

DEPARTMENT OF INDUSTRIAL ECONOMICS AND  
TECHNOLOGY MANAGEMENT

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# Benefit realization management

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# 1 Introduction

The purpose of this master’s thesis is to investigate achievement of benefits in projects, with special focus on the processes, procedures and methodologies the organizations should use - according to best practice recommended in the literature - to manage realization of benefits in their projects. According to the PMI’s Pulse of the Profession report (2017), only one in three projects (31 percent) actually realize the benefits they set out to generate ([52]). This surprising low performance rate of projects in realizing benefits, created the motive for this research project. Organizations, either in the public or private sector, undertake projects -individually or as part of programs or portfolios of projects- in order to achieve a set of well-defined overall business objectives through following the path described in their strategies and ultimately hope for realizing their purpose and visions. Business objectives vary from one organization to another but some examples could be for instance, increasing profits, maintaining or advancing market share, improving competitive advantages and gaining the upper hand in a specific market segment, public utility or even surviving in their complex and dynamic environments. While commercial projects undertaken in the private sector typically have the aim of increasing profitability for the major shareholders, public-sector projects primarily pursue political, military, social, or environmental objectives ([73]).

Independent of the type of the projects or the kind of goals they have, it is important to recognize that they are not ends in themselves and rather means to achieving higher-level ends for the targeted beneficiaries. This view on projects; however, is in contrast with the conventional approaches of project management which are based on the Input-Process-Output (IPO) model of project execution. Based on the IPO model, a project is a focused process with a limited time-frame that consumes the inputs in terms of labour, material, information and financial resources, in order to produce the predefined outputs ([78]). This short-sited view on projects has been criticised by many scholars as it looks at the project in a vacuum and ignores its contribution to the generation and realization of higher-level outcomes ([76]). Among the pioneers were Shenhar and Dvir who questioned the effectiveness of the traditional approaches to managing projects and suggested a more adaptive paradigm. The traditional project management approaches presume that a project’s ultimate goal is to get the job done on time, within budget, and according to specifications (also known as “the iron triangle”). As a result, success of projects is assessed solely based on their tactical performance and less focus is given to the business rationale behind the projects. In the traditional project management approaches, it is also assumed that projects could be decoupled from changes in their environments and business context which in turn, creates unrealistic expectations of stability. An issue that gains extra importance especially in today’s dynamic, ever-changing environments that projects have to relate to. The adaptive project management paradigm on the other hand, has a more strategic perspective on project success and believes that projects should be assessed based on their contribution to longer-term business results rather than solely their ability to meet the triple constraints. The adaptive paradigm also considers the fact that projects are uncertain, complex and highly affected by dynamics in the business environments, markets, or technological advancements([35]).

PMI introduced the discipline of benefits realization management(BRM) as a powerful instrument for aligning projects to organization’s overall strategies through identification of benefits and monitoring progress towards achieving them. However, the lack of a single, agreed upon procedure means that organizations have to establish BRM procedures on their own ([51]).

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In the first step, this thesis project aims at addressing the above-mentioned gap through conducting a literature review in order to compile the relevant theories, models and practices recommended by well-known researchers in the field of project management and particularly benefit realization management. The first research questions is as follows:

RQ1: What practices/topics are considered as relevant and/or essential for project benefit realization in theory?

In the second step, a public-sector organization; namely, Sykehusbygg HF was chosen to be further studied and researched considering the topic of benefit realization management of their projects. Sykehusbygg HF is a Norwegian hospital construction agency which was found in 2014 under co-ownership of Norway's four state-owned health authorities. Sykehusbygg HF follows the mission of becoming the leading specialist for planning, construction and restoration of hospitals in Norway aiming to provide a national competence environment for hospital planning and construction at a high international level. Sykehusbygg HF should be used in hospital Construction projects with estimated cost exceeding NOK 500 million, as announced by the Norwegian Ministry of Health and Care Services ([32]). In line with the provided background on Sykehusbygg Hf, the second research question is as follows:

RQ2: How can the knowledge acquired related to the first RQ be applied in the context of Sykehusbygg HF's projects?

In the third and final step of this master's thesis, a hospital construction project; namely, New Hospital in Drammen (NHD) was chosen as the case to be studied. The NHD project, which is currently in the construction phase, has been picked as the case of this thesis after careful considerations and several meetings with responsible consultants at Helse Sør-Øst regional health trust. This project was recommended to the author mainly because of the fact that this is one of the few projects in the hospital building construction sector in Norway that has been given careful considerations regarding processes of benefits realization management. Another factor that provided the motive for the choice of this project was the availability of the relevant BRM reports and documents. Since sufficient attention has been given to the NHD project regarding the achievement of its identified objectives, the whole processes, procedures and methods that have been used for managing realization of benefits in this project so far have been carefully documented. Helse Sør-Øst regional health trust is responsible for the project, and has established a separate project organization with resources from Sykehusbygg HF for the further work. The work is carried out in close collaboration with Vestre Viken health trust. The new hospital in Drammen will be a local hospital for Drammen, Lier, Hurum, Røyken and Sande and offer medical services to all the residents within the entire Vestre Viken HF's coverage area. Vestre Viken HF has been delegated the responsibility for concretizing the operating concepts, staffing plans and preparing the operating organization to take over the new facility. The new hospital will be located on Brakerøya and replace the current Drammen hospital and Blakstad hospital. The pre-project was completed in 2018 and the construction phase started on 14 October 2019. It is estimated that the NHD project will be ready for testing and successive occupancy in 2024/2025 ([68]). In line with the provided background on the NHD project, the third research question is as follows:

RQ3: What processes, procedures and methods are being used in the NHD project to secure realization of benefits?

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## 2 Theory

In this section, the important topics that are relevant to benefit realization management in projects have been summarized into 5 sub-sections. The theory provided below is based upon more than 70 different sources which either directly discuss benefit realization management in projects or have a similar topic which could be considered related to the issue of this master's thesis project.

### 2.1 Defining project success

Success in projects can be looked at from two different perspectives; the project management perspective and the project governance perspective. Success within the project management perspective is evaluated based on project's tactical performance in terms of time, cost, and quality. Success within the project governance perspective is measured based on project's strategic performance in terms of relevance, effectiveness, and sustainability ([63]). This is in line with Anton De Wit's distinction between project success and project management success. Project management success is measured based on producing outputs according to the triple constraints, while project success is measured against achievement of project's overall purpose or in other words, benefit realization ([73]). The perspectives stakeholders have on a project and how they accordingly assess project's success depends on their roles and responsibilities. Samset studied the perspectives of projects' key direct stakeholders, namely, the commissioner, the contractor, and the users. The contractor's focus is first and for most directed towards delivering the project's outputs according to the terms of contract laid down by the commissioner. In other words, the contractor's perspective is limited to the project's tactical performance, focusing on the agreed time schedule, budget, and specifications. The users have a broader perspective than the contractors and are mainly focused on the utility of a project or in other words, fulfilment of the project's goal. The goal of a project is the project's first-order effect that can be achieved after the outputs have been produced. The commissioner, also called the financing party has the broadest perspective on projects compared to users and contractors. The commissioners focus mainly on the fulfilment of the project's purpose, which is the long-term, highest-level objective of the project ([63]). Projects can be classified into public-sector projects such as, space, defense, education and research projects which mainly pursue political, military, or social objectives on one hand, and commercial projects owned by the private-sector which primarily pursue economic benefits on the other hand ([73]). Private owners usually attach importance to profitability or added value of their investment while public owners are more concerned with project's public utility and its combined impact on society as a whole ([63]). The figure below clearly shows that a project is undertaken as part of a process that has a longer time-perspective and follows a broader objective which Samset calls the project's goal. The process producing the project's goal is also supposed to contribute to a longer term societal process which is aimed at achieving the project's purpose ([63]).

