



Hungarian University of Agriculture and Life Sciences

***Examination of controlling methods affecting
corporate performance appraisal systems***

The Theses of the PhD Dissertation

Zsolt Barna

**Gödöllő
2024**

Doctoral School

Name: Economic- and Regional Science Doctoral School (GRTDI)

Field of science: Business and management sciences

Head: **Dr Bujdosó Zoltán**
University Professor
Hungarian University of Agriculture and Life Sciences
Károly Róbert Campus
Institute for Rural Development and Sustainable Economy
Department of Sustainable Tourism

Supervisors: **Prof. Dr habil Zéman Zoltán PhD**
University Professor
University of János Neumann
Doctoral School of Business and Management

Dr Kollár Péter
Associate Professor
Hungarian University of Agriculture and Life Sciences
Deputy Director of Education
Institute of Agricultural and Food Economics
Department of Agricultural Management and Leadership

Approval by the Head of School

Approval of Supervisor

Approval of Supervisor

TABLE OF CONTENTS

1. INTRODUCTION	4
1.1 Topicality of the subject	6
2. OBJECTIVES.....	9
3. MATERIAL AND METHOD	12
3.1 Material.....	12
3.2 Method.....	23
4. CONCLUSIONS.....	31
5. NEW SCIENTIFIC RESULTS	34
6. SUMMARY.....	36
M1. Bibliography.....	37
M2. Bibliography – own publications by MTMT.....	40

1. INTRODUCTION

"We controllers cannot behave like 'homo economicus', because a systems approach can only look at the behavioural aspects integration of behavioural aspects." (Péter Horváth; 1937 - 2022)

Controlling plays a crucial role in the life of today's organisations, regardless of the ownership structure or the legal environment. The activities of the State, including state-owned enterprises and public administration, are regulated separately, but its exposure to the challenges of the competitive environment is as great as those of other market players. These firms and organisations have therefore also been subject to the expectations that were previously only and exclusively imposed on firms operating in the competitive sector, mostly privately owned.

The role of controlling is to quantify the results of the day-to-day business activities of companies, thus making a fundamental contribution to increasing the market value of the organisation, and companies operating in the business sphere consider human resources to be an important operational element, bringing together the evaluation of the business performance of both individual and organisational units.

Several new factors, such as scarcity of raw materials, digitalisation, electrification and pandemics, have redefined the opportunities for firms and even transformed entire industries in the last 2-3 years. As with everything else, the optimal exploitation of the opportunities offered by digitalisation is a key factor influencing the functioning of the human resources discipline. As time has gone by, the opportunities for IT solutions in the human resources field have increased and, fortunately, require less and less financial investment from companies. The epidemic situation has accordingly changed the terminology, the cycles that can be studied and the range of methods.

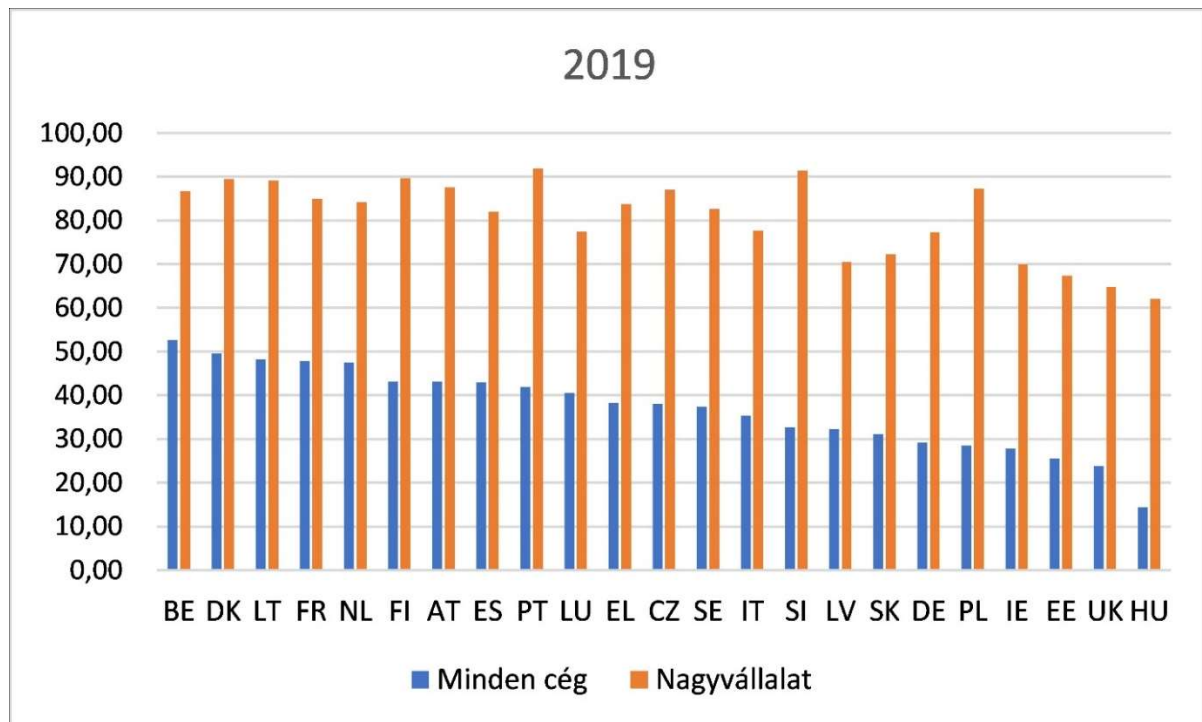
For firms operating in the market, the evaluation of individual or organisational activity has been part of operations for some time, although the methods used may vary. Partly as new actors, state-owned enterprises, the public sector or education are also trying to follow these methods, but their transposition has brought many uncertainties and problems, as the results to be evaluated are different and over different time periods.

In the public sector, we see a different perception than in the for-profit business environment, where remuneration based on performance is accepted. Here, it is rather determined by ethics and morality (Horváth, 2011). However, the pillars of the evaluation system need to be laid down, i.e. the core values and functions need to be defined, based on which a fair evaluation can be assigned to a relevant objective.

The State Audit Office of Hungary has also examined how this is achieved in public institutions, although their tasks are obviously quite different from those of normal companies (Németh, 2020). The questions not only focused on the definition of appropriate, consistent and, above all, measurable objectives, but also on the justification of the objectives, the system of sub-objectives to be achieved, their timing, their monitoring and the existence of the necessary conditions - regulatory, institutional and financial instruments.

For business organisations operating in the market, HR and digitalisation support is already part of the strategy, while the treatment of the same topic in the public sector is not necessarily positive (Felméry, 2015).

1. Figure: ERP-software user enterprises, 2019 (%)



Source: OECD ICT access by business database

The administration of human resource management, which involves sensitive personal data, is a separate system for many organisations, as it is not a core activity. This may be easier to implement in companies where an ERP system is in place, but in many cases, it is not part of the ERP system used. As can be seen in Figure 1, (blue are all of companies, red are the large enterprises) even before COVID we were lagging the European rates in the use of ERP systems. This makes it difficult for support areas such as human resources to be adequately digitised to help the company achieve its goals, and this is sometimes reflected in their capabilities (Barna, 2022).

The lack of proper project management, the lack of internal communication has brought several new problems and there are clear expectations about the efficiency gains of such systems when they are launched. This is where the important question of when it is necessary and optimal to buy such systems and start them up, and at what point in the life of a company is this really justified. From the IT side, from the developers' point of view, the way the system works is different and often the company expects something different, which they try to remedy by changing the basics rather than optimising their own processes.

It is not a good approach to think only in terms of buying something and then upgrading a lot of it, which is a very time-consuming and, not least, very expensive activity. Then, when the implementation starts, it turns out that simple process optimisation could have solved the issue, and sometimes there is already an internal need, but nobody knows about it because the user area is not consulted before the project starts.

The lead in this, as in many others, will be taken by global companies where the resources are available to professionally address and manage this important element, such as the human domain and the related performance evaluation issue, so the trends will be transferred from here to the public sector.

1.1 Topicality of the subject

If you look at the economic history of the last two or three centuries, you can see a lot of progress. Changes in technology, population growth and increased production require firms to come up with new solutions, even for their own internal operations. Although if we look back just 3-4 years, this too has been completely reassessed. We talk about the importance of strategic and long-term planning, (Kovács, 2021) the importance of mission and vision, while recording that we can only plan for the very short term, and that too by constantly adjusting in the light of incoming data. It is a contradictory period, yet some balance can be struck between them, operating in a healthy symbiosis. As much as there are differences in ownership structure, the fact is that both business and the public sector will recruit from the same labour market of candidates. Again, the answers will be found in two places. Let's see the goal and move forward from there. Beyond the short term, we need to plan for a vision that spans years, followed by the necessary systems, which the human resources area is helping to develop.

Only together can the company find the right way forward, with the departments as stakeholders, on which strategy design will be appropriate, either at the level of the departments or the company. Today, a wide range of IT options can support these efforts, so that they can serve the organisation's goals and their realisation in parallel, in parallel and in support of each other, while the right development path is being established. Both production and the related export-import activities play an important role today, as do innovative solutions that can conquer markets. Hence the importance of skills in recruitment, making training a key factor.

The core profile of the business organisation has been at the heart of management, around which the issue of improving productivity has been built, as well as day-to-day operations, and this has been supported by digitalisation. Human capital has become more valuable with the ever-changing opportunities and conditions, making this support area of companies more important than before.

As with everything, measurement has a purpose. For the human domain, it used to mean administrative and then coordination tasks, and then, taking a step further, it tried to work for and serve the various clients, the business disciplines (Karoliny - Poór, 2010).

The rise of digitalisation has shifted mindsets, and this has accelerated the introduction of innovative solutions related to human capital. Companies typically do this by hiring consultants who manage the implementation of these project-based developments from outside, as their specialised knowledge is better suited to successful implementation. This means an increase in the number and specialisation of internal control and monitoring tasks.

The previous practice of leaving the setting of indicators to management has changed. With new digital technologies, other types of data and information can be retrieved, expanding the range of possibilities for measuring performance and effectiveness. This is a new and modern trend for managers, where it is indeed possible to optimise the measurement of efficiency by weighting the right metrics (Poór, 2016).

At the same time, the time it takes for processed data to reach company managers has been shortened, so that decisions do not have to wait long. This optimises companies' responsiveness to ever-changing situations and market expectations. The human resources area is no exception in this respect, as it is already a strategic part of the company's operations, and it is therefore advisable to provide it with the right indicators to monitor and align its performance. Of course, a poorly performing unit will mean the opposite for the organisation, so a correction is also needed in terms of expectations. By detecting these anomalies in time, the effects of which are felt over different timeframes, generating planned or additional costs, they can be immediately quantified and put to a decision by the responsible parties.

As the finding that staff controlling and performance appraisal have become a strategic issue, it is now a process in the life of companies, with close implications for social conditions and economic results. It influences the realisation of the plans set for the whole company and optimises the necessary expenditure.

