

University of Sopron
Sándor Lámfalussy Faculty of Economics
István Széchenyi Doctoral School of Management and
Organizational Sciences
Business Economics and Management Program

Management Information System
and Associated Tools in Hungarian
Hospitals

Doctoral (Phd) Dissertation Thesis

Written by:
István Norbert Ujvári

Sopron

2021

Doctoral School:
István Széchenyi Doctoral School of
Management and Organisational Sciences

Head of Doctoral School: Prof. Dr. Csilla
Obádovics

Program: Business Economics and Management
Program

Head of Program: Prof. Dr. Csaba Székely DSc

Supervisor: Dr. Károly Szóka

.....
Supervisor's supporting signature

TABLE OF CONTENTS

Content of Research	4
Methodology	5
Topicality.....	7
Hypotheses of the Dissertation.....	9
Results	9
Conclusion.....	11
The Author's Own Publications Related to the Topic of the Dissertation.....	14

Content of Research

The author's area of research lies in management, controlling and management information systems used in healthcare institutions and hospitals.

Nowadays, in the healthcare sector, there is a widespread belief among publicly funded and publicly owned healthcare providers that hospitals operate more efficiently and effectively if managers rely on the right information. At the same time, there is no unified system available to managers that would allow institutions (hospital-to-hospital, task-to-task) to compare their operations. Hospitals and university health care providers (university clinical centers) can only obtain benchmark data by exchanging information and data between each other, as there is no public sector indicator system currently in place. The hospitals have complex and intricate operations that could even be characterised as overly regulatory.

The focus of the dissertation is to shed light – through research – on the information provision practices of Hungarian hospitals and sector management, and to propose the development of a new management information system (abbreviated: MIS). The aim is to lay down the foundations of a sectoral, unified management information system (MIS), building on the practical experiences of the author, as well as relevant literature and research results.

At hospital management level, the outlined proposal allows for indicator data to be available in a standardised form not only for an individual institution, but for all institutions, allowing for comparisons to be made between them. Sector management is able to monitor the institutional network under its management through such a unified system.

Methodology

The author of the dissertation aims to support his scientific research with a theoretical background, research methods and practical experience, while using methodological elements of double, deductive and inductive research.

In the framework of deductive data collection, the candidate supported the theoretical foundation of the research with international and domestic literature in order to provide suitable foundations for the analysis of data and information. Through international examples (Germany, Austria, Switzerland), he illustrates several practices related to the topic, which also serve to be relevant in the context of the Hungarian healthcare sector. The author reviewed a multitude of elements, problems, stakeholders and recent changes in relation to the Hungarian health care system. He studied the literature of Hungarian scientific authors in relation to health care controlling, as well as management information tools and systems.

In addition to the useful information and conclusions obtained from the literature, the author also conducted primary research with the intention of examining the current hospital management information system and the associated tools as accurately as possible.

The research deals with a sensitive topic, therefore the interviewed subjects may have had concerns with regards to expressing their opinions. This was highlighted by a questionnaire survey that the candidate conducted in 2015, which was sent to the executives and financial directors of about 60 hospitals. Even after getting in contact with the respondents on multiple occasions (e-mail, telephone, etc.), only 6 institutions provided evaluable answers to the questionnaire, thus the survey was unsuccessful. The candidate then chose interviewing as the subsequent research method to reveal confidential information and data that was previously undisclosed; he received valuable answers that strengthened the results of his research and that he was able to compare with the initial hypotheses. The author wanted to work with a consciously selected, analytical sample and aimed to gather at least 20 completed and evaluable interviews. A total of 35 interviewees were contacted, from which 25 successful interviews were conducted.

In order to make the information and data easier to interpret, as well as to understand the correlations and conclusions, the candidate created tables and figures that facilitated the processing of data and enabled their proper interpretation.

Regarding the applied methodology in relation to the secondary research, the candidate chose the method of data processing and analysis (evaluation, summary, conclusion).

Topicality

The general consensus around healthcare is that it is constantly short of money, the quality of public patient care is poor, or the wages of those working in the sector are low, and patients often have access to public health care late or after having gone through significant waiting period. Service providers in the sector must make not only pre-planned but also ad-hoc decisions in their day-to-day operations, which often leads to financial consequences.

It is important to highlight that the financing background and system of the Hungarian healthcare sector has not changed significantly for over 25 years. Meanwhile, the technological background of medicine has undergone significant developments. According to the government's intentions, healthcare in Hungary is primed for change, however, all the conceptual elements of the sector's new management and operation model are yet to be established. Since November 2020, significant developments have taken place with the target of fundamentally changing the operation and funding of hospitals. The author has briefly highlighted the current situation and developments in the sector, most of which are not yet fully perceptible, not to mention measures (eg: medical wage increases) whose consequences can only be measured in the long run. In several cases, the primary decisions have been made, but the detailed set of rules necessary for the operation of hospitals are still missing. In the current situation, what information do managers use in their decisions? There is now a widespread belief that publicly funded and publicly owned hospitals can operate

more efficiently and effectively if managers rely on the right information.

