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MOTIVATIONAL FACTORS OF ICT INDUSTRY EMPLOYEES FOR INNOVATIVE ACTIVITY

Abstract: *The Information and Communication Technology (ICT) industry in Croatia is recognized as the leading contributor to the national GDP, showing continuous growth and playing a key role in the country's technological, social and economic progress. National strategic plans identify the ICT sector as a cornerstone of economic development for the next six years, with its growth fundamentally relying on the innovative activity of its workforce. This paper explores the key motivators that drive ICT employees toward innovative behavior, along with work environment factors that influence their level of motivation.*

The research methodology focuses on assessing the valence of intrinsic motivators, the impact of extrinsic rewards on intrinsic motivation, and the perceived level of support for innovation within the work environment. The results indicate a high level of awareness among employees regarding both their individual innovation potential and the broader role of the ICT industry. Employees exhibit strong intrinsic motivation for engaging in innovative activities, with noticeable differences in how extrinsic motivators are perceived by those in managerial positions compared to non-managerial staff.

Findings highlight the need to strengthen managerial efforts aimed at early identification and removal of barriers to innovation. Based on these insights, the paper provides practical recommendations for ICT industry managers to develop targeted motivational strategies that enhance innovation potential within organizations. Additionally, it outlines directions for future research on employee motivation and innovation in dynamic, high-growth industries such as ICT.

Keywords: *motivation; innovation; employees; ICT industry*

1. Introduction

The information and communication technology (ICT) industry in its advanced years has the greatest prospects for growth and development, thanks to the activities of which it consists, which are closely related to technological and social progress driven by innovations (Kežić, 2023). As such, it significantly influences the trends in the economy of the Republic of Croatia. Therefore, the purpose of this paper is to contribute to the identification of the driving force of companies operating within the ICT industry in the Republic of Croatia, through the primary goal - identifying the motivational factors for the innovative action of its human resources.

The intellectual capital of a company has today become synonymous with the intangible capital of a company. Its components are relational capital, which, among other factors, includes the brand, reputation of the company and the relationship with clients and suppliers, then human capital, which includes employee competencies, working knowledge and innovation, and structural capital, which includes corporate culture, team spirit and management processes (Çalhan, Gürkan et al., 2020). The paper is therefore focused on the motivation for the innovative action of the human capital of a company, which is the bearer of knowledge and innovation. The basic starting point of the work is the view that a company's human capital is most influenced by elements from its structural capital and that a high level of their alignment has the greatest impact on relational capital, and consequently on the overall success and innovation of the company (Yilmaz and Tuzlukaya, 2023).

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2. Motivation

The general definition of motivation describes it as a theoretical concept that explains why certain behaviors are chosen in certain circumstances (Beck, 2003). In an organizational context, Miljković and Rijavec (2007) argue that motivation is represented by "processes within a person that influence the level, direction, and duration of effort invested at work" (p. 56). The above definition implies that complex assessments take place within an individual under the influence of external stimuli, and that the final response to them, which the individual returns in the form of a manifestation of a certain behavior, is individual and therefore more difficult to predict when assessing its impact on motivation for work. The above definition implies that external stimuli trigger complex processes in an individual and that they influence his behavior. Since this process is different for each individual, it is also more difficult to assess his motivation for work.

From the perspective of human resources management, work and organization, Bahtijarević-Šiber (1999, according to Dubin, 1961) emphasizes that motivation is "a complex of forces that initiate and retain a person at work in an organization". From the above definition, it can be concluded that the organizational process of selection and recruitment is challenging and complex precisely because of the multitude of factors that influence an individual's motivation to perform a job. As part of this process, it is important to predict their long-term motivation to work to some extent. It is equally important when managing employees how and to what extent their performance and development potential are managed, because circumstances inside and outside the organization are variable. Their changing nature requires continuous adjustment of employee motivation strategies in order to maintain their work and innovative potential despite the influence of new external factors.

In order to understand the complexity of defining the concept of motivation and how to manage it, the rest of this chapter describes intrinsic motivation, extrinsic motivation, and motivational factors. Then, content and process theories of motivation are presented, as well as material and non-material reward strategies as a tool for employee motivation.

2.1. Intrinsic motivation

"Employee intrinsic motivation refers to the factors that make some activities rewarding in themselves, such as hobbies, games, puzzles, creative endeavors, etc." (Beck, 2003, p. 191). An intrinsically motivated individual acts because of his inner satisfaction, not because of external rewards (Guttormsen, 2023). It is considered that intrinsic motivation is what drives an individual to learn, create and solve problems and leads to his long-term and more intense engagement in performing certain activities. As such, intrinsic motivation is one that is particularly difficult to influence because it does not require constant, but timely and individually adapted external incentives (Pureta, 2011). Some of the factors thought to promote intrinsic motivation are:

- curiosity
- considering a particular activity as challenging
- the ability to control the circumstances in which the activity takes place, make decisions related to it, and take responsibility for it
- recognition for the effort and effort invested upon completion of the activity, and
- competition with others as a challenge and a factor that further increases the significance of a positive outcome (Santos-Longhurst, 2019).

