

## VIRTUAL COOPERATION – A CONTEMPORARY VIEW ON THE COLLABORATION BETWEEN BUSINESSES IN THE 21ST CENTURY

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**Purpose:** To analyze the four key pillars of virtual organizations and assess the impact of business management solutions on the quality of information management.

**Design/methodology/approach:** The study deeply analyzed the four primary pillars that support a virtual organization, namely its primary goal, common telecommunication/IT network, mutual trust, and people. The research adopted both descriptive and comparative analytical methods, as well as synthetic methods, to study and compare various approaches to managing a virtual organization. The Shapiro-Wilk test determined the adoption of parametric significance tests.

**Findings:** The management process in a virtual organization is intricately connected to the quality of the four main pillars. Especially significant is the role of people, who are considered the primary capital in this organizational model. Efficient management of a virtual organization leads to flexibility, innovation, and achieving effective results through the adept utilization of human and technological resources.

**Research limitations/implications:** While the research provides an extensive understanding of the workings and factors influencing virtual organizations, the findings are based on the views of the 355 respondents, which may limit its generalizability.

**Practical implications:** The findings offer pragmatic guidance for managers and practitioners in the realm of managing virtual organizations. It emphasizes the need to focus on the quality and efficiency of the four main pillars, especially on human resources, to ensure the success and innovation of the virtual organizational model.

**Originality/value:** The article offers a fresh perspective on the research of virtual business cooperation in the 21st century. By amalgamating various research methods and analyzing responses from a diverse group of respondents, it reveals a deeper understanding of the factors that influence the success and management of virtual organizations. It underscores the significance of human resources and technology in this modern business model.

**Keywords:** virtual organization, virtual cooperation, human resources, technology resources.

**Category of the paper:** research paper.

## 1. Introduction

During the times of the digital transformation, businesses operating in every sector have to adapt their strategies and organizational structures to new challenges and opportunities. In this context, the concept of virtual cooperation has been gaining importance as a contemporary view on the collaboration among enterprises in the 21st century. Throughout the era of digital technologies and continuous technology advancement, ways of communication and collaboration has undergone dramatic transformation. Against this background, the new concept of virtual cooperation has come into existence. The article attempts at investigating modern enterprises defining this form of collaboration for themselves to face the challenges and the rapidly changing reality of the 21st century.

Virtual cooperation, meaning a system of coordinated intentional activities undertaken by business operators in the online space, has revolutionized the traditional business models. Teams, often scattered around the world, connecting with each other via new technologies, are capable of operating in an efficient and productive manner, overcoming the limits of time and space. This is much more than simply online work; this is a new philosophy of management, a new model of interaction and interdependence. Virtual organizations, which operate in the virtual space, are new on the market. Unlike traditional organizations with their physical presence, virtual organizations are characterized by gradually disappearing physical components such as offices or production buildings. Instead of managing a concrete physical structure, virtual organizations tend to develop into flexible networks with undefined borders. The virtual space is dominated by knowledge and imagination instead of the senses. To start a virtual organization, first you need to build an appropriate virtual space. Virtual space is a completely innovative phenomenon that contributes to dramatic change, eliminating the physical space limitations typical of states of nations, thus becoming a harbinger of globalization. The size of a virtual space depends on the system's capability to cover multiple users. Organizations have to continuously create and obtain knowledge to be able to fully benefit from the virtual space. Management of virtual organizations requires compromise in terms of the corporate culture, knowledge base and range of control. Flexibility, creativity and control systems are essential for the performance of virtual organizations. Hence, design of virtual organization consists of balancing the conceptual space with technological space and cultural space. Technology is a tool enabling transformation of an organization's vision into reality. It is important for virtual organizations to have a clearly defined vision, understanding of how virtual space works, and appropriate knowledge management capabilities. Therefore, it is reasonable to ask a question of how virtual cooperation affects the strategies of enterprises, which technologies are essential for its effective implementation, which advantages and challenges are involved in this revolutionary concept. Is virtual cooperation the future of all businesses, or is it perhaps only a transitional trend, bound to disappear as soon as another innovation emerges?

## 2. Literature review

A virtual organization, also known as a virtual enterprise, is based on four main pillars. The first of these pillars is the primary goal, fundamental and determining the actions of all partners. The second pillar is the shared IT/communication network as necessary infrastructure for the functioning of the organization (Chung, Huang, 2021). The third pillar is the mutual trust among members of a virtual organization (Hacker et al., 2019, p. 23.), which helps eliminate the consequences of limited control in a virtual environment. Finally, the fourth yet most important pillar is the people who contribute their knowledge and experience, constituting the only capital of a virtual organization (Zahar, Ismail, Rashid, 2021, pp. 8-14). Use of this potential may lead to quick and effective accomplishment of the intended goals (Brütsch, Frigo-Mosca, 1996, p. 33). There are a lot of various forms of virtual organizations (Dulebohn, Hoch, 2017, pp. 569-574), such as partnership in creating joint ventures, joint ventures as such, strategic alliances, combination of business organizations into a new corporation, building a network of businesses for the purposes of joint production and supply of distribution services. Virtual organizations may also be formed on the basis of cooperation agreements and contracts, copyrights, or purchases of contract licenses (Burton, Turner, Bettis, Burton, 2002, pp. 49-73).

