

From intangible assets to management of intellectual capital within health care industry. A comparative study between Sweden and Poland

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Abstract – In the knowledge based economy the success of organization's functionality in the sector of medical services is dependent on taking operations in the scope of intellectual capital management, making the main potential of the organization. Intellectual capital is identified by many researchers as intangible assets which can be used for building the value of the organization. The intellectual capital in consideration of its multidimensional and intangible form requires suitable technologies of management. In the sector of medical services the human capital has a significant meaning among intangible resources, its knowledge and competences, relational internal resources with patients and structural resources.

In the article were considered relations between the notions: knowledge, intangible resources and intellectual capital.

The aim of considerations is to show that the management of intellectual capital in healthcare allows more effectively realize all aims and assignments of the health care, and first of all to assure patients the best path of treatment and care. The paper presents selected case studies of management of intellectual capital and management of intangible assets within health care industry in Sweden and in Poland. The model of intellectual capital management in healthcare in Sweden is analyzed in the context "of good practices" for healthcare in Poland and in other countries which begin the implementation of models of intellectual capital management.

It was indicated that the informational technology, especially the internet technology is an effective support in management of intangible assets within health care industry.

Keywords— Health care industry, intangible assets, management of intellectual capital,

I. INTRODUCTION

Growing interest in the issue of intangible resources and intellectual capital which can be noticeable in the literature of subject is most of all the answer to challenges of management practices in all business organizations including healthcare. Nowadays the intellectual capital is perceived as a crucial factor concerning success of organization[1], the source of competitive advantage and a key element in the process of market value creation of contemporary organization[2] and values for customers - patients.

In many definitions of intellectual capital are accented the notions of: knowledge and intangible assets. Chang defines

intellectual capital as the knowledge-related intangible assets embedded in an organization[3].

This article attempts to organize and explain relationships between concepts: knowledge, intangible resources and intellectual capital.

The aim of this research is to demonstrate that the management of intellectual capital in the health sector can more effectively realize all the goals and tasks of health care, and most of all provide patients with the best possible path of treatment and care.

Swedish health care system is implementing models of intellectual capital management with the usage of ICT and internet technologies with a great success. This confirms the high value of e.g. "ERP penetration" and "Patients' access to online booking of appointments?" indicators. In the report of the Euro Health Consumer Index 2014[4].

Indicator „EPR penetration” means % of GP practices using electronic patient records for diagnostic data in Sweden (≥ 90 % of GP practices) in Poland (< 50 % of GP practices). Indicator “Patients' access to on-line booking of appointments?” in Sweden (Yes, widely available) in Poland (No, or very rare).

In presented case studies were selected examples of National Quality Registries as Intellectual Capital in Swedish Health Care Industry and example from County Council of Dalarna and “Quick Oncological Therapy” as an example of management of intangible assets in Polish Health Care Industry. Presentations of models of intellectual capital management in the health sector in Sweden can be considered as "good practices" for Polish and other countries which are already taking initiatives in the field of creation and development of intangible resources in the health sector and plan the next step which is management of intellectual capital in the health care.

The layout of the paper embraces discussion on the nature and concepts of knowledge, intangible assets, intellectual capital and management of intellectual capital. The next were presented management of intellectual capital in Swedish health care, then National Quality Registries as intellectual capital in Swedish health care industry and example from County council of Dalarna. In the VI.chapter was presented “Quick Oncological Therapy” as an example

of management of intangible assets in Polish health care industry. The summary includes the most important conclusions in the mentioned field of research.

II. KNOWLEDGE, INTANGIBLE ASSETS AND INTELLECTUAL CAPITAL CONCEPT

The knowledge perceived in the category of organization's resource is closely linked to data and information processing and using it in decision-making processes. The knowledge was recognized as a crucial attribute of effective activity of every organization, more important than capital, land property, and labor force production factor and may be converted into profit. Several researchers have demonstrated that knowledge management has a positive correlation with organisational performance [5] [6] and knowledge determines market performance of every enterprise [7]. Knowledge management organizations should perceive it as the process of identification, acquiring, collecting, processing and sharing of knowledge [8]. Created knowledge resources, skills and competences of employees and organizations develop intangible assets.

