

Change Factors Towards Sustainability at the Example of Hospitals' Secondary Processes

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ABSTRACT:

Secondary processes in hospitals are causing a major part of hospitals' carbon footprint. At the same time, initiating change towards sustainability is more difficult in secondary processes than in other processes: Often, they are not under the complete control of hospitals and involve other actors, such as service providers or purchasing companies.

The current research aims to shed light on factors influencing change in secondary processes at the example of hospitals in Germany. Building on a framework that distinguishes change factors on a micro-, meso- and macro-level, it is analysed which aspects are positively or negatively influencing change towards more sustainability.

To this end, qualitative interviews with eleven experts from hospitals and service providers have been conducted and results have been assigned to the three levels of change. Results underline the importance of inter-organisational collaboration and the design of structures and processes to establish regular cooperation and coordination. They also show that business relationships between hospitals and service providers are rather cost-related than transformational. Sustainability offers the opportunity to modify existing roles and develop future-proof businesses.

The paper contributes to existing research by focusing on multi-organisational perspectives. On a practical level, it supports hospitals in designing their change strategies and processes jointly and in collaboration with other parties that are part of secondary processes.

Keywords: sustainable change, (inter-) organisational change, hospitals' secondary processes

1. Introduction

Current environmental challenges together with increasing stakeholder expectations and stricter regulations put companies under pressure to manage their operations more sustainably. However, while there are many ideas about what to do to improve the sustainability of operations and supply chains, the implementation of sustainability-related strategies and measures seems to be challenging (Doppelt, 2017). This is even more the case, when processes cannot be controlled entirely by one organisation, but other companies such as service companies are involved in their execution. Then, the change of processes requires the cooperation of all parties involved in the process, the commitment of the leadership for cooperative efforts and the

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willingness of individuals to implement change for more sustainability cooperatively (Grossmann & Lobnig, 2013).

The healthcare sector causes 4.4% of carbon emissions worldwide (Karliner et al., 2019). A large part of these emissions result from secondary processes – processes, that are supporting the core processes of a company and that are usually tied to up- or downstream activities of an organisation (Lenzen et al., 2020). These processes are usually – at least partly – conducted by internal or external service providers, making change for more sustainable processes a difficult task.

Addressing organisational change and its driving and inhibiting factors in secondary processes of the healthcare sector in general and of hospitals in particular therefore seems to be of high interest. However, up to date there is only limited research dealing with change in inter-organisational contexts, and even less when it concerns change for sustainability. Therefore, this article seeks to shed some light on hindering and/ or enabling factors for sustainable change at the example of secondary processes in hospitals. In particular, the following research questions are posed:

- Which factors influence – positively or negatively – sustainability-related change in secondary processes of hospitals?
- Are there factors that seem to be specific for hospitals?
- Which role does the inter-organisational aspect play for change processes in secondary processes?

To this end, first a short overview about change factors, considering also inter-organisational settings will be given, referring amongst others to literature on change for sustainability, sustainable supply chains and change in hospitals. As a result, a framework for change factors on a micro-, meso- and macro-level is proposed. In a second step, results of qualitative interviews with eleven experts from hospitals and service providers will be discussed, taking into account specific features of the healthcare sector and the inter-organisational character of its secondary processes.

2. Theoretical Background

2.1 Change management and change factors

Changes in external and internal stakeholder expectations force companies to constantly adapt to new circumstances. The capability to initiate and manage organisational change is therefore considered as crucial for the survival of organisations (Luecke, 2003). Change Management can be defined as the “the process of continually renewing an organisation’s direction, structure, and capabilities to serve the ever-changing needs of external and internal customers” (Moran & Brightman, 2001: 111).

