

## TOWARDS A MULTI-STAKEHOLDER APPROACH IN HEALTHCARE FACILITIES PLANNING AND DESIGNING

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### Abstract

**Objective** – With this paper, the authors seek to raise awareness of the need for a multi-stakeholder approach and an interdisciplinary exchange in the construction context of healthcare facilities. This is critical to ensure smoother and more efficient non-medical service provision, as well as to facilitate future service innovation throughout the operational phase after finalising the building phase itself.

**Background** – At present, many hospitals in Switzerland are in the process of being renovated or being completely rebuilt. However, in many projects, the architects, designers and/or managers failed to involve non-medical support service providers throughout the planning and designing process. Consequently, the service provision and innovation in this area will continue to suffer as corresponding processes cannot be executed as effectively and efficiently as required due to limitations imposed by restrictive structural conditions and design elements. Projects conducted so far have shown that it is crucial to find out how to better involve non-medical support service providers in the planning and designing process of hospital facilities at an early stage and to clarify their role.

**Research question** – How can non-medical support service providers be involved, and their role be clarified, at an early stage of the planning and designing process of hospital facilities.

**Methods** – The research conducted was of an exploratory nature. Six experts involved in both nonmedical support service provision [Facility Management (FM)] as well as construction in healthcare (HC) facilities were interviewed, based on semi-structured interview guidelines. The Five-W-and-1-H (5W1H) technique – also known as the Kipling method – was applied for data collection as well as data analysis.

**Results** – The main research findings of this pre-study showed that firstly, many different inhibitors for non-inclusion of FM in HC at an early stage of construction have to be considered; secondly, that multiple stakeholders have to be involved in the planning, design and construction process in HC facilities and thirdly, the importance of communication in the whole context.

**Conclusion** – Three main conclusions can be drawn from this pre-study. Firstly, the role of a qualified construction-accompanying FM in HC user representative of the whole discipline, should be developed and established. Secondly, a specific HC construction project stakeholder management and communication concept including FM in HC should be developed. Thirdly, further training and advancement of current FM in HC roles should be arranged.

### Introduction

Currently, several billion Swiss francs are being, or are planned to be, invested in healthcare (HC) infrastructure (new buildings or renovations) in around 70 major new healthcare constructions [1], [2], [3], [4]. Reasons for that are ([5], [2], [6], [7], [8], [9]):

- the aging physical substance of many hospitals
- the introduction of Swiss DRG in 2012 leading to more competition and therefore greater pressure to be cost efficient and thus the need for more process efficiency
- increased demand for attractive and qualitatively superior service provision including higher comfort (the building has become a competitive factor)
- currently low interest rates

This leads to more pressure on building planners, as they are increasingly forced to prove the compliance of the building design and substance in terms of [10], [5]:

- efficiency

- functionality
- attractiveness
- flexibility
- sustainability
- facilities
- allowing new forms of cooperation.

In order to cope with the challenge of more competition, there is not only rising pressure for cost and process efficiency, but also the need for attractive service provision and comfort, increasing quality requirements with respect to the medical core processes as well as non-medical service provisions [11], [5], [12]. When talking about non-medical services, the definition of Gerber and Kuchen [13] is chosen. The service allocation model represented in Figure 1 clarifies the understanding of non-medical support services or FM in hospitals [13]. Referring to the yellow section, the non-medical support services in HC have been subdivided into four major areas:

1. Logistics, comprising procurement, inventory management, transport and distribution of goods and disposal & recycling services
2. Infrastructure, with operation and maintenance services, space management and supply, and energy and water supply /disposal services
3. Hygiene, Safety & Security, including cleaning and disinfection activities, preparation of medical devices, safety and security services
4. Hotel Business, with catering services, textile supply, accommodation, administration and operation of properties, and various other hotel services

Through the function of tactical resource management, all the non-medical support service areas mentioned above are coordinated, and systematic measures with respect to process improvement and resource optimisation are undertaken [13].