The environment in which an individual performs activities for which he is intrinsically motivated can hardly directly influence that type of his motivation. The reason for this is the fact that the human brain considers the saving of mental energy a greater reward than the reward for spending mental energy for personal development (Falk, 2023). Therefore, the approach to maintaining and encouraging this type of motivation should be indirect and adapted to each individual in order to timely determine his preferences and interests for the performance of assigned work tasks. The goal of such an approach is to adapt work tasks to the individual to the maximum extent possible, depending on what work activities give him personal satisfaction and a sense of fulfillment, while it is not excluded that in order to use his maximum potential, he is offered work in a different environment, i.e. department (Pureta, 2011). It is believed that positive feedback and recognition for the work done, where the emphasis is placed on the individual's effort and not only on the achieved result, strengthens his intrinsic motivation. It is also believed that social interaction in the work environment and collaboration with its stakeholders plays a key role in maintaining and

strengthening an individual's intrinsic motivation (Nguyen, 2024).

2.2. Extrinsic motivation

Extrinsic rewards refer to those rewards that other people give us for our behavior (Beck, 2003). Extrinsic with intrinsic motivation plays an important role in shaping individual behavior and affects the outcomes of work tasks. However, extrinsic motivation is thought to lead to short-term results (Pureta, 2011). Extrinsic motivation is the one due to which an individual performs work tasks because he is motivated by a reward for their performance or tries to avoid punishment by performing them. The individual will thus strive to complete a certain task because in return he will receive some tangible benefit, and not purely inner satisfaction. Also, an individual will perform a work task under pressure resulting from possible punishment in case of failure or the inability to fulfill a personal goal without successfully completing the given work activity. The most common tangible benefits for an extrinsically motivated individual are praise, recognition or money (Rochaun Meadows-Fernandez, 2018).

In order to exploit the maximum work potential of an individual in an organization, it is important to approach each individual individually, in order to find a balance between their intrinsic and extrinsic motivation for work activities, align strategies and adjust tools for their maintenance.

2.3. Motivation factors

In general, an individual's motivational factors are related to their emotions, which also affect their perception of the circumstances when they are faced with a goal, and are subject to change depending on the characteristics of the stimuli received from the environment, which, according to their view, affect the attainability, cost-effectiveness and the choice of the method of achieving that goal (Beck, 2000).

Within management, three groups of factors have been identified that influence employee motivation, which interact with each other in the capacity of managing employee work motivation. The first group of unified factors refers to the individual characteristics of the individual, which imply that each individual has potentially different attitudes, interests and values, and that it is precisely on them that the characteristics of the job and the available rewards for performing it will depend on which will be motivating for him. The second group of factors consists of job characteristics, which imply job attributes according to certain categories, such as its complexity, demand and autonomy, which results in the need for their alignment with the individual characteristics of the individual. The third group of motivational factors consists of organizational characteristics that contribute to its efficiency, and include its rules and procedures, personal policies, management practices, and management of the reward system with the aim of ensuring that it is maximally aligned with the other two groups of factors in order to attract and subsequently retain the appropriate profile of employees in the organization (Buble, 2013, according to Porter et al., 1974).

Due to the changing factors from the external environment that influence the motivation factors of an individual and, consequently, the inability of the organization to provide a clear and adequate answer regarding the correct and process-specific motivation strategy, numerous theories have emerged throughout history that attempt to arrive at this answer. These numerous theories are grouped into two groups, according to content and according to process (Bahtijarević-Šiber, 1999).

2.4. Content theories of motivation

In the context of organizations, Miljković and Rijavec (2007) argue that content theories are those that "focus primarily on the physiological and psychological needs of the individual, and that "it is the manager's task to create a work environment in which these needs will be met" (p. 56). The following theories belong to the content processes of motivation:

- Abraham Maslow's theory of the hierarchy of needs, based on the premise that an individual's needs can be classified into five categories, and that they are always satisfied hierarchically without exception. In order, this includes physiological needs, which are also the key to survival, the need for security in the context of protection from unpredictable external influences, the need for society and belonging, then for respect for the environment and self-esteem, and finally the need for self-actualization (Miljković and Rijavec, 2007).
- Clayton Alderfer's theory of three-stage motivation, which accepts the existence of a hierarchy in satisfying individual needs, but does not condition their satisfaction in order and classifies them into three categories. One category includes the satisfaction of existential needs,

the second the satisfaction of the need for close relationships with other people, and the third the need for personal growth and development. The assumption of this theory that if second or third level needs cannot be satisfied, the individual is redirected to satisfying lower level needs has been partially confirmed by research (Miljković and Rijavec, 2007).