Considering their nature, virtual organizations offer multiple benefits which may be particularly attractive for other businesses, particularly taking into account their flexibility, quick response to market changes (Eseryel, Crowston, Heckman, 2021, pp. 424-460.), more innovation, reduced costs, access to expert knowledge and resources (Liu, Gou, Camarinha-Matos, 2020, pp. 263-272), ability to compete globally (Lockwood, 2018, pp. 137-152).

It should be noted, however, that virtual organizations are not free of challenge (Robertson et al., 2022, pp. 451-464). In order to succeed, they need a strong IT/communication infrastructure for stability, data security and efficient exchange of information (Afsarmanesh, Camarinha-Matos, Msanjila, 2009, pp. 209-219). Moreover, for a virtual organization to perform successfully, it needs good management of relationships among partners (Morrison-Smith, Ruiz, 2020, pp. 1-33), based on mutual trust, collaboration and development of effective communication systems (Alfieri et al., 2004, pp. 33-40).

There are three main motives in a virtual organization which create and shape the competition. First, there is the need to share resources, implement new methodologies and division of competence to accomplish a global competitor's position in markets or their segments; second, the systems used in a virtual organization represent the complexity of the most profitable products by creating prototypes, production processes, design, marketing systems; thirdly, a virtual organization supports fast creation and gathering of production, financial and human resources in response to the shortening return periods for products and services (Al-Karkhi, Fasli, 2019, pp. 6-11).

Building a virtual organization is an opportunity for setting up such a management system that would enable risk sharing, defining infrastructure costs at appropriate levels, improvement of workforce qualifications and skills (Martyniuk, Korolov, 2022, pp. 111-116). A virtual organization is an organizational network constituting a foundation for a virtual organization by focusing on an unrestricted group of partners (Walker, 2006, pp. 25-41) that accept the organization's primary goals and principles. Such a perspective was presented by B. Mikula who treats a virtual organization as a networked organization (Mikula, 2018, pp. 34-46). In practice, a virtual enterprise is an arrangement in which specialized business units, being leaders in their narrow fields of expertise, can merge into a powerful whole, with practically no weak points (Bagga, Gera, Haque, 2023, pp. 120-131). Nevertheless, even though the implementation of a virtual enterprise model and operating principles may seem easy (Burrell et al., 2021, pp. 209-222), it is not easy to draft the concept and to manage it in practice. A virtual organization requires an aggressive strategy, excellent solutions, advanced technologies, overcoming barriers, and building a positive image of the company (Mitchell, 2023, pp. 1982-2008). With its characteristic features, it has a greater chance of hiring highly qualified staff (Zuofa, Ochieng, 2021, pp. 1083-1088) and using their abilities in project work. Staff members often manage their own operations and communicate with customers in ways that promote the company's image of excellence (Żukowska-Budka, 2006, p. 4). Managers are required to manage the relations between staff working out of office and the headquarters. All staff members have to be aware that they are part of a single organization and they are responsible for its functioning, reputation and prestige (Żukowska-Budka, 2006, p. 4).

The key purpose of a virtual organization is to focus on the customer, take the opportunities that emerge on the market, and avoid risks arising from continuous changes of the market environment. To ensure adequate competences and to respond to new opportunities emerging on the market, a virtual organization (Blanchard, 2021, pp. 290-296) combines the basic functions of its particular members. Members of a virtual organization have to behave (Kisielnicki, Ochowski, 2005) in an ethical and trustworthy manner versus each other. Building consensus based on common interests is essential for effective performance of an organization (Newman, Ford, Marshall, 2020, pp. 452-473). Distrust and unethical behaviors cause deterioration of collaboration and may ultimately lead to bankruptcy.

Based on a detailed review of literature on virtual organizations, the role of management solutions, and their impact on information quality, three research questions and corresponding hypotheses have been formulated.

Research questions:

1. How do different management solutions impact the quality of information management in virtual organizations?
2. What role does the IT/communication infrastructure play in determining the efficiency of information exchange in virtual organizations?

Hypotheses:

H1: Advanced IT/communication infrastructure directly correlates with enhanced quality of information management in virtual organizations.

H2: Effective relationship management among partners in virtual organizations leads to better collaboration and improved information quality.

### 3. Research methodology

The conducted study aimed to understand the impact of IT solutions on the quality of information management in virtual enterprises. To thoroughly investigate this matter, the following research hypothesis was formulated: the quality of information management in enterprises is positively correlated with the following management solutions: open training, organizational culture.