There is a wide array of research in the area of change management, addressing for example the characteristics of change (e.g. incremental vs. discontinuous change, see for an overview By, 2005), change processes models (e.g. Lewin, 1947; Kotter, 1995) or barriers of change (e.g. Post & Altmann, 1994; Al-Alawi et al., 2019). In most of these publications, explicitly or implicitly, factors driving or inhibiting change are named. For example, Lewin (1947) pinpoints that change does not only depend on the individual, but also on situations, surroundings and group dynamics. The role of the human being as an

individual and/or in social constellations is also highlighted by Dievernich *et al.* (2015). Stakeholder analysis and engagement is proposed as important tool for change management in order to be able to understand the expectations, needs and fears of individuals (Sippl *et al.*, 2022), but also to engage them for driving (sustainable) innovations (Eisenreich, 2021). Kotter (1995) spotlights the influence of leadership (e.g. vision building, communication) in change processes. Thakur and Mangla (2018), identified, next to human factors, operational and technological change factors, where technological factors could be outside or inside the company. Post and Altmann (1994), at the example of organisational change, seek for barriers to change and suggest clustering them into organisational barriers (e.g. attitudes of personnel or quality of communication) and industry barriers (e.g. capital costs, regulatory constraints or technological knowledge).

Literature focusing on change management in hospitals and/ or the healthcare sector confirms change factors that have been identified by other studies. For example, Šuc (2009) and Barba *et al.* (2021) substantiated the dependence of change on situations, surroundings and group dynamics Lewin (1947, 1951) for change procedures in hospitals. Kleine *et al.* (2022) support the critical transformational role of hospital executives which has already been emphasized by Kotter (1995). Weimann (2018) and Grossmann and Lobnig (2013) underline internal and external leadership communication as key factors towards successful change processes. A similar result has been found by Werner *et al.* (2022) and Debatin *et al.* (2011) when looking at change for sustainability in hospitals. At the same time, studies are spotlighting specific characteristics like the complexity and the path dependence of hospitals as challenging factors for change (Grossmann & Lobnig, 2013). This is particularly the case when the formerly self-determined departments and their leaders are obliged to change towards standardization or central principles (Roeder & Bunzemeier, 2017). Bate and Robert (2017) and Grün and Franke (2014) highlight the importance of the integration of stakeholders (in particular patients) into change and innovation processes in hospitals.

2.2 Change in inter-organisational contexts

Many change projects go beyond organisational boundaries, for example when they concern sustainable value chain processes across companies, business process outsourcing (e.g. in the area of facility management) or other relationships between joint projects with partners. This is also the case for many secondary processes of hospitals (e.g. operation maintenance, laundry, cleaning or catering services) which are usually (partly) provided by hospital owned subsidiaries or external service providers (Schröter 2017).

In these inter-organisational contexts, change is more difficult to handle (Grossmann *et al.*, 2013). Touboulis and Walker (2015) point out that cooperation between partners is essential. A collaborative style in the business relationship between core business and service provider is associated with better opportunities for increased quality, continuous improvement processes and adequate reactions on innovation demands (Jensen, 2022; Lok & Baldry, 2016; Atkins & Brooks, 2009). Jensen (2019, 2022) additionally emphasizes - for the case of facility management institutions - the importance of stakeholder and relationship management for enabling facility management institutions to contribute to core businesses' sustainability actions.

There are some studies in the area of Integrated Care, especially in the National Health Service of the United Kingdom or healthcare networks in general where change processes transcend organisational borders. Some studies just repeat factors already mentioned for change processes in single organisations (e.g. Cresswell et al., 2020; Nuño-Solinis, 2017). Other studies, however, are spotlighting the inter-organisational aspects of change: For example, Bhat et al. (2022) underline the importance of formal and informal arrangements that enable trust and collective relationships to develop between organisations. Auschra (2018) pinpoints to obstacles for change at the inter-organisational level, for example, insufficient leadership and coordination, differences in goals and approaches in the collaboration, incompatible organisational structures, imbalances of power, conflicts and a lack of contact persons with well-defined roles.

