Implementation of Norwegian Experience to Slovenian Hospital Sector

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ABSTRACT

Background

In Slovenia, as in all nations, the specialist health care services represent the most costly of the public sectors. Due to rapid changes in health treatment caused by development within technical delivery, medical equipment, new organizational models etc, it is an inceasing demand for development of competence and a clear role of Facility Management (FM), as well as a need to upgrade the hospital buildings portfolio. Both resource effective management and transformation of the building portfolio in line with the development of the health care services is necessary.

Aims

In Norway a method of assessing buildings performance is developed and used on approximately 20 mill square metres (sqm) of public buildings.
One of the main objectives of looking into the experiences from Norway is to see if it would be possible to implement the same methods in the Slovenian health sector. This could contribute to a more cost effective resource allocation in the health sector's building portfolio management and FM, as well as further development of theories, and to the development of innovative and efficient methods and tools to support strategic planning and strategic FM.

Methods

Methods used are literature reviews, workshops, expert groups, interviews and presentation of case studies where quantitative methods (questionnaires and mapping techniques) have been used.

Results

Based on these preliminary studies and discussions it seems possible to implent the experiences from Norway regarding innovative methods and tools for strategic property analyses and building evaluation in the Slovenian health sector. If correct, this will result in a good understanding of the buildings' viability, with a main focus on usability and adaptability. The methods and tools have been used on almost 5 mill (sqm) in Norway and approximately 1 mill sqm in Sweden. Implementing the Norwegian tool 'MultiMap' into Slovenian hospital environment will give an overview of the performance of the building portfolio today regarding technical condition, usability and adaptability. This information, together with future demands in health care, will give the platform for further strategic planning of future needs.

KEYWORDS

Health sector, Facility Management, hospital, Norway, Slovenia

BACKGROUND AND CHALLENGES

The health sector is one of the most costly sectors in all nations and the big question is how Facility Managemnt (FM) can contribute to a more cost-effective health operation. Change, innovation and current pressures give demands for change and adaptation. Health campuses in many countries comprise both new build and retrofit. Existing buildings present a greater challenge due to lack of adaptation to current and future needs. A big part of the existing hospital buildings are outdated technically as well as functionally. The need for investments are substantial to transform the facilities in order to satisfy future needs. But at the same time the economic resources are limited.

In Slovenia the 1.222 billion EUR were allotted to the Specialist Health Care Service (approx. 561 EUR per inhabitant) in the State budget for 2010 (data for 2011 currently are not available). This equals approx 55 % of the State budget. Employment in the hospital sector in Slovenia equals approx. 22.300 man-years.

Out of this allotted budget approximately 51,25 million EUR is related investment and FM costs.

The current situation represent numerous challenges in the health sector, and among these are:

- Develope a
  a. coherent approach to the transfer of best practice of sustainability within the FM industry in health sector based on evidence-based information.
  b. knowledge repository structure around the concept of adaptation and change in FM.
  c. benchmarking platform for FM decision making for strategic planning.
- Describe parameters relevant to buildings usability in the health sector, such as (based on Larssen, 2011, /2/):
  a. activities (performance of desired activities),
  b. capacity (related to activities),
  c. sufficient design (plan, room size and form, traffic area etc),
  d. equipment (including infrastructure and fixtures),
  e. Indoor environment, technical condition, adaptability and flexibility (physical, economical, organizational)
  f. resource use, risk, security (all other aspects has a direct or indirect impact on this.
- Provide a transparent mechanism for communicating FM related information to the core healthcare business.

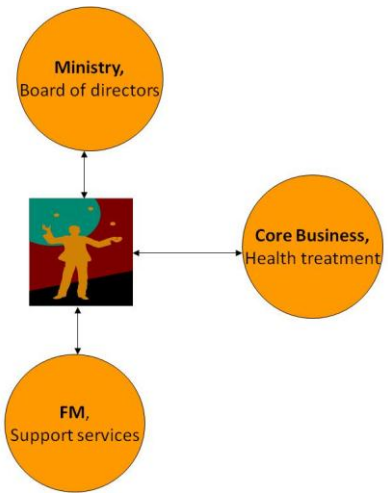


Fig. 1 Interaction between authorities, health services and facility (support services). (Ref.: Multiconsult)

Extraction of information about the huge hospital buildings portfolio will be the platform for decision making in the strategic planning process.