It provides management with constant feedback on resources, provided that the necessary evaluation is carried out based on the appropriate scale, whether it is the categorisation of salaries, the drawing up of subsidies, the analysis of a particular position or the analysis and planning of the training that is required. If we look at this from the point of view of the whole company, this could include personnel management or the way in which reports are drawn up.

Today, we have several impressive IT solutions that not only perform the necessary measurements and their analysis, but also present them in a very easy-to-understand, attractive visual format, and even allow the reader to set or rank the most important data for him or her with individual settings. These can be modified at any time, so the focus can be easily shifted to other data sets. To create value, the results of the measurements need to be presented daily, so that human capital management can adapt and adapt to the ever-changing circumstances.

The logic here is like what we see in other disciplines, so we put into the controlling report what the manager needs and at the time intervals he needs. We have already moved beyond the period of personnel administration, when the HR area first started to collect and store employee personal data. An additional benefit of the modules is that the database can be extended with information on all kinds of training and skills, and we have moved up a category again, as we have reached the internal progression, the career level. We can also plan internally to build teams for new positions and tasks, because we have basic information within the organisation, we have something to build on. Once we know that much and the planning is built into the system, then one step further and performance appraisal is in place, now based on skills and abilities and knowledge.

This is where a complete picture of the employee can be built up, which is also served by regular appraisal interviews, so that the evaluated information can be used to identify future opportunities within the company, whether it's training or a new offer on the career path.

In the human resources area, my own experience shows that in many cases the provision of the necessary IT background has been pushed into the background and is not part of the ERP systems used there. Consequently, data interoperability, without an interface, does not work, and previous practices and financial resources have not allowed for IT development in the supporting areas. Manually filling in spreadsheets does not achieve exactly what is needed, because there is no point

in running systems with bad and outdated data. It is therefore necessary to use the possibilities offered by controlling to identify problems in the organisation's operations and processes and, by involving the responsible managers in the proposals and decisions, to develop solutions with the responsible managers in the departments, thus enabling the organisation to improve its efficiency, productivity and competitiveness (Zéman et al., 2013) (Anthony - Govindarajan, 2006).

2. OBJECTIVES

When starting research, the first question is what should be its topic, purpose, task, what benefits can be derived from the facts revealed during the process, to answer the questions formulated. The basis for my choice of topic was the time I spent in different ownership structures in business organisations, the experiences and direct involvement I had there, which affect the operation of companies through the current issues of HR, controlling, performance evaluation, digitalisation.

I focus my research on the key areas of expertise, controlling and HR, and their interrelationships, in line with today's corporate focus. One important interface between the two is performance appraisal. An important element in exploring this issue is digitalisation and its role in both HR and controlling. Mirroring these roles in the different ownership structures, highlighting the different customs, rules and legal environments, as well as other influences that are shaping our times, de-globalisation following globalisation, crises, be it raw material shortages, COVID, war or the resulting collapse of supply chains and logistics systems.

Setting out the theme and clearly defining the objectives will set the tone for the paper. The objective of my research is to show the interface between HR and controlling. An important part of this interrelationship is the evaluation of corporate performance, be it at the level of departments or individual employees, which has an impact on the development of companies, on the decisions they need to take or on the development of their strategy. In the thesis, I will focus on the topics where, with the rise and rise of digitalisation, different levels of interrelationships between the controlling area and human capital management can be explored, reaching to the level of performance evaluation.

In an economic environment of uncertainty and constant change, the emergence of new technologies has led to a new direction in the development of different systems, affecting all areas of the company. I believe it is important to extend the analysis to the digitalisation of companies and changes in corporate culture, while also addressing the effects that are shaping our times, such as pandemics, shortages of raw materials and the effects of war.

I chose my approach to the topic, the materials and the information to be processed by combining literature research, the practices I have seen in companies and my own experience. On this basis, I formulated the questions and objectives. I believe that today, human capital is the only effective and innovative resource in an organisation, the one that can provide the answers to the issues that arise and need to be addressed.

My research questions are:

Question 1: What are the most important digitalisation steps for companies?

Even before the epidemic situation, digitisation was already a major issue, characterised by the emergence of new needs and solutions. Longer lifecycles in the past allowed for slower and longer lead times, preceded by proper planning. This enabled them to implement the tasks they had planned, to introduce new systems, products and processes following the right developments, and to forecast the years ahead. The increased demand for information has also made it essential for companies to understand the essence of digitalisation, which requires them to constantly rethink and, where necessary, adapt the composition of their data, including the introduction of new technologies.

Objective 1: My objective is to show the impact of digitalisation on the management system of companies and on the field of controlling and HR controlling in the light of the PES (Performance Evaluation System).

Question 2: What is the relationship between different ownership structures and the performance evaluation applied to them?

In the context of the link between controlling and HR, it is worth examining the performance evaluation practices and principles of the organisation in question, which serve to improve corporate efficiency. Today, IT solutions offer a wide range of possibilities for companies to obtain information on the performance of employees in a user-friendly way, using optimised resources, and how they can contribute to increasing the efficiency of companies and institutions. Today, this is facilitated by various IT solutions, which are available either on an island basis or as part of a business management system.

Objective 2: One of the objectives of my thesis is to examine the practices of companies with different ownership structures, in which controlling, in close cooperation with HR, ensures the proper functioning of the performance appraisal system, thus contributing to the retention of employees.

Question 3: What is the relationship between company size and digitalisation?

The existence of these systems is an important corporate factor, regardless of the size of the company. Modern digitalisation solutions are becoming more and more widespread, and no longer represent a major burden in all cases, whether the technical or financial aspects of their implementation are concerned.

Objective 3: One of the objectives of my thesis is to examine the relationship between size and the use of IT systems in organisations of different sizes. To what extent does the number of employees correlate with the degree of digitalisation, is the existence of different IT systems specific to a given size of company, are there correlations

Question 4.: What evaluation periods are used in practice by the companies surveyed from question the human controlling side, and what do the respondents' needs tell us?

From an employee's point of view - to work effectively - continuous feedback and evaluation is essential. Not only financial appreciation, but also professional development, vision, company culture and a relaxed and accepting atmosphere appear as important elements in the needs of employees, which they expect from their employer. Is there a discrepancy between the performance appraisal periods used in practice by companies and the intervals reported by employees.

Objective 4: By evaluating both the interviews and the results of the questionnaire survey, I want to verify not only the demand for performance appraisal by employees, but also the time intervals used in practice.

Question 5: Is controlling, with its now extended remit, able to support human resource management effectively enough?

The typical result of the last few years has been an increase in the role of controlling in the company. It has moved beyond the classic period when the general controlling department was limited to the usual tasks of report preparation and costing. Today, the changed planning cycles have rewritten the focus of the daily routine, not only in terms of the departments concerned, but also in terms of the activities and capabilities of the whole company. In examining the issue of corporate efficiency, one of the key themes is how the controlling discipline has adapted. How the planning cycles now in use affect performance evaluation and human capital.

Objective 5: In the context of this thesis, I intend to define the role of controlling and human resource management today and to show the main links between them.

3. MATERIAL AND METHOD

My thesis deals with the human performance appraisal and performance controlling systems used in companies with different ownership backgrounds and their economic impact. Due to the complexity of corporate operations, this affects the areas of controlling, HR and IT, their interrelationships and interfaces.

3.1 Material

Research methodology

When preparing a research project, not only the choice of the topic is on the agenda, but also the choice of the appropriate methodology. Of course, the basic aim is always to obtain and analyse the widest possible range of relevant data to obtain truly relevant information. An important element of this is to choose the right format for conducting the survey. In addition to quantity, obtaining qualitative data is just as important as the evaluation itself, or drawing conclusions and summarising opinions after processing. The sources relevant and relevant to the professional areas covered by the research are presented in Table 1 below.

1. Table: Definitive publication sources for research

Definitive publication sources				
	Author	year	Title	Field of expertise
1	Farkas F. – Poór J. – Norbert F. E. – Karoliny M	2003	Human Resources Management handbook	HRM
2	Horváth, P	2011	Controlling	Controlling
3	Horváth, P	1990	Controllershship in Handbook of German Business Management	Controlling
4	Karoliny M. né, – Poór J.	2010	Human Resources Management handbook	HRM
5	Poór J.	2015	International Human Resources Management	HRM
6	Poór J.	2016	Management-consultancy handbook	Corporate governance
7	Sajtos, L. – Mitev, A	2007	SPSS Research and data-analyse handbook	Statistics
8	Zéman, Z.	2016	Main trends in the development of controlling	Controlling
9	Zéman, Z.	2016	Strategic financial controlling and management	Controlling

Source: own editing

HR and controlling research

In connection with this topic, I started my own research, which, as I had expected, provided me with well-founded answers on corporate performance evaluation. My aim was to collect both qualitative and quantitative responses. The research, the results of which are currently being evaluated, is based on a complex questionnaire and seeks to shed light on the internal structure, IT, controlling and HR capabilities of the companies surveyed.

I have placed great emphasis on personal opinions and on the circumstances of the respondents, to get to know the operational nature of the companies and to collect basic information. The structure of the survey is relatively rigorous, as it consists of mandatory responses, and where possible, the Respondents to my research were able to provide a detailed, specific assessment. This consistent structure resulted in a quality response, giving a comprehensive picture of the organisation based on the questionnaires administered and completed. I also made sure that, as well as assessing the respondents' context, I also got to know their views, and in a free text block I gave them the opportunity to express their own thoughts on the performance appraisal system. A comprehensive report based on the results will be produced at the end of the research. More than 30% of respondents so far will be awaiting the results, indicating the relevance of the questions.

Of course, I have also looked at the possibilities, the basics, the trends and the research methods to follow. In addition, I consider my own contacts and my own work experience to be an essential source of information. I constructed my research by using qualitative interviews, each representing a separate block, on the one hand, and by sending out a questionnaire and evaluating the results on the other. This case-study methodology is typical in organisational research (Bryman, 1992), but can also be cited Eisenhardt (1989) or Yin (1994). On the one hand, the creation of theory is seen as the goal to be achieved, while Bryman's (1992) research principles put the exploration of local connections first. Stake (1994) distinguishes between qualitative and non-qualitative case studies. The aim of the qualitative case study is to understand the utility of the case to be explored. The method of detailed, in-depth analysis of the organisation under study, where the source is reliable, makes it easier to summarise generalisable information from it than if there are several organisations under study, which have fewer revealing characteristics and processes. Stake (1994) has broken down the evaluation of a case study into the study (research) and the product at the end is the report itself.

Selection of interviewees:

For the interviews, which were the focus of the research, I asked senior managers from different fields, mostly from large, nationally operating companies, to give a broad and accurate picture of the current situation of controlling, HR, IT, related issues and problems, and the practices applied not only in the field of PES, but also in the fields concerned. The seven interviewees described the current situation with more than 70,000 employees between March and June 2023, not only the facts but also their own professional opinions

The interviews covered and complemented the professional spectrum of the questionnaires sent out on what can be described as a complex task of performance appraisal. This represents 0.015% of employees, considering the national data of the KSH at the time.