2.3 Classification of change factors

Looking at organisational factors mentioned in literature, the following “groups” can be identified:

- Factors, that are external to the organisation or the organisational system/network where change takes place, as, for example legal or general technological factors. These factors, in the view of the authors, take place on a macro-level of change.
- Factors taking place on an (inter-) organisational or meso-level, concerning structures and processes that positively or negatively influence change, as, for example, the leadership style or the degree of cooperation and trust between organisational units.
- Factors pinpointing the individual in the change process (e.g. attitudes or values) and hereby taking place on a micro-level.

Some factors cannot clearly be allocated to one of the categories, but concern two or all three categories – as for example the identification and integration of stakeholders into the change process.

Also, there may be co-dynamics between the levels (Walgenbach et al. 2020), complicating a clear allocation of factors to a specific level. The table below therefore needs to be understood as a trial to classify factors named in literature to one or several change levels.

Table 1: Levels and key categories for change factors towards sustainability at the example of hospitals’ secondary processes

Level	Key categories
Macro-level (context factors)	<ul style="list-style-type: none"> • Regulatory factors (Auschra, 2018; Bhat, 2022) • Technological factors (Thakur & Mangla, 2019) • Stakeholder involvement (external stakeholders) (Sipl et. al. 2022)
Meso-level (Inter)-organizational factors)	Organizational factors: <ul style="list-style-type: none"> • Stakeholder involvement (internal stakeholders) (Roeder & Bunzemeier, 2017; Bate, 2007; Grün & Franke, 2014) • Leadership, communication (Kotter 1995, Thakur & Mangla, 2019; Kleine, 2022; Suc, 2009; Barba 2021) • Organisational culture (Bhat et al. 2022; Khalil & Kynoch, 2021)

	<ul style="list-style-type: none"> • Organisational development, organisational learning (Nuño-Solinís, 2017) • Governance structures (Werner et. al. 2022, Debatin 2011) Inter-organizational factors: • Leadership (Auschra, 2018, Grossmann et. al 2013) • Roles within cooperation (Auschra, 2018, Grossmann et al. 2013) • Goals and approaches of the cooperation (Auschra, 2018, Bhat et al. 2022) • Compatibility of organizational structures (Auschra, 2018, Grossmann et al. 2013) • (Im-)balances of power (Auschra, 2018, Grossmann et al. 2013) • Arrangements that enable trust (Auschra, 2018, Grossmann et al. 2013) • Character of collaboration (Jensen 2019, 2022, Lok/Baldry 2016, Atkin/Brooks 2009) • Conflict management (Auschra 2018, Bhat et al. 2022, Grossmann et al. 2013)
Micro-level	<ul style="list-style-type: none"> • Individual awareness, capabilities and motivations (Dievernich et al. 2015; Post & Altman 1994)
<p>*Acknowledgements: There are co-dynamics between the levels. Stakeholder engagement could be located in all three levels.</p>	

Literature – especially in hospitals – seems to have focused until now on the organisational aspects of change, neglecting inter-organizational factors as well as factors on a micro-and/ or macro-level. Inter-organizational factors are, however, especially relevant for hospitals’ secondary processes. There are indications that stakeholder participation and cooperative approaches between the organizations involved in the change process can positively influence sustainability related change (Eisenreich et al. 2021, Jensen, 2019 2022; Broumels & Nardelli, Lok & Baldry, 2016, Atkin & Brooks, 2009). Consequently, these aspects will be explicitly addressed in the following empirical research.