#### 2.1.1 The logical framework method

One of the methods that has been proposed for defining and evaluating project success is the logical framework (LFM) ([6]). The LFM method helps the project participants clearly distinguish between the two separate components of project success; namely, product success and project management success. LFM does this through formulating a hierarchy of

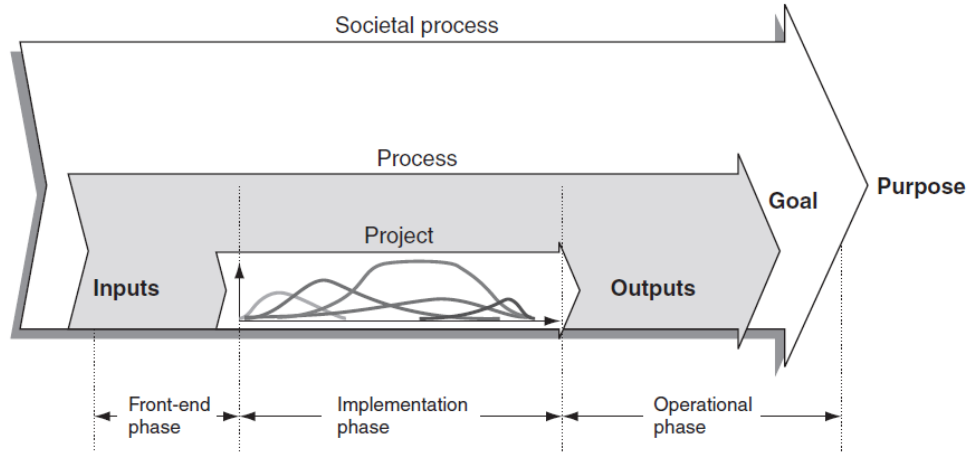


Figure 1: The project as a part of a larger process, considered in a societal perspective

Source: [63]

project objectives using a top-down approach. The project objectives are displayed in a four-level hierarchy, in which realization of objectives at each level provides the means for generation of the higher-level objectives. It starts with identification of the highest-level objective of the project, which is called the project goal and stands for the rationale behind the project. According to Jessen, a project's rationale or the underlying reasons triggering project initiation could be divided into four categories ([1]). Some projects are initiated to solve an existing operational problem that needs to be addressed immediately to maintain appropriate and profitable business. Some projects such as evaluation studies, maintenance or upgrading projects are initiated to prevent a potential problem in the future. Projects could have a particular business or strategic objective as their rationale; projects aiming at creating organizational changes or meeting new market demands are some examples. The fourth category includes projects aiming to exploit opportunities resulting from a new technology or a new market. According to Baccarini, product success is achieved when the project goal is realized. Project purpose is a project objective which exists at one level below the project goal in the hierarchy and is defined as the first-order effect of project on the target users. Realization of project purpose objective could be measured in terms of the extent to which the project outputs satisfies intended users' needs. Project output objectives are the immediate products of the project which are produced through exploiting the required input objectives such as resources, man-hours and fundings. As

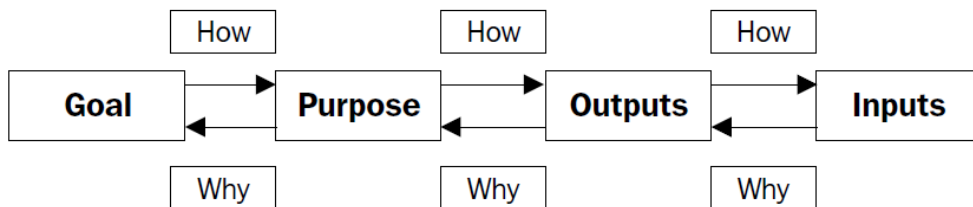


Figure 2: The logical framework

Source: [6]

shown in the figure below, LFW through showing the cause-and-effect linkages between



the project objectives, implies that project management success- achievement of output and input objectives- is secondary to product success and even when projects achieve excellent performance in terms of cost, time and quality, would still be considered failures if they cannot realise the highest level objectives ([6]). One note of caution is that the terms 'project goal' and 'project purpose' have been described differently in the literature, with Baccarini placing project goal at the highest level and Samset placing it at the second to highest level.

### 2.1.2 The Input-Transform-Outcome model

Zwikael and Smyrk state that all projects produce two different kinds of results: a cluster of predefined outputs and a set of target outcomes. While outputs are tangible, physical effects that are available immediately after the project is executed, Outcomes are defined as intangible, measurable end-effects that are realized some time after project execution is finished. Target outcomes express a desired change in the value of a particular variable such as market share, operating cost, waiting times and etc that the funder seeks to achieve through investing in the project. For instance a project can have delivering of a new bridge as an output with decreased travel time as the target outcome. Zwikael and Smyrk criticised the output-focused view of the IPO models of projects as they result in dominance of the iron triangle performance measurement criteria and ignoring benefit realization criteria in assessing success of projects([76]).In order to offer a better representation of projects, the authors ([78]) introduced the Input-Transform-Outcome (ITO) model of a project.

The ITO model is complementary to the IPO model as it displays the generation of the target outcomes which are the very reason for producing the outputs and undertaking the project in the first place. This model is consistent with the emerging approaches of project management that consider projects as means to creating change and that they are undertaken to generate profits for the parent organization. The ITO model is built on

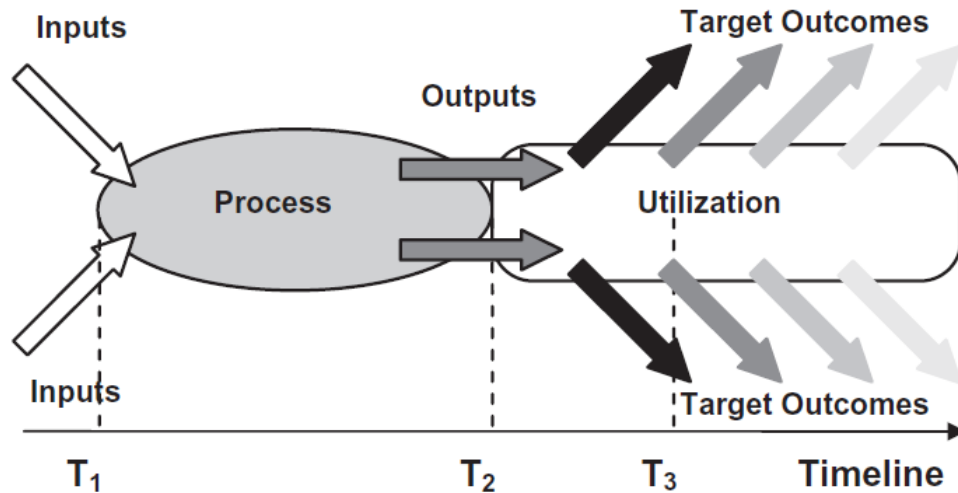


Figure 3: The Input-Process-Output (IPO) model of project execution

Source: [78]