#### **Knowledge, development, salaries**

This hypothesis is consistent with the results of the t-test, which showed that enterprises with a higher level of information management more often use open and closed training, focusing on development, knowledge, and communication, and in enterprises with a higher organizational culture. The multiple regression analysis also confirmed this hypothesis, showing that open training, organizational culture, knowledge, development, and salaries are significant factors explaining the quality of information management.

To verify this hypothesis, a survey was used in which respondents were asked to evaluate various aspects of information management using a Likert scale ranging from 0-5, where 0 indicates the least importance of knowledge in a given area, and 5 signifies the greatest importance.

A total of 355 respondents participated in the study, including 25% women and 75% men. Of these respondents, 25% held managerial positions, 20% were supervisors, 55% were directors of various departments, and the remainder were knowledge workers from different sectors of virtual enterprises.

To ensure the reliability and validity of the data, statistical analysis was conducted, including the Shapiro-Wilk test to verify the normal distribution of the studied traits. Since the p-value was greater than 0.05, it was assumed that the probability density distributions did not significantly differ from a normal distribution, allowing for the application of parametric significance tests to analyze the data.

This methodological approach allowed for a deep understanding of the impact of IT solutions on the quality of information management and provided tangible value to managers and other specialists involved in managing virtual enterprises.

## 4. Research results

The aim of the study was to assess the influence of enterprise management solutions on the quality of information management.

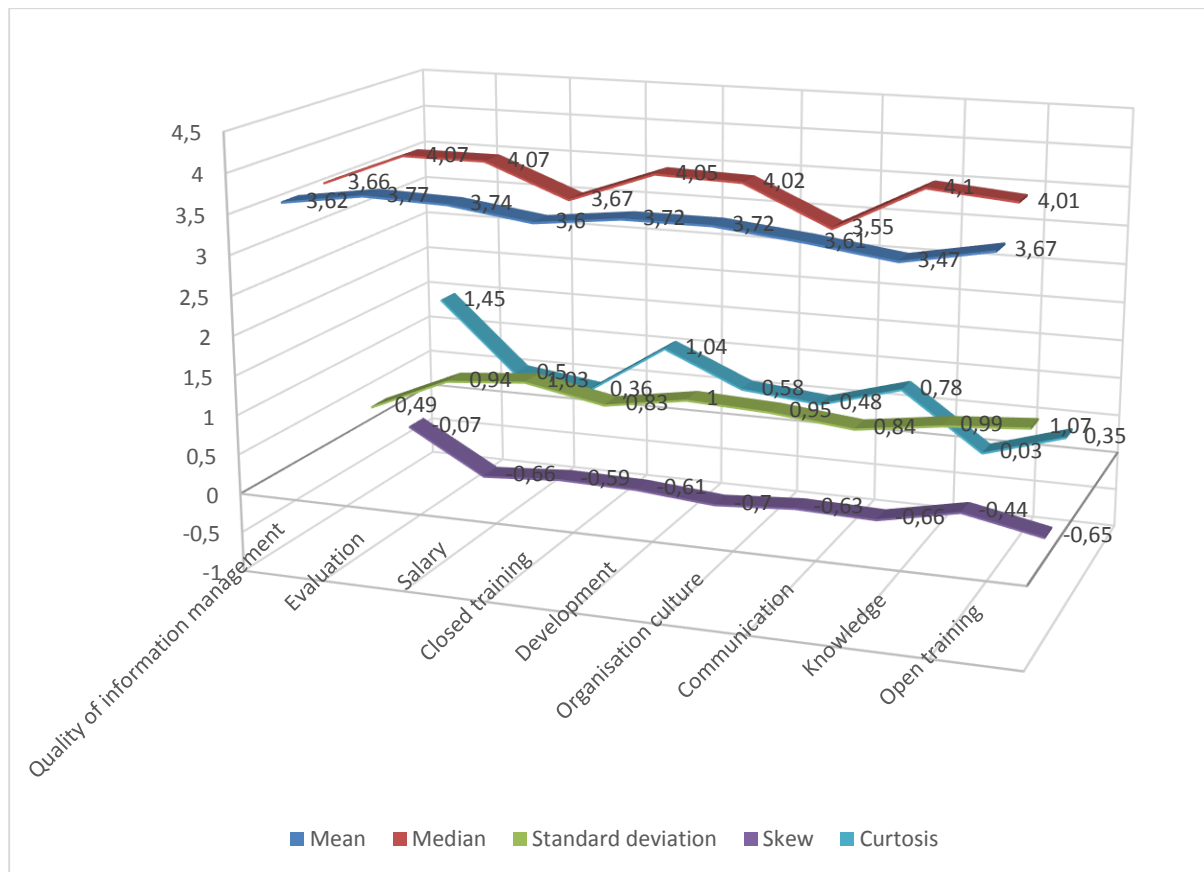
Table 1, figure 1 presents the descriptive statistics for the measured variables and the Shapiro-Wilk test results which was used to verify the normal distribution of measured traits. Given that  $p > 0.05$ , it was assumed that the probability density distributions were not significantly different from a normal distribution, and parametric significance tests were consequently employed.