3. Methods

In order to understand in detail the most important factors for change in secondary processes, a qualitative study design was chosen. Qualitative approaches enable new results through a rather open approach, with a more circular research process (exploratory character) (Mayring, 2019). Value of qualitative research does not arise from the numerical sample size or statistical analysis, but from the saturation of the content. In order to achieve an ideal sample size in qualitative interviews, several variables, such as the scope of the study and the difficulty of the topic, needs to be taken into account. Most importantly is the expectation about the amount of useful information provided by each participant (appropriate data) (Morse 2000). Due to essential differences in national health systems, the authors decided for a national study focus, selecting eleven experts from Germany. Interview partners were chosen to represent hospitals with different

characteristics as well as regional and national service providers with different size and focus to ensure that information from different context is considered in the study. Furthermore, experts were selected based on their function (key person for sustainability related development in the company), their expert knowledge (explaining a higher amount of experts from University hospitals that already do research on the issue) and their general openness for enabling change processes (indicated by their function); all of them were directly or indirectly related to the research project (see Appendix A, table 1). Interviews were conducted using a semi-structured interview guide. Key questions served as orientation in the interview, but could be adapted to the situation. They varied slightly for representatives of hospitals and service companies in order to consider their different perspectives. Interviews were recorded, transcribed and anonymized. Data was treated by the method of qualitative content analysis (Mayring, 2019). To this, text passages from the interviews were categorized and assigned to the above-mentioned macro-, meso- and micro-levels and the key categories. Benefit of this approach was, that the categories are not totally fixed, so that new findings could be generated. Results were presented to the interview partners in an anonymous and aggregated form during a workshop, allowing discussions and a communicative validation of the results (Flick, 1987).

4. Results

4.1 Results on the macro-level

Experts from hospitals and service companies both described current crises such as the energy crisis and supply chain problems as a hindrance, but also as a catalyst for change as they require to search for new – and possibly more sustainable – solutions. Most experts named regulations – especially in the area of hygiene – as barrier for sustainable change: *“processes are very standardized. For good reasons, because they meet certain hygiene standards (...) high hygiene standards in Germany and the European Union, of course for good reasons, but we are very regulated in everything we do.”* (SP2¹). At the same time, experts were of the opinion that regulations enabling change towards sustainability for hospitals are rare, but would be an important driver of change. All experts mentioned that the increasing societal demand for more sustainability – also in the healthcare sector – is driving change in hospitals. A hindering factor is the lack of transparency regarding important sustainability aspects in the supply chain, e.g. about carbon footprints of products used by hospitals and service providers. Finally, economic factors were emphasized as a potential barrier for change towards sustainability. Amongst others, the hospital financing system in general and insufficient financial resources for sustainable change in particular are hindering investments in sustainability in hospitals.

4.2 Results on the meso-level

4.2.1 Results on organisational levels

Experts supported the notion, that organisational culture (described as informal systems, shared values and beliefs), is an important influencing factor for successful change towards sustainability in hospital's secondary processes. In general, the size of hospitals with its numerous and heterogeneous staff and the heterogeneity of the workforce in

¹ Anonymization: for example “H1” for Hospital 1 and “SP1” for “Service Provider 1”

service companies was mentioned as a barrier for change processes: *"In our hospital, of course, the size is a problem, because it's just a huge tanker and a cross-section of society"* (H7); *"the cultural adaptation is very diverse here"* (SP4).

For hospitals, an interviewee stated that the strong and autonomous (specialist) departments and hierarchical thinking complicates the introduction of new and more sustainable procedures. Moreover, patient-centeredness as internalized value and attitude of hospital employees was seen as a potential challenge for change, as prioritization of patient safety often leads to excessive consumption in the routines (security instead of sufficiency principle), not only in medical core processes, but also in secondary processes. An example is the cleaning of areas with low infection risk (like emergency staircase) in a fixed cycle but not by necessity. In this context, for service companies, an interviewee described the need of an overall cultural change in the organisation as follows: *"Sustainability in all areas, not just selectively with a project, but really as a cultural component in the company (...) that has something to do with raising awareness"* (SP4).

Leadership engagement is seen as extremely important for change, and has the potential to affect the organisational culture if it is credible. One expert (H4) stated that - in practice - there is a *"communicated willingness"* by the board of directors without sufficient resources.