There are two major characteristics of intangible assets: they neither create value nor generate growth and they represent capabilities and potential for future growth and income [9].

More recently, intangible assets have been identified as key resources and sources of competitive advantage. It is argued that a sustainable competitive advantage results from the possession of resources that are inimitable, not substitutable, tacit in nature, and synergistic [10].

Intangible resources in organizations, also in the health care have always existed. In many management concepts the knowledge, skills, relationships with environment, reputation, etc., were accentuated but these resources were dispersed and unstructured. The response to the need of its organization and classification is the concept of intellectual capital.

There exist various approaches to defining the Intangible Assets and Intellectual Capital. Some authors consider these terms to be synonyms, while the others still separate them from each other.

The terms intangible assets, knowledge assets and intellectual capital are interchangeable owing to the fact that all three terms are "widely used: intangible assets in accounting literature, knowledge assets – by economists, intellectual capital – in management and law literature; and on the whole they come to the same: to the future benefits that are not embodied materially" [11]. Intangible assets, or intellectual capital, are defined by Lev as non-physical sources of value (claims to future benefits) generated by innovation (discovery), unique organizational designs, or human resource practices [12].

Starovic and Marr [13] also wrote that intangible assets are only a constituent part of the potential intellectual capital acknowledged as the assets in a company's bookkeeping

and accounting records. The term intellectual capital has been defined in a very wide sense as the set of intangible resources and capabilities, or knowledge assets, possessed or controlled by the firm, that are linked to firm competitiveness and performance [14].

Stewart defines intellectual capital as the intellectual material that has been formalized, captured, and leveraged to create wealth by producing a higher valued asset [15].

Wang and Chang and other have proved the positive relationship between intellectual capital management and business output [16]. Bontis considered intellectual capital as a strategic performance measure introducing a transition in thinking about a new structure and process supporting a company's productive assets [17].

Intellectual capital can be classified as: human capital, organizational capital and customer capital [18], or human capital and structural capital [19], or internal structure, external structure and individual competences [20]

There is the growing gap between the book value and trading value of organizations is the reason of greater interest in the conception of intellectual capital. This intellectual capital is identified by many researchers as intangible assets which can be used for building the value of the organization [21].

It is worth indicating that among identified about 200 intangible resources by representatives of the resource school, only the part of them is an object of turnover in the market [22].

Common health care industry intangible assets are mostly focused on relational assets as: patient relationships; medical, dental, and other professional licenses; certificates of need; facility operating licenses and permits; physician (and other professional) employment agreements; physician (and other professional) noncompetition agreements; executive (and other administrator) employment agreements; executive (and other administrator) noncompetition agreements; administrative services agreements; medical (and other professional) services agreements; facility or function management agreements; equipment use or license agreements; equipment and other supplier purchase agreements; joint venture agreements; joint development or promotion agreements. In human and structural assets counts: patent files and records (manual and electronic); electronic medical records computer software; medical and administrative assembled workforce; office systems, procedures, and manuals; position or "station" procedures and manuals; service marks and service names; a professional's personal goodwill; an entity's institutional goodwill; medical (other professional) staff privileges [23].

Most health care industry participants own and operate intangible assets. These intangible assets can be industry-specific (e.g., patient charts and records, certificates of need, professional and other licenses), or they can be general commercial intangible assets (e.g., trademarks, systems and procedures, an assembled workforce) [24].

Summing up the above discussion it is worth noting that:

- knowledge resources converted into value for healthcare organizations constitute the basis for the creation and development of intellectual capital
- intellectual capital is formed on the basis of management of knowledge resources which could be the source and values material of contemporary organizations in health care industry,
- intellectual capital is both knowledge in itself, and a result of its transformation on intangible assets,
- support structure to build the intellectual capital in the health sector are knowledge management processes including identification, acquisition, collection, processing and sharing.