**Table 1.**  
*Descriptive statistics*

	Mean	Median	Standard deviation	Skew	Curtosis	Shapiro-Wilk W-value
Quality of information management	3,62	3,66	0,49	-0,07	1,45	W=0,979; p=0,441
Evaluation	3,77	4,07	0,94	-0,66	0,50	W=0,912; p=0,322
Salary	3,74	4,07	1,03	-0,59	0,36	W=0,933; p=0,122
Closed training	3,60	3,67	0,83	-0,61	1,04	W=0,932; p=0,231
Development	3,72	4,05	1,00	-0,70	0,58	W=0,911; p=0,322
Organisation culture	3,72	4,02	0,95	-0,63	0,48	W=0,944; p=0,455
Communication	3,61	3,55	0,84	-0,66	0,78	W=0,923; p=0,233
Knowledge	3,47	4,10	0,99	-0,44	0,03	W=0,976; p=0,122
Open training	3,67	4,01	1,07	-0,65	0,35	W=0,967; p=0,233

Source: own elaboration.

In the subsequent steps, differences between lower and higher levels of information management quality were tested. It was statistically significant ( $p < 0.05$ ) that enterprises with a higher level of information management quality also had higher employee ratings, higher salaries, more frequently employed both open and closed trainings, emphasized on development, knowledge, communication, and had a superior organizational culture (table 2, figure 2 & 3).



**Figure 1.** Descriptive statistics.

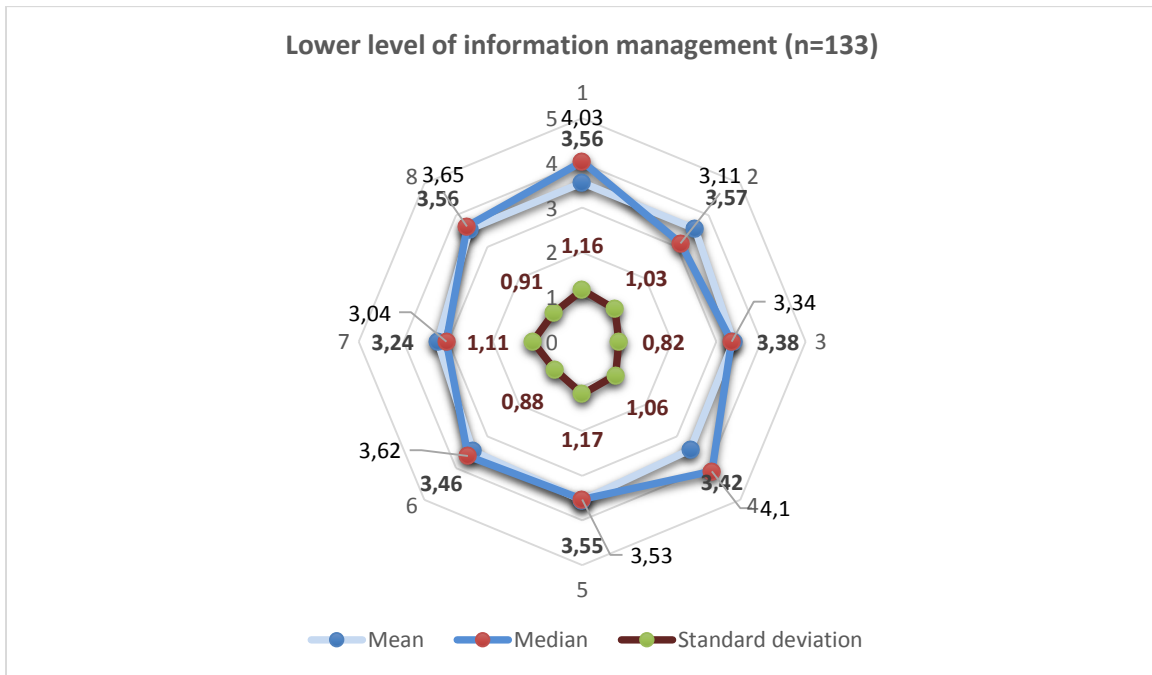
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**Table 2.**

*Descriptive statistics with Student's t-test of differences between lower and higher levels of information management*

