

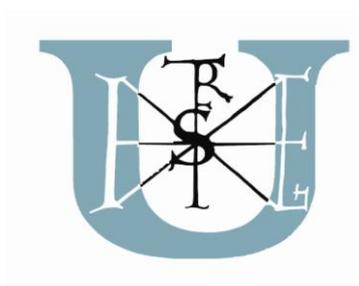
Szent István University, Gödöllő

**Doctoral School of Management and
Business Administration**

THESES OF DOCTORAL (PhD) DISSERTATION

**MANAGERIAL FUNCTIONS AND ROLES IN
TRADITIONAL AND VIRTUAL ENVIRONMENTS**

**Written by:
GÁBOR TÖRÖK**



Gödöllő, 2012

Overview of the Doctoral School

- Official title:** Szent István University
Doctoral School of Management and Business Administration
- Scientific field:** Management and Business Sciences
- Head of School:** Dr. István Szűcs
full professor, Doctor of the Hungarian Academy of Sciences
Szent István University, Faculty of Economic and Social Sciences,
Institute of Economic Analysis and Methodology
- Supervisor:** Dr. Csaba Makó
full professor, Doctor of the Hungarian Academy of Sciences
University of Debrecen
Faculty of Economics and Business Administration

.....
Approval by Head of School

.....
Approval by supervisor

Contents

1 BACKGROUND AND OBJECTIVES OF WORK.....4

 1.1 Grounds for choice of subject area4

 1.2 Objectives of the dissertation.....4

2 SOURCES AND METHODOLOGY OF THE DISSERTATION.....5

3 RESULTS OBTAINED FROM THE ANALYSIS.....6

 3.1 Results and conclusions obtained from the study of professional literature6

 3.2 Results obtained from the analysis of empirical data15

4 SUMMARY OF NEW AND INNOVATIVE RESULTS
OBTAINED FROM THE RESEARCH18

5 CONCLUSIONS AND RECOMMENDATIONS19

6 PUBLICATIONS BY THE AUTHOR RELATED TO THE
SUBJECT OF THIS DISSERTATION21

1 BACKGROUND AND OBJECTIVES OF WORK

1.1 Grounds for choice of subject area

Starting by the last decade of the XX. century, initially materialising in the developed countries before reaching global dimensions, a new trend began to emerge concerning organisations and leadership. This new trend was triggered by revolutions in the fields of information technology and info-communications network technology. Accordingly, due to advances in the field of digital technology in general and the internet in particular, the traditional boundaries of time and space became more porous and virtual in nature which, among other consequences, created a radically new environment for organisations and their management. In my view, it is this very historical development that makes it justified, timely and important to conduct a comparative analysis of managerial functions and roles across traditional and virtual environments. The term '**virtual**' refers to situations in which groups of persons implementing a set of coordinated efforts with the aim of reaching a specific objective are separated from one another in space (as well as in time too, in many cases), and not being able to establish direct interpersonal contacts, rely on infocommunications technology as a medium to implement their acts of coordination. Compared to traditional forms of work related human interactions, where exchanges take place at the same time and point in space, virtual work situations are best described as 'almost the same but not identical'.

1.2 Objectives of the dissertation

One of the main objectives of my dissertation is to discuss in what ways and to what extent managerial functions, activities and roles that were originally developed to suit the needs of traditional organisations, prevail under circumstances where direct interpersonal relationships, defined as personal exchanges taking place at the same time and space among cooperating parties, are either limited or made impossible. In other words, my objective is to describe the new characteristics of such situations where employees are scattered over different geographical locations and so their efforts can only be managed and coordinated from a distance with reliance on infocommunications technology as a medium.

The other main objective of my dissertation is to develop a theoretical-methodological approach and model that make it possible to operationalise the concept of the '**knowledge worker**', thus rendering it a suitable subject for the triple purposes of empirical research, establishing a basis for estimating the number of knowledge workers in Hungary and describing the socio-demographic characteristics of knowledge workers. My attention has been turned to the subject area of knowledge workers especially because it is this social group constitutes the most typical cluster of employees in the so called new economy and information society. The size and structure of this group can be considered important indicators of the level of social-economic modernisation. At the same time, finding adequate means to manage knowledge workers (including identifying ways to cope with the problems of virtual cooperation) is one of the key challenges of the XXI. century.

2 SOURCES AND METHODOLOGY OF THE DISSERTATION

The sources and methods used in the preparation of this dissertation can be classified into two main groups. One is **professional literature** discussing managerial functions, activities and roles as well as their organisational and broader context. When discussing managerial functions, activities and roles, my intention was to describe what exact meaning they carried under the conditions of traditional industrial mass production and in what ways this meaning came to change with the rise of the post-industrial era (knowledge based economy, information society). My basic principle was to discuss the subject area concerned by means of reaching back, as much as possible, to primary sources and works by authors considered classic. (This definition applies to the 'newly classic' authors of the subject fields of virtual teamwork and distant management as well.) Since this dissertation is concerned with some of the special subsections of organisational and management literature (functions, roles and virtuality), I considered it justified and necessary from the point of view of research methodology to study the text bodies concerned in great depths. While doing so, my intention was to make systematic references to the conceptual interconnections (in some cases of historic significance for science) existing between the different subject areas, while adding my own opinion and some occasional points of criticism. Most of my comments are included in footnotes in order to be treated as separate from the main body of text, leaving the later to be entirely devoted to the factual introduction of the ideas proposed by the authors discussed.

The other main group of the sources and methods used for preparing this dissertation consists of both the database concerning knowledge workers, that was made subject to secondary analysis as part of my research, and the techniques that were employed in the process. I chose to adopt the research method of secondary analysis because I was not in a position to implement any studies of such scope and methodological standard as to meet the criteria of primary research. The secondary analysis concerned was conducted based on a survey database created as part of the World Internet Project of 2006 based on a nationally representative sample population of 3969 heads. The primary objective of the survey had been to study the social repercussions of growing internet usage in Hungary but it had also generated information that could be made use of as part of my empirical study on the subject area of knowledge workers. As a first methodological step, I explored and made subject to critical analysis all the sources of professional literature that provided points of reference for a definition of the concept of knowledge workers. My main conclusion was that the phenomenon of the knowledge worker could only be conceptualised and operationalised for the purposes of empirical research by way of adopting a complex and multi-dimensional approach. It was to follow up on this conclusion, that I developed a conceptual and operational framework (model) for the identification of knowledge workers, as well as devised the methodology of the secondary analysis to be conducted. The subject of the secondary analysis concerned was supplemented with a field of additional research conducted by myself based on a small sized sample (n=59). This additional input enabled me to describe some of key factors that make up the self-concept of knowledge workers.