- Achievement motivation theory, by David McClelland, according to which an individual has three basic needs, the need for achievement, for society and for power (Miljković and Rijavec, 2007). The theory focuses on motivation for work, with the premise that increasing the difficulty of a task increases the probability of failure, which is being avoided, but also the meaning in the event of successful completion of the task, thus focusing on motivation to achieve a goal and satisfaction based on the reward that will follow from its achievement. (Bahtijarević-Šiber, 1999).
- Herzberg's two-factor theory of motivation classifies motivational factors into two categories: motivational, intrinsic factors that lead to satisfaction such as the job itself, recognition, achievements, responsibility and advancement, and hygiene, extrinsic factors that lead to dissatisfaction such as relationships with colleagues, superiors, working conditions and salary (Miljković and Rijavec, 2007). This theory, unlike previous ones, focuses on encouraging the intrinsic motivation of individuals in the workplace, with the premise that if a group of motivational, intrinsic factors is positively affected, satisfaction can result from them, while acting on a group of hygiene, extrinsic factors cannot lead to satisfaction but can only result in preventing dissatisfaction. Previous research has confirmed that both groups of factors within this theory lead to both satisfaction and dissatisfaction. (Bahtijarević-Šiber, 1999).
- John Miner's role theory of motivation highlighted the importance of motivation and categorized it into three business roles: manager, expert, and entrepreneur. Individuals in the role of manager have a need for competition, power, affirmation, differentiated status, and a desire for responsibility for routine tasks. Individuals in the role of expert have a need for learning, independent action, status, helping others, and a need to identify with a profession that is based on values, while individuals in the role of entrepreneur have a need for achievement, risk avoidance, performance feedback, innovative solutions, and a need to plan for future opportunities. (Bahtijarević-Šiber, 1999).

Content theories of motivation have contributed to a better recognition and understanding of the internal needs of individuals and the factors that encourage them to act. In the work environment, content theories of motivation are important because they help to align the needs of the job with the needs of the individual. These theories indicate that an employee will be more motivated to perform work tasks when they are provided with conditions that will satisfy as many of their needs as possible.

2.5. Process theories of motivation

Unlike content theories of motivation that focus on providing answers to the question of what motivates an individual to satisfy their physiological and psychological needs, process theories of motivation in the context of an organization, as Miljković and Rijavec (2007) claim, "attempt to understand the thought processes that influence people's behavior at work" and "explain how needs lead a person to behave in a certain way, depending on the rewards and work opportunities available to them (p. 56). Some of the more significant process theories are:

- Vroom's cognitive model, which is based on the assumption that an individual's motivation to perform a task depends on his assessment of three factors: expectations of how much effort will be required to perform the task, what reward he will receive for performing it, and how attractive that reward is to him (Miljković and Rijavec, 2007). From the above concept of the theory, it can be concluded that the focus is on finding the right reward instrument that will meet employee expectations.
- Adams' theory of inequality in social exchange, which is based on the assumption that an individual compares his or her investments and profits with the investments and profits of other individuals in his or her work environment who perform the same or similar jobs. Investments refer to the knowledge, skills, effort and learning of the individual, and profits most often refer to salary, recognition and various benefits. This comparison made by an individual can have positive and negative inequality. Positive inequality implies a feeling of recognition by an individual that for the same or smaller investments he or she has received more in return than others, which can affect the emergence of feelings of guilt and result in improved work performance as compensation. Negative inequality implies a feeling of recogni-

tion by an individual that for the same or larger investments he or she has received less in return than others, which can create a feeling of injustice and result in such an individual trying to establish equality in his or her own way (Miljković-Rijavec, 2007).

- The Porter-Lawler expectancy model expands Vroom's cognitive model with an additional six factors that together influence an individual's work motivation. Additional factors included, according to Buble (2013, based on Porter and Lawler, 1968), are the individual's abilities and characteristics, his perception of his role in the work process, intrinsic and extrinsic rewards as a result of his performance, the perception of the fairness of the rewards received, and the degree of satisfaction with the result (p. 347). Two feedback loops are included in this model. The first feedback loop is observed in the relationship between performance and the perceived fairness of the rewards in relation to the effort invested. The second feedback loop is observed in the relationship between the perceived value of the reward and the overall satisfaction with the achieved goal. (Buble, 2013).
- Lawler's model of expectations that expands the Porter-Lawler model of expectations by including the following factors in the relationship between effort and performance and in the relationship between performance and effect - objective situation and individual perception of the situation, perceptions and opinions of other people about the situation, cumulative individual experience in the same and similar situations.

Process theories of motivation have added an additional dimension to content theories by confirming that, due to external influences, an individual's needs do not necessarily always occur in the same order and that the same combination of external influences can result in different outcomes in different environments. The foundations they laid still serve as starting guidelines for work organizations today to find a balance between intrinsic and extrinsic factors of employee motivation in order to utilize their maximum work and innovative potential.