the IPO model, to which the utilization and the flow of target outcomes have been added

on the right hand side. Utilization is the mechanism during which participation of the project customers in one or more of the downstream processes, leads to the generation of the target outcomes. Project customers are defined as stakeholders who receive the project outputs and then utilize them in such a way that contributes to the generation of target outcomes. Downstream processes are the altered operational processes whose execution by the project customers leads to changes in the measured values of the target outcomes. In the previous example for instance, the availability of the project output (the bridge) for the customers (road users) allows them to execute the downstream process (commuting between home and their office) in a shorter time, activating the generation of the target outcome (decreased travel time). As shown in the horizontal timeline below the figure, T1 stands for the time at which the project execution begins while T2 represents the time at which project execution is completed and outputs are delivered. The duration of time between T1 and T2 corresponds to the whole project duration based on the traditional approaches; however, in the ITO model this duration indicates the time required to produce the project outputs. In this model T3, which is sometime after the utilization mechanism has begun, represents project termination. T3 is the time at which a flow of target outcomes has been ensured, suggesting a longer project duration than the traditional approaches. The project is considered complete if only the actual flow of outcomes meets the target outcomes and there is enough evidence showing that this flow will be sustainable in the future. The length of the lead-time between T2 and T3 is dependent on how the target outcomes are defined and expected to be generated through utilization. This lead-time should be reasonably short enough so that the key players would still be interested in assessing project success ([78]).

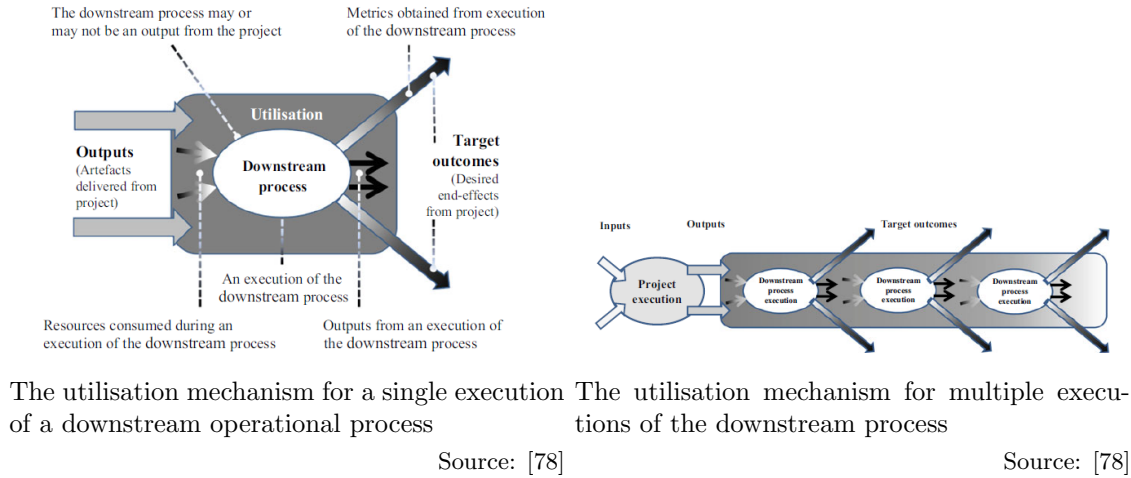


Figure 4: Downstream operational processes

Projects can affect operational processes and lead to generation of target outcomes through either creation of new downstream processes, moderation of existing operational processes, or terminating existing operational processes. The effect of the execution of downstream processes by the project customers can be expressed in terms of the changes in specific variables, also called the process metrics. Trip-time, for instance, could be considered a process metric in the bridge project example. Zwikael and Smyrk argue that the project funders -commissioners- are the most important stakeholders to consider when measuring project success. They define funders as the entities with discretionary authority to allocate economic resources to projects. They base their argument on the fact that the funders are the only stakeholders that decide on the release of funds, allowing the project to be undertaken. In accordance with the recent studies showing that efficient production of

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outputs is an incomplete measure of funder satisfaction ([75]), they conducted a survey to rank the relative importance of 16 project management factors to the funders. Among these 16 factors, achieving target outcomes came out as the most important reason for funders to invest in projects ([78]). Achievement of target outcomes results in generation of "flow of value", also called benefit, for identified beneficiaries which is not necessarily limited to the funders. It is important that a strong causal relationship exists between generation of target outcomes and benefit realization. For instance in a project to re-engineer procurement processes of an organization, achievement of target outcomes in terms of for instance, reduced costs of procurement, directly results in generation of flow of value in terms of for instance, financial benefit through cost saving ([78]).

### 2.1.3 Project evaluation criteria

The Organization for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) defined five key evaluation criteria for public interventions in 1991, namely, relevance, effectiveness, efficiency, impact and sustainability. In 2019, OECD DAC presented a revised version of the evaluation criteria which is refined and more compatible with the Sustainable Development Goals defined in the 2030 Agenda and the Paris Agreement([19]).

The criterion "coherence" has been added to the 5 initial evaluation criteria with the purpose of assessing the intervention's compatibility with other interventions (both carried out internally and externally), determining whether they support or undermine each other. This criterion emphasizes "systems thinking" and the importance of looking at projects as part of a bigger picture, considering the synergies, harmonization, and interdependencies between the project and other interventions to avoid duplication of effort or adversarial relationships between them ([19]).

Relevance has been defined as "The extent to which the intervention objectives and design respond to beneficiaries' global, country, and partner/institution needs, policies, and priorities, and continue to do so if circumstances change"([19]). In other words, when assessing relevance attention should be paid to the choice of the project's concept and goals to ensure that they match the needs and priorities of the key stakeholders. Assessing relevance is not a one-off attempt at the project appraisal. Due to the dynamic environment of the projects and the beneficiaries' shifting needs and priorities, it is imperative that assessment of relevance be repeated at specific intervals.

Both effectiveness and impact criteria intend to assess the project's effects or expected effects depending on the time the assessment takes place. These criteria are complementary to one another and diverge in the kind of effects they focus on. Effectiveness, measures the level of performance or progress projects made in realizing their first-order effects. The term First-order effects stands for the direct and primary objectives for which the project was initiated in the first place. Impact, on the other hand, focuses on the higher-level, longer-term effects which could be either intended or unintended. In other words, the impact criterion assesses the project's overall negative or positive consequences in social, economic and environmental terms.