3 RESULTS OBTAINED FROM THE ANALYSIS

3.1 *Results and conclusions obtained from the study of professional literature*

The first concepts of organisational and managerial functions, considered today as of classic importance, were conceived on the basis of experiences originating from the world of industrial mass production, characterised by localised production facilities and large scale hierarchical-bureaucratic settings, and were derived from the experiences of middle level managers predominantly engaged in supervising the activities of physical workers. In 1911 Frederick W. **Taylor** argued that the management function was such a complex activity that only at the corporate executive level could it be realistically assumed that one could adequately fulfil all its requirements. And since it was deemed unrealistic to expect such thing in the case of middle level managers, Taylor suggested that the universal nature of their role should be eliminated and their function as complex manager be substituted with that of the functionally specialised supervisor. In the case of Taylor, functional differentiation resulted a system suggesting eight supervisors each of whom having a supervisory role connected to a single functional aspect of the work process. As a conclusion, however, employees ended up receiving instructions simultaneously from eight different supervisors. Four of the eight supervisors were engaged on the factory floor where work was being executed in its physical form, while the other four were located in the factory office and were involved in conducting more intellectual activities. Over the years this setup grew into a case of extreme specialisation and proved not viable.

Henri **Fayol** published his main piece of work in 1918. His book was centred around the concept of creating **separate corporate functions** where the term function was used to describe areas of activity that were differentiated according to the system of work allocation, such as technical, sales, finances, security, accounting and management. Within the domain of management itself, Fayol continued to identify five subfunctions (managerial activities), which were **planning, organising, direct supervision, coordination** and **control**. Fayol even suggested that direct supervision could be considered a separate function of its own and although he himself did not implement such separation in practice, later developments justified the rightness and importance of his idea of treating personal leadership as a unique dimension.

Fayol held the view that the management function was in a broad sense concerned with the workings of the corporation as a social organisation as well as with the members of the organisation and the rules pertaining to the formal relationships existing among them. He considered the task of establishing such relationships an organisational issue; he was thinking in terms of structures rather than spontaneous networks of informal interactions. Even with regards direct supervision he put the emphasis on directives and instructions (i.e. means of administrative control). His philosophy of the corporation was built on the concepts of hierarchy and authority. These sources gave statutory rights to managers, entitling them to issue instructions and to rely on means of power to enforce the execution thereof. Nevertheless, concerning managerial authority, he suggested that it did not only derive from office or statutory sources but it had a personal component as well. Fayol's understanding of the organisation emphasised order, discipline and mutual respect as well as it advocated the identification of clear and concise organisational boundaries. The two principles of single person supervision and unity of direction are typical examples of these tendencies. According to the first, a per-

son in a subordinate position was supposed to receive instructions pertaining to a particular task only from a single source. According to the other, the totality of activities related to a single outcome was to be made subject to the direction of a single manager. These principles can still be enforced today, however their relevance has diminished as the nature of organisations as well as management have undergone changes (especially due to the emergence of matrix and project based organisations).

Fayol was one of the first to raise awareness of the importance of **information forwarding** and **communications**, but considered them only as means to support the purposes of authority and hierarchy. He believed that as a basic rule communications should follow the formal chain of command; however, since it could slow down the workings of the organisation, employees as a rule of exception should be entitled (upon asking for the approval of their superiors) to contact each other directly too. In other words, Fayol's concept of the organisation was predominantly built on the idea of hierarchically determined and vertically oriented forms of communications but it also opened a **window of opportunity** for horizontal or lateral communication. Later on, along with developments such as the matrix and network organisations, this opportunity grew to become an **obligation**. Fayol distinguished between social and material order. The essence of both was precise positioning: all things should have an orderly place assigned to them and all things should be placed accordingly. The actual content of a job or position should be in accord with the capabilities of the employee filling in that position and the same should be true the other way around: employees must meet the requirements of their jobs. This concept of social order necessitated the creation of two management functions: **organising** and the **selection of personnel**. Fayol asserted that to maintain social order within the corporation, it was inevitable to have a clear knowledge of all needs for labour as well as awareness of the possible sources from which manpower could be recruited. A further skill of importance was to keep these two factors in balance. If we add to this all his other 'most frequently applied principles' pertaining to the way employees are treated and managed (remuneration, fair conduct, initiative, unity of workers, stability of the workforce), we shall see that they reflect a highly conscious and even strategic approach to human resources.

Drawing upon the range of papers published by Max **Weber** during the interval of 1919-20, the following concepts need to be made mention of as pertaining to the subject matter of this dissertation. From the perspective of the allocation of labour, Weber distinguished between two categories of activities: 'actions concerned with the giving of commands' and 'actions concerned with obeying commands'. The first was considered the equivalent of the management function, whereas the second, often regarded as the direct opposite of the first, as execution, frequently being the same as labour. Within the frame of reference of the corporate organisation, the management function was considered a specialised form of behaviour pertaining to the coercion and enforcement of order. Weber asserted that the existence of an organisation was fully dependent on whether there was a manager or management board in place. In this context, **the management function was considered not merely an organisational function but as much as a prerequisite for the organisation's existence**. According to Weber, the management function could be defined as a profession (as well as source of income), representing the totality of a set of specialised activities, all pertaining to the process of using systematic means to coordinate the way in which actions performed by others are continuously brought in contact with the material means of production. Based on this definition, coordination should be **considered the most underlying management function**. Nevertheless, providing for the continuity of operations, or **systematic functioning** in Weber's terminology, should just as much be regarded as a critical function. After all, this activity could be interpreted as the time dimension or dynamic aspect of the coordination function itself.