III. MANAGEMENT OF INTELLECTUAL CAPITAL IN SWEDISH HEALTH CARE

According to the Swedish law, Chapter 2, Section 1 § LYHS, health care should be based on science and proven experience and designed to meet the individual patient needs in the best possible way. The belonging healthcare staff have to perform its work in accordance with science and proven experience. A patient must be given expert and caring health care that meets these requirements.

The National Board of Health and Welfare (Socialstyrelsen) is a government agency in Sweden under the Ministry of Health and Social Affairs [25]. The Board has several responsibilities and aims, for example:

- To draw up national guidelines for care and treatment with aim is to develop and improve health and medical services and social services, and to ensure that they are run with a knowledge of the most effective methods.
- To develop standards that will support those who are working in order to improve quality, safety and efficiency in health care.
- To provide a basis for knowledge-based care, to support the development of methods and other improvement work, to facilitate quality assurance and to encourage efficient use of resources.
- In collaboration with the Swedish Association of Local Authorities and Regions [26] to develop national indicators for quality measurement in health and social care.

Knowledge-based health care requires knowledge about what should be done and how it should be done (Fig. 1) which applies practical skill as well as dialogue with the patient. The dialogue is a significant prerequisite for the staff in order to explain and communicate various positive and negative effects of a certain medical treatment.

With this said, the development of the health care needs to be developed in consistent manner meaning that the treatment should be equal for all patients in the country, and that the treatment should be based on facts.

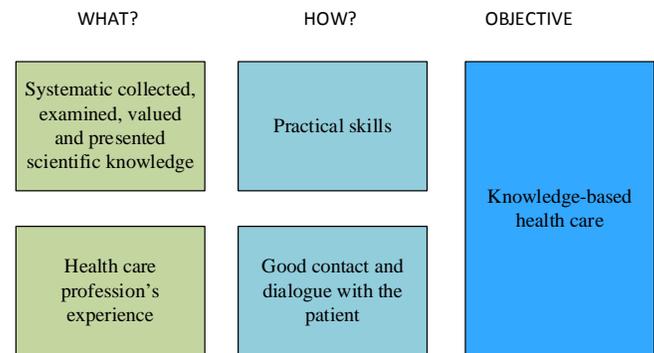


Figure 1: Knowledge-based health care

National quality registries (NQRs) is a system of quality tools which aim to continuously improve and provide good health care. NQRs can be seen as intellectual capital in Swedish health care because they can contribute to the growth of both organizational and human capital.

IV. NATIONAL QUALITY REGISTRIES AS INTELLECTUAL CAPITAL IN SWEDISH HEALTH CARE INDUSTRY

National quality registries in Sweden have a long history. From the beginning, they were created by the individuals who themselves would benefit from them in their professional lives. Today they contain individualized data concerning patient problems, medical interventions, and outcomes after treatment; within all healthcare production in the country. The individualized data is protected by several laws. NQRs also enable:

- Monitoring the progress made in health care, both for the individual patients, as well as at the aggregate group level (for example, a group of cancer patients).
- Following patient outcomes per county, hospital or clinic.
- Support the health care work (for example, checklists).
- Compare healthcare units' own work over time and identify areas for improvement.
- Research based on data from Sweden's healthcare units.

In Sweden there are six Regional Cancer Centres and six Competence Centres. Registers in cancer field (approximately twenty national quality registers) are organized in six Regional Cancer Centres (RCCs): Norr, Stockholm Gotland, Syd, Sydöst, Uppsala Örebro och Väst (Fig. 2).

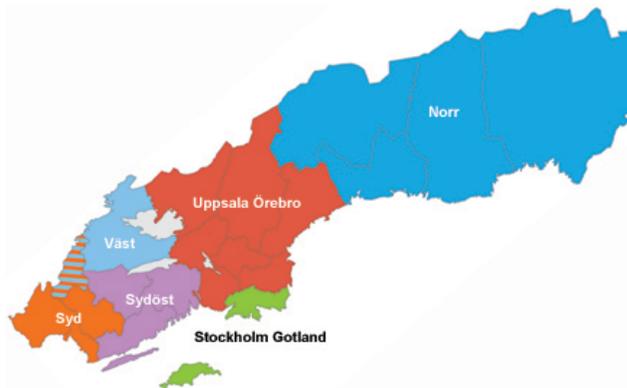


Figure 2: Six Regional Cancer Centres in Sweden (source: SKL)

RCCs work for a more patient-focused, equitable and effective cancer care. These centres receive, encode, record and verify the information annually forwarded from the region to the Cancer Registry at the National Board.