<b>Strategic Management Services</b> <b>Sustainability</b> Life-Cycle Planning/ Life-Cycle Engineering; Environmental Mgmt. System; Energy Mgmt.; Environmental Protection Activities <b>Quality Management</b> Quality Mgmt. Strategy; Standards & Guidelines; Process -; Structure/Potential -; Result Quality Mgmt. <b>Risk Management</b> Risk Mgmt. Strategy; Dispositive Special Situations; Error Mgmt.		<b>Corporate Identity</b> Corporate Identity Strategy <b>Resources / Sourcing Management</b> Strategic Resource Mgmt.; Pricing / Negotiation Strategy; Fostering of Innovation <b>Asset /Portfolio Management</b> Business Model Development-; Financing Mgmt.-; Investments-; Project Portfolio Mgmt. - & Programm Mgmt.-; Cooperation-; R & D Strategy <b>ICT Management</b> ICT Mgmt. Strategy	<b>Projekt Management</b>
<b>Management Support</b> <b>Finance &amp; Controlling</b> External Accounting/ Financial Accounting; Internal Accounting/Controlling, Reporting <b>Personalwesen /HRM</b> Personnel Administration; - Planning; - Controlling; Recruitment; Staff Dismissal; HRM; Employee Appraisal/Surveys; Personnel Training & Formation <b>Legal Services &amp; Contract Management</b> Legal Services; Patent & Copyright Mgmt.; Insurance Service; Contract Mgmt.; Representation in Courts and to Authorities <b>Marketing &amp; Communication</b> Marketing and Communication Serv. <b>Administration</b> Administration; Translations; Reprography; Travel Serv.		<b>ICT Services</b> <b>ICT Workplace Services</b> Elektronik Workplace-; Telephony/(Smart)Device Serv. <b>Medical Business Application Services (HIS)</b> Patient Dossier Mgmt. -/ - Documentation Serv.; Diagnostic Appl. Serv.; Patient Name Resource Planning Appl. Serv.; Med./Therap./Nursing Decision Support Appl. Serv. <b>Non-Medical Management &amp; Support- Application Services</b> Strat. Mgmt. Decision Support Appl. Serv.; ERP Appl. Serv.	
<b>Non-Medical Support Services</b> <b>Logistics</b> <b>Procurement</b> Internal Ordering; Operational & Tactical Procurement <b>Inventory</b> Incoming Goods Inspection; Inventory Mgmt.; Commissioning <b>Transports &amp; Distribution</b> External/Internal Transportation of People; Transport & Distribution of Goods; Mail/Courier Serv.; Relocation; Fleet Mgmt. <b>Disposal &amp; Recycling</b> <b>Tactical Resource Management</b> <b>Infrastructure</b> <b>Operation &amp; Maintenance</b> Immovable Non- /Medical Property, Plant and Equipment; Non- /Medical Mobile Tangible Assets; External Surfaces; Help Desk & Caretaker Services; Tenant Fit-Out <b>Space Management &amp; Supply</b> Provision & Mgmt. of Premises; Property Administration; Workplace Provision <b>Energy &amp; Water Supply / Disposal</b> <b>Hygiene, Safety &amp; Security</b> <b>Cleaning &amp; Disinfection</b> Maintenance -; Intermediate -; Thorough -; Special Cleaning <b>Preparation of Medical Devices</b> Sterilisation Serv. <b>Safety</b> Occupational Safety & Health Protection <b>Security</b> Personal Security; Fire Protection; - of Property; - of Information <b>Hotel Business</b> <b>Catering</b> Patient - /Resident -; Staff - & Guest Catering; Vending Serv.; External & Internal Event Catering <b>Textile Supply</b> Laundry Serv. & Repairs; Patients' -; Residents' -; Operation's -; Special Laundry; Workwear & Special Laundry; Laundry Serv. for Third Parties <b>Accommodation Administration &amp; Operation of Properties</b> Staff/Guest Accommodations; Patient/Guest Hotel; On-Call Accommodation <b>Hotel Services Various</b> Reception & Contact Center; Wardrobe; Event Mgmt.; Owner-Operated Kiosks & Shops; Childcare; Non-Medical Patient Care; Non-Medical Media Library & Archive			

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In recent years, it has become clear in numerous publications and projects undertaken by the authors that the non-medical processes in hospitals (FM in HC) can contribute to process optimisation, quality improvements and cost-cutting [14], [15], [16], [17], [18], [19], [20]. However, it is obvious that the contribution can only take effect if the infrastructure accommodates the optimised processes. In old buildings, this is not easily possible as they were planned with different perspectives. However, with new buildings, the harmonisation of the processes with each other as well as with the infrastructure is a great opportunity for more efficient and qualitatively enhanced service delivery at a

lower price [11], [21]. This, however, requires the appropriate and early involvement of all the necessary stakeholders in the area of non-medical support services [11], [22], [21]. The already established norm SIA 113 [23] identified the value of FM in construction projects and defined the activities and roles in different phases of construction (“strategic planning”, “preliminary studies”, “project planning”, “tender”, “realisation” and “management”), although not particularly dealing with healthcare construction [23]. The importance for (multi-)stakeholder involvement and management has been acknowledged for quite some time and different general frameworks have been presented:

- **in general** ([24], [25], [26], [27]). In (lean) construction (e.g., [28], [29], [30])
- **in Facility Management** (e.g., [28], [31], [32], [33], [34], [35])
- **in healthcare** ([36], [37], [38], [39], [40], [41], [17], [42], [43])
- **in healthcare construction** ([44], [45], [29], [46], [30])

However, in many projects, the architects, designers and/or managers failed to involve non-medical support service providers throughout the planning and designing process. Consequently, service provision and innovation in this area will continue to suffer as corresponding processes cannot be executed as effectively and efficiently as required due to limitations imposed by structural conditions and design elements. Projects conducted so far have shown that it is crucial to find out how to better involve non-medical support service providers in the planning and designing process of hospital facilities at an early stage and to clarify their role.

## Research Problem, Research Question and Objectives

Previously conducted projects have shown that although the above-stated benefits of non-medical service involvement in the healthcare infrastructural planning and designing have been identified, there is a gap in determining how exactly the process of integration needs to take place during the planning and design phases of the construction [47], [48], [49]. This also involves the conflict of interest that might exist between different stakeholders involved in the process of planning and construction [50].

The goal was therefore to conduct a pre-study to investigate the probable ways of including FM in HC (very) early into the planning and design activities of healthcare facility construction. The research question was therefore formulated as:

“How can non-medical support services be better integrated into the planning and design stages of construction projects involving healthcare facilities?”

This includes the following sub-questions:

- “Who” needs to involve whom in the process of project planning to ensure the early involvement of FM?
- “What” has to be done to involve FM very early into the planning phase of construction process?
- “When” should the FM be integrated into the planning phase with reference to the SIA norm 113?
- “Why” is this early involvement of FM considered important to hospitals?
- “How” can this goal of early involvement be fulfilled?

With this paper, the authors seek to raise awareness of the need for a multi-stakeholder approach and an interdisciplinary exchange in the construction context of healthcare facilities. This is critical to ensure smoother and more efficient non-medical service provision, as well as to facilitate future service innovation throughout the operational phase after finalising the building phase itself.

## Methodology

The choice of the research study adopted for this paper is of exploratory in nature with an aim to provide deeper insights into the research problem, to offer opportunities for additional projects and to the community for further research direction rather than underlining conclusive answers to the research problem [51], [52].

Therefore, the research design accommodates a qualitative approach following in-depth semi structured interviews as a method of data collection [53], [54], [51], [55], [52]. The interview guideline was developed with a focus on relevant areas of the research topics that were necessary to answer the research questions using an adapted problem analysis technique for questioning based on the Five-W-and-1-H (5W1H) technique [56], [57]. The 5W1H technique - also known as the Kipling method – helps to explore a problem with simple, but open-ended questions such as What?, When?, Where?, Who? and How? [58]. The goal of asking such open-ended questions is to gather as much information as possible in a short time frame, to challenge the current perspectives of people, to view a certain problem from different perspectives and to generate new ideas [58]. The reliability and validity aspects of the guideline was addressed by reviewing the questions for its subjective relevance by an expert [59].

A purposeful non-random sampling was applied to identify those experts who were able to provide useful insights towards answering the research question and meeting the research objective [54]. Six experts involved in non-medical support service provision as well as construction activities within hospitals in Switzerland were interviewed.

The authors used a deductive-inductive hybrid approach to analyse the qualitative data. The interview transcripts were analysed deductively based on pre-set categories (based on the multidimensional classification of 5W1H information “who”, “when”, “what”, “why” and “how” according to Walter [57]. Moreover, the construction phases as described by SIA 112 [60] “strategic planning”, “preliminary studies”, “project planning”, “tender”, “realisation” and “management” were used as a reference. Furthermore, inductive analysis was applied for categories generated outside this framework that emerged during the coding process [61]. In order to increase the validity of coding, the coding process was re-iterated and refined by consolidating coding with two methods - thematic and open coding. The coded data was classified into the two-dimensional matrix illustrated in Table 1. It aims to provide a holistic overview of the multiple stakeholders interacting with each other in different phases of planning, design and construction of healthcare facilities, delivering the necessary arguments to meet the research objectives and answering the main research question. The X-axis in the matrix concerns the aspect of “who” and the Y-axis concerns the aspects of “when” referring to the six phases of the norm Swiss Association of Engineers and Architects – SIA 112 [60]. The performance Model SIA 112 clarifies service planning in different phases of construction [60].