The author proved that currently there is no unified management information system in place at the hospitals in Hungary. In his practical experience, all the conditions are in place to develop of a unified management information system in the sector, which would not only contain management data, but would also measure the quality and efficiency of patient care.

As a starting point, the candidate established four hypotheses and examined them in the context of relevant literature from several authors. Furthermore, through empirical analysis and qualitative research methods, he highlighted the deeper contexts of the researched topic. The sector and subsequently the management of hospitals can be characterised by the presence of relationships of trust and the prevalence of sensitive data and information. Hence his decision to conduct a type of qualitative research – the interview survey – which allows for a significant amount of confidential data and information to be revealed. He did so with the intention of confirming or discarding the pre-formulated hypotheses, highlighting the need for a unified information service in the context of both hospital and sector management, and outlining a possible solution for a unified, sectoral management information system.

Hypotheses of the Dissertation

At the start of the research, the following hypotheses and sub-hypotheses were formulated in relation to the topic:

- H1. Hungarian hospitals use complex, integrated management information systems and software.
- H2. Hospital managers are not satisfied with the information provided in their own institution.
 - a) In this respect, there is a difference between health care providers located in the Budapest region and in the countryside.
 - b) In terms of satisfaction, there is no significant difference between the opinion of top-level and low-level management.
- H3. In addition to the mandatory data registers required by law, there is no regular, fully operational management information service in Hungarian hospitals.
- H4. There is no unified management information system within the healthcare sector that would provide solid foundations for the controlling analysis of institutions.

Results

Based on the author's investigation and practical experience, the new and recent results achieved in the stated field of research can be summarised as follows:

T1 In general, it can be stated that some kind of management information system is used in Hungarian hospitals. At hospitals where the composition and content of the internal information service are known, a management information system is used, meanwhile at

institutions where they are not known, such system is not in place. Hospitals that possess a management information system use it as part of a non-integrated system.

T2 There are various statistical correlations between the satisfaction with the provision of management information and the frequency, quality and content of the provision of information. In institutions where management information services are available, they are likely to be satisfied with it. However, when examining the frequency and quality of the service together, the respondents were dissatisfied. The majority are managers who, from the perspective of their own departments, have articulated their dissatisfaction. Managers who are unfamiliar with external management information services are distrustful of the quality of the internal management information service.

T2 / a.) There is no significant difference in MIS-related satisfaction based on hospital location among health care providers and sector management. Thus, the location of institutions does not affect managers' satisfaction with information provision.

T2 / b.) There is no statistical correlation between the satisfaction with management information provision and management levels. There is no significant difference between the opinion of top-level and low-level management in this respect.

T3 According to health care providers, in addition to fulfilling legal requirements, they maintain a broad data register, and they also use management information systems and software. Further investigation is needed,

however, as none of the experts stated that hospitals also keep records of data beyond the legal requirements. The examination of the full operational coverage yielded results that are in line with the expectations of the author. There was no statistical correlation between coverage and management levels. There is a strong correlation with the use of the MIS: according to the majority of managers, the management information service does not cover the entire scope of operations. Currently, managers primarily receive controlling, financial and economic information and data, and the interpretation of the management information system is limited to these areas.

T4 Based on the statistical analysis, it can be stated that there is currently no unified management information system in the healthcare sector – this is further strengthened by the author’s personal and practical experiences.

Conclusion

In the healthcare sector, there is a widespread belief among publicly funded and publicly owned healthcare providers that hospitals operate more efficiently and effectively if managers rely on the right information. At the same time, there is no unified system available to managers that would allow institutions (hospital-to-hospital, task-to-task) to compare their operations. According to the author’s qualitative research, 84% of the interviewees supported this presumption.

The results of the survey shed light on many different elements of the topic.

In Hungarian hospitals, where they use a management information system, the composition and content of the internal information service is well-known, and where the content of information is not well-known, they do not use such a system. In general, therefore, one of the means of providing managers with internal information is the management information system, which, however, is not used as part of an integrated system. When examined together, the frequency and quality of management information was deemed unsatisfactory by respondents. Managers, representing the views of their own departments are also mostly dissatisfied with the content of the management information service. The geographical location of the institutions does not affect the satisfaction of managers, nor does the fact that they are in top-level management or low / mid-level management positions. According to health care providers, in addition to fulfilling legal requirements, they maintain a broad data register, and they also use management information systems and software.