- 4,691 M persons as employees (February 2023 KSH, national data)
- of which by age group 25-54: 3,545 thousand persons, i.e. 0.019%

Table 2 summarising the professional interviews is shown below.

2. Table: Summary table of the professional interviews

Professional interviews								
	Main business activity	Nature and area of activity	Ownership background	Digitalization / ERP	PES / evaluation period	Respondent's position	Response's nature of activity	Nr. of staff concerned by responses (persons)
1	public transport	national / public service	Hungarian / national	yes	yes / yearly	senior manager	HR	58000
2	freight forwarding	international / stock exchange	international / private	yes	no	senior manager	general management	5900
3	financial, banking services	national/ stock exchange	Hungarian / private	yes	yes / yearly	senior manager	HR	8500
4	automotive trade	national / stock exchange	Hungarian / private	yes	yes*** / yearly	senior manager	general management	210
5	game management	national	Hungarian / national	yes	yes/ quarterly	senior manager	Controlling	1710
6	household appliance retail	national /private	Hungarian / private	yes	yes / half-yearly	owner / sr. man.	general management	50
7	food retail	national / franchise	Hungarian / private	yes	no	senior manager	Controlling	340* / 3500**

*Central, **national nr. of staff, ***only for senior managers

Source: own editing, based on own research

The aims of the research are described in section 2 of this thesis. The primary database used to explore and provide evidence is the appropriate scientific methods to support the findings of this research and the related study is presented below, based on the business organisations that have a core function of controlling, including some form of human controlling and performance appraisal. The research consists of a secondary and a primary part, for which I have developed a picture following a review of the literature currently available to me. In addition to the current state of the art, the practical time spent in different companies as a professional experience will also broaden the theoretical knowledge by understanding the practice in the organization including the link between controlling HR and IT and these disciplines.

The paper presented the trends and opinions on the basic concepts related to the field and the topic, which guided the research objectives. Readers of the series were able to learn about the intersection of controlling, HR and IT and the impact of digitalisation and unforeseen global events on business organisations with different ownership structures.

The mere fact of having a performance appraisal system is not enough for it to perform its task with sufficient effectiveness in the changed short planning environment, where normal work has become almost project-like in duration and it has become important that project tasks can be integrated and thus measured. This requires the right evaluation period and method, such as the practical use of 360°. The primary part of the research can be grouped according to two principles: qualitative and quantitative. Research conducted on the quantitative principle gives the opportunity to quantify and generalise in terms of the population under study, which are determined using statistical methods (Sajtos - Mitev, 2007).

Following the interviews, I chose to conduct the primary research by means of quantitative data collection through a questionnaire, which was partly done through a social networking site (LinkedIn) and through an e-mail sent out to the names of the respondents using my own database. I also aided in filling it in on request in several cases. The questionnaire method is a very common and accepted primary research method and information gathering technique (Boncz, 2015) and consists of the following blocks in terms of research design:

Characteristics of the responding economic operators:

- Respondent's own opinion
- Business practices in their response in relation to space
- PES free text
- Demographic block

These blocks concerned the interfaces between the areas of controlling, IT and HR, the framework of the questionnaire available through the link was provided by a Google Forms form, which, similarly to the literature review, included controlling HR and IT blocks. The free and ready-to-use survey administration web-based software offered by Google adequately supported the research work. Two of the thirty-seven questions were open-ended, the responses were compulsory with the necessary branching, so that all the responses received could be fully evaluated as a homogeneous result. For 3 questions, Likert scale questions were formulated with 16, 15 and 6 sub-questions respectively, asking respondents to give an overall rating for one area.

This was followed by an opportunity to share opinions on the focus of the TOR system through question 25, as well as individual opinions on the questionnaire. Respondents were able to indicate if they wished to receive the results of the survey and to provide their company and email address. The full questionnaire is attached as Annex 6.

Primary research can be divided into 2 versions: qualitative and quantitative research, where the quantitative version provides quantifiable data that can be generalised to the population under study, thus allowing us to answer basic questions such as how many or how many people can be analysed using statistical methods (Sajtos - Mitev, 2007).

For the primary study of this thesis, I chose quantitative data collection using a questionnaire for direct inquiry. A previous opinion also identifies the use of questionnaires as the most common research method for primary research (Boncz, 2015), this type of information gathering technique is suitable for both descriptive and explanatory purposes.

In preparing the questions, I have also used practitioners in the formulation of the questions, as well as known research methods, and the interviewees of the related professional interviews were also managers in different research areas, covering controlling, HR and IT and general management, and in key positions where they have insight into the issues affecting more than seventy thousand employees in the context of performance appraisal.

Sampling itself is a procedure by which the part of the population to be investigated is selected. Stratified sampling is sampling that ensures a good or equal representation in the sample of the proportions of each stratum of the population deemed relevant to the study (Falus Tóth et al. 2011). A self-completion questionnaire format was used, which was read and interpreted by the respondent, thus ensuring that companies could complete the research questionnaire with the greatest possible anonymity.

The Google Forms interface was tested several times before finalisation, not only to check its functionality and the time required, but also to check its technical and content-related aspects, with the involvement of representatives of the various fields. Respondents were contacted in a first round via electronic channels such as electronic circulars or circular messages, and then also via personal messages addressed to their names. I contacted members of my own circle of contacts in various ways and places, not only through existing channels, but also using a professional social networking site (LinkedIn), not only in a post, but also by personal message. It took a quarter of an hour to complete.

The sampling process, which is one of the databases for this dissertation, involved representatives of the relevant disciplines and thanks to the rigorous design of the questionnaire, the large number of responses received was aggregated in a processable state due to the homogeneous nature of the responses, including the national access channel for sharing the questionnaire, with a total of 471 complete responses.

Previous surveys

Self-awareness is the cornerstone of firms' competitiveness in the market, whether it is knowledge of the characteristics that define their own organisation and management or, by comparison, the similar characteristics of their competitors. In Hungary today, we are witnessing a steady increase in the number of company managers who recognise the importance of human resource management and can place it in its proper place in terms of importance. Finding and, above all, retaining a workforce with the right skills and experience is essential to the effectiveness of an organisation. Not so long ago, the process was simply about filling vacancies as quickly as possible. In today's context, this means rapid change, often requiring knowledge of new technologies and the possession of specific skills and competences, so it is increasingly important not only to fill the gaps that arise, but also to recruit the right people with the right competences, both human and professional.

Reducing turnover rates, developing effective motivation and compensation systems, and organising succession are major challenges, and we must also consider the fact that today's workers' needs in terms of employment have changed - for both technical and social reasons - as they are more skilled, innovative and mobile than before, and therefore have higher financial and moral expectations.

As they say nowadays, "there are two certainties, uncertainty and constant change", neither of which, in a micro- or macroeconomic environment, supports the feasibility of long-term sustainable employment, and therefore a strategic approach to human resource management is needed, beyond carefully planned and implemented workforce management. Given the importance of this topic, my research aims to develop an HR controlling model that reflects the integration of human resources and controlling processes in a company, which can become an effective corporate governance tool beyond the traditional accounting-based metrics (Szűcs, 2017).

There have also been previous studies on human resource management, the organisational role and competences of HR in Hungarian business organisations (Bokor, 2007). In this context, a good starting point is a 1999 study entitled "In Competition with the World", which presents the results of microeconomic research on the international competitiveness of the Hungarian economy, indicating that firms typically place organisational development, human resource management and marketing under the direct control of their first- or second-line managers, thus suggesting the importance of these areas (Czakó-Wimmer-Zoltayné, 1999 and 2004). Research by Professor Poór et al. supports this with their finding that a significant proportion of Hungarian business organisations have a strategic plan for human resources. For example, in 2000, 70.4% of the firms surveyed had a written HR strategy (Karoliny et al. 2000, Poór, 2003).

In addition to the implementation of systems, it is necessary to define expectations, managerial and professional competences, which are indispensable elements for HR to be able to act as a recognised and effective business value creator partner, both inside and outside the organisation, by continuously meeting expectations (Bokor, 2005). Digitalisation, the development of technology related to the activities of companies, innovative processes and the various processes of globalisation have also reached human resource management. As a result, its approach and functions have been affected and, in addition to the traditional functions already known, new areas of expertise have emerged or become more important, such as HR (employer) branding, health promotion, HR controlling, knowledge management, retention management, generation management, competence management, talent management and diversity management.

Responses to the changing environment have significantly renewed the field of human resource management over the last more than a century.

If we look at the representatives of the classical management school (Fayol, Taylor, Weber), we can see that already at the beginning of the twentieth century, traditional HR functions such as performance appraisal (here still as a time norm), selection, motivation, development or retention, the role of loyalty can be identified (Dajnoki - Héder, 2017). In addition to performing administrative tasks (PA), HR has gradually gained a more important role in organisations. Typically, American models have emerged, and HR management is nowadays referred to as strategic human resource management, where employee competencies are also a key issue.

Sampling

In the academic literature, a case number of 4-10 interviews is suggested in the context of qualitative research because of the complexity (Eisenhardt 1989). In this research, the focus of the interviews was typically on medium and large companies. Faced with the advantages and disadvantages of each of the qualitative and quantitative research methods, I decided to use both

methods together. My aim was to achieve the widest possible research spectrum, which I could achieve quantitatively, and to exploit qualitative opportunities through face-to-face interviews, where I could gain a deeper, comprehensive picture of the organisation's operations and internal state, as well as its surrounding environment (Simon, 2016).

For the qualitative research, companies of different sizes, structures and ownership backgrounds were selected, and the diversification of the aspiring companies' activities was also considered. In the case of the interviews to be conducted here, I endeavoured to ensure that the respondents came from the fields of HR, controlling and management, and to determine the direction of the questionnaire to be developed based on the discussions with them.

For my quantitative research, the questionnaire format was chosen, but in a hybrid way, aiming at obtaining both quantitative and qualitative data and information at the same time. Hybrid research refers to the use of different principles but over the same time, by connecting the two principles (Neulinger, 2016).

In addition to the questions to be answered in the blocks, there were Likert-scale response options for the characteristics of the topic. The questions and groups of questions were built on each other, and it was also important to obtain answers that were sufficiently homogeneous, complete and easy to process. Accordingly, both multiple-choice and scaled questions were compulsory. I gave respondents a separate opportunity to express their own thoughts on the Performance Evaluation System (PES), in a free-form format, independently of the practices of the business organisation they had described, and their opinions based on the set of questions I had identified. The structure of the questionnaire is detailed in Table 3 below.

3. Table: Structure and characteristics of the 36-question questionnaire

HR and Controlling research - Doctoral thesis			
Number of respondents: 471			
Section name	Questions		
	Number	Nature	Sub-questions
Informatics	4	Multiple choice	0
HR	1	Multiple choice	0
	1	Likert scale	16
Characteristics of the business organisation in the answers	3	Multiple choice	0
	1	Likert scale	6
	1		15
Respondents' opinion	6	Multiple choice	0
Typical practice of the responding entity in performance appraisal	7	Multiple choice	0
Performance Appraisal system (PES)	3	free text	0
Demographic issues	10	Multiple choice	0

Source: own editing, based on own research

This free-text section is characterised by a high level of detail and the high quality of the information obtained, even though it is drawn from a much smaller sample than the quantitative study. The relevance of the information is further enhanced by internal and external data, including the questionnaire itself and related professional articles, research and expert opinions, to ensure the soundness of the research.