Table 1. The two-dimensional matrix representation of results using 5W1H technique

5W1H multi-dimensional classification						
	<b>When?</b>					
<b>Who?</b>	Strategic planning	Preliminary studies	Project planning	Tender	Realisation	Management
↓	Interacts with <b>Whom?</b> <b>Why?</b> <b>What?</b> <b>How?</b>					

Inductively generated categories were clustered separately. Primary data collected was compared to secondary sources to validate the congruency of its findings, mainly to the SIA Norm 112 Construction Planning [60] and SIA Norm 113 FM-adapted Construction Planning and Realisation [23].

## Results

The research findings of this pre-study are manifold. The most important findings are:

### *Many different inhibitors for non-inclusion of FM in HC in an early stage of construction*

Even though a limited number of experts were interviewed, many different inhibitors for the current non-involvement of FM in HC in an early stage of construction were brought up, the most important ones being lack of:

- time and resources due to intensive involvement in daily business and day-to-day operative functions
- long-term strategic thinking, planning and responsibilities of FM in HC
- innovation-oriented attitude; prevalent traditional mind-set of FM in HC
- FM conceptualisation, including awareness of interfaces between operational and strategic functions, future trends, and processes by all stakeholders
- alignment and voicing of opinions, and measurable contribution to medical core business
- role and project definitions in HC construction projects
- overall know-how of HC business and hospital workflows by FM in HC
- necessary competencies and skills as well as project and business experiences by FM in HC
- willingness for co-ordination, collaboration and interactions with interdisciplinary functions by all stakeholders involved

### *Who-should-involve-Whom-When-Why-and How*

In order to answer the research question, the key stakeholders identified were assigned to the different phases of planning and construction process according to SIA 112 [60] as described in the Methodology chapter. The results of the sub question “Who” should involve “Whom” is described in the following section. The aspect of “When” to include could also be clustered and is illustrated in Figure 2. For the sub-questions “What”, “Why” and “How”, insufficient generalizable data was available to make a differentiated statement. However, the aspect of communication was stressed – the results on this topic is summarized below.

### *Multiple stakeholders involved in the planning, design and construction process in HC facilities*

According to the experts interviewed, the main stakeholders responsible identified in the process of construction in HC and FM involvement are as follows:

- owner-representative(s)
- user representative(s)
- architect(s)

- planner(s)
- project manager(s)
- members of building project organisation
- hospital managers

The crucial role of the “FM user-representative”, who is rarely involved, was highlighted. It was suggested that in the future, this role should fulfil the following requirements:

- Systematically represent the needs and requirements of non-medical support services in the planning and design phases of construction
- Be someone who has a feeling for the context through experience and understands what FM information is needed in what phase of the construction project
- Possess the ability to see the interfaces between operations and hospital construction strategy.

### ***Importance of communication***

As a general aspect within the whole process, the need for effective communication among various stakeholders internally and externally was brought up repeatedly. Effective communication including discussions, addressing issues and making critical decisions to stay in course of the plan seems crucial in every phase of a construction project. Those interviewed, highlighted the importance of communication between all the stakeholders involved in the construction project and they emphasized the need for communication between interdisciplinary units. In terms of FM in HC, the urgent need for a more holistic understanding of the entire hospital workflows involving different business units was stressed.

### **Conclusions**

The claim that non-medical services are not well integrated into the planning and design phases of HC facilities construction projects was affirmed also in the Swiss healthcare context through the input given by the experts interviewed. Applying the simple questioning framework of 5W1H, numerous indications could be determined as to why this seems to be the case and what the possible measures to be undertaken in order to overcome this in the future could be. The most important and valuable measures were:

- the definition and establishment of the role of a qualified construction-accompanying FM in HC, who shall be regarded as a user representative of the whole discipline
- the development of a specific HC construction project stakeholder management and communication concept including FM in HC
- further training and advancement of current FM business competencies in HC roles

### ***Definition and establishment of the role of a qualified construction-accompanying FM in HC user representative of the whole discipline***

The role of a qualified construction-accompanying FM in HC user representative should be defined by consulting different stakeholders involved in HC facility constructions. Consulting a wide variety of stakeholders could not only ensure that the role would be defined in a holistic, suitable and practicable manner, but could also mean that collaboration during the definition process would enhance the acceptance of the new role. As a basis, the SIA113 which was developed in co-operation of 26 project partners as a practical guide to include FM into constructional planning phases ([62], [23]) could be used as a conceptual framework, however developing it more in depth with reference to the HC context. The benefit of such a new role that is able to identify (e. g. more efficient processes in the operational business phase, better life cycle costing, more use of synergies) should be clearly stated and promoted from the beginning. The definition of the role should also include the ideal profile of a person taking over this role (e. g. experience and understanding of FM in HC overall, know-how of healthcare organisation management and HC service provision). Figure 2 illustrates the conclusion that the qualified construction-accompanying FM in HC user representative should cover the whole areas of nonmedical support services in hospitals presented in detail in Figure 1, which is schematised in yellow in Figure 2. Facility Management should systematically be involved in the “Lifecycle Management” according to SIA 113 [23] from strategic planning all the way to the building management.