Weber introduced two further management functions: **direction** and **regulation**. The first focuses on organisational actions and determines *what to do and how it is supposed to done*. The second defines to *what is permitted* or at least *what is not prohibited*. The idealised version of Weber's bureaucracy was characterised by the dominance, or rather the exclusive rule, of the direction function. In other, words *direction* is implemented by means of the use of programmed algorithms such as formal rules and regulations. In mature instances of bureaucracy, management as an organisational function, as well as all the subfunctions of management, are executed by the bureaucratic mechanism itself, within the limits of its authority, by means of *regulating* tasks, procedures and the rights to issue commands or instructions. Being fully replaceable, those filling in bureaucratic positions, including managers (superiors) at the various levels of the hierarchy, are of no significance as individual personalities at all. They only had to meet the professional requirements of the position they held. **Formal communications**, that is the creation, storing and sharing of written records, was considered of great importance in bureaucratic organisations, and any regulations pertaining to these activities were strictly adapted to the requirements of the formal hierarchy. The idealistic form of bureaucracy as described by Weber has lost much of its dominance or has been transformed over the past almost one hundred years. Nevertheless, human activities based on the allocation of work can not be implemented without some form of coordination and regulation and this inevitably necessitates the continued existence of some form of bureaucracy in the broad sense. Hierarchy is even less possible to leave behind as the need to develop hierarchical structures just as much encoded into the workings of organisations, reinforced by both natural and social determinants, as into spontaneously evolving networks of human relationships.

Out of his works, the book published by Chester I. **Barnard** in 1936 may be regarded as the one to have contained the most such ideas that would remain valid over time in spite of all the organisational changes taking place even till today. This may primarily be true due to the theoretical approach that he chose to address his subject. His tendency towards the abstract (similar to that of Weber) made him focus on the most general and at the same time most underlying aspects of organisations and management. His broadest conceptual category was termed the **system of cooperation** and was used to refer to any sets of individual actions, complex sets of activities implemented by the participants of a system, that are harmonised in order to bring about common objectives. The level of efficiency (and ultimately, the probability of survival) achieved by systems of cooperation was defined as a function of the extent to which they succeeded in providing for the needs of the participants of the system. Barnard distinguished between three types of cooperation based systems.

One was the **formal organisation** defined as a system of intentionally coordinated activities or efforts involving two or more persons. In his view, the formal organisation represented a special form within the broader category of systems based on cooperation. Barnard considered this construct analogous to the workings of the electromagnetic field known from physics: magnetic force arises as a result of an interaction between a piece of metal and a magnet but it is not directly created by any of the two objects itself. Similarly, individuals could be regarded as the objective sources of an 'organisational field' the energy of which originates from what is intrinsic to the individuals concerned. Barnard concluded, that **formal organisations were not made up of individuals as building blocks but rather created as a result of the interrelations and actions existing among these individuals**. In his view, what made these activities into a system was the coordinated nature of the efforts and activities concerned - it was for this reason that he considered coordination **the broadest and most underlying organisational and managerial function**. The environment of the formal organisation was made up of

physical objects, living persons and materialised outputs of activities; all of these may change or become modified over time but if coordination as a function remained to be provided for, the formal organisation would be sustained despite all the changes. (Provided that the needs of the ever current members of the organisation were met.)

His second category, **the informal organisation**, was defined as an outcome of interactions taking place among individuals who did not share any conscious aims to join their efforts and where a set of interrelated objectives that could give direction to any sort of common efforts was missing. Barnard assigned major importance to the informal organisation. Even virtual organisations could be used to validate his assertion that understanding the underlying bonds and linkages inside an organisation meant the learning of who was who, what was what and why things were the way they were within the informal organisation. According to him, the informal organisation had three functions: providing for communications outside the formal channels, fostering cohesion and facilitating capacity for cohesion within the formal organisation and reinforcing the personal integrity and self-esteem of those comprising the organisation. (It is to be noted that Barnard's concept of the informal organisation only partially overlaps with the way it is interpreted by occupational psychology, so widely known by virtue of the work done by the representatives of the Human Relations School.)

Concerning his third category, the **management organisation**, Barnard's vantage point was that those in managerial positions, as well as their subordinates under given circumstances, performed managerial functions or in other words implemented tasks (obviously to varying degrees) aimed at the coordination of common efforts. It is the totality of these functions (and not persons) that made up the management organisation. Nevertheless, not even such an organisation, considered in the broadest sense, was able to coordinate overall systems of cooperation as such systems regulated themselves as self-organising mechanisms in their own right. Barnard compared the contributions the management organisation made to the operations of the overall system to the service done by the nervous system (including the brain) to the workings of the total body. (This comparison would later be echoed in the ideas of Henry Mintzberg.)

With regards **space** and **time**, Barnard held the view that organisations that were considered formal according to his criteria were not in any way (or only to a minor degree) constrained in terms of their localisation in space. Even in his own times, he experienced a sense of 'no-where-ness' (a lack of spatial belonging) and he assumed that the proliferation of electronic communications technology would give further impetus to the broadening of this enigmatic sensation. Barnard assumed that while space in the sense of locality became relative (or virtual by modern terminology) in formal organisations, the time dimension would gain special importance. Accordingly, the continuous and/or temporary nature of cooperative actions would grow to become a key aspect of the organisation as questions like 'when' and 'for how much time' would obtain fundamental significance. In my view, these aspects of Barnard's concept of the formal organisation have had a revolutionary influence on future developments, with particular regard to the various aspects of virtuality.

Barnard considered **communications** as of key importance and addressed any related issues with a level of inventiveness that pointed far ahead of his age. He held the view that the subject area of communications should play a central role in any theory of the organisation that was to consider itself all-encompassing. This was so because the structure of the organisation was almost completely defined by means of the techniques of communications in use. In his views, authority, power, status are strongly interwoven with communications; accordingly,

hierarchy was manifested in certain aspects and modes of communications. He defined the source of authority as the **acceptance** by employees of the content of communications delivered by superiors. Accordingly, power and authority could only reach effect if subordinates acted in line with the content of communications (instructions, directives) aimed to them. If such acts of communications were rejected, authority could not materialise. I consider this notion one of the most original ideas suggested by Barnard even though to some extent it resembles Weber's concept of legitimacy and especially its manifestation with regards the context of rational-legal rule. According to Barnard, authority arose from two main sources: **position** and the ability to exercise **superior management skills**. This concept resembled the notions of Fayol and the more so as Barnard emphasised that authority implied responsibility and required the acceptance of responsibility by those in power.

According to Barnard the three most important **managerial functions** were the following. 1) Establishing and maintaining the communications system, including appointing the right personnel to positions in 'communications centres'. 2) Ensuring that the tasks to be carried out as part of the cooperation system were indeed implemented, which required adequate managerial skills. 3) Identifying objectives and plans which needed to be done with the involvement of representatives from the various functional fields and hierarchical levels. Concerning the implementation of tasks and with particular respect to the making of team decisions, Barnard emphasised the importance of the practice of **delegating responsibilities**. He considered the act of collective decision-making an essential component of team existence and a key source of a shared sense of satisfaction. He believed that it was the act of decision making that made the members of a work community experience their belonging to a single team as well as it provided feedback and reinforcement concerning their social status and role within the team. This notion is again one of those important early insights that since its time of conception have become widely accepted. It provides a relevant frame of reference even for understanding of virtual teams and their management.