2.6. Reward strategies for employee motivation

The reward system in a company should be implemented keeping in mind that material and non-material strategies for rewarding performance and desirable work behaviors are extrinsic rewards for intrinsically (de)motivate employees to achieve work goals within their scope of work.

Material rewards are divided into direct and indirect material compensations, with direct ones representing those from which the employee has a direct material benefit, and indirect ones representing those for which the company means direct material value, while the employee uses products or services that have arisen from that value. The group of direct material compensations at the individual level includes, for example, salary, bonuses and incentives, fees for innovations and improvements, and at the company level, this group includes, for example, bonuses and awards related to the company's results and its profit, a share in the company's profit and a share in the company's ownership. The group of indirect material compensations at the individual level includes, for example, scholarships and tuition fees, specializations, paid absences and days off, and the use of a company car. The group of indirect material compensations at the company level includes, for example, pension insurance, health care, payment of a "Christmas bonus" and additional educational programs (Vrhovski, 2021).

Types of non-material reward strategies according to Vrhovski (2021) are – "job design, management style, participation, management by objectives, flexible working hours and programs, recognition and feedback, organizational culture, training and career development" (p. 40). The motivational approach to job design seeks to distribute jobs within the workplace in a diverse and complex manner, increase the autonomy of the individual in their work, and give responsibility and authority to employees within their scope of work.

Employee participation in this context implies the use of employees' creative potential by including them in decision-making, shaping and implementing change processes, in solving problems and in participating in shaping their work goals. Flexible working time forms and programs imply the possibility of harmonizing work and biological rhythms, reducing absenteeism, increasing employee efficiency and flexibility. Recognition and feedback imply that an individual regularly receives confirmation for their successes that their efforts and work are appreciated and confirmation of their work efficiency in relation to expectations, which creates a stimulating work environment and builds mutual trust. Organizational culture implies linking core values to employees and, through intensive communication with employees, creates an informal, friendly atmosphere and spreads a spirit of togetherness in order to encourage and

reward risk-taking in the organization as well as excellent results based on the set goals. Improvement and career development in the function of non-material rewards imply that the organization takes care of employees' affinities for professional growth and development and, in accordance with this and in accordance with the needs of the job, enables them to participate in education, and that it does not limit but supports them in career development within the organization, in the desired direction (Vrhovski, 2021).

To increase the work and innovative potential of a company, it is important to continuously identify at the individual level which tools within the reward strategy are the greatest incentive for him, primarily for intrinsic motivation, then for his extrinsic motivation. In addition to their identification, it is important to find a balance between those that stimulate the employee's intrinsic and extrinsic motivation for performing work tasks when implementing tools within the reward strategy.

3. Innovativeness and innovations

Hernaus and Marić (2023, according to West and Farr, 1990) argue that innovation is "a socio-political process by which new ideas, processes/procedures and products/services are meaningfully promoted, introduced and successfully applied in an organization". From an entrepreneurial perspective, the first step in this process is to recognize the need for change as a favorable opportunity to create new value or add value to new processes/procedures and products/services. In the context of successful and dynamic entrepreneurship, it is extremely important to implement this process continuously and systematically(Drucker, 1992).

In the framework of innovation management, Prester (2010, according to Shavinina, 2003) claims that innovations are divided into three categories according to type – product innovations, production/service provision process innovations, managerial innovations. The product innovation category includes new product designs and new product packages. Changes in the way production is carried out are classified in the category of innovations in the production/service provision process, and changes in procedures for issuing products are classified in the category of managerial innovations. In the case of new services, the most common categories of product innovation and managerial innovation are combined (Prester, 2010).

According to the degree of novelty, innovations are divided into incremental and radical. Incremental innovations include small novelties and gradually introduced novelties and are more frequent and have also proven to be cumulatively more effective than less frequent, radical ones. Radical innovations include those that are most often conditioned by some external factor, such as changes in technology or legislation, that most often require a quick reaction and adaptation and most often open up space for incremental innovations within the entire company. When implementing innovations, an important role is played by the use of individual and cumulative knowledge of all available resources in the organization in order to influence the identified risks in a timely manner to the greatest extent possible and thus reduce the uncertainty of the outcome of the successful implementation of innovations (Prester, 2010). From a management perspective, innovation management is carried out through six steps. The first is the search for an idea, the second is the selection of the idea, the third is implementation, the fourth is the collection of necessary resources and knowledge, the fifth is the development of the project and the sixth is the launch of the innovation (Prester, 2010).