Efficiency measures "the extent to which the intervention delivers, or is likely to deliver, results in an economic and timely way" ([19]). In this definition, the term 'results' pertains to effects on all levels encompassing not just outputs but also outcomes and impacts. For the cost-benefit analysis the reference should be what is reasonably achievable with respect to other similar initiatives and benchmarking data ([19]and[63]).

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Sustainability has been defined as "the extent to which the net benefits of the intervention continue, or are likely to continue". In assessing sustainability of projects, it is important that the capacities of the underlying systems necessary for continuation of the benefit flow over the medium and long term be analyzed. It is also mentioned that in analyzing the underlying systems, all aspects of sustainability should be considered, indicating that financial, economic, social and environmental capacities be analyzed simultaneously([19]).

## **2.2 Benefit Realization Management**

### **2.2.1 Definition of benefit**

Zwikael et al. define benefit as "the flow of value" to an entity (not necessarily the funder) which is triggered by realization of a target outcome" ([76]). Bradley describes benefit as 'an outcome of change which is perceived as positive by a stakeholder'([11]). From an organizational perspective, projects are considered as temporary organizations which are tools for achieving the base organization's strategic objectives. These projects and the positive changes they create, should result in strategic improvements in the business of the parent organization ([69]). Serra et al. defined these business strategic improvements as benefits ([65]). In other words, projects or portfolios of projects help organizations achieve their strategic objectives through generation of benefits that bridge the gap between the business's current level of value and the envisioned value level targeted by business strategies. In line with Serra et al., Badewi described project benefits as "measurable advantages owned by a group of stakeholders incurred by changing the current state through project management mechanisms". Badewi further stated that these benefits can be either financial or non-financial. While financial benefits (e.g. ROI) are measurable and estimated prior to project initiation, non-financial benefits could be either tangible (e.g. accident rates) or intangible (e.g. customer satisfaction or risk reduction)([7]). Zwikael and Smyrk categorized project benefits into two classes; project target benefits and fortuitous benefits. The difference between these two is that the former describes the predefined benefits that the funder seeks to achieve by investing in the project and the latter refers to benefits which were not planned for and might emerge as a result of the project. In identifying benefits and managing their realization, attention is given to target benefits rather than the emergent benefits. ([78]). Rolstadås et al. also defined target benefits as "what the project owner expects to obtain from using the project results after the project has been handed over to them from the project organization"([60]).

### **2.2.2 Definition of benefit realization management**

PMI's Pulse of the Profession defines benefit realization management as "the collective process of identifying benefits at the outset of a project and ensuring, through purposeful actions during implementation, that the benefits are realized and sustained once the project ends" ([51]). Similarly, Bradley describes BRM as "the process of organising and managing, so that potential benefits, arising from investment in change, are actually achieved" ([11]). Badewi offered a definition on the basis of the work by Ward and Daniel[71] on Benefit Realization in Information Technology(IT) projects as "the initiating, planning, organising, executing, controlling, transitioning and supporting of change in the organisation and its consequences as incurred by project management mechanisms to realise predefined project benefits" ([7]).

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### 2.2.3 Why is benefit realization management necessary?

As surveys show that around 70 percent of projects fail in generating the expected benefits they were undertaken to deliver, it could be reasonably argued that the adoption of BRM is necessary ([36]). BRM helps organizations select the most optimal projects and programs of projects for realizing strategic objectives through facilitating discussions about value and practicality of the initiatives ([53]). Therefore, one major advantage of BRM is enabling more effective decision making on which projects to invest in. Benefit identification as the first step in BRM, helps organizations avoid funding the wrong projects and the following financial losses ([51]). Moreover, the study conducted by Serra et al. on the correlation between BRM and project success, provided strong evidence that BRM contributes to successful execution of projects especially on criteria related to achieving strategic objectives and creating value for the business([65]). Another study by PMI found that companies reporting high benefit realization maturity, waste 67 percent less money as a result of reduced project failure rates ([53]). Despite the emphasis of literature on the importance of benefits management, the data from the PMI's pulse of the profession survey (2016) showed that 83 percent of organizations have low benefit realization maturity.

### 2.2.4 Benefit identification

PMI states that organizations need to follow a formal approach for realization of benefits and further introduced the three principals of 1- identifying benefits, 2-executing benefits management, and 3-sustaining benefit realization as the backbone of BRM ([53]). BRM starts with investigating the strategic impacts of the projects, programs, and portfolios to identify whether they can deliver the intended benefits and business results ([53] ).In other words, the business cases developed for the projects are carefully appraised in the benefit identification phase. It is imperative that all the expected outputs, planned outcomes and benefits of the projects be clearly described in the business case. During project appraisals, the relevance of project benefits to the strategic objectives of the organization and how each of these benefits are going to be generated are assessed. The discussions about project's potential contributions to achievement of organizational strategies provide the inputs for the definition of key success factors ([65]). After approving the business case, if it is approved, meaningful metrics and key performance indicators should be developed to measure and compare progress of projects in benefit realization against the planned benefits to see if the project is on the right track to achieving them. In addition to the benefit metrics and KPIs, the appropriate processes and procedures alongside the required roles and responsibilities for monitoring and measuring the delivery of benefits should be established. Companies with mature benefit realization capability also create a communications plan to report the recorded progress of projects to the key stakeholders ([53]). The following advantages of identifying benefits have been stated in the literature;

The PMI's Pulse of the Profession survey showed a clear difference in strategic results of the companies who identify benefits as part of the business case before project initiation, and the ones who do not; with the former having 74 percent of their initiatives meeting intended business results compared to 48 percent in the latter.

Companies who adopt a purposeful, and formal approach to benefit identification also experience enhanced project management success; meaning that more projects are finished on time and within budget. One reason for this could be that project teams can better maintain momentum to deliver the project knowing why these projects are needed and how they can contribute to organization's progress or even in some case survival.

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Benefits identification is a brainstorming session that paves the way for important discussions and analysis of project's value to the stakeholders. These discussions provide the decision makers with real insights into which projects to prioritize and what the appropriate level of investment for each project is, relative to other initiatives. Benefits identification also helps organizations more clearly delineate between the tangible (quantitative) and intangible (qualitative) benefits ([53]).

Chih and Zwikael noticed that there was a gap in the literature about how project benefits should be formulated and appraised; therefore, they conducted extensive interviews with senior managers to develop a conceptual framework in the context of public projects. Their study found that seven factors are of special importance during project appraisal:

1-strategic fit; assessing whether project's target benefits closely align with the organizational strategic goals.

2-Target value; meaning that benefits are clearly defined to avoid ambiguity and various interpretations through having a baseline and setting a specific target value. 3-Measurability; it is imperative to set measures for target benefits so that their achievement could be assessed in project evaluations, considering the fact that it is more difficult to define direct measures for intangible benefits. 4-Realism; that target benefits are reasonably achievable factoring in all the constraints and contextual limitations to avoid optimism bias.

5-Target date; target benefits should have a predefined realization target date that is sometime after the project outputs have been delivered and their utilization by the project customers has started.