Demographic block

A demographic block has been integrated in the final part of the questionnaire.

For questions 26 - 36, more than 60% of the respondents (n471) are male, most of them over 40 years old. In terms of education, 90% of the respondents have a tertiary education and have been working for the companies mentioned in the responses for more than 7 years, 40% have been working for the companies mentioned in the responses for between 1 and 6 years and only 10% who have not yet completed their first year in the company at the time of answering.

Typically, representing a quarter of the respondents, it was middle or senior managers, or possibly owners, who completed the questionnaire.

Regarding the age of employees, companies have members of the Baby Boom generation as well as age groups X, Y or Z, with different needs, of course, to which employers have responded with different motivation models that work well in practice. Accelerated technological development and an ever-changing market environment have changed - and in many cases exaggerated - these expectations and differences, and HR professionals need to be able to meet these specific needs to make the company attractive to the new generations without losing the older generation. To summarise these so-called generational characteristics (Ms Kiss 2013), the

Baby Boomers are still looking for new ways, knowledge, information and careers, while their behaviour is characterised by discipline, respect and perseverance. Their knowledge, experience and loyalty are assets that can make a company of any type and size the best. They are less flexible, resistant to change and accept hierarchical structures. They are afraid of their jobs being taken away by the generations that follow them.

Generation X is the transition generation, who have been exposed to IT and the internet from a young age, which has shaped the way they work and live. Most of them do their work with someone telling them what to do and how to do it. They are better educated than their predecessors and have experienced the technological revolution, the regime change and the economic crisis. They are less committed to their employer but adapt easily to change.

Generation Y were born under the previous socialist system but grew up in an emerging democracy. They are open to new ideas, agile, ambitious, and seek high financial reward. They are the first wave of the digital generation, who are highly confident in challenging the rules set by the previous generation. They have high expectations of the workplace, wanting their work to fit their lives and not the other way around. They are less loyal than their parents. They make decisions quickly and leave as soon as they get a better offer.

Generation Z is already the world's first global generation born into a world of digital technology and in constant contact with each other. They instinctively acquire skills such as multitasking, collaborative learning and self-regulated learning. They live at a much faster pace than their predecessors. If something is not to their liking, they move on, changing jobs comes naturally. The phenomenon of job-hopping can also be linked to this generation.

A major challenge for HR professionals is that these generations have different characteristics and needs, so creating and encouraging intergenerational collaboration, creating satisfaction among different generations, and attracting and retaining key people, which also plays a role in building the HR brand. In addition, companies often face the challenges of an organisational culture change, new types of job design, managing age-related knowledge transfer and avoiding age discrimination, the tasks of generational diversity management.

Challenges such as limited resources and an ageing society are inherent to the 21st century, as are globalisation, increasing employer expectations and technological advances, all of which have increased the importance of talent management at organisational level to overcome these obstacles.

Meanwhile, the global marketplace has created a situation where even small and medium sized companies are now competing at this level to survive.

The number of multinational companies has doubled since 1990, but the growth is not only in company size but also in consumer expectations. According to some research, the potential consumer size will increase by 172% between 2010 and 2030 (Krell 2013). One important corporate goal is to find the employees who can achieve the business goals they have set themselves, despite dwindling human capital. Thus, if the prerequisite for achieving business objectives is to attract employees with the necessary talent, the focus on talent becomes central, and its management becomes not just an HR issue, but a more strategic task.

In addition to the evaluation of the tasks performed, the importance of the work experience is also on the agenda, which also indicates an expected labour market trend. In Deloitte's 2017 Global Human Capital Trends, one of the four leading consultancies, found that in today's advanced digital environment, employees have a general expectation that work should not only be results-oriented, but also engaging and enjoyable. The trend is that, alongside employee engagement and workplace culture, companies are seeking to develop a complex system that impacts the overall employee experience - bringing together HR, workplace and leadership practices that impact on the work experience. Thanks to modern technology, HR has a number of tools that can make this experience a decisive factor for employees. Increasingly popular are workplace wellness or fitness apps, which come with extensive feedback tools.

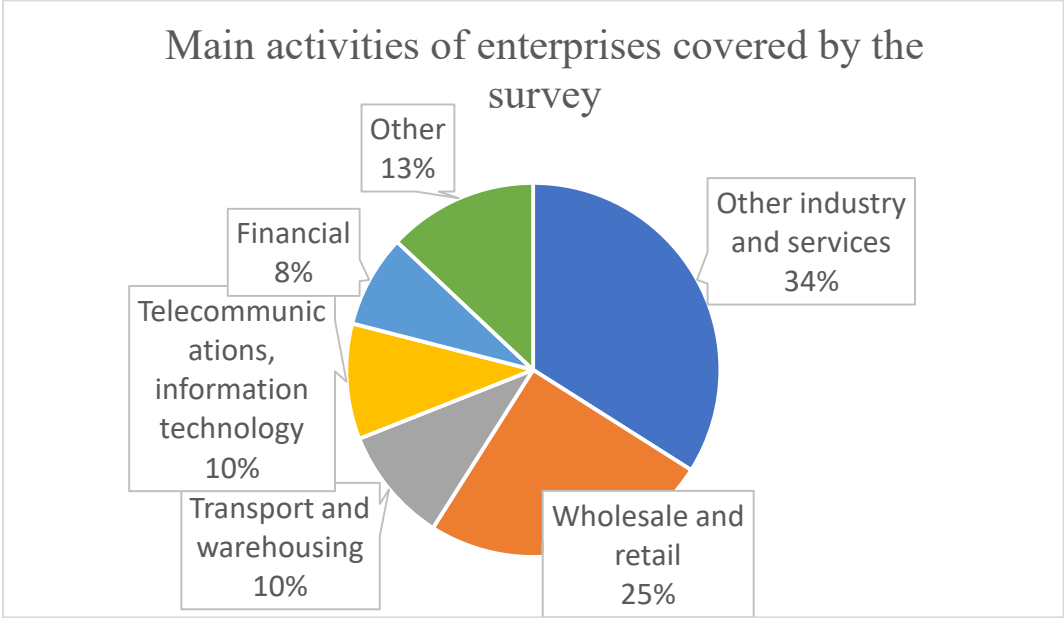
According to Deloitte's research, 80% of employers surveyed considered guided workplace experiences to be important (Deloitte, 2017) However, the research shows that the practical application of this novelty is still to come, as only 22% of decision-makers surveyed said they have implemented this type of solution in their company. This is supported by the result that 56% of respondents believe that they are not yet or only partially ready to implement work experience.

A previous survey found that, except in one area of central government, these organisational development tools are either not present or only partially present. "Among the HR managers, executives and HR staff working in central public administration surveyed, the need to use modern and interdependent HR tools has already emerged, especially among those who previously worked in the private sector or in HR management or other managerial positions in multinational companies." (Bokodi, Szabó, Stréhli-Klotz, Petró, 2013). This is linked to the formulation of precise organisational goals, employee support, the use of coaching and agile performance management systems. Like most other disciplines, human resource management has undergone many necessary changes in recent times, due to changes in the economic, social and labour market environment. Change, the arrival of new trends, has had an impact on the transformation and development of previously well-established areas, and has also helped to create completely new ones.

Human resources are a crucial part of organisations, and meeting their changing needs will determine the success of different organisations in general. In terms of location, more than two thirds of the respondents are in the capital and a further 15% in the agglomeration of Pest County. Nearly half of these companies are Hungarian private companies in terms of ownership, 26% are foreign, 21% are state-owned and the remaining 6% have a mixed ownership structure.

In terms of activity, a quarter of them operate internationally, 58% nationally and almost 13% locally or at county level. In terms of size, large enterprises with 250 or more employees account for 45% of respondents, with one-fifth in the SME sector and 12% in the micro enterprise sector, with up to 9 employees, the percentage breakdown of data on enterprise activity is shown in Figure 2 below.

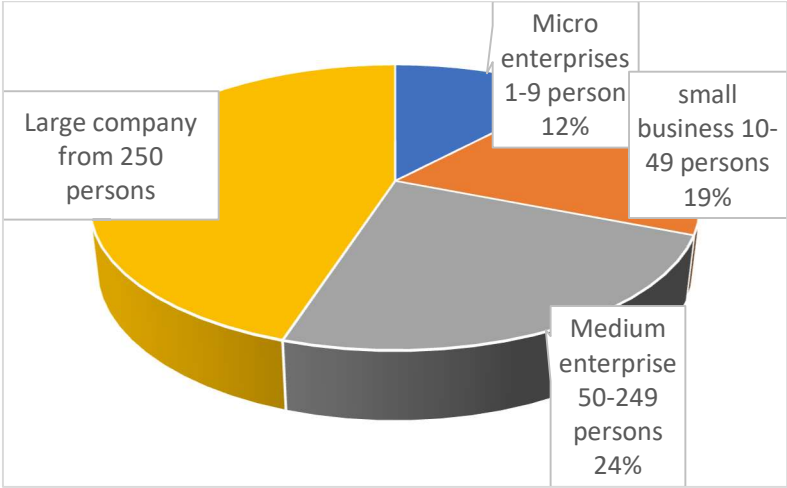
2. Figure: Main activities of enterprises



Source: own editing, based on own research (n471)

I aggregated the electronic responses managed by the Google spreadsheet into an MS Excel database, and then reformatted the data using the IBM SPSS statistical software package for social sciences. The tests were carried out using SPSS software. A characteristic feature of the sampling procedure is that even the most rigorous procedure does not yield a sample that is perfectly representative of the original population, but the number of responses collected was successful and could be used to test the findings. Figure 3 below shows the distribution of the research sample by company size.

3. Figure: Survey responses of enterprise size



Source: own editing, based on own research (n471)

Question 35 of the questionnaire asked about the size of the company among the scientific data on population in the XXXIV Survey 2004. (SME Act) contains the thresholds, the number of employees and other criteria for determining whether a company is an SME, and within this, the size categories of micro, small and medium-sized enterprises, it can be seen that 45% of the organisations participating in the survey are large enterprises, 24% medium-sized enterprises, 19% small enterprises and 12% micro enterprises. These data were further analysed according to the type of controlling organisation.

The difference between controlling instruments and the way they are applied is largely influenced by the difference in perceived organizational as well as management systems, in addition to their capital strength (Farkas-Fekete, 2008). In addition, the size of an organization is typically the main reason for whether it applies controlling systems and controlling activities, the emergence of which is usually associated with large firm size. This has been confirmed by another previous study (Szóka, 2007), which attributes the difficulties caused by the lack of an SME sector to the lack of controlling professionals, poor information, misconceptions about controlling, company size and the financial implications of its application. The information from the sample also confirms that those who are not familiar with controlling and its benefits do not take advantage of HR controlling and performance evaluation (Bogáth, 2017). In agreement with Bogáth, SMEs often lack the necessary financial resources to implement controlling, may not have the need for financial data, or the accountant may not have good basic knowledge of planning, analysis and controlling, especially if this task is outsourced to the accountant. Based on the research carried out, Table 4 below shows the levels of development of company size and controlling and their correlation.