Barnard defined underlying **managerial skills** as loyalty, sense of responsibility, acceptance of responsibility and ability to identify with the 'corporate personality'. To him the latter one implied such behaviour and mentality that would make the individual subordinate his self (even perhaps to extreme measures) to the interests and expectations of the corporation he worked for. (It is to be noted that although loyalty has remained an important criteria for employees, Barnard's concept regarding full adherence to 'corporate personality' appears to have grown outdated.) Barnard also advocated the importance of such skills as vigilance, wide ranging curiosity with an interest for details, flexibility, ability to influence one's environment, calmness and brevity. In modern terminology the same set of skills are referred to as job expectations for those filling in managerial positions, or in other words, managerial competencies.

Henry **Mintzberg** approached management activities specifically from the social psychological point of view of role theory and developed two successive models of **managerial roles**. His two models, introduced in 1989 and 1994 respectively, differed from one another in more than one respect. The subjects of his empirical research were incumbents of high or top level managerial positions and so his models of management roles may be considered as predominantly (but not exclusively) applying to these groups of positions. The structure and content of the two models concerned are the following.

1989	1994
1 Interpersonal roles	1 Management by information
1.1 Representative/ceremonial role 1.2 Personal managerial role 1.3 Roles related to the building and maintaining of relationships	1.1 Communications role ('membrane') 1.2 Controlling role (using information in an indirect and institutionalised way for exercising power)
2 Roles related to information	2 Management by people
2.1 Role of observer 2.2 Roles related to forwarding and disseminating information 2.3 Role of spokesman	2.1 Management (internal orientation) 2.2 Establishing/maintaining relationships (external orientation)
3 Decision-making role	3 Management by actions
3.1 Entrepreneurial role 3.2 Trouble-shooting role 3.3 Resource allocation role 3.4 Negotiation/reconciliation role	3.1 Internal action (active involvement in projects or other problem solving efforts) 3.2 External actions (active involvement in carrying out negotiations and concluding business deals)

In his model of 1989 the emphasis was to the largest extent put on information related roles. It was in relation to these roles that managers most explicitly manifested themselves as either nerve centres of their organisational units or as centres of the nervous system of their organisations. According to Mintzberg **information processing was a key component of managerial work and communications, in the case of managers, to a large extent was to be considered as work itself.** He stressed that the ten roles he identified could not be (or at least not easily) treated as separate as they made up an integrated whole or body. The most underlying problems of work were also related to information roles: if the members of a team (employees) were not able to share all the pieces of information (mostly by means of verbal communication) necessary for their work, then the team could not be ineffective in producing outputs. Mintzberg also pointed it out that although the ten management roles comprised an integrated whole, it did not necessarily follow that all managers would pay equal attention to all the roles concerned. The influence of multiple factors could result in different sets of priorities or proportions and could ultimately give rise to a variety of different managerial styles.

Mintzberg perceived that as far as the top managerial practice he observed was concerned, the exchange of information was realised predominantly by means verbal interaction and only to a lesser extent by way of written communication. Data and information obtained from sources related to information technology had little or no relevance at all within the top managerial circle he studied. From this he drew the conclusion that since verbal information were stored in the minds of human beings, the strategic databanks of organisations were localised not in the memory of computers but inside the minds of managers. Although this assertion has not been made obsolete by the developments that have since taken place in the domain of information communications technology, in my view, it may need to be revisited or refined especially in view of the advances that corporate knowledge management has gone through.

A role based approach to study the work of managers can still be useful and applicable today and can even be related to managers working in virtual environments. Having said that, the past two decades have seen a marked movement away from role based methods and expectations and gave rise to a new trend with the focus being shifted to **competencies**. Competen-

cies may be defined as an aggregate of pieces of knowledge, skills and experiences that needs to be mastered to a certain degree in order for someone to be able to meet or exceed expectations in a particular job or position. As far as competency related professional literature is concerned, the works of **Richard Boyatzis** needs to be noted. Boyatzis relied on highly convincing theoretical and empirical methods to demonstrate the existence of relationships among managerial functions, activities, competencies and roles.

Accelerating technological development during the second phase of the XX. century as well as shifts in economic, demographic and educational trends led to deep transformations regarding the machine and mass production based industrial societies of the developed countries. With the revolution in information technology sweeping the world during the nineties of the past decade, this shift of paradigm was made complete and capitalism entered a new era. There have been many different terminology suggested to describe and explain the various aspects of this transmission. Some of these are *post-industrialism*, *new economy*, *knowledge economy*, *network economy*, *information society* or *knowledge society* have been used as verbal definitions. The expansion of the new economy was much facilitated by the revolution taking place within the domain of information technology and with particular regard to quantum leap advances regarding the internet and the world wide web, among other areas. The newly emerged infrastructure of information technology in a general and infocommunications technology in particular have created a digital platform that made it possible for persons and organisations to cooperate in an interactive manner as well as to develop and maintain network based relationships for both economic and social ends. The processing, distributing and making use of information became more and more key factors of efficiency and this trend was reinforced by a broadening of the scope of knowledge-based tasks and activities. Those engaged in tasks related to the processing of information, implementing symbolic or abstract operations or generating knowledge came to represent a growing proportion within the occupational structure of information- and knowledge based societies. Conclusively, in knowledge societies knowledge workers have grown to represent the most dominant and typical components of the workforce. Besides the usual practices of employment, new and atypical forms of work arrangements have appeared: ways have been developed to utilise the workforce in new and flexible forms (e.g. mobile work, distance work) and the ratio of the self-employed has increased. The tendencies of globalisation have had their impacts labour markets too.