6-Accountability; assigning clear accountability for project's benefit realization is crucial for ensuring their generation (to be further discussed in another chapter)

7-Comprehensiveness; that a complete set of target benefits addressing different stakeholders' needs be developed. Also the fact that benefits from different categories such as financial/non-financial, long/short termed, direct/indirect, and from different level goals-strategic/tactical/operational- be included([16]). The necessity of a formal and explicit benefit formulation process for successful benefit realization in Information System (IS) development projects, has been proved in the study conducted by Doherty et al. in the context of public projects ([21]). PMI's Pulse of the Profession survey findings showed that organizations who use formal approaches for BRM have better project performance (efficiency) and more successfully deliver on strategy (profitability/ROI). From the organizational perspective, formal approaches to BRM include practices that can be replicated across projects, such as following a predetermined process for reporting benefit realization, using standardized documentation for reporting metrics and KPIs related to benefit realisation, and routinely receiving information on projects actual performance against the determined metrics([51]).

Chih and Zwikael's study showed that a formal benefit formulation process in the context of public projects, engages end-users and governing stakeholders in order to reflect all stakeholders' needs, fosters cross-functional collaboration among different government agencies to develop a shared understanding of the project benefits, and conducts benchmarking studies to compare the formulated benefits with the ones of the similar projects in the past to check their realism or getting them quality assured by external consultants ([16]). In their study, Chih and Zwikael also showed that managers' high public service motivation and willingness to do public good, senior executive's leadership to direct the

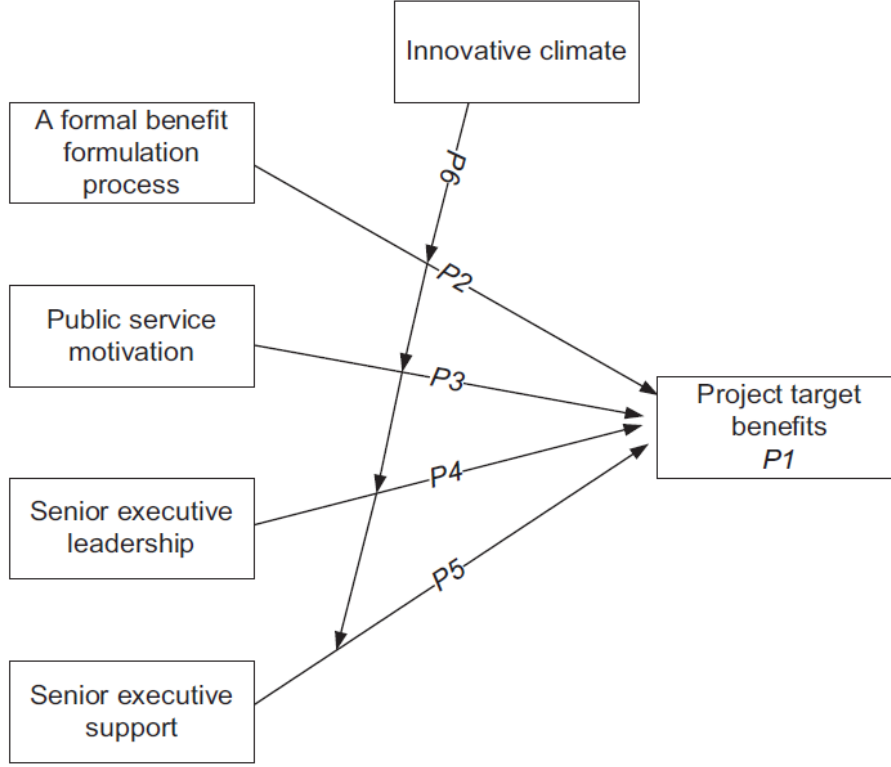


Figure 5: Conceptual framework for public projects benefit formulation and appraisal

Source: [16]

benefit formulation process toward the government’s vision and present a single point of accountability, and senior executive’s support for the project by provision of the necessary resources and commitment could largely improve the benefit formulation process. In the end, it was mentioned that a highly innovative environment that supports creativity and is open to change, could enhance the combining effects of the previously mentioned factors as an important contextual factor ([16]).

### 2.3 Benefit management ownership

Identifying benefits alone does not guarantee their realization but is an important initial step in the BRM journey. PMI defines the second step, Executing Benefits Management as “the practice of minimizing risks to future benefits and maximizing opportunity to gain additional benefits”. The important questions now could be ‘who should be held accountable for benefit management?’ and ‘what are the roles and responsibilities of the individual/group accountable for it?’. It is essential that an entity or individual be assigned a clear point of accountability for benefits realization. Otherwise, as Harrin mentioned, benefit management could disappear through the cracks and deprived of the attention it deserves when neither project managers, operational managers nor senior executives know if this falls within their domain of responsibility ([29]).

The individual accountable for benefit realization has been given different terms in literature such as, the ‘project owner’, the ‘senior responsible owner(SRO)’, the ‘project sponsor’ or the ‘business owner’.

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Turner and Muller define project owner as "the individual holding the project's business case with a special focus on keeping the project aligned with organizational strategy, who is ultimately held accountable by the senior management for project's success" ([41]). That owners are responsible for business case means that the parent organization is relying on them to cancel a project if its business case stops being valid or justified ([37]).

Zwikael and Smyrk define the role of the project owner as "an individual appointed and held accountable by the project funder for the realisation of target outcomes". They also point out that the funder her/himself might decide to fill in this role in some cases ([78]).

The Office of Government Commence(OCG) defined the role of senior responsible owner as "the individual responsible for ensuring that a project or program of change meets its objectives and delivers the projected benefits" ([28]).

The APM Body of Knowledge defines the project sponsor role as 'accountable for ensuring that the work is governed effectively and delivers the objectives that meet identified needs' ([54]).

PMI's pulse of the profession defines the business owner role as "individual who takes overall responsibility for monitoring and measuring benefits and ensuring they are achieved" ([51]). For the sake of simplicity, the individual/steering group accountable for benefit realization is referred to as the project owner in this report.

Johansen et al. describe project ownership as a composite function that includes four different roles; the asset owner, the Project Executive Officer(PEO), the sponsor, and the users ([37]). The asset owner is responsible for project portfolio management; meaning selecting and managing the right combination of projects. The asset owner must put together a balanced portfolio of investments that would have the highest return for the parent organization whilst considering the funding and resource limits; therefore, the portfolio should only consist of high-impact projects that each play a role in realizing organizational strategies ([49]). The asset owner being responsible for both cost and income of the projects, has the decision-making authority and owns the business cases ([37]). The PEO, appointed by the project owner, serves as the point of contact between the owner's organization and the executing party and is responsible for governing and supporting the project organization in efficiently delivering the predetermined outputs on time and within budget. The sponsor is an individual/organization responsible for provision of funding and securing resources for the project and could be outside the owner's organization ([37]). Samset names this role the financing party ([63]), while Zwikael and Smyrk refer to it as the project funder ([78]). lastly, the owners are defined by Johansen et al. as the ones to whom results of the project (project outputs) are delivered in order to be applied or operated. The users might be either employees of the same organization (internal) or another separate organization as a client (external) ([37]).