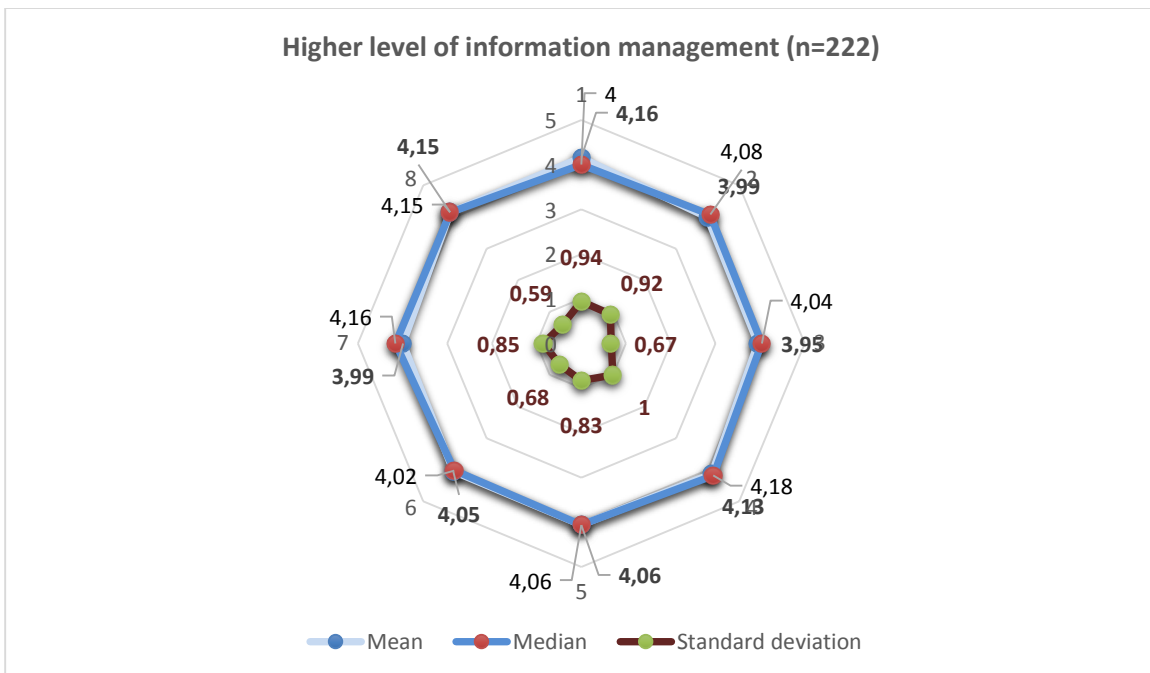
	Quality of information management						T-test	
	Lower level of information management (n = 133)			Higher level of information management (n = 222)				
	Mean	Median	Standard deviation	Mean	Median	Standard deviation	t-value	p-value
Evaluation	3,56	4,03	1,16	4,16	4,00	0,94	-6,53	<0,01
Salary	3,57	3,11	1,03	3,99	4,08	0,92	-7,33	<0,01
Closed training	3,38	3,34	0,82	3,95	4,04	0,67	-10,58	<0,01
Development	3,42	4,10	1,06	4,13	4,18	1,00	-7,70	<0,01
Organisation culture	3,55	3,53	1,17	4,06	4,06	0,83	-7,82	<0,01
Communication	3,46	3,62	0,88	4,05	4,02	0,68	-9,18	<0,01
Knowledge	3,24	3,04	1,11	3,99	4,16	0,85	-8,13	<0,01
Open training	3,56	3,65	0,91	4,15	4,15	0,59	-10,62	<0,01

Source: own elaboration.



**Figure 2.** Lower level of information management (n = 133).

Source: own elaboration.



**Figure 3.** Higher level of information management (n = 222).

Source: own elaboration.

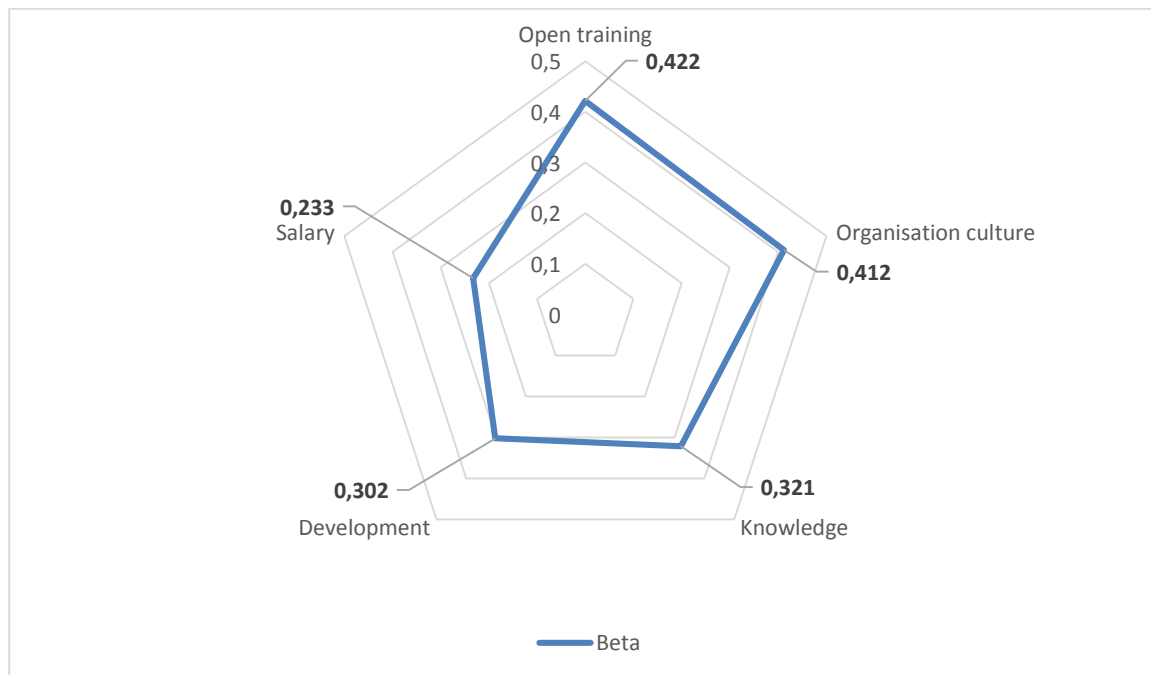
A multiple regression analysis was also carried out. It accounted for 59.8% of the variance and was higher with the more frequent application of open training, and the greater the organizational culture, knowledge, development, and salaries (table 3, figure 4).