Advances in the field of information technology has made possible a new and more relativistic (and disintegrative) interpretation of time and space, as well as a reconsideration and potential reintegration of these two basic factors in a new and virtual environment, possibly on a global scale. Developments regarding the reconceptualisation of time and space bears major significance to the changes taking places in the world of work and especially to any future trends that may influence the directions of the changes to come. As a component of the flexible systems of management and organisation introduced by the new economy, time is more and more being considered a resource that requires accentuated managerial attention and efforts. Some of the key features of the post-industrial era include phenomena such as the **transformation of organisations**, a process of **intra- and inter-organisational relationships becoming network based** and, as a partial consequence of this, a tendency of **networks becoming virtual**. The borders between networks and organisations are becoming less solid and under certain circumstances and from certain viewpoints, the two categories become interchangeable. Organisational intelligence, organisational learning and knowledge management have become key success factors for organisations that represent the essence of the new economy. At the same time, traditional hierarchical-bureaucratic structures continue to exist especially within the domain of large industrial corporations.

Regarding organisations and management, the word ‘**virtual**’ carries the meaning ‘**it is almost the same / it is almost like that, but not exactly so**’, where the subject of comparison may be defined as whatever we have traditionally got used to and so come to regard as tangible and real. The most underlying characteristic as well as challenge associated with activities taking the form of virtual cooperation or distant management, is the limited nature or complete lack of direct interpersonal cooperation. As a result, the process of communication which plays an important role in traditional organisational settings too, grows to become a factor of vital significance. It is therefore understandable that one of the central issues emphasised by the related professional literature is the task of providing for adequate **communications** among all the members and managers of virtual teams. There is general agreement regarding that there is a need to harmonise the human factor with whatever infocommunications technology is available and that the means, forms and channels of virtual communication need to be selected and used on the basis of functional considerations. It is of particular importance to define the ‘**cultural protocols**’ of the communication process. Such standards, partly to arise from managerial expectations and partly from the group norms established by the cooperating parties, are supposed act as to regulate the way contacts and relationships are managed, information is shared and feedback is given within the system. Cultural protocols can obtain particular relevance when the participants of a virtual cooperation situation represent **different national cultures** - a situation that is becoming more ordinary as globalisation takes on momentum.

One of the most difficult challenge distant managers are faced with is to meet the psychological needs of virtual team members and to cope with the challenges of **group dynamics** in general and interpersonal conflicts in particular. In this regard, professional literature recommends the use of a combination of communications based on technical channels and meetings that take the form of interpersonal encounters. One of the most important and most frequently addressed issues related to virtual cooperation is **trust**; this applies not only to the workings of teams and management but also to inter-organisational networks that have more or less become virtual in nature. All the authors discussing virtual management emphasise that without an adequate level of trust being provided for cooperation among virtual team members being located far from one another, will suffer and perhaps even come to an end. It will certainly jeopardise work processes and set limits to performance levels. It is for this reason that building and maintaining trust is regarded as one of the most important tasks of managers, as well as a key competency requirement associated with managerial performance. At the micro level, trust is influenced by the experiences that the parties concerned (interacting team members) gained earlier in similar situations as well as by other factors such as the depth to which the interacting parties are acquainted with one another, the extent to which they regard the work situation as an important one, the level of utility and profit expected to be realised from the work process concerned and the general level of trust that one experiences as a member of a given society. At the macro level, trust is a factor embedded in societal-national cultures which can be distinguished as either high or low trust societies. Although not disregarding the importance of trust as a factor of importance, it is still to be noted that the nature and change of interpersonal relationships among members of virtual work situations as well as the effectiveness of virtual teams as such can be explored and studied along some alternative dimensions as well. For example, agent theory, which describes the interrelations among members of an organisation as a system of transactions between **commissioners** and **agents accepting commissions**, may in certain cases provide an adequate conceptual model for analysis and research. This organisational concept implies individuals among whom a network of connections is created via the process of establishing commission contracts, where the key motif for

being parties to the contract, in case of both commissioners and the agents, is their shared purpose to maximise profits.

Following an approach centred around the conceptual dimensions of **functions, activities, roles** and **competencies**, the. Managers of virtual teams have formal authority but as a result of a lack of opportunities to provide for direct supervision they only have limited chances to implement their authority in practice. There is much truth in the assertion, advocated by professional literature, that the power and control exercised by managers over subordinates is more or less equal to that exercised by subordinates over themselves. This is so because on the one hand side team members become self-controlled – meaning that **the management function becomes internalised**. On the other hand, the management function, at least to some degree, can also become a **team function** exercised collectively by the members of team. (The fact that self-controlling teams having no appointed single-person leaders were viable were proved by a long series of experiments as early on as in the 1970s.) That parts of the management function can be transferred to non-managerial employees, with particular regard to some of the authority related to decision-making being delegated to subordinates, is made possible by the fact that subordinates are competent and able to implement such tasks. Of course, this opportunity is also an obligation for managers as highly qualified employees (knowledge workers) are becoming more and more demotivated if no autonomy is delegated to them. So although direct supervision is not possible as a result of spatial distances, it is perhaps not even needed at all due to the high level of competencies that employees possess. Nevertheless, managers need to continue to take responsibility for the overall effectiveness and efficiency of their teams' functioning. To ensure this they need to **identify clear objectives** in the first place. Secondly, they need to **implement systems and processes** (that is formal control-mechanisms) and thirdly they need to rely on **performance assessment systems** based on actual achievements. To provide for all these facilities is not an easy task at all for managers supervising their teams from a distance. They need to establish trust with team members despite difficulties of meeting them in person as well as they need to reinforce their loyalty and dedication partly on a cognitive and partly on an emotional basis. In more general terms, managers need to foster in their teams the forming of a collective identity as well as facilitate the emergence of a 'common frame of reference' for interpreting issues and attributing shared meanings. They also need to find ways to help their teams relive and reinforce their consciousness of their own existence (a sense of 'we are'). Finally managers need to coordinate the team's efforts while keeping an eye on all the factors of cooperation that have just been mentioned. The concept of the psychological contract introduced earlier in professional literature is valid and applicable in the case of virtual team work, too. However, quite naturally, its actual content needs to be customised to the particularities of the virtual work situation.

The above discussed managerial tasks can be considered related to the internal world of virtual teams. However, managers need to exercise a very important external function too. This comprises activities such as acquiring and providing for the availability of resources for those whose work they supervise as well as representing their teams' interests and creating awareness in the organisation of the results achieved by their teams - thus making their teams 'visible' in their respective organisations and particularly for the eyes of key decision makers. Since virtual work situations are typically related to matrix organisations, project work and network based cooperations, managers also have to cope with the challenges of crossing organisational boundaries in order to build and expand network relations. They are supposed to do this in order to provide for the resources they need for them to be able to realise their internal team functions. All this can be summarised by saying **that the main function that lead-**

ers of virtual teams need to implement as part of their work is not so much related to the immediate supervision of team activities but rather to the process of ensuring the availability of resources so that such supervision can be realised.