PRIMARY OBJECTIVE

The primary objective of the project is to examine the possibility to implement methods and tools witch provide information needed to support the strategic planning for future development of hospitals in Slovenia. This is essential for improvement in the resource efficiency in the health sector by strengthening the interaction between core business (health treatment) and the supporting services. The highest priority will be to provide information that may, together with scenarios on core business trends, support the work with identifying future need for dimensions and types (content) of hospitals.

Similar projects have been done in Norway. The MultiMap modelhas been widely used for hospitals and other portfolios in the public sector. It is an objective to see if this method can be applicable in Slovenian context.

The Norwegian R&D-project *"Buildings and Property as a strategic means of effective health services"* (2006-2010, project leader professor Svein Bjørberg, Multiconsult / NTNU), /1/. Established an aggregate summary of the status within the Norwegian Specialist Health Care Serviceses. Results from the project and the PhD-study by Anne Kathrine Larssen (defended in 2011) , /2/, will be the basis of the Slovenian project.

The biggest, and probably most complex hospital in Slovenia, is University Medical Center in Ljubljana (UMCLJ). with buildings mainly situated on the north and south of Zaloška road in the center of Ljubljana. There are a few dislocated buildings. The buildings og UMCLJ date from different periods from 1898 to 2010.

In addition there is one clinic center in Maribor, with fewer medical functions than UMCLJ, and some other hospitals with various types of treatments.

THE NORWEGIAN TOOL "MULTIMAP"

Development of MultiMap started back in 1998 in Norway based on Oslo municipality's need for an overview of technical and environmental condition, upgrading cost and technical value of the total building portfolio of approximately 4 mill sqm. MultiMap has since then been further developed and refined, especially in connection with the mentioned R&D projects.

MultiMaphas been the driver in the ongoing work within strategic FM. Data structure is based on the Norwegian Standards classification system (Norwegian Statndards, NS, ref /5/), with elements such as NS 3424 "Condition Assessment of Construction Works", NS 3451 "Table of Building Elements", NS 3453 "Specification on Building Costs", NS 3454 "Life Cycle Costs for Building and Civil Engineering Work" and NS 3457 "Table for Building categories".

NS 3424, "Condition Assessment of Construction Works", is the most central. It uses condition grades between 0 and 3. Condition grade 0 is equivalent to the best grade (new building), and condition grade 3 corresponds to the lowest rating. Table 1 gives a general description of the condition grades in the standard.

One of the main objectives of MultiMap is to be a resource-efficient way of obtaining information for use at a strategic level and that the data are suitable for large building portfolios. The results of the survey will provide a general overview of the needs,

possibilities, risks and limitations in the portfolio, toform the basis of any further/deeper analysis. The purpose of MultiMapis not to be detailed and/or exhaustive.

Condition grade	Description
0	No symptoms
1	Slight symptoms
2	Medium-strong sympt.
3	Strong symptoms

Table 1 Condition grades due to Norwegian Standard NS 3424

MultiMap consists of several modules which totally give information of a building or building portfolio regarding the potential for future use (see fig 2).