In order for the innovative process in an organization to be effective, it is necessary, like any other process, to align it with the strategic goals of the company and set a framework and guidelines within that framework. Finally, it is necessary to fill out a list that will answer questions whose answers should provide the final picture of the profitability of engaging in the innovation process itself. The most common profitability checks are reduced to calculating the expected return on investment, or calculating the calculation of reaching the break-even point in a precisely defined period, the exact amount of increase in sales revenue, or the achievement of a certain number of competitive advantages. All of the above depends on whether the project for implementing the idea that should result in the desired innovation will be approved. This approach ensures controlled conditions and the task environment, as well as the focus of stakeholders, who, according to the aforementioned, given guidelines, try to shape and generate an idea that will result in the approval of the project and ultimately the implementation of the innovation with the least possible identified risks (Trias de Bes and Kotler, 2016).

In order for an organization to develop into an innovative one, it needs to have an appropriate organizational structure, key individuals who will

promote innovation, work on innovative projects as a team, and a creative climate. The organizational structure depends on the industry in which the organization operates, its size, the age of the company, and its strategy. The organic structure of the organization is more suitable for innovative organizations than the classical and mechanicistic one, due to the intense need for open communication channels and the possibility of greater flexibility when working on innovative projects, horizontally and vertically within the organization. In such an organization, teamwork is almost imperative because it can offer more ideas and solutions than an individual, but for such work to be successful, Prester claims (2010, according to Tidd and Bessant, 2009) that the key elements for the proper functioning of a team to achieve innovation include - clearly defined tasks and goals, effective team leadership, a good relationship between team roles and personal preferences, an effective system for resolving conflicts, and constant connection with the environment outside the company. A creative climate is achieved through a company's organizational culture, which is based on shared values, beliefs, and behavioral norms of all individuals within the organization. Organizational culture actually provides a behavioral framework that encourages and rewards innovative behavior, thereby creating a creative climate within the company (Prester, 2010).

The identified factors that stimulate the level of employee creativity are:

- autonomy in decision-making
- clearly defined goals for the context and product of creative work
- opportunity to use different skills within the scope of work tasks
- a high degree of diversity of work tasks within the scope of job requirements.

If the organizational environment does not encourage the creative contribution of an intrinsically motivated employee, it will be absent (Hernaus and Marić, 2023, according to Liu et al., 2016).

4. Methodology

The main objectives of the research are the assessment of the importance of certain motivational factors for the innovative activity of employees from the perspective of employees in the ICT industry. According to the conclusions, recommendations for practice will be presented to managers in charge of designing and implementing motivational programs in order to increase the innovative potential of companies.

The research questions that were asked for this purpose are:

- Do ICT employees perceive themselves and the industry in which they operate as creative?
- Are ICT industry employees intrinsically motivated to be innovative and by what factors?
- Which material and non-material reward strategies have the greatest impact on the intrinsic motivation of ICT industry employees to be innovative?
- How stimulating for innovative activity do ICT industry employees consider their current work environment?

The survey method was chosen because it can cover a larger number of respondents from different companies operating within the ICT industry in a limited period of time, thus making the sample more representative. The survey was conducted anonymously between 15 and 20 August 2024, and was distributed to employees of a total of 15 companies operating within the ICT industry. The created survey was distributed through a network of personal contacts and intermediaries, and at the very beginning it contained an elimination question through which employees outside the ICT industry were prevented from further participation.

The research methodology is based on Vroom's process theory of motivation, combined with the results of secondary research on innovation and creativity in the workplace and on intrinsic and extrinsic motivation factors. The questions contained in the survey questionnaire are therefore primarily focused on the evaluation of intrinsic motivation factors and extrinsic factors from the work environment that influence them, and on the evaluation of the support of the work environment for innovative action. The authors consider Vroom's process theory of motivation to be the most relevant for the research in question because employees of the ICT industry will have the opportunity, through closed questions, to indicate which of the numerous rewards listed is the most attractive to them for their innovative work and what kind of support for such work they expect within their work environment. Also, because employees will have the opportunity, in addition, in an open-ended question, to state what would most encourage them to act innovatively. Since extrinsic rewards valued by employees are among the most commonly used in human resources management practice, the

authors believe that the recommendations resulting from the clarified combined approach will be a relevant basis for further research on the topic and for possible pilot phases in companies in the ICT industry.

The survey questionnaire, excluding the elimination question, contains 18 questions, including 3 open-ended questions on the support of the current work environment for innovative action and 4 questions organized on a Likert scale from 1 to 5, which allow for the evaluation of each offered intrinsic and extrinsic motivator for innovative action. Insight into the entire survey questionnaire and other research results is also available upon request from the authors of the research. The following section presents the most important results of the analysis of the conducted research.

5. Results

The survey was completed by 91 employees of the ICT industry, of which the share of female employees was 29.7% and the share of male employees was 70.3%. The most represented respondents are those aged 46 to 55 years, whose share in the total number of respondents is 36.3%, followed by respondents aged 26 to 35 years with a share of 31.9%, and respondents aged 36 to 45 years, with a share of 24.2%. The least represented respondents in the study are those aged 18 to 25 years, followed by respondents aged 56 and over.