3.2 Results obtained from the analysis of empirical data

Having studied the professional literature I have chosen as support material to estimate the number of knowledge workers in Hungary, I have drawn the following conclusions:

- knowledge workers can only be established as a separate category within the overall working population by means of applying several selection criteria simultaneously (multi-dimensional approach)
- some of the selection criteria concerned needs to be defined as prerequisites for being included in the category of knowledge workers; these are to be formulated as **normative-selective factors**
- to decide if an employee qualifies as a knowledge worker it is necessary to consider his digital literacy, which represents a measure of both the extent to which the use of information technology is part of the individual's scope of duties at the workplace and the level of the skills and competencies he has mastered in using such technology

For someone to be classified as a knowledge worker, I have identified the following preselection criteria: active earning status, professional position and degree in higher education. There has been a total of 256 heads in the database meeting his triple criteria. This preselected group has been further differentiated along dimensions measuring digital literacy. These measures (variables) have been categorised as follows.

- General purpose use of infocommunications equipment and applications (IKT)
 - ✓ frequency of using computer at the workplace
 - ✓ total time of internet usage at the workplace per week.
- Level of skills related to using infocommunications equipment and applications (IKT)
 - ✓ level of competence related to using computers (based on self-assessment)
 - ✓ level of competence related to using the internet (based on self-assessment).
- Special purpose activity involving infocommunications technology (IKT)
 - ✓ frequency of using the internet to search for work related information
 - ✓ total time devoted to searching for work related information on the internet per week.

The variables classified into the above introduced three groups (dimensions) made it possible to further apply the logic of normative-selection, combine screening criteria or define more rigorous criteria for selection. (For ease of use I have dichotomised the variables that were previously measured along five point scales.) Those who met the preselection criteria of being identified as knowledge workers were further classified into two groups (levels) as follows. The first level was defined as to comprise those who extensively use infocommunications equipment for general purposes and command a high level of skill related to the use of such equipment. This aggregate was built on the following factors: everyday use of computer at the workplace, considerable amount of weekly internet usage and above average level of competence related to using both computers and the internet. The second level (the elite) were defined as those who met all the previous criteria plus had high levels of engagement in special purpose activities involving infocommunications technology. (Meaning that they regularly

search the internet for information related to their work and devoted a significant amount of time to such search activities.)

Besides the above methods, I also have performed several multi-variable statistical analyses (principle component analyses and cluster analyses). My approach was based on the assumption that if I obtained similar results (results that did not differ in terms of their order of magnitude) by means of using different methodologies to analyse the same database, then it was probable that the figures obtained could be considered as good estimates. Ultimately, the data produced by nine principle component analyses and factor analyses were found meaningful. The results obtained from these were in principle the same as the data acquired from the previous procedure. Based on this, it may be concluded that the estimated figures identified as the lower and upper limits of the number of employees classified as knowledge workers may be considered as well-founded. A summary of the results obtained is presented in Table 1.

Table 1.

The estimated minimum, maximum and mean values of the number/proportion of knowledge workers, based on a domestically representative sample (N=3969)

Strata within the sample and bases of comparison	n=	Number/proportion of knowledge workers		
		minimum (n=20)	maximum (n=44)	Mean (n=33)
Members of the sample in active earning status	1419	1,4%	3,1%	2,3%
Professionals among those in active earning position	588	3,4%	7,5%	5,6%
Professionals having a degree of higher education	256	7,8%	17,2%	12,9%
<i>Active earning status, professional and having a degree in higher education all together</i>	256	7,8%	17,2%	12,9%

According to the Hungarian Central Statistical Office (KSH) the total number of those employed in 2005 were 3 846 386. There were two main employment categories in the nomenclature of KSH which in essence matched the preselection criteria used by myself for identifying knowledge workers (professional status and degree of higher education). The total number of employees in the two categories combined were 850 051 representing 22.1% of the total employed population. By projecting the estimates obtained from the sample onto the figure of 850 051, we conclude that **the number of knowledge workers in Hungary during the first decade of the XXI. century is likely to have fallen within the range of 66 000 to 146 000, the most probable mid-value being 110 000.**

Concerning the characteristics and internal stratification of the group of knowledge workers, I formed the hypothesis that in case the category of knowledge workers was more than just a abstraction and had real sociological relevance, then knowledge workers were supposed to significantly differ along many dimensions from those who classified as professionals, had degrees of higher education but at the same time did meet my criteria for being considered as knowledge workers. Unfortunately, the number of items used as the basis of comparison were low (knowledge workers: 32 heads, other professionals with degrees of higher education: 24 heads) and this should be reason for caution as far as the interpretation of the results are concerned. Nevertheless, in the case of seven out of twelve socio-demographic variables that have been analysed, the research indicated significant differences between the data belonging to knowledge workers and other professionals with degrees of higher education. These are the following:

- sex (the proportion of male knowledge workers is significantly higher)
- type of home settlement (the main differentiating factor is that knowledge workers are located in the capital or in minor municipalities in much higher proportions than other professionals with degrees of higher education; in the case of county capitals and other towns that situation is more balanced)
- knowledge of foreign languages (in this respect knowledge workers take the lead)
- educational degree of the father (in the case of knowledge workers the proportion of fathers with degrees of higher education is much higher, while the proportion of fathers with degrees limited to primary school education is much lower as compared to other professions with degrees of higher education)
- type and industry classification of workplace (knowledge workers are employed more in the production type enterprises of the market/profit-oriented sphere of the economy while other professionals with degrees of higher education are more likely to be employed in the service oriented organisation of the public sector)
- distance working (the proportion of those engaged in some form and amount of distance work is higher among knowledge workers).

In summary, **it seems that the hypothesis suggesting the existence of differences along sociological dimensions between knowledge workers and other professional with degrees of higher education is correct.** However, for the hypothesis to be established with absolute certainty, further research is needed.