Moreover, the integration of employees in the change process and the extensive communication and training was emphasized as enabling change factor, especially when there is a heterogeneous workforce. Interviewees named different formats for engaging employees: from information over workshops, working groups, training courses and suggestion schemes up to the creation of the role of "ambassadors for sustainability" in all departments. One expert described employees as generally open to change, but frustrated with waiting for visible changes, which underlines the importance of clear communication and also expectation management. The formulation of goals and mission statements as enabling factors was named both by experts from hospitals as well as service providers. At the same time, experts stated, that organisations are only beginning to operationalize (measurable) goals. There is no systematic evaluation of target achievement yet, except in the area of energy management. This area is usually well evaluated due to external obligations for auditing or certification processes.

Most experts were of the opinion, that sustainability-related reporting potentially has a positive effect on change for sustainability. For hospitals, there is seen a need for target group specific communication, e.g. for the board, employees, the public, because one publication does not fit all stakeholders needs: *"it is always important to provide accurate information, to look, which target group do I want to address now? Depending on the situation, I have to communicate this information specifically"* (H2). Experts from service providers rather see the need of reporting targeted to the general public and potential customers. In general, from the interviews could be deducted that currently reporting is rather qualitative (storytelling).

Experts from hospitals as well as from service companies considered the institutionalization of sustainability as critical. For example, the employment of "sustainability managers" was mentioned as an enabling factor for change, as these managers take the role of "advocates" for sustainability, creating awareness through communication (more bottom-up role), supporting strategy development with measurable results (more top-down role), and facilitating concrete activities.

While sustainability managers and/ or departments are more and more common in hospitals, for service providers, separate positions or a department for sustainability are seldom: mostly sustainability is understood as an integrated part of management such as knowledge management and/ or dealt with within the existing structures. Experts mentioned that service companies increasingly provide climate managers for customers. Experts from service companies emphasized the need to establish functions of coordinators and/ or head-workman for enabling change towards sustainability. They play an important role in communicating, implementing and examining sustainability aspects. For example, in the infrastructural area (cleaning) there are strictly specified performances and if operators should act sustainable, the responsibility is therefore predominantly in management, e.g. providing dosing aids, training the operators and checking the implementation.

4.2.2 Results on interorganisational levels

The interviewed experts from hospitals are underlining a central role of service providers for the arising sustainability in secondary processes. They appreciate service companies as sustainability experts in their field and emphasize the need for participation of service providers for achieving sustainability related goals. *"Without our service company, we would also have some sustainability actions, but it is crucial to think about the services. Without that we would miss the mark"* (H7). They ascribe especially for external providers high market pressure to act sustainable.

It is important to mention that commissioning hospitals create the conditions for sustainable actions of the service providers, especially by integrating sustainability into service contracts. Experts from service companies criticized that sustainability is an issue in the tendering phase, but once it come to contract negotiation, price is dominating over sustainability issues. Consequently, contracts usually lack sustainability criteria, and there is little leeway to consider them when implementing the service: *"If a client buys diesel and then looks for the socket for the electric car, then it doesn't work at all"* (SP2). From the perspective of service providers, hospitals main concern are cost savings and an *"smooth"* (SP3) service provision with as little interference as possible. Service providers often seem to feel in a weak position, being aware that *"the mechanism is to use secondary processes to reduce costs"* (SP3). Trust and partnership in the business relationship tend to be expandable through hospitals and their service companies: *"Are you acting in partnership or are you simply trying to look for performance deficits in order to reduce the bill?"* (SP3). It is important to mention that the role and responsibility that a service provider can assume for sustainability, depends on how the relationship between both parties is designed in general: is it long-term (which could be given for subsidiaries as well as for external service providers with long-term contracts up to 5 years), and whether it is more cost-focused or more partnership-based, i.e. instead of the cost centeredness there is also an idea of collective developments (e.g. continuous improvement processes in the contract).