There are ten criteria that specify the frame and focus of the RCC activities and its organization:

1. Design and implement a plan for the region's on prevention and early detection of cancer.
2. Manage and coordinate the region work in order to make cancer care chain more effective.
3. Have a plan that ensures cancer patients' access to psychological support, rehabilitation and good quality palliative care across the region.
4. Strengthen patients' position in their cancer care.
5. Design and implement a plan for the development of the region's cancer care.
6. Reinforce progress towards knowledge-driven cancer care.
7. Strengthen clinical cancer research both in the region and in the country.
8. Have a clear management structure with strong roots within the county, interact with other RCCs and have systems for monitoring cancer care quality.
9. Develop a strategic development plan for cancer care in the region.
10. Develop a plan for cancer care level structuring and support the implementation of the plan.

Registers in cancer field have a common technology platform, owned by county councils / regions and the management and development of RCC.

Six competence centers ("registercentrum") for the other NQRs (approx. 60) have been established: Registercentrum Norr (RCN), Uppsala Clinical Research Center (UCR), QRC Stockholm, Registercentrum Västra Göteland (RVG), Registercentrum SydOst (RCSO) and Registercentrum Syd.

In these competence centres, several registries share the costs of staff and systems that a single registry could not bear, e.g., in technical operations, analytical work, use of registry data to support clinical quality improvement, and helping to make registry data beneficial for different users. These six Competence Centres have not a common technology platform. Hence, a continued development of

the registries can be assured, although the system follows a decentralized model, i.e. each register is governed by an executive board.

Results from NQRs are available to medical units and county management over the Internet. Results from NKR are also accessible by reports like "Open Comparison and Assessment". These reports are freely available to all, including citizens.

Citizens do not have access to the results over Internet. Recently, there are some attempts (by some NQRs) to enable reports even to citizens.

V. EXAMPLE FROM COUNTY COUNCIL OF DALARNA (SWEDEN)

The Swedish Association for Diabetology (SFD) established The Swedish National Diabetes Register (NDR) in 1996 in response to the St. Vincent Declaration, whose purpose was to persuade European countries to reduce the prevalence of diabetes complications [27].

The NDR is maintained by the Swedish Society for Diabetology on behalf, and with the financial support, and the Swedish Association of Local Authorities and Regions [28].

The NDR is the largest diabetes register in the world. Approximately 90% of all Swedish people with diabetes were entered in the register in 2013. The NDR has engaged the participation of both hospitals and primary care clinics. The overall objective is to reduce morbidity and mortality, as well as to maximise the cost-effectiveness of diabetes care. The register offers a unique opportunity to monitor the quality of care in terms of risk factors and the potential complications of diabetes, as well as the evolution of treatment methods [29].

Electronic data entry at www.ndr.nu provides a clinic with immediate access to its results, as well as county-by county and nationwide comparison statistics. A patient's data may be entered repeatedly throughout the course of a year. Approximately 86% of NDR users sign on with personal cards [30].

County council of Dalarna transmit data directly from medical record to the NDR database. 100% of all county's people with diabetes were entered in the register in 2014 (by the law the patient has the right to say no to registration). All data entries are automated and validated on a continuous basis.

Each specialist clinics as well as primary care clinics has immediate access to their results, as well as nationwide comparison figures. The results are based on input data for the period of time that the user selects. A diabetes care unit can autonomously generate their annual report, including nationwide comparison figures. The reports serve as a tool for monitoring and improvement efforts.

This register data is documented evidence and leads to better outcomes for patients. The critical factors for success are measuring results integrated into the overall diabetes care process, as well as training the entire team to participate in the

improvement effort. Another factor that is crucial is the commitment of physicians and other professionals to measuring results, collecting data and discussing what they have learned.