The results obtained from empirical research other than the ones introduced so far can be summarised as follows. Due to their educational background and the nature of their work, project managers, who made up the subjects of the small sample research (n=59), are considered typical representatives of knowledge workers. Their responses indicate that they describe their work in such a way that is more or less in line with the characteristics of knowledge work, although perceive it as less creative and innovative. Only 60.7% of them have ever come across the term ‘knowledge worker’. (Nevertheless, the term ‘knowledge management’ were found to be familiar for 96,4%.) With regards the interpretation of the term ‘knowledge worker’, respondents gave answers that varied along a wide range with 51.8% only having a ‘vague idea’ and 48.2% saying he or she had an ‘essential understanding’. To the question whether ‘the members of a project team (including the team leader) could be considered knowledge workers’, 35.7% of the respondents gave an affirmative answer, while 60.7% said ‘partly’ and 3,6% answered no. As a result of the analyses it can be concluded that the concept of ‘knowledge worker’ has already appeared in the thinking of the project management population but the level of awareness and understanding associated with it is currently rather unstable. Employees’ self-consciousness and willingness to identify themselves as knowledge workers is therefore rather vague even among those who are indeed representatives of the knowledge worker community.

The analysis conducted based on the WIP 2006 database concerning the relationships between the number of distance workers and knowledge workers produced some rather unrealistic results, particularly if we compare the results to the data on the number of knowledge workers available from domestic and international sources. In my opinion, this is explained by the mistaken phrasing of one of the applicable questions included in the survey used for the WIP 2006 project. This again draws attention to the fact that if there is no consensus about the interpretation of certain terminologies or if the methods used are not harmonised, it is impossible to obtain results that could provide for valid, reliable and meaningful comparisons.

4 SUMMARY OF NEW AND INNOVATIVE RESULTS OBTAINED FROM THE RESEARCH

The **choice of subject** of this dissertation is considered novel and original because (to the best of my knowledge)

- the representatives of Hungarian professional literature have not yet addressed and discussed management functions and roles as separate points of consideration
- the subject areas of the virtual work situation and virtual management have in principle remained so far unexplored in Hungary and so it follows that the connections existing between the two subject areas have not been made subject to research either
- knowledge workers, considered as representatives of the new economy, have not yet been made subject to any comprehensive analysis (either theoretical or empirical) in the Hungarian professional literature.

Novel results originating from the study and analysis of professional literature:

- reconsideration and reassessment of some of the classic works and branches of organisational theory with a particular view to the areas of management functions, management activities and roles
- detailed discussion of Chester Barnard's concepts of organisations and management with special emphasis on the fact that Barnard's works, compared to their true significance, are underrepresented in Hungarian management science
- providing an overview of the changing macro-societal and organisational environment of management as part of the context of the new economy and information society
- accentuating the importance of the changing role (virtualisation) of time and space in the world of work
- underlining and documenting the movement in professional literature away from role-based approaches towards competency-based approaches of management, based on the works of Boyatzis
- describing the most important subject areas and conclusions related to the virtual work situation as well as virtual teamwork and management, based on leading American management literature.

The following new results have been obtained from the **secondary analysis** of a domestically representative survey database and a **small sample survey conducted by the author** himself:

- defining a methodology to operationalise and measure the category of knowledge workers (based on professional literature and the available database)
- providing an estimate of the proportion and overall size of the group of knowledge workers as part of the Hungarian working population based on traditional and multi-variable statistical methods
- describing the internal (socio-demographic) stratification of the group of knowledge workers and providing inputs for further discussions on issues related to the 'self-consciousness of knowledge worker'
- analysing the relationships between knowledge work and atypical forms of work activities (distance work, mobile work).

5 CONCLUSIONS AND RECOMMENDATIONS

The history of organisations and management stretches over a period of almost one hundred years representing a process of **functional differentiation** where **continuity** and **discontinuity** have both played a role. Continuity is mostly manifested in the way **hierarchy** and **bureaucracy** as institutions have been sustained over time, while major new developments and tendencies have taken the forms of technical novelties and innovations related in the field of technology. Among these, of crucial importance are the quantum leap developments that have been taking place within the domain of infocommunications technology since the 1990s. It is to be noted thought that besides the revolution of infocommunications technology itself, there have been several other macroeconomic, societal and global tendencies that have contributed to the radical reconfiguration of the organisational landscape. Infocommunications technology has made it possible for virtuality to become an integral part of the workings of organisations as well the forms of cooperation team members adopt to overcome their separation in time and space. It has also grown to be a part of the methods that managers rely on to lead their teams from a distance. The incorporation of virtuality into all these aspects of work can be interpreted as a **response to the challenges posed by the rapid changes taking place in the global environment**. Nevertheless, the emergence and expected proliferation of virtuality at the workplace is only one component of the underlying changes that are shaping the world of work. These changes are primarily manifested in the expansion of new forms of employment and the emergence of new types of psychological contract (loyalty, motivation) to be established between organisations and their members.

From the above introduced dual point of view of discontinuity and continuity it can be seen that **although infocommunications technology has acted as a catalyst and accelerating factor for the events that have taken place, the roots of the changes reach further back in time**. In my view, the paradigm of management began to shift when Fayol's principles of *unity of management* and *single person management* started to loose its firm acceptance. An **external driver** of this process, energised by several macro level factors, was the fact that enterprises needed to become more resilient and flexible to market demands. It was a consequence of this that organisations embarked on a process of **internal reconfiguration**, initially embracing divisional type structures which later gave room the matrix organisation. Such transformations had soon had their impacts on the way organisations were managed as well. The development of the management function including all the changes of principles and practices associated with it, was also quite substantially fuelled by the changing nature of work itself as well as the emerging practice of employing large quantities of more qualified and more demanding labour. **White collar employees were becoming more autonomous and were increasingly engaged in more responsible tasks while working as integral parts of organisational structures that grew more and more complex** over time. It was the need to manage these employees that came to challenge, at least in part, the classic principles of Fayol. It is not that classic managerial functions have grown obsolete (since planning, organising, control and personal leadership remains to be needed as management functions) but rather that the set of conditions applying to their implementation as well as the practice of their execution have been transformed. Traditional managerial functions need to be attended to in ways different from previous practices while new environmental conditions call for special functions and new competency requirements. Most of these pressures are linked to the influence that infocommunications technology exerts on the world of work, making possible to overcome the traditional boundaries of time and space and enabling the virtualisation of interpersonal and organisational relationships.

Considering the fact that the virtual work situation and distance management has in principle not been made subject to any empirically based studies in the Hungarian professional literature, it could be an important research task to study the typical patterns and configurations along which classic management principles and new ways of management, involving elements of virtuality, are blended in the case of Hungarian organisations. There are two approaches that can be recommended for such further research.