The share of respondents with more than 10 years of work experience in the ICT industry is the largest and amounts to 60.4%. Of the remaining 59.6% of respondents, the majority have work experience in the industry of 7 to 10 years, followed by 13.2% with work experience of 4 to 6 years. The least represented are employees within the ICT industry with work experience of 1 to 3 years, followed by respondents with less than one year of work experience.

In the total share of all respondents, respondents employed in the positions of leaders, managers and directors make up 34.1% of the share, and employees in other positions make up 65.9%. 53.9% of all respondents regularly and often acted innovatively, 36.3% of them sometimes acted innovatively, while the remaining 9.8% rarely or never acted innovatively. Respondents whose job position is a leader, manager or director acted innovatively in 87.4% of cases, and the group of other employees in 91.67% of cases.

98.9% of respondents consider the ICT industry creative, 78.8% consider themselves creative, while 86.8% consider that innovative activities bring them personal satisfaction. 69.3% of all respondents were always or often self-motivated for innovative activities, 27.5% sometimes, and 3.2% were rarely or never motivated for innovative activities. 38.5% of all respondents believe that their work environment has always or often been conducive to creative and innovative activities, 40.7% believe that their work environment has sometimes been so, while 20.9% believe that their work environment has rarely or never been conducive to creative and innovative activities.

Tables 5.1., 5.2., 5.3. and 5.4. show how respondents evaluated the offered groups of factors related to intrinsic factors, non-material rewards

Tabe 5.1. Intrinsic motivational factors for innovative action

To what extent do the above factors personally motivate you to act innovatively?	All respondents
INTRINSIC FACTOR	**Average grade**
A sense of personal achievement	4,47
Desire for learning and personal development	4,33
Ability to make independent decisions and take responsibility for their outcomes	4,22
Curiosity	4,21
Contribution to the team and organization	4,21
High degree of creative freedom when performing work tasks	4,19
Possibility of receiving feedback and progress	4,10
Challenging and complex tasks	4,07
Contribution to the community that could be impacted by the implementation of my idea	4,05
Competition with colleagues	2,92

and indirect and direct material rewards as a function of extrinsic rewards. Respondents were allowed to evaluate each presented factor using a Likert scale from 1 to 5, where a rating of 1 implies that they are not motivated by that factor at all, while the factor to which they assigned a rating of 5 implies that it is extremely motivating for them to act innovatively. The factors in each figure are presented in order from the highest to the lowest average rating, with the factor with the highest rating taking first place and the factor with the lowest rating taking last place. Also, the factors that take first place are highlighted in green, and the factors that take last place are highlighted in yellow.

Table 5.1. shows the average rating of intrinsic motivational factors for all respondents. The feeling of personal achievement was rated the highest by all respondents on average, 4.47, while the factor Competition with colleagues was rated the lowest with the lowest average rating of 2.92.

The group of respondents whose job position was a leader, manager or director rated the factor Desire for learning and personal development the highest, with an average rating of 4.21, and the factor Feeling of personal achievement ranked second in the overall ranking with an average rating of 4.15. For the group of other respondents, the feeling of personal achievement was the most highly rated factor, with an average rating of 4.53. Both groups of respondents rated the factor Competition with colleagues with the lowest average rating. The average rating for the group of all offered intrinsic factors for all respondents is 4.08, for the group of respondents whose work position is a leader, manager or director is 3.95, and for the group of respondents whose work position is not a leader, manager or director 4.05.

Table 5.2. shows the average rating of non-material rewards as extrinsic motivational factors for all respondents. Involvement in decision-making when designing and implementing changes was rated the highest by all respondents on average, 4.22, while the least valued factor was Low level of diversity of work tasks within the workplace with the lowest average rating of 2.09.

The group of respondents whose job position was not a leader, manager or director rated the Flexible working hours factor the highest, with an average rating of 4.35, and the factor Clearly defined individual goals for the context and product of innovative work ranked second with an average rating of 4.21. The factor Involvement in decision-making when designing and implementing changes in their group ranked third in the overall ranking with an average rating of 4.17. For the group of respondents whose job position is leadership, management or director, Involvement in decision-making when designing and imple-

Table 5.2. Extrinsic motivational factors for innovative action - intangible rewards

To what extent do the above factors from your work environment motivate you to act innovatively?	**All respondents**
INTANGIBLE PRIZE	**Average grade**
Involvement in decision-making when designing and implementing changes	4,22
Flexible working hours	4,20
Clearly defined individual goals for the context and product of innovative work	4,18
Involvement in setting individual goals within the job description	4,10
Ability to use different skills when performing work tasks	4,09
An organizational culture that encourages creativity and innovation	4,09
Praise and recognition from the organization	4,08
Clearly defined team/departmental/organizational goals for the area of innovation	4,07
Praise and recognition from immediate superior	4,03
Leadership style of the superior	4,00
High degree of diversity of work tasks within the workplace	3,81
Low level of diversity of work tasks within the workplace	2,09

Table 5.3. Extrinsic motivational factors for innovative action – indirect material rewards

To what extent do the above factors motivate you to act innovatively?	All respondents
INDIRECT MATERIAL REWARD	**Average grade**
Additional education	4,10
Paid scholarship/tuition for desired education	3,88
Additional days off130,512	3,85
Payment of funds into a supplementary pension fund	3,77
Additional health insurance	3,66
Use of company car	3,13

menting changes is the most highly rated factor, with an average score of 4.09, while second place is shared by the factor Organizational culture that encourages creativity and innovation and the factor Praise and recognition from the organization with an average score of 4.03. Both groups of respondents rated the factor Low level of diversity of work tasks within the workplace with the lowest average score.