The NDR in County council of Dalarna is the “success” example for management of human and structural assets in health care industry.

VI. „QUICK ONCOLOGICAL THERAPY “AS AN EXAMPLE OF MANAGEMENT OF INTANGIBLE ASSETS IN POLISH HEALTH CARE INDUSTRY

The Polish healthcare system for a dozen or so years is facing profound reforms. The most important determinants of changes are [31]:

- limited access to Healthcare,
- the long time of waiting for a visit at the specialist
- requirements of the European Union towards Poland as the member state,
- limited funding of medical services,
- demographic changes of societies
- lack of competition among insurers,
- unequal status of public versus private healthcare providers,
- indebtedness of public healthcare institutions
- development of information technologies which facilitate implementation of e-health system.

The basic direction of reforms in Polish healthcare system concerns implementation of e-health system. E-health system can improve prevention of illness, delivery of treatment, and support a shift from hospital care to primary care. e-Health can help to provide better citizen-centered care as well as lowering costs and supporting interoperability across national boundaries, facilitating patient mobility and safety [32]. e-Health can benefit citizens, patients, health and care professionals but and health organizations. Information technologies support management of intangible assets within health care industry.

Among many elements of intangible assets the greatest attention is concentrated on: development of internal human resources and their competences (doctors, nurses) and on external (patients) resources. The more and more greater meaning has a development of internal relations and relations with patients. In Poland like in Sweden are supported solutions which take into account formation of competence centres, particularly concerning cancers. Centres of competences assure possibility of wide consultations, supports from doctors, supports of patients, assurance of the wide access to the full information e.g. about the case history, about new methods of treatment, about facilities which have at their disposal the latest equipment, about new medicines and therapies etc.

An example of such a solution can be a program „Quick oncological therapy”, which became initiated from 1 January 2015 r. for patients with the suspected cancer.

Benefits which will be brought from implementation of

„Quick oncological therapy” are [33]:

- shortening of queues for patients with the suspected neoplasm,
- the arrangement of the diagnostics process and treatment of patient,
- introduction of quick diagnostics and complex treatment,
- diminution of the mortality of oncological patients,
- decrease of medical costs, thanks to the detection of the illness in the early stage.

The process of „Quick oncological therapy” was presented in figure 3.

At the first stage of the process the patient with the suspicion of cancer is registered in the IT system „service of diagnostics card and the oncological treatment DiLO”. This DiLO card called also „ a green card” is a symbol of this program and assures patients quicker and more effective path of diagnostics and the oncological treatment.

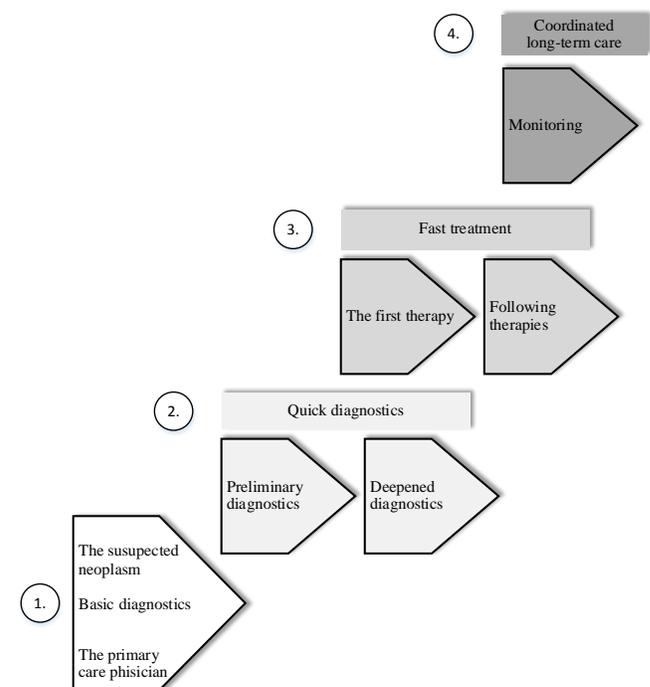


Figure 3: The process of „Quick oncological therapy”

The IT system supporting „the quick oncological therapy” is integrated with Polish National System of Information Management Circulation (SZOI). The application is centrally installed and makes possible the work of many organizational units in one place, so in one „bank” of data. The structure of the system enables data exchange with other systems, and consequently allows for smooth information flow among different subjects (with doctors, service providers, with Departments of Voivodeship NFZs National Health Fund (NFZ). The figure 4 presents DiLO card device system.