One approach could follow the path of exploring the micro-world and internal mechanisms of virtual operations. Fundamentally, this would involve an analysis of the work processes and a detailed study of the interactions and communications that take place. Areas of special attention could be the following: a qualitative and quantitative study of organisational communications as a complex media, the role and relative importance of the basic factors of decision-making (e.g. being informed, competence, power, hierarchical position) in the case of actors cooperating over large distances. Methods: field observations, semi-structured interviews and study of organisational documentation in a broad sense.

The other approach could have the aim of researching the extent to which the relevant factors and interrelations associated with the virtual work situation and virtual management are widespread and characteristic of the world of work in current Hungary. For this to be accomplished, in the first place, one needs to clarify the set of issues and criteria that could serve as the basis for the collection of larger scale (extensive) empirical data, plus a method needs to be defined to set up the research sample. Some of the methodologies that could apply to this approach are the following: data collection based on surveys and interviews, use of information obtained from the first research approach introduced above. The continuation of the research work aimed at gaining a deeper understanding of the situation and characteristics of knowledge work and knowledge workers in Hungary is also an approach that has justification.

As related to some of the more theoretically oriented subject areas of this dissertation, it would be worth to conduct further studies of the applicable professional literature as well. Some of the recommended areas in this regards could be: the reconfiguration of the categories of time and space in the world of work, a study of the literature of the sociology of knowledge from the point of view of organisational and management theory, an analysis of the interrelations between sociological action theory and various schools of organisational thinking.

6 PUBLICATIONS BY THE AUTHOR RELATED TO THE SUBJECT OF THIS DISSERTATION

Name of author used in case of publications: GÁBOR TÖRÖK L.

Reviewed publications in foreign languages published in scientific journals

Knowledge workers, competencies, virtuality and management.

In: Polish Journal of Management Studies 2011 Vol 4. pp. 67-77. (ISSN 2081-7452)

<http://www.pjms.zim.pcz.pl/knowledge-workers,-competencies,-virtuality-and-management.php>

Co-author: Mária, Dr. Farkasné Dr. Fekete

Reviewed publications in foreign languages published in scientific volumes

Identification of Critical Factors of Virtual Working: Theory and Paractice. pp. 177-183.

In: Humanization of Work and Modern Tendencies In Management (267 pages)

Szerk. Felicjan Bylok, Leszek Cichoblazinski Czestochowa, 2010.

Kiadó: Wydawnictwa Politechniki Czestochowskiej (ISBN: 978-83-61118-57-2)

Co-author: Mária, Dr. Farkasné Dr. Fekete Mária

Reviewed publications in Hungarian language published in scientific journals

Virtualitás a szervezetek és a munka világában

Társadalomkutatás (ISSN 0231-2522)

Expected date of publication: 2012 (vol.30.) 3.issue. Certificate of acceptance is attached.

Tudásmunkások Magyarországon

Társadalomkutatás 2011 (vol.29.) 3.issue. pp. 49-369 (ISSN 0231-2522)

Az informális kapcsolati háló és a kompetenciák - Szociometria és 360 fokos értékelés alkalmazása egy felsővezetői team vizsgálata során

Vezetéstudomány, 2005. (vol.36.) 4.issue. pp. 29-44. (ISSN 0133-0179)

Reviewed publications in Hungarian language published in scientific volumes

A szervezeti kultúra

In: Vezetés- és Szervezetpszichológia Klein Sándor et al. (pp. 477-507.)

SHL Hungary Kft. H.n. 2001. 717 pages. (ISBN: 963-00-7008-1, ISSN: 1418-6586)

Harmadik kiadás: 2012

Publications in foreign languages published in scientific conference papers in full length:

Virtuality in the World of Labour

In: 6th International Conference of PhD Students - University of Miskolc, Hungary. pp. 12-18. August 2007 Economics II. pp. 697-702. Published by University of Miskolc, Innovation and Technology Transfer Centre Editors-in-chief: Dr. László Lehoczky, Dr. László Kalmár (ISBN 978-963-661-783-7 Ö ISBN 978-963-661-778-3)

Co-author: Zsuzsa, V. Bellász

The Process of Transformation of National and Organization Culture in Hungary (Presentation) The First International Conference on Business, Management & Economics Cesme, Izmir, Turkey 16-19 June 2005. Session 49. Organization, Management & Leadership (item 224 on Conference CD)

Publications in Hungarian language published in scientific conference papers in full length:

A „virtuális” munkaszituációk megjelenése és fejlődése Magyarországon

Tradíció és Innováció - Nemzetközi tudományos konferencia

A Szent István Egyetem Gazdaság és Társadalomtudományi Karának jubileumi konferenciája 2007. december 3-5, Gödöllő. The twelve pages presentation is published on the CD containing all the materials submitted to the Conference.

Papers published in foreign languages in other publications:

Zkušenosti s 360stupňovou zpětnou vazbou v nadnárodní společnosti v Maďarsku pp.132-136. In: 360stupňová zpětná vazba jako nástroj rozvoje lidí Szerk. PhDr Marián Kubeš, CSc., Mgr. Ľubica Šebestová Vydala Grada Publishing 2008. 147 pages (ISBN 978-80-247-2314-3)

Papers published in Hungarian language in other publications:

Paradigmaváltás, sikertényezők, virtualitás, üzleti kilátások – A projektmenedzsment szakma tükre 2010

In: Projektmenedzsment a gazdaságban 13. Projektmenedzsment Fórum 2010. április 8. Előadások gyűjteménye. pp. 208-219. Hírközlési és Informatikai Tudományos Egyesület (ISBN 978-963-8111-72-2)

A virtualitás humán aspektusai

Híradástechnika 2009. (vol.64.) issues: 7-8. pp. 24-28. (ISSN 0018-2028)

Vezetés virtuális környezetben - avagy kontroll a távolból

A HR mint üzleti partner – 16. Országos Humánpolitikai Konferencia és Kiállítás, Balatonfüred, 2006. május 16-18. Volume of submitted studies: pp. 156-159.

A 360 fokos értékelés módszertani tapasztalatai egy magyarországi vezetésértékelés példáján Munkaügyi Szemle 2007. november-december, pp. 35-40. (ISSN 0541-3559)

A 360 fokos eljárás alkalmazása kompetencia vizsgálatokban I.-II.
Humánpolitikai Szemle 2005/4. pp. 3-14. 2005/5. pp. 3-11 (ISSN 0865-7009)