, i.e. in veterinary medicine 18 02).
3. Type of waste - part of the process from which the waste originates, i.e. different waste streams (third pair of digits, for example - cytotoxic waste - 18 01 08 * and 18 01 09, i.e. drugs other than those listed in 18 01 08*).

Hazardous waste is marked with an asterisk (*).

IMPACT OF PHARMACEUTICAL WASTE ON PUBLIC HEALTH AND THE ENVIRONMENT

The rapid growth of the pharmaceutical industry in the last few decades has led not only to more drugs on the market, but also to a significant risk to the environment and public health when these drugs are not disposed of properly.

Pharmaceutical waste can have hazardous properties and negatively affect public health and the environment, and therefore proper handling of this type of medical waste can significantly reduce the risk of danger. Inadequate medical waste management practices and other resulting hazards can be minimized and controlled by applying strict procedures and effective practices.

Proper management of pharmaceutical waste can be a very complex process for healthcare facilities. A hospital pharmacy has between 2,000 and 4,000 different items, each of which must be assessed against national hazardous waste regulations. Pharmacists and nurses generally do not receive training on hazardous waste management during their academic studies, and managers and responsible persons of safety and environmental protection services are not familiar with the active ingredients and formulations of pharmaceutical products.

As a result of uncontrolled disposal and emissions, many different active pharmaceutical compounds are being detected in soil and water streams around the world. Concern is growing over the damage they could cause to human health and the environment.

If not handled and disposed of properly, pharmaceutical waste can eventually enter water bodies, including drinking water sources, through sewer lines and landfill effluents. This can lead to risks to public health and the environment, one of which is bacterial resistance to antibiotics.

Hazards of pharmaceutical waste

Some pharmaceutical compounds (antibiotics, antineoplastics, opiates, etc.), disposed of as waste, can have dangerous properties that can threaten public health and the environment. Hazardous substance means waste that poses a significant or potential threat to public health or the environment, such as flammability, reactivity, corrosivity and toxicity. This type of waste may contain biologically aggressive pharmaceutical products or hazardous chemicals.

Residues of pharmaceutical products can enter certain environmental media during production, consumption and disposal.

Large quantities of pharmaceutical waste are particularly dangerous if they are unwanted pharmaceutical products or pharmaceutical products with an expired shelf life that need to be disposed of.

Genotoxic waste, i.e. the toxicity of the substance itself and the extent and duration of exposure, represents a danger for medical workers responsible for handling and persons in direct contact. Adverse effects may occur due to inhalation, ingestion or absorption through the skin or mucous membranes. All persons who are near this hazardous pharmaceutical waste are exposed to the risk of danger. The release of genotoxic waste into the environment can have catastrophic ecological consequences.

Wastewater from healthcare institutions can contain chemicals, pharmaceuticals and infectious biological agents and other impurities. Since untreated wastewater enters groundwater and contaminates local sources with pathogens, numerous water-borne diseases such as hepatitis A and hepatitis E, schistosomiasis, typhoid, etc. can develop.

The release of pharmaceuticals, especially antibiotics without treatment, into wastewater causes resistance to antibiotics that are widely used in hospitals for treatment. The presence of many drugs that affect the ecosystem (antineoplastics, analgesics, estrogens, etc.) has been recorded in wastewater.

The basic principle of efficient waste water management is to strictly limit the discharge of hazardous liquids into the sewage system. Only non-hazardous pharmaceutical waste can be discharged into the sewage system without prior treatment.

It is important to emphasize that the dangers are not only related to pharmaceutical waste. The processing and disposal processes of pharmaceutical waste can also pose a threat to public health and the environment. Therefore, when choosing a treatment technology, its potential impact is assessed (eg waste incinerators, autoclave and steam disinfection methods, mechanical treatment, and disposal). The environmental impact of the operation of a facility or facilities in the waste management sector is assessed and elaborated through the Environmental Impact Assessment (EIA) procedure.

Wastewater treatment and disinfection are very effective means of neutralizing pollutants, under certain circumstances regarding the quality of the water being treated.

ROLES AND RESPONSIBILITIES

The highest priority in any healthcare system is the delivery of medicines as a strategic product. In the current context of a health-conscious society, managing pharmaceutical supply chains has become more complex, as it involves saving people's lives and requires the participation of various parties such as drug manufacturers, distributors, customers and regulatory agencies.

After a drug is launched, an entirely different set of goals, drivers and constraints become dominant. Key participants in that part include multiple government agencies, hospitals, clinics, drug manufacturers, drug distributors, pharmacies, retailers, research organizations, and authorized institutions responsible for protecting public health by ensuring safety (Kapor 2018).

Below are the general roles and responsibilities of stakeholders, important for the implementation of the pharmaceutical waste management system.