### **2.3.1 Project manager's role in BRM**

Zwikael et al., assign single point of accountability for benefit realization to the project owners, meaning that they are held answerable to the funder for achievement of project strategic goals. They further argue that neither the funders nor the project managers should be held accountable for target benefit realization. They base their argument on the fact that the project funder (senior executive), typically being responsible for a portfolio of investments alongside his/her other organizational commitments, would not have enough time to fully involve with each project. Also the senior executive's expertise lies within



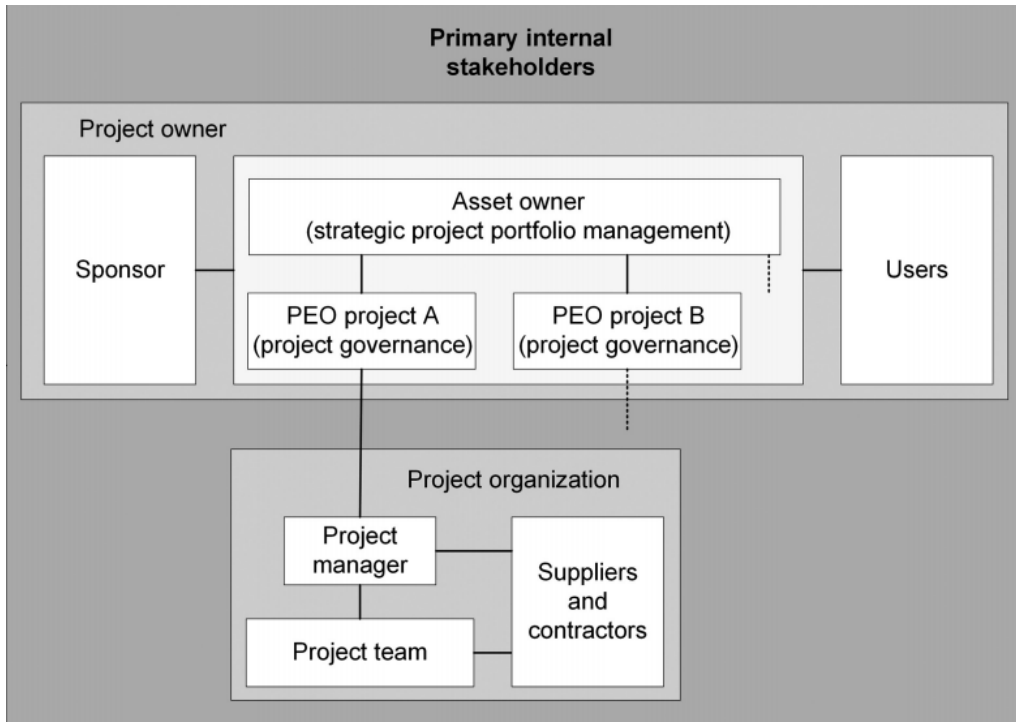


Figure 6: Project ownership

Source: [37]

the domain of making strategic decisions rather than tactical decisions at the project level; therefore, they lack the necessary skill set for closely monitoring projects' performance. They also state that project managers should be held responsible only for delivery of the project's outputs and not the target benefits for the following three reasons. First of all, project managers are more focused with objectives related to efficiency of the projects rather than effectiveness, because their performance is typically measured based on different criteria (time, cost, and quality) than target benefit realization. Second, accountability for benefit realization should be assigned to an individual with a more permanent role in the organization than project managers, because usually target benefits are realized some time after project's completion and project managers have a transient role which ends after delivery of outputs. Lastly, project managers are typically introduced to the specific projects after the front-end has passed, so they are left out of the strategic phases where the choice of project concept and benefit identification takes place ([74]). On the contrary, PMI's pulse of the profession survey findings showed that organizations with high benefit realization maturity hold cross-functional teams consisting of project managers, business owners, and senior executives, collectively responsible for benefit realization. They considered benefit realization management as a team effort, to which all participants contribute through sharing their own expertise, and no specific role or function is of more importance compared to the rest of the team. The report attached especial importance to the role project managers should play during the execution phase for realizing target benefits. The organizations that more fully realize benefits, hold their project managers responsible for monitoring project's KPIs and benefit metrics to determine if the projects is on the right track to realizing benefits. In these organizations, project managers' performance is not solely assessed based on the triple constraints. In addition to being responsible for output delivery, they are provided with incentives to hold on to the benefit focus throughout the project life cycle. Therefore, it is necessary that project managers also participate in the benefit identification process so they can fully understand the goals of the projects and

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how they are supposed to deliver value to the parent organization. Their second important responsibility is reporting and communicating project's performance indicators, especially the benefit-specific metrics to the project owners and senior executives, providing them with real-time insight into the progress of projects. This real-time data enables business owners to determine whether projects would be able to deliver the use-value expected of them. If not, the business owner would then have the opportunity to take drastic measures through redefining/redirecting the investment, or even killing the project in spite of the time and money spent on it so far. The third responsibility of project managers regarding benefit realization could be ensuring that the project target benefits stay aligned with the strategic objectives of the parent organization. However, the above mentioned responsibilities do not fall on the project managers alone and are shared among the cross-functional project team ([51]). APM emphasizes the importance of the project owner's role both during the front-end phase of projects-for benefit identification- and after project output delivery-for ensuring proper transition to business-as-usual, as the greatest risks lie in these phases and typically the project execution team have their lowest involvement ([2]).

### **2.3.2 Project owner's role and responsibilities in theory and practice**

Crawford et al. distinguished between the two perspectives of the project owner's role. Due to the fact that the owner works in the interface between the permanent organization and the temporary organization (project/program), his/her role could be looked at from two opposing directions. One of the directions-from permanent organization towards temporary organization- defines the project owner's role as providing governance and oversee of the projects and/or programs on behalf of the parent organization. The opposite direction, on the other hand, is mostly interested in the project owner's role in providing top management support for the projects ([18]). Crawford et al. also mention that depending on the circumstances, the project owner might have to add more weight to one perspective of his/her roles. For instance, in dealing with projects that are mission-critical or are tied to high financial risks for the parent organization, when project failure would impose severe consequences, the project's performance cannot live up to the base organization's expectations, market conditions have high pace of change and uncertainty, there has been changes in the organizational strategy and therefore the project needs to be realigned with the new context and etc, the owner's governance role would be dominated. Within these circumstances, the owner's role in representing the parent organization's business requirements and interests on the projects and making sure that they can deliver value, is emphasized. The parent organization is counting on the owner's expertise and business acumen to take drastic actions such as reprioritizing, restaffing, redefining, or even terminating projects whose business cases seem to be no longer solid from a business point of view. On the other hand, the owner might emphasise championship when the base organization is failing to provide projects with required resources or critical decisions for their progress, there seems to be resistance against the project at least in some parts of the organization, there is lack of consensus among different stakeholders in the parent organization about the projects' scope or goals and each try to impose their own definitions, or when the project management team are inexperienced or have a poor performance. Within the mentioned circumstances, it is essential the the owners have sufficient seniority and authority in the parent organization so that they can defend the project at the higher organizational levels especially when there is fierce competition between projects for limited funding and resources available ([18]). In line with Crawford et al., Bryde also distinguished between the perspectives of the role of the project owner and mentions a couple of responsibilities for each. He defined the governance perspective as "external focused