The fact that none of the experts stated that hospitals keep records of data beyond the legal requirements requires further investigation. The examination of the full operational scope yielded results that met the author's expectations. According to the majority of managers, the use of the MIS in the provision of management information does not cover the entire scope of operations. Under current practices, managers receive primarily controlling, financial and economic data and information, and the interpretation of the management information system is limited to these areas. It is the candidate's view that a well-functioning management information system

not only collects and summarises data and information from these areas, but also contains the most important indicators covering the entire scope of operations. Of these indicators, not intending to examine the entire scope exhaustively, the author highlighted two: the quality of patient care and capacity utilisation.

According to the statistical analysis carried out by the author, there is currently no unified management information system in the healthcare sector, which he was able to further confirm through his personal and practical experiences.

The most important conclusion of the dissertation is that, based on relevant literature, his research results and practical experiences, the author defined the foundations of a sectoral, unified Management Information System. The sectoral MIS model outlined by him can be an effective tool not only for sector management, but also for hospitals, enabling the structured collection and analysis of data and information. It eliminates unnecessary data requests between healthcare providers and sector management, as MIS actors in the industry can not only see and evaluate data from their hospital online, but also compare them with data from other hospitals. A typical example of the current state information provision is when data gets requested from hospitals by the sector management: the request has a short deadline, and content that can be found typically in the hospital's (medical, economic, etc.) or a governing body's (NEAK, Hungarian State Treasury, EESzT database). etc.) system. This redundancy could be resolved with the integration of data and information into the MIS model. After all, the biggest

advantage of the sectoral MIS is that it collects data and information from fragmented and differently structured systems into one system, the sectoral MIS model.

In the long run, the author considers the development of a national and institutional reference indicator system based on the MIS model to be the most important task, as it would not only gather information and data according to current practices (management, controlling, financing), but also process and collect indicators related to patient care. Furthermore, from the perspective of sector management, it would be necessary to formulate target indicators that would enable the measurement of the performance and the quality of operation in the sector. The purpose the system would be twofold: on the one hand, hospitals could evaluate their patient care and operational frameworks at different management levels using the same system, on the other, sector management could improve the efficiency and quality of the care system by setting benchmarks. With this up-to-date information service, intervention points can be identified for hospital management and sector management allowing for improvements in the quality and efficiency of patient care.

The Author's Own Publications Related to the Topic of the Dissertation

1. *Istvan, Norbert Ujvári; Marcel, Pop (2017): Knowledge export from the perspective of a renowned University, In Jurnal Medical Aradean (Arad Medical Journal) Vol. XIX, issue 4, 2016, pp. 16-27 <http://jmedar.ro/volumes/vol-xix-2015/vol-xix-iss-4-2016/813-knowledge-export-from-the-perspective-of-a-renowned-university>*

2. *Ujvári István Norbert (2016): Fogorvosi beavatkozások költségkalkulációja,*
Magyar Fogorvos: a Magyar Orvosi Kamara fogorvosi tagozatának lapja 25: 6, pp. 305-311., 7 p.
3. *Ujvári István Norbert (2015): Számvitel és Vállalatvezetés, Gazdaság és Társadalom (különszám) pp.76-87. DOI: 10.21637/GT.2015.00.06.*
4. *Ujvári István N. (2015. április): AVIR – használható és működő vezetői eszköz egy költségvetési intézményben; IME: Interdiszciplináris Magyar Egészségügy / informatika és menedzsment az egészségügyben XIV. Évfolyam 3. szám pp28-33. ISSN: 1588-6387 (nyomtatott), ISSN: 1789-9974 (Online)*
5. *Ujvári István N. (2014. október 2.): Interaktív controlling egy tradicionális intézményben: "Controlling új szemléletben" - trendek és kapcsolódások; In: Nyugat-magyarországi, Egyetem Közgazdaságtudományi Kar (szerk.) Befektetések, Pénzügyek, Minőség: VIII. Soproni Pénzügyi Napok: Pénzügyi, adózási és számviteli szakmai konferencia kiadványa; Sopron, Magyarország; pp. 1-26. ISBN: 978-963-89173-9-3*
6. *Ujvári István (2013): Egészségbiztosítási rendszer sajátosságai és dimenziói: 1. szekció In: Fábán, Attila (szerk.) VII. Soproni Pénzügyi Napok: "Öngondoskodás - Nyugdíj - Egészség": Pénzügyi, adózási és számviteli konferencia, Sopron, Magyarország Nyugat-magyarországi Egyetem Közgazdaságtudományi Kar, (2013) pp. 1-4. Paper: CD, 4 p.*