4. Table: The relationship between company size and controlling

Positive thoughts on PES			
Implications	Goals	Benefits	Perspectives
value-assessment	individual	material	diligence
feedback	corporate	professional	skills
development	organisational	appreciation	training needs
motivation	economic	recognition	punctuality
efficiency			corporate values

Source: own editing, based on own research (n471)

3.2 Method

The questionnaire itself is a fully or semi-structured (i.e. containing only open-ended questions or both open-ended and closed-ended questions), formalised and standardised questionnaire, in which questions are pre-written, sequenced, whether in electronic form or in a form interpreted by a surveyor, and quantitative and qualitative elements are linked at one or more levels. I have tried to create a manageable material for all stakeholders, and accordingly I have considered the possible perspectives of all stakeholders on the use of the questionnaire.

The stakeholders of the questionnaire are all those who have some level of interest in the questionnaire or in the research itself. The literature identifies five possible stakeholder groups, which may have different purposes or expectations from the questionnaire.

The Clients, who are the initiators or funders of the questionnaire research, may have research, business or policy objectives. The practical implementers of the research are the Interviewers (interviewers), whose aim is to make the questionnaire as clear as possible, thus minimising the need for additional explanations from respondents. The Respondents play an important role. They generally want to complete questionnaires that are not too long, are clear enough so that they do not require too much energy, are able to sustain their attention, and tend to skip questions or topics that are more awkward or that touch on deeper ideas. We can limit this with pre-set answers, answer sets and compulsory completion. This is followed by the work of data recorders and analysts, who tend to prefer a questionnaire with a clear, unambiguous layout to facilitate data processing. The aim of the Questionnaire Designer (researcher) is to balance the needs of the stakeholders, ensuring the necessary objective and ethical process.

Data collection methods

I focused on the online, computer-assisted self-interviewing (CASI), a sub-form of the face-to-face interview, as it allows for anonymity, thus resulting in more honest responses, and facilitates data analysis as the data is immediately recorded in digital form. As well as giving respondents more time to think about their answers, we can prevent missing answers by making questions compulsory, so that the respondent can only move on to the next question or page if they have completed the previous one. I have used filter questions and all three groups of closed-ended questions, i.e. multiple choice, which gives more than two finite answer choices, dichotomous questions, where there are two answer choices, e.g. yes-no, and rating scales, where there are more than two finite answer choices, the order of the answer choices expressing both direction and strength.

Closed-ended questions have the additional advantages of being easy and quick to answer, easier to record, analyse and compare data, and easier to reproduce results where necessary. I have also used the 'other' response option where I either felt uncertain about the accuracy of the options given or the respondent is forced to choose between the categories given, even if they feel none of them are true.

Open-ended questions were also included, where respondents answered the question with their own sentences and thoughts and these were recorded verbatim, because I was curious to see the answers in the respondents' own words, which is useful additional information for the final use of the research results. In terms of the scale used, I opted to use the Likert scale, where the sub-questions were answered using a mid-point (5-point) Likert scale. The Likert scale is one of the most famous and commonly used rating scales, typically used in social science research today.

The scale was developed by the American social psychologist Rensis Likert in 1932 and is generally a five-point attitude scale that measures the extent to which respondents agree with a given statement.

Compared to other methods, the data collection version itself is low cost, prettier than paper questionnaires, more interactive and environmentally friendly.

It offers measurable completion time and question randomisation and can be customised through branching/skip-logic, as well as the ability to reach many respondents in a short time and to record many responses.

In the questionnaire survey, I have kept in mind that respondents not only answer individual questions, but also interpret each question in the context of the whole questionnaire and the circumstances of the survey. A question may also bring out other thoughts and feelings in a respondent that may influence their response to subsequent questions.

I took advantage of the additional, face-to-face professional interviews, so that - as interviewer - I had the opportunity to ask back or even receive longer answers, or to ask more complex questions. My thesis deals with the operation of a business organisation with different activities, different staff and different ownership structures, and covers the topics of controlling, HR and performance evaluation. This is extended and supported by a questionnaire survey, which, through a questionnaire like the interviews, measures the business organisations and their operations, as well as the personal perceptions of the respondents, both of the methods used and of their personal opinions on the issues discussed.

There are also several publications I know of on the subject, so there are some basic ideas for research. This is supported by the personal experience and contact capital available to carry out the fieldwork, whether it is knowledge of the available legislative environment or the operating rules of the company or organisation. This is complemented by questionnaires that do not conflict with the limitations of the GDPR, nor with the category of classified data of the organisation under investigation. In other words, the choice of the topic and my own personal capabilities ensure that I can carry out well-founded research on the given topic.

Sample selection

Case study surveys are structured interviews covering a single case study unit (Babbie, 2015), regardless of the size of the organisation involved. The interview is presented in my research by summarising the performance appraisal methods and controlling systems of each of the organisations I studied separately. The selected organisations were not chosen on a statistical basis, but on a theoretical basis, touching on the different types of activities and corporate structures (Miles-Huberman, 1994), which I present using Table 5 below.

5. Table: The differences between the qualitative and quantitative research

Qualitative research	Quantitative research
<i>Low sample size and embeddedness in context</i>	<i>With many samples and the context becoming irrelevant</i>
<i>Purposefully selected sample</i>	<i>Random sampling procedures</i>
<i>Theoretically oriented pattern</i>	<i>Representativeness</i>
<i>Step-by-step pattern</i>	<i>Predefined pattern</i>

Source: Miles - Huberman (1994), based on Stake (1994)

The researcher can rely on his or her own intuition and acquired knowledge (Kvale, 1996) to decide on the composition of the sample. In the case of the qualitative method, the sample set is not fixed and is subject to change as the research progresses, which may be influenced by intermediate results (Gelei, 2002). The theoretical direction of the sampling is dictated, or possibly overridden, by the objective itself. In the case of general findings, it refers to a specific case or content (Bokor, 1999).

Interview-based data collection

The backbone of my research is professional in-depth interviews, - complemented or completed by questionnaire research, - with not fully structured interview instruments, so that I can gain deeper insights into different interpretations. With a fully structured set of questions, the real thoughts and inner processes behind the sentences would not be sufficiently understood. With this kind of method, the data acquisition is repetitive and continues until the last item is processed (Glaser-Strauss, 1967).

In the interviews that I will be conducting, I will identify the main directions, but I will also try to ensure that the interviews give me the opportunity to touch on more important areas that I have already included in the questionnaire research. I use an interview schedule for the interviews. During the interview, my aim is to allow the interviewee to express their personal experiences and opinions on the topic, as this will help my research on the topic.

My main interviewees will be senior controllers, HR professionals and operational managers. The semi-structured interviews are planned to touch on the organisation's operations, structure, level of digitalisation and involvement in the TIR. Continuing with the presentation of the controlling system and the methods and tools used, we will cover the monitoring activities related to HR and controlling processes. We will examine the methods and procedures used to measure organisational and individual performance.

To gain a deeper understanding, I will also try to look at the management organisation processes and, where separately possible, the controlling systems of project organisations. My research aims to illustrate (also) through specific cases the different ways of assessing the performance of business organisations with different ownership structures. The role of human capital in determining the market value of companies is becoming more and more important, and the concept of continuous training and development, life-long learning, is slowly becoming part of the everyday life of organisations.

As a result of these developments, new HR functions have emerged alongside traditional areas of activity in response to environmental challenges and have been closely integrated into HR strategy. In addition to the classic HR functions (recruitment, selection, performance appraisal, motivation, development, job design, job security, industrial relations), the existing areas of expertise have been extended and sometimes the focus has shifted to other activities in response to the changing environment. In addition to recruitment and selection, the process of staff turnover has seen the introduction of a placement and onboarding programme, even as part of the HR partner function.

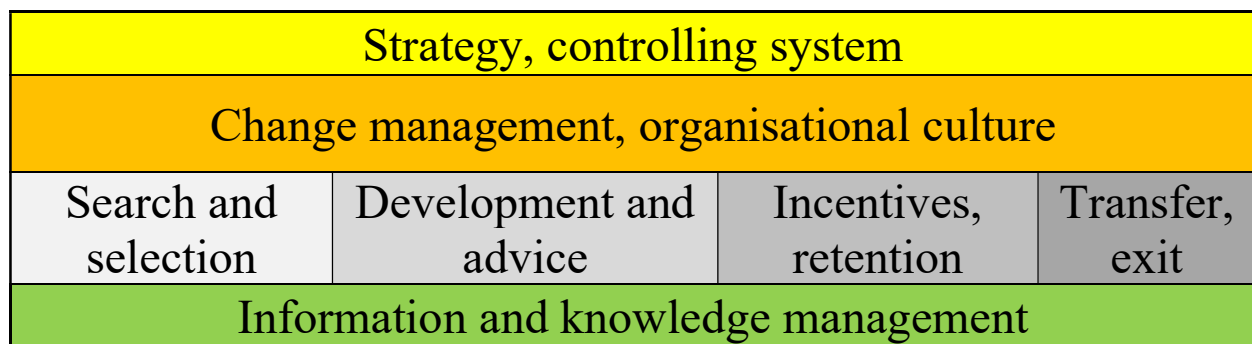
Nowadays, we are seeing performance management systems rather than performance evaluation as part of an integrated systems approach, which again confirms the 'everything is connected' view. Training and development have always been central to business organisations.

The development of career planning systems, which can now be seen as a function, is linked to this, as is career management and knowledge management.

From a controlling perspective, the only way to efficiently perform the expanding tasks - if there is no way to drastically increase the available resources - is to outsource recurring tasks and automate routine processes (Kovács, 2019). According to Osmanagić Bedenik and Lalovac (2007), the mission of controlling is to introduce and effectively apply tools that improve the transparency of business processes and sufficiently support management responses to external and internal changes, which results in strengthening the viability of the company (Vuko and Ojvan, 2013).

HR controlling has become a close part of the HR function, because the indicators used for analysis provide information for staff planning and management decisions. Today, regardless of the ownership structure, competitive organisations are evaluated at many levels and in many areas (e.g. competitors, stakeholders, target group members or market researchers), on which the success and popularity of the evaluated organisation largely depends. This evaluation affects both the products and services offered by the company and the employer/employee brand image. If the organisation's image is highly rated by opinion leaders, employees tend to have a positive opinion of the organisation and thus find it easier to work with on a day-to-day basis.

4. Figure: The human resource management value chain model



Source: own editing based on Bacsur K. – Boda Gy. [2010]: Személyügyi kontrollong

For human resource management to be effective, as shown in Figure 4, it must be an integrated part of the corporate strategy (Bacsur-Boda, 2010), which is particularly challenging in a situation where a completely new organisation is created through acquisitions.