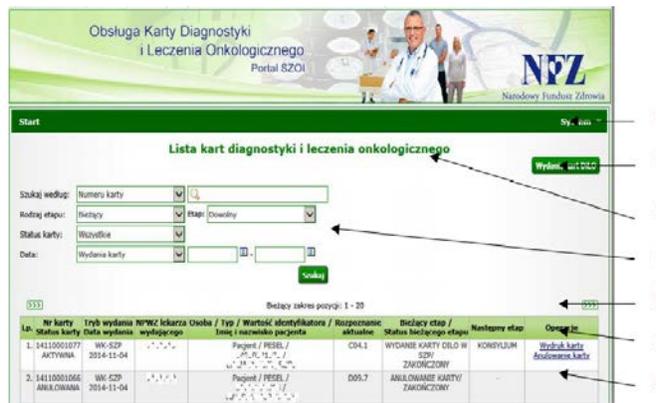


Figure 4: DiLO card service system

Legend:

- 1 – The name and version of the system;
- 2 – System menu;
- 3 – Operations available for the list;
- 4 – The name of the list;
- 5 – The block of filters/searching;
- 6 – Navigation options;
- 7 – Names of columns and options of classification;
- 8 – Positions (elements) of the list and available for them operations

The system enables:

- Registration and issuing DiLO card
 - Printout of the DiLO card
 - Cancellation of DiLO card
- Ultimately, the application will enable:
- Registration of card's usage stages
 - Registration of closing the card
 - Registration of all events with the use of network services (synchronization of service provider application or a doctor with system).

The most important resources and functionalities of the system:

- information concerning performed basic diagnostics and examination results
- referral to specialistic consultation
- the result of preliminary diagnostics
- information concerning health status of a patient, symptoms, performed examinations etc..
- diagnosis within the scope of treatment
- case conference
- data concerning diagnoses of neoplasm,
- schedule of treatment fixed at case conference
- information concerning schedule of treatment.

“The quick oncological therapy” program has been functioning in Poland only for three months and it is difficult in the so short time to evaluate its effects. Per today's, both among doctors and patients opinions about the efficiency of this program are divided. Undoubtedly, it is

the example of a new outlook on problems of management in healthcare and accentuations of intangible assets. The program ensures the access to centres of competences and medical councils and develops competences of doctors. The assurance of patients with an access to full information about their disease and diagnoses builds confidence to hospitals and strengthens the relation with patient.

VII. CONCLUSION AND FUTURE WORK

Management of intangible assets should not be only in the field of interest of single subjects (hospitals, clinics), but also in care industry.

The large meaning for the development of the human capital has an access to modern medical technologies. It especially concerns technological support of the diagnostics (including imagery diagnostics) and medical robotics.

Also the use of telemedicine contributes to the development of human capital, increasing possibilities of the professional and scientific development of employees.

In the relational capital management of hospitals can be used patient relationship management systems based on commercial CRM systems [34].

Sweden has come relatively far in efforts to develop both the knowledge base and guidelines for health care. Sweden has a world-leading approach to support health care priorities and unique monitoring capabilities thanks to NKR's. It is possible for managers on several levels to follow up processes and results in a depth way although patient access to the NKR's results need to be more developed.

Management of intellectual capital and intangible within health care industry in Sweden and Poland was presented on the examples of diagnostics programs and oncological treatment. The common feature of analyzed examples is the aspiration to the construction of common information and knowledge bases integrated in the scale of all the country's IT systems. Important is also to ensure the access to centres of competences development for doctors what is most important in building of the confidence of patients to hospitals and strengthening relational capital with the patient, what in turn will contribute to the consolidation of the competitive position of the hospital in the market of healthcare services

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