The interviews draw a heterogeneous picture of the structure of the cooperation between hospitals and service companies on sustainability. Often, it is occasionally and problem-oriented, for example when there is a remerging of formerly separated waste

groups by cleaning operators. Sustainability can be, too, a sub-item in regular exchange formats like monthly jour fixes or annual planning meetings.

Another usual form of cooperation is to be found when service companies provide energy managers or climate managers for the hospital and these are responsible for the moderation of joint meetings in the energy management. For other issues, except from the well-established energy management, there is no common practice seen yet. However, partly there are integrations of services companies members into the hospital's own sustainability-related working groups (e.g. waste management, catering or sustainability in general). Moreover, proactive roles of service providers in those groups, sharing their expertise, contributing to the issues or even in moderating such meetings, can be seen as well.

Integration of service providers into the strategic sustainability development of the hospital as a very high level of collaboration is rarely. In the given sample, it is found between a hospital sustainability department and the upper management of a 100% subsidiary service provider. In this example, the service providing management formulates sustainability goals for their area of responsibility and designs ideas for implementation, with the support of the sustainability department. Performance reporting from service companies to hospitals are mostly found without sustainability issues.

To sum up, especially in view of service providers, price and cost-reducing mechanisms seem to be predominating factors in the business relationship between hospitals and service companies finding their manifestation in contracts. But there are some dynamics towards more collaborative styles within the ongoing processes like enhanced communication.

4.3 Results on micro-levels

Experts consider the behaviour of individuals – especially employees, patients and executives - as a critical factor for sustainability related change. Irresponsible behaviour at the individual level is causes huge ecological and economic costs. For example, patients turn the heating on high level while windows are opened or even remove the temperature limit on heatings (H 4). Because employees and patients represent a cross-section of society, information, instructions and recommendations on sustainability should be communicated in a target group specific way.

5. Discussion

This article seeked to understand barriers and/or enablers of change at the example of secondary processes at in German. To this end, in a first step a framework of change factors was derived from existing research, which was used as guide for qualitative interviews with experts from German hospitals and selected service providers.

Reflecting the framework of change factors suggested in chapter 2.3.3 with the results of the interviews, some notable observations can be made:

Macro-level factors are considered as important and reflect broadly the factors suggested in prior research, among them the stakeholder demands and legal obligations. The latter are thought to be a positive driver when they concern obligations to implement or report on sustainability. On the other hand, hygiene regulations were considered as inhibiting,

especially when they are reflected in organizational culture, in which routines of clarification and double securing may lead to needless resource use. This aspect is something peculiar for the health sector and need to be considered when designing change programs for hospitals. In addition, limited financial resources, when related to the financing system of hospitals, may be regarded as something specific for the health-sector. Finally, experts mentioned the lacking transparency as inhibiting change. This factor probably applies also to sustainability-related change in other industries and could be translated in policy recommendations towards more transparency about carbon footprints of products.

On the meso-level, the importance of an institutionalisation and professionalisation of governance structures such as the establishment of sustainability management departments were emphasized as precondition for towards sustainability. This aspect has been mentioned also in literature, however it seems to be particularly important for change towards sustainability. Additionally, the important role of leadership and communication was confirmed: Commitment of the board and the (top) executives and a mix of well-communicated top-down and bottom-up approaches are positive factors towards change.

On an interorganisational level, according to literature, factors like collaboration, communication, partnership, trust, joint goals and coordination (Auschra 2018, Bhat et al. 2022, Eisenreich 2021, Grossmann et al. 2013, Jensen 2019) is seen to be essential for driving change towards sustainability.

At the same time, the results of the interviews show that the general approach of cooperation between hospitals and external service companies is mostly price-dominated. Based on the interviews, fundamental sustainability-orientated practice in the early phase of a cooperation between hospitals and external services with impact on supplier strategy, selection and contracts seem to be non-existent. Nevertheless, experts describe cooperative mechanisms in the ongoing business relationship, such as the involvement of the management level of the service companies in sustainability-related working groups in the hospitals. Persons engaged in these groups seem to work more freely and on an equal footing to discuss solutions beyond contractual and price-dominated agreements, enabling service companies to contribute and expand their expertise. These developments can build self-efficacy, decrease power imbalances and build trust among partners (Broumels & Nardelli, 2018).