A good employer brand facilitates the attraction of the most talented employees, thereby ensuring that talent is valued and compensated appropriately within the organisation. Strengthening the employer brand has a positive impact on the organisation by enhancing the organisation's ability to retain talent, building employee commitment and increasing organisational attractiveness (Mosley, 2009). Therefore, building a well-branded employer brand increases workforce productivity, thus contributing to organisational competitiveness.

Image also determines the perception of individuals about the products and services offered by organisations, thus influencing the consumption of products/services, i.e. the production of profit. If a company wants to remain competitive today, it must compete for talented professionals. This is particularly important for companies where employee competence is the basis of operations.

In today's labour market, one of the most dominant tools in the "battle" to attract talented workers has become employer branding. Meanwhile, the employee values company performance as part of the employer brand (sectoral attractiveness, company reputation, product quality, working environment, benefits and perks, organisational culture, work-life balance and corporate responsibility) (Figurska - Matuska 2013).

By reinforcing loyalty with these factors, employers can help to ensure that employees do not only perform their daily tasks within the organisation for financial and livelihood reasons, but that they develop an inner bond and enjoy coming to work, making work an experience.

The development of the HR brand is becoming increasingly important, as in addition to attracting a skilled and talented workforce, the problems of retaining key employees are also being addressed. Retention management is trying to address this as a new area, as failing to do so is costly, time-consuming and energy-intensive, because the lost workforce has to be replaced, where recruitment, selection, onboarding are all costly, plus the uncertainty about the new candidate and the lost knowledge (which is taken away by the departing colleague, usually straight to the competition). The continuing 'ageing' of society is reducing the pool of employees that can be attracted - so demographic changes are also affecting organisational operations - which clearly places a premium on human capital and excellence. Therefore, fewer workers are required to do more work than before, but employees also have higher expectations of employers (Canton 2013).

Employee retention rates and loyalty are affected by employee satisfaction. Previous research has found that companies need to focus on five key aspects to retain their best employees: the right employee environment, clear goals and expectations, and good organisational communication. An open working environment and regular feedback, support for training and development, challenging and stimulating work tasks and recognition, appreciation and reward for good work are part of this (Thomas, 2017).

The ability of organisations to retain staff is influenced by the approach of the manager, through the role and location of HR in the organisation, and the quality of HR systems. Performance management and bonus schemes are the most common retention tools, while specific training programmes and individual development plans are of particular importance in attracting and retaining talented employees. Innovative ideas also have a positive impact on the loyalty of talented employees when the organisation provides opportunities for feedback and implementation (Csendő et al. 2016).

Generational management, or the solution to effectively employing a changing age workforce, where the difficulty of retaining and motivating employees is compounded by the fact that the organisation has to face the different expectations of the generations.

The importance and widespread relevance of HR systems and "How can a bank achieve growth through HR software?" the best example is Greater Bank Ltd. in Hamilton, Australia. The bank manages 250,000 customers and \$4.2 billion in assets. The vision of Greater Bank Ltd. is to become a true customer-empowered bank, where customers decide how and in what form they use the financial institution's services. Their mission is to serve customers for generations. To achieve both, they needed to make cultural and technological changes that they knew could best be introduced through HR. But to be a critical driver of this overall business transformation, HR had

to be equipped to deliver. Greater Bank was looking for state-of-the-art HR software that could meet the challenge. It engaged an external company to help it achieve this goal. With this software, the bank provided its employees with dramatically higher levels of compliance training.

With the system upgrade - the launch of the program - Greater Bank Ltd. will increase training compliance with its previous learning management system from below 65% to 90% within 3 months of implementing the IT solution. Within 6 months of implementing the software, it achieved 98% training compliance. Empowered employees to realise the customer-centric banking vision. Transforming the business through a streamlined approach to performance management and using integrated data to make informed strategic decisions helped business leaders do this by providing an easy-to-use software tool for employees.

The research design

The aim of this chapter is to give an overview of the research design, including the reasons for the choice of method, the processing and analysis of the data received. In the context of designing survey research, the evaluation characteristics or criteria focus on three directions, design questions, data collection and data analysis (Dube' and Pare' 2003; Arnold et al. 2016), with a special focus on qualitative sampling (Becker - Schmid, 2019).

The labour market affects all employing organisations, from public administrations to SMEs and large companies, regardless of ownership structure. The digital strategy of SMEs is often still at an early stage, with the IT focus still working on core business solutions, but the research also seeks to map the state of these organisations in terms of both controlling and HR, with a focus on performance assessment. The situation is different in public administrations or large enterprises, where the level of digitalisation allows these core business support functions to run their day-to-day operations on a much more advanced IT basis, not to mention their important role in corporate governance and planning. According to the latest CRANET survey, including domestic respondents, there is a growing perception that the use of multiple remuneration solutions is common and varies according to different levels of seniority (Poór et al. 2024). The practice in the context of TER offers financial solutions, bonuses, share packages, equity, mainly for senior managers, which is typically used by a subset of companies in the competitive sector.

To obtain quality information, a structure was needed that would guide the respondent through the questionnaire, covering different areas and topics, with multiple-choice or Likert-scale questions, while allowing for the expression of personal opinions in both a closed and open-ended format. The structure of the questionnaire was designed to bring the quality and complexity of the responses up to interview level in terms of content.

A common technique in contemporary information society research is the use of qualitative interview methods, which allows the investigation of a variety of currently relevant research topics (Eisenhardt and Graebner 2007), especially in areas where little prior research currently exists (Siggelkow 2007). This concept follows the approach of Eisenhardt (1989) and Yin (1989) (2014). In contrast to the individual case, this approach can derive much more general results on a stronger basis by using interview data from multiple companies in multiple situational contexts (Eisenhardt 1989; Yin 2014). The sets of questions shed different light on the situation in the field, the methods used and even the personal opinions and mindsets of the respondents.

This research approach allows us to explore areas of research that are still at an early stage of investigation, using detailed questions such as "how", "who" and "why" (Yin 2014). This information is characterised by a high level of detail and quality, as it is derived from a much smaller sample than in quantitative research; it therefore has a higher intrinsic value.

4. CONCLUSIONS

Question 1: What are the most important digitalisation steps for companies?

Even before the epidemic situation, digitisation was already a major issue, characterised by the emergence of new needs and solutions. Longer lifecycles in the past allowed for slower and longer lead times, preceded by proper planning. This enabled them to implement the tasks they had planned, to introduce new systems, products and processes following the right developments, and to forecast the years ahead. The increased demand for information has also made it essential for companies to understand the essence of digitalisation, which requires them to constantly rethink and, where necessary, adapt the composition of their data, including the introduction of new technologies.

Objective 1: My objective is to show the impact of digitalisation on the management system of companies and on the field of controlling and HR controlling in the light of the TÉR.

Finding 1: Through my own research, I have shown that companies are putting a lot of emphasis on digitalisation. An important element of this is the introduction and widespread use of ERP systems, as well as the existence of a controlling and HR module. The cross-tabulation analysis used confirmed the findings from the interviews that the ERP system and its operation is very closely related to the size of the company. The existence of an ERP system is a basis for the support of controlling, including the HR area. The HR department operates the performance appraisal function on this basis or on an island basis.

Question 2: What is the relationship between different ownership structures and the performance evaluation applied to them?

In the context of the link between controlling and HR, it is worth examining the performance evaluation practices and principles of the organisation in question, which serve to improve corporate efficiency. Today, IT solutions offer a wide range of possibilities for companies to obtain information on the performance of employees in a user-friendly way, using optimised resources, and how they can contribute to increasing the efficiency of companies and institutions. Today, this is facilitated by various IT solutions, which are available either on an island basis or as part of a business management system.

Objective 2: One of the objectives of my thesis is to examine the practices of companies with different ownership structures, in which controlling, in close cooperation with HR, ensures the proper functioning of the performance appraisal system, thus contributing to the retention of employees.

Finding 2: Both the interviews and the responses to the questionnaire survey, as well as the cross-tabulation measurements based on these, confirmed that performance evaluation is related to the ownership structure, and is present not only in foreign or mixed-ownership companies, but also in Hungarian private and state-owned companies.

Question 3: What is the relationship between company size and digitalisation?

The existence of these systems is an important corporate factor, regardless of the size of the company. Modern digitalisation solutions are becoming more and more widespread, and no longer represent a major burden in all cases, whether the technical or financial aspects of their implementation are concerned.

Objective 3: One of the objectives of my thesis is to examine the relationship between size and the use of IT systems in organisations of different sizes. To what extent does the number of employees correlate with the degree of digitalisation, is the existence of different IT systems specific to a given size of company, are there correlations

Finding 3: According to the interviews and the questionnaire responses, there is a strong correlation between the size of the business organisation and the degree of digitalisation, the presence of appropriate ERP systems is clearly more typical for companies with a higher number of employees, and the larger number of employees also justifies better IT support

Question 4.: What evaluation periods are used in practice by the companies surveyed from the human controlling side, and what do the respondents' needs tell us?

From an employee's point of view - to work effectively - continuous feedback and evaluation is essential. Not only financial appreciation, but also professional development, vision, company culture and a relaxed and accepting atmosphere appear as important elements in the needs of employees, which they expect from their employer. Is there a discrepancy between the performance appraisal periods used in practice by companies and the intervals reported by employees.

Objective 4: By evaluating both the interviews and the results of the questionnaire survey, I want to verify not only the demand for performance appraisal by employees, but also the time intervals used in practice.

Finding 4: The interviewees' statements, as well as the results of the questionnaire survey carried out, demonstrated that, in addition to the clear need for performance appraisal, the appraisal cycle is typically annual, with a significant proportion of respondents, 41%, continuing to indicate this as the preferred appraisal period. A new model for optimising and synchronising the system has been developed accordingly, complementing the previous method. The implementation of the model is not directly related to the degree of digitalisation of the company, is not a prerequisite for the existence of an ERP system and does not entail additional investment costs.

Question 5: Is controlling, with its now extended remit, able to support human resource management effectively enough?

The typical result of the last few years has been an increase in the role of controlling in the company. It has moved beyond the classic period when the general controlling department was limited to the usual tasks of report preparation and costing. Today, the changed planning cycles have rewritten the focus of the daily routine, not only in terms of the departments concerned, but also in terms of the activities and capabilities of the whole company. In examining the issue of corporate efficiency, one of the key themes is how the controlling discipline has adapted. How the planning cycles now in use affect performance evaluation and human capital.

Objective 5: In the context of this thesis, I intend to define the role of controlling and human resource management today and to show the main links between them.

Finding 5: My research has shown that HR and controlling work closely together at many points. In today's modern corporate organisation, the functional cooperation between these two important areas is part of the way in which companies manage their human resources and raise them to a strategic level. A significant link has been seen between the practice of performance appraisal and its related objectives, such as communication between managers and subordinates, alignment of organisational and individual goals, retention of employees and long-term enhancement of their commitment and performance.