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client-representing”, which includes activities such as benefit (business result) identification, establishing project strategy highlighting the priorities, defining benefit metrics and success criteria, monitoring the business environment of the projects throughout their whole life cycle -including terminating projects is necessary-, and ultimately seeing that projects deliver the expected benefits. He describes the other perspective as ”internal focused supporting/championing” including tasks such as making a commitment to the project manager in provision of sufficient resources-for instance project staff, supporting project managers in accomplishing their roles, providing the project staff with necessary training, and generally creating a favorable climate for projects to fulfill their objectives in the parent organization. Furthermore, he argues that classifying owners’ role only into two categories of external-focused and internal-focused is an oversimplification of their roles. He suggests a third class called ”Internal/external focus, championing” perspective, which consists of two activities from the external-focused perspective, namely, monitoring the project’s business environment and terminating a project if necessary, and one activity from the internal-focused perspective which is provision of resources to the project manager. He justifies inclusion of the ”canceling a project if appropriate” activity into the championing perspective as a logical extension, meaning that a true project champion who has defended the project all the way and worked hard to overcome organizational resistance against it, should also be able to take a drastic measure and terminate the project knowing that it is doomed to failure ([15]). To get a better understanding of the project owner’s role in practice, Olsson and Berg-Johansen conducted interviews with project managers and project owners of seven governmental IT projects from six public organizations in Norway. They found out that the ideal picture that is described in theory and textbooks does not match the definition and responsibilities of project owners in practice. In theory, as mentioned earlier, project owners are responsible for both operations benefit realization- through governance mechanisms- and efficient execution of the project and output delivery- through providing project managers with top-management support/championing. Project owners being described as owners of the business case who are ultimately responsible for projects delivering business results, should be located relatively high in the organizational hierarchy, where the strategic decisions are made, to have the requisite authority to accomplish their roles. Olsson and Berg-Johansen highlight the fact that project owners are in the perfect position to weight project costs against benefits because they have incentives to maximize value creation of the projects. They have the required incentives because, depending on their role definition, are either held accountable as an agent for benefit realization on behalf of the funder, or directly motivated to maximize benefit realization of their owned resources ([48]).

However, the survey findings showed that in practice the project owners were senior managers whose responsibilities were limited to ensuring project delivery- the cost side- rather than being involved in the strategic level decision-making and owning the business case- both the cost and operational benefit side. This means that their responsibilities were confined to providing top-management support for the project managers mainly through securing allocation of organizational resources and funding to the project team ([48]). In order to address the mismatched perceptions of the role of project owners in theory and practice, Olsson and Berg-Johansen made a distinction between two types of this function. Project owner type 1 would be described according to the definitions of the role provided in theory, responsible for both benefit realization (business results) and efficient project execution (output delivery). Project owner type 2 is based on the perceived definition of the role in practice, which covers mainly strengthening project output delivery through provision of senior support to project managers ([45] and ([48])). Breese et al. conducted a research through interviews with managers who used to work as project sponsors at a

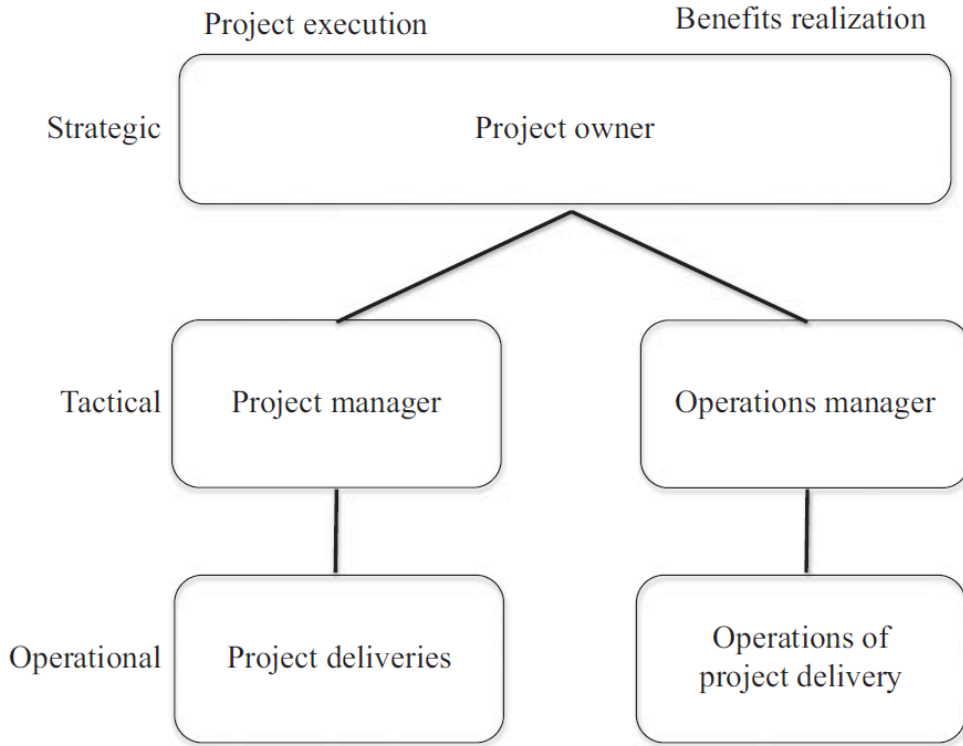


Figure 7: Project ownership role as described in the literature

Source: [48]

hospital which is a foundation trust in the National Health Service (NHS) in England. The research aimed at providing a real picture of project sponsorship in practice based on how the project owners experienced their roles and how they defined their responsibilities for benefit realization. They classified the project owners' conceptions of their role into three categories: "just doing the day job", "the capable manager", and "wearing two different hats". The first conception is related to executive directors who did not differentiate between their day-to-day role in the organization and project sponsorship. The underlying perception was that the executive directors' seniority in the organization sufficed for the project ownership role and that they did not receive training to acquire a different or additional skill set for it. Most importantly, perhaps, was that these senior executives did not even mention benefit realization as a function of the sponsorship role. The sponsors who experienced the second conception described sponsorship based on their own personal views and understandings of the role rather than a formal standardized approach. From their point of view, sponsorship mainly concerned project delivery but they also mentioned benefit identification as an important part of the sponsor's role during the front-end phase. However, they did not consider themselves accountable for benefit realization after project termination. Only in the third conception, were managers clearly aware of their domain of responsibilities as project sponsors and held themselves accountable for benefit identification as well as benefit realization. Unlike the first two conceptions, in which project sponsors were expected to be able to undertake the role because they have obtained seniority as executive directors, the third conception emphasized the importance of providing project sponsors with specific guidance or training in order to equip them with the necessary knowledge and skill-sets required for the function ([13]).