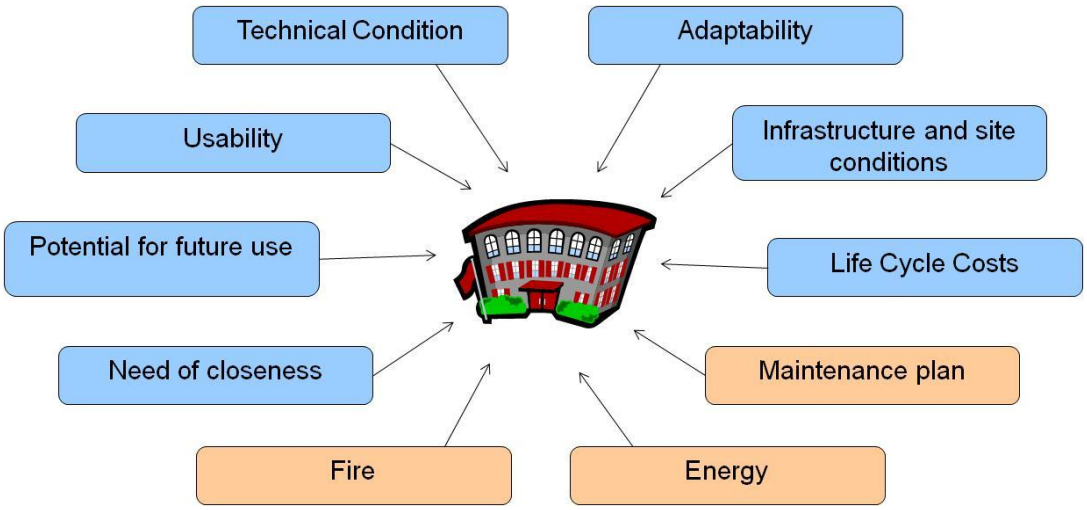


Fig. 2. Different modules in MultiMap (Ref.: Multiconsult)

All information is based on *"constructive research"* (Kasanen et. Al, 1993, Lukka, 2003), /3/, which is a procedure to develop innovative "constructions" solving a concrete problem. In this context "Construction" is an abstract term describing what is going to be "constructed". The central elements in constructive research are, /3/:

- Focus on "real-life" problems which is relevant to solve
- Production of innovative construction which is meant to solve the "real-life" problem
- Includes attempt to implement the new construction to test the practical approach
- Close involvement and cooperation between researcher and representatives from practice as a team. Teaching and empiri will then be implemented
- Explicit contact to theoretical knowledge

Structured information from the hospital portfolio will be applied into the Usability / Adaptability matrix (The Viability Model - see table 2) and shape a direct overview of the status of the portfolio., including, if chosen, technical condition, indoor climate etc.

All information is structured according to NS 3424 “Condition Assessment of Construction Works”. Also the module “Adaptability” has this structure.. Degree 0 is highest demand, i.ex floor to ceiling hight, and degree 3 is the lowest. During the assessment the physical parametres are registered and given a performance degree, ex degree 2. If the demand for a certain medical function is degree 1, then the floor is not suitable for this function. When all parametres have been assessed, a performance profie can be compared with a set of demand profiles wich gives the answer on what kind of medical functions actually can take place in every floor.