Table 5.3. shows the average rating of indirect material rewards as a function of extrinsic motivational factors of all respondents. The factor Additional education was on average rated by all respondents with the highest rating, 4.10, while the least rated factor was the factor Use of a company car with the lowest average rating of 3.13.

In both groups of respondents, when analyzing the results, no significant deviations were recorded in the factors rated with the highest and lowest average ratings in relation to the highest and lowest presented average values of the group of all respondents.

Table 5.4. shows the average rating of direct material rewards as extrinsic motivational factors for all respondents. The *Bonus* factor based on overall performance was rated the highest by all respondents on average, 4.41, while the least valued was the *Share in Company Ownership* with the lowest average rating of 3.82.

The group of respondents whose job position was not a leader, manager or director valued the *Salary factor* the most, with an average rating of 4.43, and the *Bonus* factor based on overall performance ranked second in the overall ranking with an average rating of 4.34. For the group of respondents whose job position was a leader, manager or director, the order of the most valued factors in the overall ranking was reversed, with the *Bonus* factor based on overall performance ranking first in the overall ranking with an average rating of 4.36, and the *Salary* factor ranked second with an average rating of 4.15. Of the 3 offered groups of extrinsic motivation factors for innovative action, all respondents gave the highest average rating to the group of direct material rewards, followed by the group of intangible rewards and the group of indirect material rewards. No differences were observed in the ranking of the aforementioned groups of extrinsic factors among respondents whose job position is a leader, manager or director compared to other employees.

The group of respondents whose job position is a leader, manager or director would be most motivated to innovate by factors from the group of

Table 5.4. Extrinsic motivational factors for innovative action – direct material rewards

To what extent do the above material factors motivate you to act innovatively?	All respondents
DIRECT MATERIAL REWARD	Average grade
Bonus based on overall performance	4,41
Salary	4,40
Monetary compensation for each implemented innovative idea	4,24
Monetary compensation based on the company's results and its profits	4,23
Share in company ownership	3,82

intangible rewards, such as support from superiors and the work environment, which was additionally confirmed by the analysis of an open-ended question on the topic of the greatest obstacles to innovative action in the current work environment, where the level of support from superiors and the organization stands out as the greatest obstacles, followed by process, administrative and financial limitations. This is followed by challenging tasks and then material rewards. The group of other employees would be most motivated to innovate by factors from the group of tangible rewards, of which salary stands out, then factors from the group of intangible rewards, of which encouragement and support from superiors and the organization, and process improvement stand out. However, for this group of respondents, an additional analysis of the open-ended question on the topic of the greatest obstacles to innovative action did not confirm the main findings, in the part that the group of tangible rewards is the greatest motivational factor for innovative action. They only pointed out the need for additional research on the topic of how motivating factors from the group of intangible rewards, such as the level of support from superiors and the work environment, and the lack of time for innovative work within the current job, are compared to factors from the group of tangible rewards.

6. Discussion

The results of the research confirmed that employees of the ICT industry consider themselves and the industry in which they work to a great extent to be creative, which confirms the conclusion derived from secondary research that creativity and the environment that encourages it are an important basis for innovative activity and the creation of added value for the company (Hernaus and Marić, 2023). This confirmed that as such, employees are an important variable within the intellectual capital of the company (Çalhan, O., Gürkan, A. et al., 2020). Also, the results support secondary research that classifies creative endeavors as factors of intrinsic motivation, from which it can be concluded that there are indications that employees of the ICT industry are highly intrinsically motivated for innovative activities (Beck, 2003). Mostly by the factor of personal achievement, which confirms the results obtained from secondary research in the part that emphasizes the importance of activities that are rewarding for the employee in themselves (Beck, 2003). The research also confirmed the findings of secondary research conducted by Hernaus and Marić (2023) and Santos-Longhurst A. (2019) in that the intrinsic motivation factors for innovative action of ICT industry employees are a sense of personal achievement, a desire for learning and personal development, the ability to make decisions and take responsibility for them, curiosity, a high degree of creative freedom when performing work tasks, the ability to receive feedback and progress, challenging and complex tasks, and competition with colleagues. The research additionally determined the importance of each factor for innovative action of ICT industry employees and found that a sense of personal achievement is the most motivating factor for them, and competition with colleagues is the least motivating factor.