**Table 3.**  
Regression coefficients

Statistics	Regression coefficients		
	Management solutions	Beta	p-value
Quality of information management R = 0,787; R <sup>2</sup> = 0,598; F = 343,22; p < 0,01	Open training	0,422	<0,01
	Organisation culture	0,412	<0,01
	Knowledge	0,321	<0,01
	Development	0,302	<0,01
	Salary	0,233	<0,01

Source: own elaboration.



**Figure 4.** Regression coefficients.

Source: own elaboration.

Given the findings, the previously formulated research hypothesis – the quality of information management in enterprises is positively correlated with the following management solutions: open training, organizational culture.

Knowledge, development, salaries - has been verified.

This hypothesis is consistent with the results of the t-test, which showed that enterprises with a higher level of information management more often use open and closed training, focusing on development, knowledge, and communication, and in enterprises with a higher organizational culture. The multiple regression analysis also confirmed this hypothesis, showing that open training, organizational culture, knowledge, development, and salaries are significant factors explaining the quality of information management.

Open training can help employees develop the skills and knowledge they need to manage information effectively. Organizational culture can promote the sharing of information and the collaboration of employees. Knowledge is essential for making informed decisions about information management. Development can help employees stay up-to-date on the latest information management trends. Salaries can help attract and retain talented employees who

are committed to information management. The results confirm that management solutions, especially training (both open and closed), organizational culture, knowledge, and employee compensation, play a significant role in determining the quality of information management in virtual enterprises.

## 5. Discussions

The above may lead to the conclusion that virtual enterprises have countless opportunities and strong points that drive their success and competitive advantage. Flexible management is one of the crucial aspects enabling virtual businesses to adapt to the changing market realities and to respond quickly to new opportunities. It makes them capable of surpassing conventional enterprises which frequently have to overcome more significant difficulties involved in their structures and decision-making processes. Another advantage is the proactive competition policy with which virtual businesses are able to break ground for changes in the industry and be ahead of competition. By monitoring the market, trend analysis and adjusting their strategies accordingly, these enterprises have the ability to build their competitive advantage and to maintain their leading positions. Catering to customer needs is the essential goal of every business, while virtual enterprises have certain extra tools that help them accomplish this goal. With the use of such advanced technologies as artificial intelligence and data analysis, they can learn more about the preferences and expectations of their customers so as to personalize their proposal and adapt to individual needs. This is extremely important because in the contemporary competitive environment, customers want to receive such products and services that would be tailored specifically to their needs. Creation of new competences is another advantage available to virtual enterprises. As they operate in a rapidly changing technology environment, they have the opportunity to grow continuously and to acquire new capabilities. They can invest in personnel training, develop their in-house competence centers and liaise with other operators to gain new knowledge and skills. This, in turn, translates into innovative management and the ability to place new and unique products on the market. Cost reduction is another factor speaking to the advantage of virtual enterprises. With the use of such advanced IT and communication technologies as cloud and online collaboration tools, they may reduce the costs of maintaining traditional offices and infrastructures. Staff can work efficiently online, thus generating cost savings on office leases, purchases of equipment and maintaining other operating costs. Improvement of quality and management innovation is another positive effect generated by virtual businesses. With the use of advanced IT utilities and systems, they are capable of streamlining their management processes, optimizing information flows and take better decisions. With automation of routine tasks, staff can focus on more value adding, creative tasks, which helps the quality of their work and the level of innovation of the entire