There is some evidence that the organisational relationship (fully or partially owned subsidiary vs. external service provider) plays a role for both partners' possibilities to act more sustainable. In the given sample, collaboration is particularly high (joint working on the achievement of sustainability goals) in a constellation where the service provider is a fully owned subsidiary.

6. Implications and further research

The results of this study contribute to theoretical insights as it highlighted change factors in interorganisational contexts, such as structures and processes that enable cooperation on sustainability goals or the consideration of sustainability aspects in early phases of the cooperation (formulation of strategic goals, consideration of sustainability

in contracts). The case study character also allowed identifying factors that are particularly relevant for the health sector (e.g. patient-centred organizational culture driven by double securing hygienic aspects). At the same time, there are a number of practical implications that can be derived from the study and that have been discussed with practice partners of the project (representatives from hospitals, service companies and other stakeholders such as the German Association for Facility Management (GEFMA)).

These implications encompass for example the need to involve stakeholders (among others employees, patients, service providers at different levels of the value chain) in the development of sustainability-related policies and measures. This would be reflected in a change of understanding of internal and external service providers as strategic allies in favour of sustainability, with appropriate (contractual) conditions and appropriate communication. Furthermore, results indicate that hospitals and service providers should establish appropriate governance structures and focus more on the formulation and measurement of clear sustainability related objectives. Finally, target group-oriented communication needs to be enhanced that accompanies well-designed bottom-up and top-down change processes.

There are certainly a number of limitations of the study. Firstly, the process of deriving impact factors from literature could be enhanced by extending the literature basis and grouping context factors by means of a content analysis. Besides, because of its qualitative-explorative character, the national focus and the limited number of interviews, theoretical and practical implications have a case study character and need to be validated for other contexts. As explained in chapter 2.3 change management is influenced by a number of factors (e.g. regulatory context, culture), which vary not only between countries, but also - as in Germany - between Federal states and potentially between hospitals. These differences refer for example to the size (from small hospitals with primary care services to big hospitals providing maximum care), the agency (public, private, ecclesial), the link to an university (university hospitals) or the focus (hospitals providing a broad range of treatments versus hospitals with a focus in specific medical disciplines). Within the study, we covered some, but not all of these peculiarities, and further research would be necessary to uncover potential differences in the collaboration between hospital and service provider based on hospital characteristics or region of activity. The qualitative results of this study therefore need to be understood as a basis for further quantitative and / or trigonometrical research approaches in other national or an international context to validate and confirm its results and or uncover geographical or other differences.

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Appendix A: List of interview partners by function and characteristics of the organisation 1

List of interviewees by function and characteristics of the organisation

Number	Function	Characteristics of organisation
Hospital*		
1	Head of Central Climate Working Group	University Hospital
2	Assistant to the Managing Director	Hospital providing basic or standard care
3	Head of Executive Board Sustainability/Climate Management Staff Office	University Hospital
4	Sustainability Officer	Specialised hospital
5	Officer for Strategic Business Development	University Hospital
6	Head of Sustainability	University Hospital
7	Head of Sustainability Management Department	University Hospital
Service provider**		
1	Managing Director	Medium size organisation (regional, ecclesiastic)
2	National Consultant Facility Management	Top ranked facility management service provider**
3	Managing Director	Top ranked facility management service provider**
4	Managing Director	Medium size organisation (regional, ecclesiastic)

* Classification for hospitals by health care supply levels, based on *Gesetz zur Änderung des Gesetzes zur wirtschaftlichen Sicherung der Krankenhäuser und zur Regelung der Krankenhauspflegesätze*, 1981 (BGBl. I s. 1568)

**Classification for service providers, based on Lünendonk (2022)