5. NEW SCIENTIFIC RESULTS

Concluding this research process for my thesis, I have formulated the following new scientific findings:

- My own research has shown that companies are putting a lot of emphasis on digitalisation. An important element of this is the introduction and widespread use of ERP systems, which is closely correlated with the size of the company.
- The HR discipline operates the performance appraisal function on the basis of this or as an island, which is related to the ownership structure, present not only in foreign or mixed-ownership companies, but also in Hungarian private and state-owned enterprises.
- There is a close correlation between the size of the business organisation and the degree of digitalisation, the presence of appropriate ERP systems is clearly more typical for companies with a higher number of employees, and the larger number of employees also justifies better IT support.
- In addition to a clear need for performance appraisal, the appraisal cycle is typically annual, with a significant proportion of respondents, 41%, continuing to indicate this as the preferred appraisal period. A new model has been developed to optimise and synchronise the system, complementing the previous method. The new model is designed to be used not only in large enterprise environments, but also to allow cost-effective implementation in today's digitalisation environment and is not necessarily linked to the existence or implementation of an ERP system.
- My research has shown that HR and controlling are closely interlinked at several points. In today's modern corporate organisation, the functional cooperation of these two important areas is part of the modern corporate organisation, thus facilitating the management of human resources in companies and its strategic upgrading. A significant link has been seen between the practice of performance appraisal and its related objectives, such as communication between managers and subordinates, alignment of organisational and individual goals, retention of employees and long-term enhancement of their commitment and performance

In today's corporate governance models, the cooperation and integration of all disciplines is essential for effective operation. In addition to the various economic constraints often mentioned, the lack of skilled labour and the radical change in the role of generations in the workplace are creating new challenges for companies.

Incentives are an important element in retaining staff, but increasing efficiency is also an inevitable goal for today's organisations. In most cases, the focus is built around the core business. For a large company, the digitalisation acquis was available before Industry 4.0. Now technology has reached the point where other players in the economy can easily build HR support systems. An important complement to the wider use of performance appraisal is the right interval and the communication within the organisation that goes with it.

In the case of the new model, existing systems can be essential for the operation of a modified TIR adapted to the strategy and planning cycles. Where this IT solution is not yet in place, the availability of digitalisation, even cloud-based systems, can provide a solution for rapid implementation.

Agile organisations can also be immediately connected for project-based tasks, and the KPIs for performance evaluation for the tasks can be integrated immediately, so that the project organisation can be evaluated for pre-defined periods. There is no need for new IT developments, possibly reorganisation or the creation of a new workgroup. With the involvement of the relevant project manager, the performance assessment can be extended to the project automatically.

In view of the shortened planning cycles - and in many cases even project-like, rapid measures and improvements - these can indeed be easily incorporated into the performance evaluation process, since the activities of agile organisations and working groups established through internal, management consultations are also seen by the direct managers, who should be able to incorporate these tasks - and their fulfilment - into the evaluation of the given period. In the case of projects taken down by agile teams, the milestone could be that the area manager receives feedback from within the company on the work of his/her direct reports, which could be the next step in the development of a 360° evaluation.

In summary, the research covered the interrelationship of controlling, HR and IT in the context of performance appraisal. It discussed the impact of the operations of business organisations of different sizes and ownership backgrounds on performance appraisal. It has shown the presence of different performance appraisal cycles in companies and their significant divergence with the now shorter planning cycles and the increase in the number of project tasks. The results of both the professional interviews and the questionnaire survey highlighted the need for a new model that could have an impact on the overall functioning of the company and its efficiency.

A step towards further research could be the spread of the representative form and the 360° method, which is as widely used as possible in companies, and which has become available in the meantime thanks to the opportunities offered by modern digitalisation. An important element of agile organisations will be a synchronised evaluation system to manage change.

6. SUMMARY

I've come across the subject of performance appraisal several times, as a manager, subordinate, and consultant, so it's been a long-standing concern. I have seen many organisations from the inside, I have experienced the good and the bad of this system, and I have been confronted with the question of how to apply this system in a way that is both fair and effective. From this point of view, my aim was to create an easy-to-apply model for the effective use of a performance appraisal system, based on the methods seen and used in different companies, and to develop them further.

The literature covers a wide range of current issues and problems of performance appraisal, as well as the latest IT solutions emerging in this field. In addition, the research environment has been modified by several new factors, starting with COVID, shortages of raw materials, the war situation, and fundamental changes in economic conditions and environment that have occurred only in the last 5 years. These circumstances have accelerated the pace of digitalisation, with the effects of Industry 4.0 being intensively felt in these areas.

In preparing this thesis, I aimed to provide a broad spectrum of material, covering a total of more than 70,000 employee performance appraisal systems, experiencing the principles, methods and technology used in organisations of different sizes and ownership structures, with or without ERP systems.

Both the interviews and the questionnaire research have highlighted that the role of controlling has changed and has been valorised. The same was the case for human capital. Today, controlling is no longer only responsible for collecting, processing, and monitoring data from a classical economic and financial point of view. The focus has shifted to the whole organisation, including the human resource's function, with several new elements such as performance appraisal. In a highly competitive environment, the importance of professional and regular performance appraisals has increased for both employees and employers. The shortening of planning cycles, the multiplicity of tasks and short deadlines have created new challenges for companies. Agile organisations, project-type tasks and planning periods require companies to be more efficient and coordinated in today's market conditions, and to this end, the retention of staff, alongside good performance, has become a key issue.

The reports covered the operation of the IT, human resources and controlling organisation of the company, the type of systems used, the method and period of evaluation, including other related human resources measures and solutions. The responses showed the intention and the practices used.

The overall research and modelling revealed that there is a clear need for the use of performance appraisal from both sides, with only differences in the method and timeframe used. As economic circumstances now require companies to plan differently, there is a clear need to align this function of human capital management with the strategy and timeframes set by the company, and modern digitalisation solutions are now available to manage it.

M1. Bibliography

1. ANTONY, R.N. - V. GOVINDARAJAN (2006): *Management Control Systems* 12th Edition.
2. ARNOLD, C., D. KIEL, and K.-I. VOIGT. (2016) How the industrial Internet of things changes business models in different manufacturing industries. *International Journal of Innovation Management* 20 (8): 1–25.
3. BABBIE, E. (2015): *The Practice of Social Research*, Cengage Learning; 014 edition
4. BECKER, W. – SCHMID O. (2019) The right digital strategy for your business: an empirical analysis of the design and implementation of digital strategies in SMEs and LSEs *Business Research* <https://doi.org/10.1007/s40685-020-00124-y>
5. BOKODI, M. – SZABÓ, Sz. – STRÉHLI-KLOTZ, G. – PETRÓ, Cs. (2013) *Közszolgálati Humán Tükör Kutatás Strukturált interjú „Közszolgálati Humán Tükör 2013” résztanulmány* ISBN 978-615-5269-39-4
6. BOKOR, A. (2007) *Záró Kutatási Tanulmány – Humán Tükör Kutatás eredményei – visszajelzések a HR szervezetek működéséről (2007 évi kutatási forduló)*
7. BONCZ, I. (2015) *Kutatásmódszertani alapismeretek PTE ETK*, ISBN 978-963-642-826-6
8. BRYMAN, A. (1992): *Research methods and organization studies*. Routledge, London
9. CANTON, J. (2013): *Global Futures Forecast 2013: The Top Trends That Will Shape the Coming Year*. Institute for Global Futures.
10. CSENDŐ, Cs. – FRAJNA-PILLER, A. – HORVÁTH, A. – KOLBE T. – KOVÁCS, T. – POÓR, J. (2016): *Szakemberhiány és munkaerő-megtartás a kulcsmunkakörökben 2016. Kutatási zárójelentés, Budapest, 25. p.* ISBN: 978-963-269-591-4
11. CZAKÓ, E. – WIMMER, Á. – ZOLTAYNÉ, PAPIRIKA, Z. szerkesztette, (1999): *Versenyben a világgal– A magyar gazdaság nemzetközi versenyképességének mikrogazdasági tényezői*, p. 25-30. Czakó, E. – Wimmer, Á. – Zoltayné, Paprika, Z. szerkesztette (2004): *Versenyben a világgal– A magyar gazdaság nemzetközi versenyképességének mikrogazdasági tényezői.* (kéziratban)
12. DAJNOKI, K. – HÉDER, M. (2017) „Új szelek fújnak” – a HR válasza a globalizáció és a változás kihívásaira DOI 10.17047/HADTUD.2017.27.E.84 <http://real.mtak.hu/72149/1/dajnoki.pdf>
13. DELOITTE (2017): *Rewriting the rules for the digital age. 2017 Deloitte Global Human Capital Trends* <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/human-capital/hc2017-global-human-capital-trends-us.pdf> 2 017.09.27.
14. DUBE', L. – PARE, G., (2003) Rigor in information systems positivist case research: current practices, trends, and recommendations. *MIS Quarterly Executive* 27 (4): 597–636. <https://www.jstor.org/stable/30036550>
15. EISENHARDT, K.M. (1989) Building theories from case study research. *Academy of Management Review* 14 (4): 532–550.
16. FELMÉRY, Z. (2015/1) *Megkövetelt teljesítmény? Közgazdász Fórum OSZK* http://epa.oszk.hu/00300/00315/00112/pdf/EPA00315_kozgazdasz_2015_1_026-052.pdf [Letöltve 2021.02.12](#)
17. FIGURSKA, I. – MATUSKA, E. (2013): *Employer branding as a human resources management strategy*. In *Human Resource Management & Ergonomics*, vol. VII./2.
18. GELEI, A., (2002): *A szervezeti tanulás interpretatív megközelítése: a szervezetfejlesztés esete*. Ph.D értekezés, Budapest Corvinus Egyetem
19. GLASER, B. G., STRAUSS, A. L. (1967): *The discovery of grounded theory: Strategies for qualitative research*. Aldine de Gruyter, New York