organization. Good reputation on the market is another advantage of virtual enterprises. With their flexibility, innovation and adaptability to the changing market needs, they are received positively among customers and business partners. Virtual enterprises are often associated with modernity, advancement of technology and commitment to the development of digital communities. Shorter product launch cycles are another important aspect contributing to the competitive edge of virtual enterprises. With the use of the Internet and digital technologies, they are capable of placing new products and services on the market faster. Testing, production, distribution and marketing processes can be more efficient and fast, thus enabling virtual organizations to gain competitive advantage and win a larger share of the market. Higher numbers of prospective customers are yet another advantage available to virtual enterprises. With the Internet and global accessibility, they can reach customers all over the world. They can operate online, offer their products and services through e-commerce platforms and attract customers from various regions and cultures. This opens up new market and new growth opportunities for them. Successful direct marketing is the next aspect of virtual enterprises' superiority. Through the use of the marketing tools available over the Internet, such as online advertising, social networks or e-mail campaigns, they can successfully reach their target group and build their brand awareness. Direct communication with customers further enables them to collect feedback and adjust their marketing strategies in real time. Efficient management of human capital is another strong point virtual enterprises can rely on. With the online work options and flexible time schedules, they are capable of attracting and retaining highly qualified employees. Staff can enjoy more freedom and a better work-life balance, which gives them stronger motivation and commitment to their jobs. Facilitated financial handling of sales is the final aspect worth emphasizing here. By using electronic payment systems, virtual enterprises can smoothly process their transactions and handle their sales. Offering diverse payment options and secure online solutions gives them higher confidence from customers and streamlines closing their sales. Ergo, virtual enterprises have multiple opportunities and strong points that drive their success and competitive edge. Flexible management, proactive competition policies, satisfying customer needs, creating new competences, reduction of costs, improvement of quality and innovation of management, good market reputation, shortened product launch cycles, higher numbers of prospective customers, successful direct marketing, good management of human capital and streamlined financial handling of sales - all these features are the driving force for growth and success of virtual enterprises. Virtual organizations, a contemporary model of doing business, bring forth a myriad of advantages and opportunities but also face inherent challenges and threats.

Virtual organizations adapt swiftly to changing business landscapes, ensuring their operations remain fluid and responsive. The digital nature of these organizations leads to quicker transaction closures. Overhead costs related to transaction processing are drastically reduced. The legal intricacies associated with transactions are minimized. These organizations can implement production, pricing, and other strategies at scales surpassing the capabilities of

traditional enterprises. With lesser infrastructural and overhead costs, capital expenditures are substantially lower.

However, there's an inherent risk of collaborating with businesses that might not uphold professional standards in virtual organizations. The absence of predefined standards can lead to inconsistencies in operation. On the brighter side, virtual organizations can promptly fill market gaps, ensuring they stay ahead of competitors. They have the aptitude to close deals even in the face of legal or corporate hindrances. The decentralized nature allows these organizations to harness the best professional offerings of every partner. Virtual organizations are often at the forefront of adopting cutting-edge management methods. They can collaborate with entities that might be inaccessible in conventional organizational structures. The operations of virtual organizations inherently align with the tenets of globalization.

The key problems with managing a virtual organization are the following:

- Coordination of the competence center with the providers of additional competences.
- Integration of the service providers' network in the process of pursuing the global strategy of the enterprise.
- Building the corporate identity and culture, particularly in the case of online work.

Virtual computer networks are extremely versatile and are broadly used in operations of companies as effective communication tools. However, their development is based on a much broader spectrum of factors and technologies driving performance and business efficiency. The first essential aspect which determines growth of virtual computer networks is their availability. With the continuously improving Internet access, businesses can easily set up connections among teams and branches worldwide. This streamlines the process of sharing information, collaboration over distance and quick decision making. Moreover, with the availability of virtual computer networks, organizations are capable of effectively managing their IT resources and providing rapid support. Simplicity for users is another important factor. Virtual computer networks are designed to be intuitive, easy to operate for users with various levels of technical proficiency. A transparent user interface and customization options facilitate working with a system, which in turn offers higher productivity and less training requirement. Low costs can also be seen as a key advantage of virtual computer networks. By using this technology, enterprises can significantly reduce their spending on IT infrastructure, such as servers, local area networks or software. Virtualization of corporate operations will also lower the costs of business travel, as meetings can be held over distance through teleconferencing and videoconferencing. In addition to the factors enumerated above, growth of virtual computer networks is also based on diverse IT systems. Workflow management systems facilitate effective monitoring and coordination of activity at an organization, thus leading to higher efficiency of business processes. Group work systems support team work through sharing documents, schedules and tasks. Moreover, knowledge management systems offer knowledge gathering, retention and accessibility within an organization, thus contributing to higher innovation and competitive advantage. Teleconferences and video conferences are available as

means to hold meetings over distance, which in turn offers time savings and business travel cost efficiency. Nowadays, organizations use virtual organization-dedicated systems more often as well. These advanced platforms provide options for building virtual work environments in which personnel can collaborate and share information efficiently. The advancement of virtual computer networks is linked to the development of news portals. These enable the personnel to access most recent information about the organization, the industry or the market, thus being able to take more informed decisions. With the advancement of technology, speech and handwriting recognition systems are being improved as well. They offer automated processing of voice and text data, thus improving communication and data processing efficiency. Thus, growth of virtual computer networks is based on multiple diverse IT systems and technologies. With their availability, user-friendly interfaces, low costs and integration of various systems, virtual computer networks are highly valuable tools for businesses, improving their performance, innovation and competitive advantage.