Ministry of Health

- coordinates the implementation process and monitors the implementation of the management plan for all types of medical waste, including pharmaceutical waste;
- provides a budget to cover part of the costs of establishing and maintaining a medical waste management system, including pharmaceutical waste;
- support for capacity building and mobilization of resources needed for the implementation of pharmaceutical waste management activities in cooperation with interested parties;
- raising public awareness and reporting on activities related to medical waste management;

Ministry of Ecology and Environmental Funds/Agencies

- facilitates the process of meeting environmental standards in healthcare institutions;
- provides a budget to cover part of the costs of establishing and maintaining a medical waste management system, including pharmaceutical waste;
- monitors the application of legal regulations on the environment in healthcare institutions;
- carries out environmental protection activities from waste generated in healthcare;
- ensures a national data collection system for medical waste management and consistent inspection;
- supports and promotes waste reduction practices to protect health and the environment, etc.

Private sector

- invests in the development of all segments of the waste management system through public-private partnerships;
- realizes projects of recycling and reuse of non-hazardous medical waste.

Healthcare institutions have an obligation

- provide a budget and infrastructure for the implementation of medical waste management (MWM) activities;
- establish a committee for the UMO to ensure that the system functions well and has the necessary resources;
- appoint a responsible person for the UMO;
- ensure the participation of healthcare workers in training activities on the management of UMO, human resources and procurement;
- provide personal protective equipment (PPE) for workers;
- perform separation, storage, transportation, treatment and disposal of waste;
- to provide waste storage/treatment facilities adapted to regulations and standards for the disposal of pharmaceutical waste, that is, drugs and medical devices that have expired;
- cooperate with licensed operators for the transport/treatment of pharmaceutical waste;
- regularly report to competent institutions and update internal rules and procedures;
- promote good management of all types of medical waste, by established regulations.

Manufacturer/Supplier

- accept the return of unusable pharmaceutical products, i.e. waste and take them away for treatment and disposal;
- supervises and manages the procurement, storage and distribution of quality medicines and related medical supplies;
- ensure that the quality of medicines and medical materials is in accordance with the requirements defined by the relevant regulatory bodies;
- coordinates donations of medicines, medical materials and equipment;
- assume responsibility for the management of pharmaceutical waste related to the services they provide.

Treatment and disposal company

- provides treatment and disposal of pharmaceutical waste by health and environmental protection standards.

Municipal waste system

- accepts and integrates non-hazardous pharmaceutical waste into the streams of non-hazardous municipal waste and disposes of it at an organized sanitary landfill.

Public pharmacies

- issues drugs and procures drugs by supply chain management standards;
- Dispose of expired medicines and other unusable pharmaceutical products through accredited organizations in a manner determined by standards and regulations.

Community

- handles unusable pharmaceutical products conscientiously, and responsibly, by recommendations and regulations established by law.

Roles and responsibilities in the pharmaceutical waste management system are divided, and the success of the establishment and functioning of the system and the supply chain directly depends on the active participation of all actors.

METHODS OF TREATMENT AND DISPOSAL OF PHARMACEUTICAL WASTE

Waste treatment and disposal technologies are an integral part of a medical waste management system that includes both the best available technologies and the best environmental practices.

In order to determine the treatment options for pharmaceutical waste, it is necessary to consider: characteristics and quantities of waste, technological capacity and requirements, capacity of the healthcare facility for waste management, environmental safety factors, local treatment options and technologies, treatment efficiency, mass and volume reduction, availability space for equipment, infrastructure requirements, skills required for handling, public acceptance, possibilities of final disposal, costs in relation to individual elements of the system, etc. (WHO, 2019).

Pharmaceutical waste should be sorted by dosage form (solids, liquids, etc.) or by active ingredient, in relation to treatment options. It is very important to separate non-hazardous and hazardous waste materials, with special attention to controlled substances, cytotoxic and cytostatic agents, disinfectants, etc.

Treatment options

Treatment options are chosen according to national legal conditions and the situation at the local community level regarding the characteristics and amount of pharmaceutical waste and available financial resources.

According to the WHO, there are several basic treatment and disposal options for hazardous components from medical waste, which include thermal treatment, chemical treatment, radiation, biological and mechanical treatment.

Table 1. Overview of disposal methods according to types of pharmaceuticals (Source: WHO, Guidelines for Safe Disposal of Unwanted Pharmaceuticals in and after Emergencies. 1999)

Method	A type of pharmaceutical	Comment
Return to manufacturer or donor	All large waste pharmaceutical products, antineoplastics.	Cross-border transport and procedures may take time.
Incineration at high temperatures with temperatures significantly exceeding 1200°C	Solids, semi-solids, powders, antineoplastics, controlled substances.	Very expensive treatment process, especially for dedicated incinerators.