20. HORVÁTH, P. (2011): Controlling. Vahlen, München
21. KAROLINY, M.né, – POÓR, J.(2010) *Emberi erőforrás menedzsment kézikönyv 5.* átdolgozott kiadás Budapest, CompLex Kiadó
22. KAROLINY, M. - POÓR, J. - SPISÁK, GY. (2000): Az emberierőforrás-menedzselés az üzletiszférában – tapasztalatok magyarországi nagyvállalatoknál, in: Vezetéstudomány, p. 13-22;
23. KOVÁCS, B. (2019) A controlling-folyamatok hatékonyságának mérése és növelése E-CONOM Online tudományos folyóirat http://publicatio.uni-sopron.hu/1746/1/03_KovacsB_Econom_VIII1.pdf ISSN 2063-644X
24. KOVÁCS, SZ. (2021) Teljesítménymérési módszerek összehasonlító elemzése *Economica* XII. évf. 3-4. sz. ISSN 2560-2322
25. KRELL, E. (2013): Exploring What It Takes to Lead in the 21st Century, *Baylor Business Review*, <http://bbr.baylor.edu/exploring-leadership/> 2017.09.11.
26. KVALE, S. (1996): *InterViews. An introduction to qualitative research interviewing.* Sage, Thousand Oaks, California
27. MILES, M.B., HUBERMAN, M.A. (1994): *Qualitative data analysis.* Sage, London
28. MOSLEY, R. (2009). *Employer Brand. The Performance Driver No Business Can Ignore.* A Shoulders of Giants Publication.
29. NEULINGER, Á. (2016) Több-módszertanú és vegyes módszertanú kutatások korreferátum Simon Judit „Kutatás-módszertani trendek a marketingben” című tanulmányához *Vezetéstudomány* 66 XLVII. ÉVF. 2016. Marketingtudományi különszám / ISSN 0133-0179
30. NÉMETH, E.– SZIKSZAINÉ, K. M. (2020) *Állami Számvevőszék Elemzés Budapest* https://www.asz.hu/storage/files/files/elemezsek/2020/kozszerfa_teljesitmenymerese_20200518.pdf?download=true Letöltve 2021.02.12
31. OSMANAGIC- BEDENIK, N. – LALOVAC, B. (2007): Kontroling – faktor poslovnog uspjeha na primjeru hotelskih poduzeća. *Acta turistica*, 19 (1), pp. 83–99.
32. POÓR, J. (2016) *Menedzsment-tanácsadási kézikönyv 4.* bővített, Átdolgozott kiadás Akadémiai Kiadó Budapest
33. POÓR, J. – ROBERSON, M. (2003): Globális fejlődés: az emberi erőforrás menedzsment (EEM)eredményessége a magyar vállalatoknál az új évezred elején, in: *Vezetéstudomány*, p. 13- 19.
34. SAJTOS, L. – MITEV, A. (2007), *SPSS Kutatási és adatelemzési kézikönyv* ISBN 9789639659087
35. SIMON, J. (2016) *Kutatás-módszertani trendek a marketingben.* *Vezetéstudomány - Budapest Management Review*, 47 (4). pp. 54-62. DOI 10.14267/VEZTUD.2016.04.10
36. SLOAN, A.P.Jr. (1963), *My Years with General Motors*, New York ISBN-13 978-0385042352
37. STAKE, R.E. (1994): *Case Studies.* in: Denzin, N.K. és Lincoln, Y.S. (1994): *Handbook of qualitative research.* Sage, Thousand Oaks, California
38. SÜTŐ, D. (2017): A controlling fejlődéstörténete, helye és szerepe a gazdálkodó szervezetekben. In: *International Journal of Engineering and Management Sciences*, Vol. 2, No. 4, 466-477. p.
39. THOMAS, A. (2017): 5 Things Successful Companies Do to Retain Top Talent <http://www.selectinternational.com/blog/bid/148239/5-things-successfulcompanies-do-to-retain-top-talent>
40. YIN, R.K. (2014). *Case study research: design and method*, 5th ed. Thousand Oaks: SAGE Publications Inc

41. VUKO, T. – OJVAN, I. (2013): Controlling and business efficiency. Croatian Operational Research Review (CRORR),
<https://webcache.googleusercontent.com/search?q=cache:zMA3EvLemD4J:https://hrcak.srce.hr/file/143327+&cd=11&hl=en&ct=clnk&gl=at> (letöltve: 2018.09.25.)
42. ZÉMAN, Z., GACSI, R., LUKÁCS, J., HAJÓS, L. (2013): Management control system in banks, *Bank Controlling*, Vol. 21 No. 3 pp. 14-17

M2. Bibliography – own publications by MTMT

Journal articles:

BARNA, Z. (2024b). THE ABSENCE OF CONTROLLING AS A SEPARATE ORGANISATIONAL UNIT IN BUSINESS ORGANISATIONS. CONTROLLER INFO.

BARNA, Z. (2024a). Teljesítményértékelés - Vélemények és a gyakorlat összefüggései. POLGÁRI SZEMLE: GAZDASÁGI ÉS TÁRSADALMI FOLYÓIRAT.

CSEKŐ, K., SINGH, M. K., SEMJÉN, B., SÁRKÖZY, H., & BARNA, Zs. (2024). Industry 4.0, Artificial Intelligence and Sustainability: A Bibliometric Review. PÉNZÜGYI SZEMLE/PUBLIC FINANCE QUARTERLY (1963-), 70.

BARNA, Zs. (2022). HUMAN PERFORMANCE ASSESSMENT METHODS IN THE PUBLIC AND COMPETITIVE SECTORS IN THE CONTEXT OF DIGITAL INDUSTRY 4.0. ACTA OECONOMICA UNIVERSITATIS SELYE, 11(1), 18–32.

GÁBOR, Á., & BARNA, Z. (2021). A HR funkciók szerepe a controlling fókuszú szervezetben. CONTROLLER INFO, 9(1), 30–31. <http://doi.org/10.24387/CI.2021.1.6>

Book excerpts:

BARNA, Zs. (2023). A SZAKMAI GYAKORLAT SZEREPE AZ ELHELYEZKEDÉSBEN. In Tanulmányok a Diplomás Pályakövető Rendszer 2010 és 2021 közötti kutatásainak eredményeiből (pp. 169–184).

BARNA, Zs., VAJDA, G., & ZÉMAN, Z. (2022). THE IMPACT OF DIGITALIZATION AND INDUSTRY 4.0 ON CONTROLLING AND PERFORMANCE EVALUATION. In NEW ASPECTS OF FINANCIAL LITERACY (pp. 5–25).

POÓR, J., SZABÓ, K., BALOG, K., BARNA, Zs., & HÁMORI, T. (2023). Hungary – An American Transnational MNC in Hungary: Past, Present and Future of HRM Evolution. In The Global Human Resource Management Casebook (pp. 75–84).

BARNA, Z. (2021). A COVID HATÁSA A VÁLLALATI PROJEKTMUNKÁRA. In Az emberierőforrás-menedzsment aktuális globális, regionális és helyi kihívásai és a COVID-19 (pp. 150–161).

HÁMORI, T., BARNA, Z., BALOG, K., ŠEBEN, Z., & POÓR, J. (2021). Amerikai világítástechnikai cég Közép-Kelet-Európában. In Nemzetközi menedzsment (pp. 504–517).

Article published in scientific conference:

BARNA, Z. (2023). VEZETŐI KONTROLLING HR TÁMOGATÁSA (HR SUPPORT FOR MANAGEMENT CONTROLLING). In 15TH INTERNATIONAL CONFERENCE OF J. SELYE UNIVERSITY EMPLOYMENT AND LABOR MARKET (pp. 348–366).

BARNA, Z. (2023). TELJESÍTMÉNYÉRTÉKELÉS A BIZONYTALAN ÉS VÁLTOZÓ PIACON. In 14th International Conference of J. Selye University. Section of Economics, Mathematics and Informatics. Conference Proceedings (pp. 9–20). <http://doi.org/10.36007/4492.2023.09>

BARNA, Z. (2023). RÉGI SÉMÁK, ÚJ HELYZETEK – PROJEKTKIHÍVÁSOK A MEGVÁLTOZOTT KÖRNYEZETBEN. In Megújulás és növekedés a Covid árnyékában (pp. 17–28).

BARNA, Zs. & VAJDA, G. (2021). Banking sector's human performance management. In Aspects of Financial Literacy (pp. 403–416).

Abstracts:

BARNA, Z. (2023). VEZETŐI KONTROLLING HR TÁMOGATÁSA (HR SUPPORT FOR MANAGEMENT CONTROLLING). In 15TH INTERNATIONAL CONFERENCE OF J. SELYE UNIVERSITY EMPLOYMENT AND LABOR MARKET (pp. 348–366).

BARNA, Z. (2023). TELJESÍTMÉNYÉRTÉKELÉS A BIZONYTALAN ÉS VÁLTOZÓ PIACON. In 14th International Conference of J. Selye University. Section of Economics, Mathematics and Informatics. Conference Proceedings (pp. 9–20). <http://doi.org/10.36007/4492.2023.09>

BARNA, Z. (2023). RÉGI SÉMÁK, ÚJ HELYZETEK – PROJEKTKIHÍVÁSOK A MEGVÁLTOZOTT KÖRNYEZETBEN. In Megújulás és növekedés a Covid árnyékában (pp. 17–28).

BARNA, Zs. & VAJDA, G. (2021). Banking sector's human performance management. In Aspects of Financial Literacy (pp. 403–416).

Other scientific works:

BARNA, ZS. (2023). New Times in Performance Evaluation. THE INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE AND BUSINESS ADMINISTRATION, 9(4), 21–34. <http://doi.org/10.18775/ijmsba.1849-5664-5419.2014.94.1002>

BARNA, Z. (2022a). Digital Human Performance Evaluation in the Public and Private Sectors. THE INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE AND BUSINESS ADMINISTRATION, 8(5), 7–13. <http://doi.org/10.18775/ijmsba.1849-5664-5419.2014.85.1001>

BARNA, Z. (2021b). Financial Sector's Human Performance Management. THE INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE AND BUSINESS ADMINISTRATION, 8(1), 37–44. <http://doi.org/10.18775/ijmsba.1849-5664-5419.2014.81.1003>

BARNA, Z. (2021a). COVID Effect onto the Corporate Project Work. THE INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE AND BUSINESS ADMINISTRATION, 7(6), 16–24. <http://doi.org/10.18775/ijmsba.1849-5664-5419.2014.76.1002>

Balázs, K., Barna, Z., Boros, J., Zdeněk, C., Dajnoki, K., Kálmán, B. G., ... Zsigmond, T. (2024). A VÁLLALATI-SZERVEZETI STABILITÁST VESZÉLYEZTETŐ TÉNYEZŐK – AVAGY GAZDÁLKODÁS, MENEDZSMENT ÉS HR A HÁBORÚ ÁRNYÉKÁBAN (IPAR-MEZŐGAZDASÁG-SZOLGÁLTATÁSOK-EGYÉB TERÜLETEK) - FACTORS THREATENING CORPORATE ORGANISATIONAL STABILITY – OR GOVERNANCE, MANAGEMENT AND HR IN THE SHADOW OF WAR (INDUSTRY-AGRICULTURE-SERVICES OTHER SECTORS).

József, P., Zdeněk, C., Silvia, T. K., Erika, V., Erika, S. H., Tibor, Z., ... Tibor, Z. (2024). FACTORS THREATENING CORPORATE ORGANISATIONAL STABILITY – OR GOVERNANCE, MANAGEMENT AND HR IN THE SHADOW OF WAR (INDUSTRY-AGRICULTURE-SERVICES OTHER SECTORS). (P. József, C. Zdeněk, T. K. Silvia, V. Erika, S. H. Erika, Z. Tibor, & I. K. Éva, Eds.).

BALOG, K., BARNA, Z., BOROS, J., BRUDER, E., DAJNOKI, K., HOLLÓSY-VADÁSZ, G., ... Hámori, T. (2022). A vállalati-szervezeti stabilitást veszélyeztető tényezők.

BARNA, Z. (2022b). Digitalization – From Controlling to performance evaluation in the light of Industry 4.0. <http://doi.org/10.5281/zenodo.6351741>