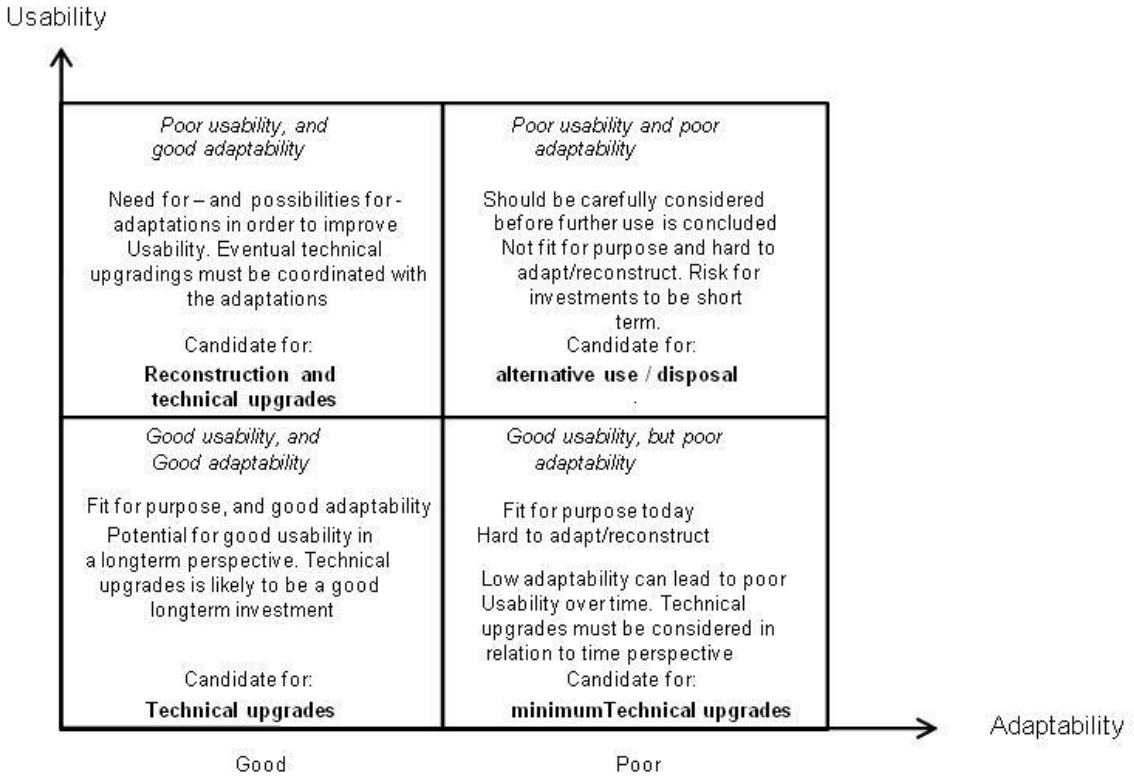


Table 2.The viability model (In Norwegian:”Levedyktighetsmodellen”. The combination of usability and adaptability (Larssen, 2011, /2/, adapted from Larssen and Bjørberg, 2004, /4/)

Totally the tool has been used for approximately 4,7 mill sqm (GFA) of hospital bulidings in Norway and approxemately 1 mill sqm in Stockholm. In addition it has been used on approximately 15 mill sqmof public buildings of other kinds, mainly education.

HEALTH SECTOR IN SLOVENIA COMPARED WITH NORWAY

The health sector in Slovenia is divided into three levels (general, secondary and tertiary):

1. *Health centers* (general) in every municipality, communes etc. There are only public on this level.
   a. First line treatment
   b. Every person has a personal doctor
   c. The combination of compulsory health insurance and voluntary health insurance:
   d. There are 58 health centers. Some (Ljubljana – six, Kranj - eight) have branches in smaller local communities.

2. *Hospitals* (secondary) are located in different parts of Slovenia
   a. Ten different regions. Ten general public hospitals (one in every region)
   b. Ten specialized hospitals (eight public hospitals and two private hospitals)
3. *Clinic centers* (tertiary):
   a. Totally two; one in Ljubljana (is also public hospital for Ljubljana and surrounding communities) and one in Maribor (is also public hospital for Maribor and surrounding communities)
   b. Ljubljana has all treatments and medical functions and also responsible for R&D / education
   c. Maribor just as in Ljubljana but with fewer medical functions.
4. There are also 1514 Licensed Private doctors in Slovenia (information from year 2007).

The Norwegian sector is a little different. Almost all hospitals are owned by the government and divided / organized into four health regions (Regional Health Trusts, RHT). Each RHT owns a number of Hospital Trusts, wich can consist of one or more hospitals. Buildings and property are owned by the Hospital Trusts.

In the big cities there are also minor private hospitals. All this covers level 2 and 3 compared with Slovenia. The municipalities (total of 430) are responsible for level 1 in Norway. All people have a dedicated doctor. Some doctors work on his / her own, some are gathered in clinics. People pay a small fee for consultation but the main part is covered by the government. Those who use private hospitals pay a larger part of the total costs.

IMPLEMENTATION APPROACH

The focus in the development of the model has been to develop methods and tools that are valuable for strategic FM and in the decision making processes. This has provided the following two key principles for the method developed:

- Focus on only the most important structural properties
- The right detail and accuracy level, ie to optimize the relationship between resource use and quality of the work to obtain sufficient information.