Medium temperature burning with two incinerator chambers with a minimum temperature of 850°C	Solid, semi-solid, powders, controlled substances (in the absence of high temperature).	Antineoplastics (cytostatics) are best burned at a high temperature.
Burning in a cement kiln	Solids, semi-solids, powders, liquids, antineoplastics, anti-infectives, controlled substances. Aerosol canisters.	Liquid antibiotics can be diluted with water, left to stand for several weeks and flushed down the drain. Aerosol containers - do not burn, they can explode.
Immobilization	Solids, semi-solids, powders, antineoplastics, controlled substances.	
Encapsulation of waste	Limited quantities of raw solids, semi-solids and powders. Controlled drugs. PVC plastic. Glass. Paper, cardboard.	Preferably after immobilization of waste drugs. Controlled drugs - do not dispose of in a landfill unless they are encapsulated. Solid substances - no more than 1% of daily municipal waste should be disposed of in an untreated form (non-immobilized). Aerosol containers - do not burn, they can explode. PVC plastic and glass - not for burning in open containers. Paper, cardboard - it is preferable to recycle.
Immobilization	Aerosol canisters.	Waste solids, semi-solids and powders preferably after immobilization
Inertization	Waste solid, semi-solid substances and dust. PVC plastic.	Immobilization of solid, semi-solid substances and powders is preferred.

It is important to minimize the amount of cytotoxic, antineoplastic, and cytostatic waste by using the optimal amount of drugs, proper classification, and replacement with other appropriate drugs that have less harmful properties. If there is any hazardous pharmaceutical waste, it should be disposed of by returning it to the supplier, incineration at high temperatures (at least 1200 ºC), or chemical decomposition as per the manufacturer's instructions.

Incineration should be done under strictly controlled conditions in incinerators equipped for the purification of emitted pollutants that are released into the air. If it is not possible to treat the waste or export it for adequate treatment, then encapsulation and inertization are the last solutions.

After treating pharmaceutical waste, the remaining waste material can be disposed of in landfills that are controlled and arranged according to technical standards to ensure safety. Open landfills pose numerous health and environmental risks.

Before disposing of pharmaceutical waste, every healthcare institution should make sure that it won't cause any harm to health and the environment.

CONCLUSION

The production and consumption of pharmaceutical products generate waste that contains harmful substances, which can negatively impact human health and the environment. Inappropriate disposal of pharmaceutical waste can contaminate groundwater, surface water, and soil, leading to the entry of harmful substances into our water supply systems. This can result in the contamination of the water we drink and cause harm to animals and plants through sewage system discharges. Additionally, improper disposal can increase the risk of creating antibiotic-resistant super bacteria, which can cause serious damage to flora and fauna.

To reduce the negative impact, an adequate system for managing medical waste is necessary. The hierarchy of waste prioritizes actions, including prevention, preparation for reuse, recycling, recovery, and disposal, with the latter being the least desirable option, as it can reduce the impact of waste on the environment and human health. The introduction of regular monitoring and reporting of quantities, practices, and systems related to medical waste at the national level, innovative technologies, and strengthening of existing pharmaceutical waste management systems can provide adequate protection of human health and the environment.

There are several pharmaceutical waste treatment technologies, including thermal treatments, chemical neutralization, degradation, and recycling, each with its advantages and disadvantages. It is essential to choose the most efficient and economically viable treatment method to ensure safe removal and treatment of waste, reduce the risk of water and soil contamination, and minimize harmful impacts on the environment.

Although Republika Srpska's health institutions have legislation covering the medical waste management system, the problem of returning medicines from households, from citizens themselves, remains unsolved in Western Balkan countries. Management and disposal of unused or discarded medicines from citizens require educating the population about the correct way of disposing of medicines, which includes returning them to public pharmacies, as done in EU countries.

Strengthening legislation, educating the public about proper disposal of medicines, promoting alternative methods of treating pharmaceutical waste, and greater cooperation between all relevant actors are recommendations for improving the management of pharmaceutical waste and reducing its negative impact on the environment. Carefully planning and implementing appropriate measures can reduce the risk of improper disposal, pollution during the management of pharmaceutical waste, and ensure the sustainability of the entire process and system.

OPTIMIZACIJA PROCESA UPRAVLJANJA FARMACEUTSKIM OTPADOM

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APSTRAKT

Rad ima za cilj da kroz istraživanje relevantne literature, analizira upravljanje farmaceutskim otpadom, te pruži adekvatna znanja kako bi uticao na bolje razumijevanje problema koje nastaju neadekvatnim upravljanjem farmaceutskog otpada i njegovog uticaja na životnu sredinu.

Farmaceutski otpad predstavlja izazov za društvo i životnu sredinu, s obzirom na sve veću upotrebu lijekova i farmaceutskih proizvoda. Upravljanje ovim otpadom je kompleksno i zahtjeva saradnju između farmaceutskih kompanija, zdravstvenih ustanova, vlade, lokalnih zajednica i javnosti.

U okviru metodologije korištene su metode analize, pri kojoj složenu analizu razdvajamo na sadržajne elemente, i reproduktivne sinteze odnosno, jednostavno prikupljanje i sjedinjavanje činjenica, pojmova ili saznanja u jednu cjelinu.

Identifikovani su društvene posljedice koje su praćene povećanim rizikom za zdravlje i životnu sredinu, različite tehnologije pogodne za tretman specifičnih vrsta opasnog farmaceutskog otpada i date preporuke za unapređenje.

Ključne riječi: upravljanje procesima, farmaceutski otpad, životna sredina, tretiranje, zbrinjavanje

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