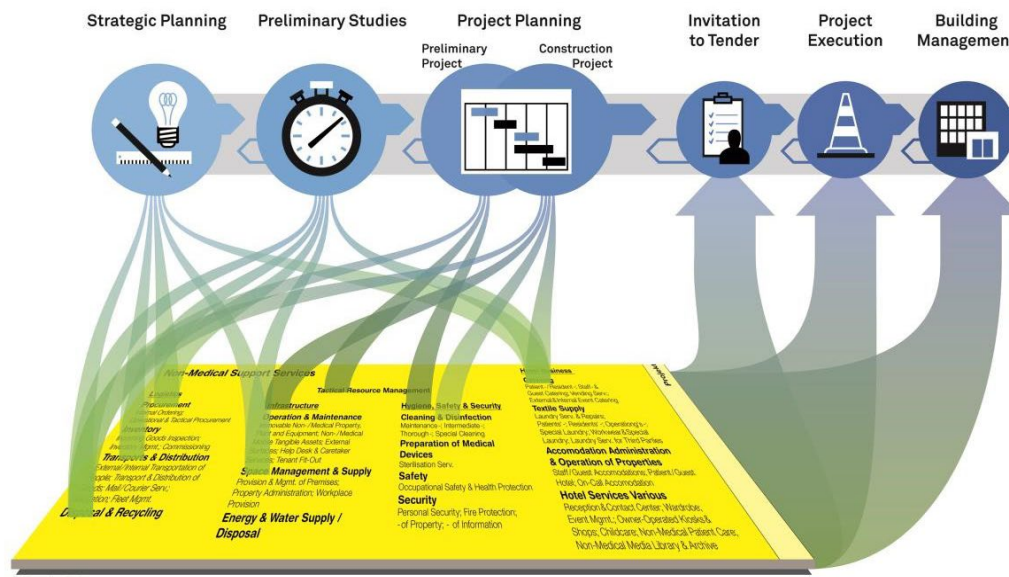


Figure 2. Context of qualified construction-accompanying FM in HC user representative of the whole discipline, suggested to be involved throughout the Lifecycle Management according to SIA 113 [23]

### ***Development of a specific HC construction project stakeholder management and communication concept including FM in HC***

Based on existing (multi-)stakeholder management and communication concepts, a specific framework should be developed which provides the context-specific information for HC construction projects, including all the important stakeholders including FM in HC. It should also take into account the specific situation of a hospital which provides services 24 hours a day, 365 days a year with the corresponding implications of staff availability and the thus necessary communication channels.

### **Further training and advancement of current FM business competencies in HC roles**

Looking at the different inhibitors for the non-inclusion of FM in HC in an early stage of construction stated in the Results section, specific further training for people working for FM in HC should be offered in order to initiate a change of mind-set within the discipline and the entire HC sector. Particular aspects to be trained should, among other things, involve:

- overall holistic understanding of the HC business and role of FM in HC within the service delivery
- innovative thinking, future trends
- awareness of interfaces and potential synergies between operational and strategic levels voicing of opinions
- project management knowhow
- ways of co-ordination, collaboration and interactions across disciplines and with internal and external consultant
- dealing with change management

### **Critical reflection, limitations, outlook**

The research presented can be seen as a starting point for further developments. The small sample size, as well as the limited perspectives involved in this explorative research, cannot be seen as generalisable result. However, tendencies and crucial points could be determined, giving clear indication on where and how to proceed. In a next research iteration, the following aspects should be further investigated and developed individually:

the role of a qualified construction-accompanying FM in HC user representative of the whole discipline the development of a specific HC construction project stakeholder management and communication concept including FM in HC programs for further training and advancement of current FM in HC roles

It seems important that all the HC facilities construction stakeholders identified are consulted and involved in the development process. Once the frameworks are developed, their application in practice should be investigated by researchers, validating the results, and eventually providing evidence-based guidance on adapting the frameworks in a systematic manner wherever necessary.

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