Virtual organizations foster growth of new markets and increase the performance of design, operations and communication processes. Virtual enterprises have numerous advantages, such as the use of synergies of different companies, short project execution times, flexibility and responsiveness to changes in demand, ability to consolidate resources and competences, effective use of information, online learning, reduction of costs, decentralization of management, flatter corporate structures, equal positions of business operators, no rigid hierarchies, fluid roles in the organization, process orientation, effective use of IT networks, focus on key success factors, influence on the organizational structure, interactive communication with customers and the environment. Virtual organizations support taking advantage of the partners' strong points, thus shortening the time to market and leading to business growth. In addition, virtual enterprises offer access to new markets, market segmentation, building customer loyalty and offering integrated solutions.

In light of the conducted research, the analysis of the impact of IT solutions on the quality of information management in virtual enterprises emerges as crucial for modern organizations. The main research hypothesis, suggesting that the quality of information management in enterprises is positively correlated with management solutions such as open training, organizational culture, knowledge, development, and compensation, has been confirmed. Companies with a higher level of information management quality often use both open and closed training, focus on development, knowledge, and communication, and also have a higher organizational culture. Moreover, employee compensation also plays a key role, underscoring the value of compensation in attracting and retaining talented workers dedicated to information management.

Considering the ever-increasing importance of knowledge and human capital in organizations, as well as the growing complexity and necessity of effective information management, these results highlight the value of investing in the right tools and managerial

practices. How organizations manage their knowledge and human capital becomes a key to their success in today's dynamic business environment.

Although the study provided significant findings, there are certain limitations. The number of respondents, as well as the primary focus on virtual enterprises, might limit the generalization of the results to a broader business context.

For managers and specialists dealing with the management of virtual enterprises, it is recommended to continue investing in training (both open and closed), promoting an organizational culture conducive to knowledge sharing, and appropriately compensating employees for their contribution to information management. Additionally, continuous monitoring and evaluation of the tools and strategies used for information management are essential to ensure their relevance and effectiveness in the changing business environment.

## **6. Summary**

Summing up the discussion above, organizations nowadays tend to appreciate the importance of knowledge and human capitals more and more. Many businesses invest in data gathering and sharing systems, while their corporate structures undergo transformation. The tools to support this process include the Internet and advanced computer networks, enabling enterprises to communicate with their environment. Virtual organizations, acting on the basis of network models, are able to quickly respond to customer needs and to expand their operations accordingly. Knowledge is becoming the primary source of competitive advantage, while good knowledge management drives the rapid growth of the organization. Nevertheless, it should be emphasized that there is still a group of business owners and managers who fail to perceive the role of knowledge as the key success factor for a business undertaking. The human capital and knowledge are the most valuable resources of advanced corporate organizations. They optimize their operations through maximizing the use of the intellectual capital. The prevailing management methods include learning, knowledge management, building the corporate culture and project management. Interpersonal relations in advanced organizations are collaborative, involving joint learning, knowledge transfer and frequent instability of the governing system. Most communication takes place on the horizontal level in an informal manner. Personal identity is often linked to group identity. The essential management methods and tools include learning, training, mentoring, coaching, intellectual capital management, knowledge management, and project management.

The following general conclusions have been drawn from the discussion in this paper:

- Virtual organizations are gaining popularity as a new form of organization, engaging advanced technologies and computer networks.
- Virtualization gives organizations flexibility, scalability and adaptability to changes in their environment.
- Virtual organizations use knowledge and human capital as their key resources, drivers of the competitive edge.
- However, there are also certain barriers and threats relating to virtual organizations, such as technology challenges, lack of legal regulations, Internet addiction and its negative consequences.

As we discuss the aspects of virtual organizations, the following lines of further research can be proposed:

- Study of technology solutions that may contribute to streamlining the operations of virtual organizations, such as data transmission security, new models of virtualization, and growth of infrastructure.
- Study of psychological and social aspects of virtual organizations, including the consequences and ways of managing Internet addiction.
- Study of knowledge and intellectual capital management strategies at virtual organizations, such as effective gathering, sharing and using knowledge.
- Study of the impact of virtual organizations on the corporate culture and interpersonal relations, particularly on the development of group identity and collaboration.
- Study of successful project management methods at virtual organizations, taking into account the unique challenges involved in distributed teams and online communication.

Continued research in these areas will foster further understanding and improvement of virtual organizations, thus contributing to their performance, innovation and long-term success in the rapidly changing business environment.

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