According to the secondary findings of Vrhovski (2021), Hernaus and Marić (2023) and Prester (2010), according to which respondents were offered certain non-material rewards as extrinsic factors for innovative action, it was confirmed that all the rewards offered for employees of the ICT industry in this context are motivating. The research additionally determined the importance of a particular factor for the extrinsic motivation of employees of the ICT industry for innovative action, i.e. it was determined that from this group of extrinsic factors, employees are most motivated by the factor of involvement in decision-making when designing and implementing changes, and the least by a high degree of diversity of work tasks. Also, according to the secondary findings of Vrhovski (2021), according to which respondents were offered groups of direct and indirect material rewards as extrinsic factors for innovative action, it was confirmed that all the rewards offered for employees of the ICT industry are motivating for innovative action. For the group of direct material rewards, the research additionally determined that employees of the ICT industry are most motivated for innovative action by the bonus factor based on overall performance, and the least by a share in company ownership. Also, in this context, they are most motivated by the possibility of additional education, and least motivated by the use of a company car, among indirect material rewards.

By linking secondary statements according to Prester (2010) on the topic of the needs of an innovative organization, the research found that employees of the ICT industry do not consider their current work environment to be sufficiently stimulating for innovative action, which indicates the possibility of a lack of rewarding innovative behavior.

6.1. Recommendations for increasing the innovative potential of ICT companies

Based on the presented results of the primary research and the discussion of the results comparing them with the findings of the secondary research highlighted in the paper, the following recommendations are presented for managers in the ICT industry responsible for designing and implementing motivational programs to increase the innovative potential of companies:

- Conduct internal surveys among employees once a year on the topic of intrinsic and extrinsic motivation factors for innovative action and on the topic of the quality of support within the work environment for innovative action and, to the greatest extent possible, adapt them to hierarchical responsibilities and complementarity of job positions.
- Based on the results of the conducted internal surveys of intrinsic and extrinsic motivation factors of employees for innovative action, address proposals to responsible stakeholders within the company for the implementation of changes in the employee reward system for innovative action.
- After conducting internal surveys, share the results of the survey with all employees and inform them about further steps that have been taken/will be taken/and by what deadline.
- To the greatest extent possible, adapt the reward system so that it allows the employee to choose incentive rewards for innovative action within the available, designated financial resources.
- Once a month, conduct individual and team open conversations and discussions on the topic of obstacles within the work environment for innovative action and possible solutions and address them to responsible stakeholders.
- Quarterly conduct open conversations on the collected information regarding obstacles to innovative action within the work environment and their possible solutions at the level of all managers responsible for designing and implementing motivational programs within the company.
- Give priority to managerial functions when implementing approved changes in the reward system and measures that are expected to remove obstacles to innovative action in the work environment with the aim of first influencing the increase in their level of motivation for innovative action in order to successfully motivate the employees for whom they are responsible.
- Define and implement a system for systematically monitoring the impact of implemented changes on the level of innovative action at the company, organizational unit and individual employee levels.

Each company must adapt the recommended activities to its organizational structure and its goals for increasing innovative potential.

7. Conclusion

The ICT industry is an important factor within the long-term plan for economic growth and development of the Republic of Croatia. Given its important role and nature, which is based on systematic innovative action, this paper first theoretically presents key concepts related to motivation and innovation. In order to fulfill the aim of the paper, its structure was approached in the following way - the key concepts, motivation and innovation are presented three-dimensionally, from an entrepreneurial perspective, from the perspective of the managerial function and from the perspective of the human resources management function. After gaining insight into the described spectrum of secondary findings using the survey method, empirical research was conducted to determine the factors that motivate employees of the ICT industry to act innovatively in order to present recommendations for managers who are responsible for their motivation programs within the company.

Based on the presented and discussed results of secondary and primary research, as well as presented recommendations for further research and recommended practices for managers in charge of employee motivation programs, it is concluded that ICT industry employees:

- have a high level of awareness of the nature of the industry in which they work and the needs for their innovative actions
- are highly intrinsically motivated for innovative actions
- believe that despite their high level of intrinsic motivation, they are not sufficiently extrinsically stimulated for innovative actions within the work organization
- believe that despite their high level of intrinsic motivation, they are not adequately encouraged within the work environment for innovative actions
- that the extrinsic motivational factors that encourage them to be innovative are bonuses based on overall performance, then involve-

ment in decision-making when shaping and implementing changes, then additional training

- that the obstacles to their innovative actions are primarily caused by the level of support from superiors and the organization for innovative actions.

Based on everything presented in this paper, the authors conclude that the innovative activity of employees within the ICT industry is currently at a satisfactory level, but that taking into account the high long-term expectations from the industry at the national level, every company operating in it should try to preserve and utilize the full potential of its human capital as an important factor of its intellectual capital.

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