Furthermore, it is considered essential that the tools and methods are generic and that the surveys can be repeated over time and produce comparable results. For large portfolios it is also of importance how to aggregate and communicate data.

Another important objective has been to optimize the relationship between detailing and the use of resources. This has led to the following basic principles for the mapping of the building stock:

- The use of excising knowledge
  Mapping of building information should, as far as possible be based on existing knowledge in the organization, i.e. from administrators and users. They work in the buildings and are familiar with history and modifications, the current problem areas, maintenance situation, user opinion, etc.
- Forms and explanatory matrices
  To systematize information and to establish an objective point of view, matrixes/ forms for the assessment, including guidance, are developed. The definition of reference levels through descriptive explanatory matrixes is an essential basis for the registration. An example of a descriptive explanatory matrix is shown in table 3.

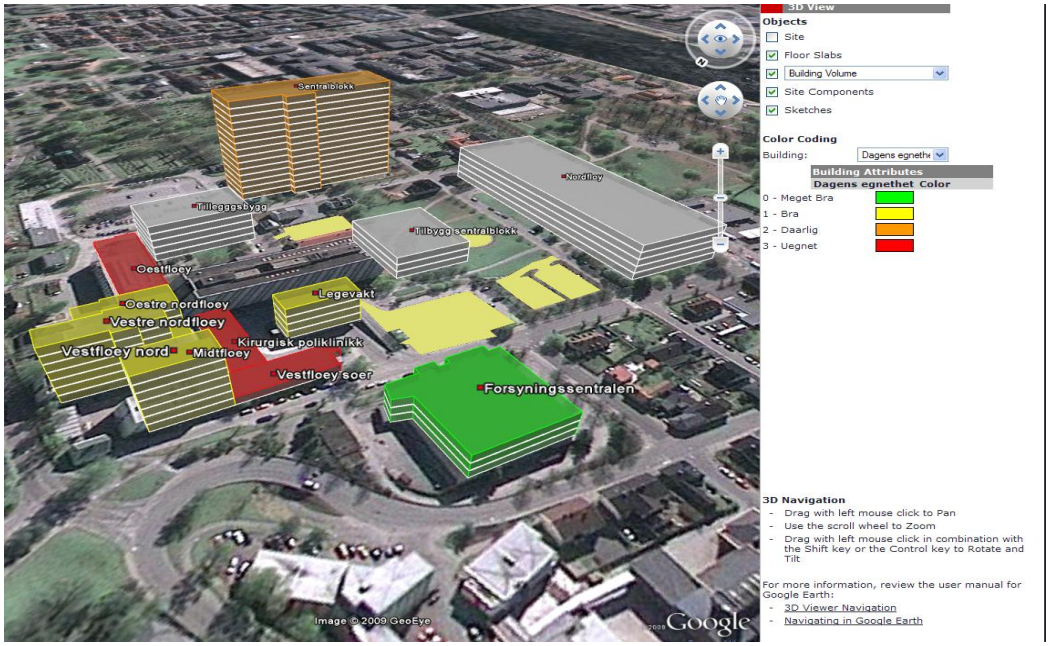
FUNCTIONALITY - INTERNAL LOGISTICS				
Parameters	Grade 0	Grade 1	Grade 2	Grade 3
Functions	The facilities contains the functions the organisation (user) needs, now and in the known future. No complaints from users.	The facilities contains to a high extent all necessary functions the users need in todays situation.. Only small amount of functions located in other facilities/building.	The facilities lack some essential functions, resulting in regularly use of other fasilities/buildings.	The facilities does not give room for necessary functions. Large amount of essential functions located in other facilities/buildings. High amount of complaints/dissatisfaction from users.
Area/space	Suffisient area (m2) to support necessary functions satisfactorily, now and in the known future.	Suffisient area for todays functions.	Amount of space (m2) is little. The spaces is small and well suited for the different functions. Low space/area efficiensy.	Acute need of more space in order to perform necessary functions.
Design and shape	Design and technical solutions is a very good support to the core activity, today and in the known future. The internal logistics is good and the core activity can operate effectively.	Design and technical solutions is a good support to todays core activity. The internal logistics is good and does not hinder effective operation for the core activity.	Design, shape and technical solutions is inexpedient. Essential functions is ineffecively located.	Design and technical solutions is inexpedient. Internal logistics is bad and results in ineffective operation of the core activity.

Table 3. Example on an explanatory matrix, part of the Usability matrix. (Ref.: Multiconsult)

Based on the Norwegian experience the implementation of a similar way of gathering strategic data in Slovenia should be based on following approach / steps:

1. *Establish cooperative partners*. This has been done and consists of UMCLJ, GEA-College, both from Slovenia, and Multiconsult from Norway. Several meetings and workshops have been done and the conclusion so far is that the implementation process should continue. The approach and all data structured as described should clearly give added value in the strategic planning within hospital sector in Slovenia.
2. *Form an organisation* for the project implementation. In addition to today involved companies / organisation, it will be preferable to establish a steering committee including representatives from other hospitals, ministry and other stakeholders. The steering committee should also be responsible for overall input needed for the total analysis such as today structure and main figures, trend in developments in medical methods and technology, dimensioning the health care facilities for future health care needs etc.
3. *Clarify classification systems* that are needed. In former Yugoslavia the German norms (DIN) was usual in use. But today there are no national standards similar to the Norwegians. The UMCLJ uses a standard classification system for condition survey based on EUROCODE which are widely used in the design and verification of the stability of buildings in Slovenia. The decided classification systems should then be implemented in the different modules of the tools including development of all the necessary helping matrixes.
4. *Training of people* who should be responsible for the system in future. This group should also be responsible for training (through special workshops) those who shall give information to the modules.
5. *Choose a pilot hospital* as a starting case. This hospital should have a great variety of health functions and different ages of the buildings. Then the normal assessment process as used in Norway should be performed:
   a. Workshop with people at the hospital responsible for setting grades based on helping matrixes
   b. Assessment of grades as input to the database
   c. Make tables and other structured info out of the input
   d. Establish reports with results and suggested actions
   e. Make adjustments according to experience made
6. *Establish a plan* for assessment of the whole hospital sector in Slovenia. This will include workshop at each hospital and further steps as for the pilot hospital.

7. *Summing up.* When all data is clarified a summing up report for the whole hospital sector should be prepared. For this report it is crucial to use extracted data to make the best communication level as shown on picture 1.



Picture 1: Example on visualizing results (Ref Multiconsult)

RESULTS AND DISCUSSION

Implementing "MultiMap" as a tool for gathering data as one basis for strategic planning in Slovenia has some challenges. Currently we do not have adequate tools or methods on which we could base strategic planning in Slovenia. The data on which strategic decisions are based on are therefore often insufficient and non-transparent.

It is obvious that the possibilities are of great interest. With implementing "MultiMap" as a tool for gathering data we get a better and more transparent way of communicate a huge amount of data. This will make a more firm platform for decisions in the strategic planning process for future development of hospital sector. And this will totally add value to the process itself.

Identifying the correct information necessary for decision and transparency of data collected can be a reason for opposition from some individuals in Slovenia to implementing "Multimap" as the tool for gathering necessary data.

The primary objective of the project is to examine the possibility to implement methods and tools witch provide information needed to support the strategic planning for future development of hospitals in Slovenia. Furthermore it is also an objective to see if this method can be applicable in Slovenian context.

Due to information, discussions and workshops throughout a periode of six months the developed tools and methodology in Norway meet the criteria's that were defined as primary objectives.

But a tool is just a tool, the result depends on how we choose to use it.

CONCLUSIONS

The Norwegian methods and tools have been examined, and found to be a good way of getting structured data for strategic planning and development of future hospitals in Slovenia.

Experience so far proves that the methods and tools are relevant and useful for strategic planning and for early stages of feasibility studies. Meetings and workshops between Norway and Slovenia so far have been positive and have established a platform for further cooperation within FM in the hospital sector

Further steps will be done to establish funding and then follow the steps for implementation.

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