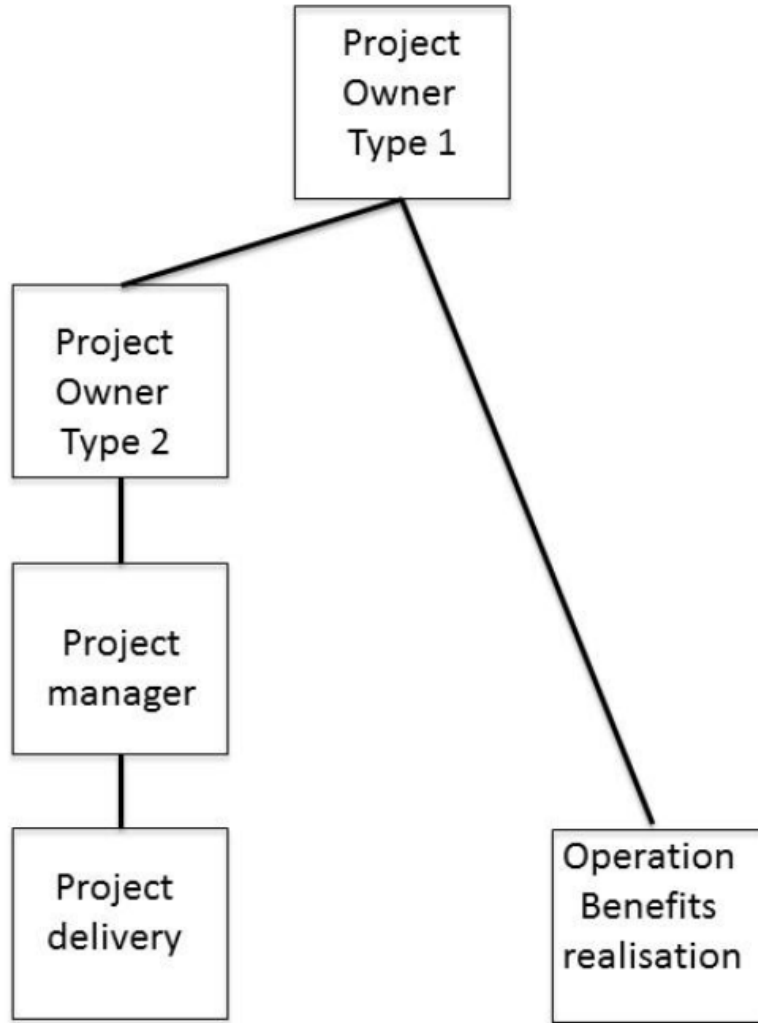


Figure 8: Project owner type 1 and 2

Source: [48]

### 2.3.3 Required characteristics of project owners

APM described three fundamental attributes necessary for project owners: 1-good leadership qualities meaning that they are credible, confident, and authentic enough, 2- ability to work in an environment with high levels of uncertainty and ambiguity, 3-possessing a good understanding of both project execution and the dynamic nature of the business and its environment ([2]). In his study, Andersen [1], investigated to what extent in practice the project owners possess the desired attributes recommended for them in theory. His survey findings showed some important flaws and weaknesses which were partially on the part of the project owners themselves, and partly due to the structure of the parent organization. For instance, it is important that project owners have excellent interpersonal skills and be willing to motivate the project teams and provide them with support whenever the need for it arises. Although all the project owners in the interview thought that they had the ability to motivate and support the project team, nearly half of the project managers judged the owners' performance poorly in this regard. The survey results also showed

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that there is clear room for project owners to improve their communication skills. Good communication skills is an especially important attribute for project owners as close collaboration with project managers is a critical success factor for benefit realization. Another attribute recommended in literature for project owners is seniority and a relatively high organizational level, which almost all the survey respondents agreed with and perceived owners to have appropriate authority and power within the organization ([1]). One point worth mentioning is that despite seniority being a key requirement for project owners, giving them authority and power to defend the project at high organizational levels, with more seniority comes a broader scope of responsibilities, and consequently less time to devote to each of them ([18]). On the other hand, it is imperative that the project owners be well aware of the accountability associated with their roles and dedicate enough time and commitment to undertake them with special focus on creating relationships between the project teams, the intended beneficiaries, and impacted areas of business ([2]). In this context, appointment of mid-level managers such as business or operations managers who can more closely monitor daily challenges of the projects has been recommended ([74]and[13]).

## **2.4 Project Governance**

project governance has been recognized in literature as a crucial factor that paves the way for adoption and implementation of benefit realization management approaches in projects ([11]). According to Muller, corporate governance is essential as it "provides a framework for ethical decision making and managerial action within an organization that is based on transparency, accountability and defined roles" and "Without a governance structure, an organization runs the risk of conflicts and inconsistencies between the various means of achieving organizational goals, the processes and resources, thereby causing costly inefficiencies that impact negatively on both smooth running and bottom line profitability" ([40]). Projects as temporary organizations also need their own governance structures, in which key project players are identified and their roles and responsibilities are clearly described. The overall governance structure present in organizations is usually inadequate for projects because the corporate governance is based on operational processes in organizations, and hence functionally-oriented. Therefore, the accountability arrangements and reporting lines described in the corporate governance would not sit well with unique and transient project teams who are gathered together from across functional and organizational boundaries ([78], [77]). Garland defines project governance as "the framework within which project decisions are made". The aim of project governance has been defined in the literature as delivery of the projects' target benefits which are aligned with the strategic objectives of the organization ([40]).

### **2.4.1 Underlying principles of Effective Project Governance**

Garland describes four principles underlying Effective Project Governance (EPG):1- "Ensure a single point of accountability for the success of the project". Garland states that at the governance level, where the strategic decisions are made by the steering committee, it is essential that all concerned have comprehensive role statements which clearly define their accountability and responsibilities. At the governance level, the most important accountability is for the project success/benefit realization and it is imperative that one person is nominated and held answerable for it. 2- "Service delivery ownership determines project ownership". Garland highlights the fact that organizations must first and

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foremost focus on the services they deliver rather than the assets they produce and those assets should be considered as tools/platforms for provision of some kind of service for the end users. Another point is that many factors are in play that force organizations to continually improve their service levels in order to remain competitive or even survive in their dynamic environments. Technological developments such as radical innovations, introduction of new laws and legislation for organizations, environmental factors, and population increase are some examples. Organizations can best respond to these changes in their environments and enable new, more effective, or more efficient service levels through the use of projects or programs. The same logic applies to projects or programs, meaning that they are justified in the services they provide rather than the assets they produce. As a result, Garland argues that the operational side of the organization who are owners of the services and responsible for their ongoing operation, must be assigned ownership of projects/programs and ultimately be held accountable for their success. This is especially important for benefit realization because when the ownership of projects is given to the delivery side of the organizations, who are responsible for producing the projects' assets, discrepancies between the the project outcomes and the organizations' service requirements could follow as a major consequence. Zwikael and Smyrk further elaborated this point by directly assigning accountability for benefit realization to project owners on behalf of the funders. Moreover, they argued that project owners can better exercise leadership and guide the work of projects through holding project managers accountable for production and delivery of the project outputs([78]). 3- "Ensure separation of stakeholder management and project decision-making activities". Garland emphasises the fact that the project decision-making committees should consist solely of the stakeholders whose inputs are absolutely essential for leading the projects and making pivotal decisions. Involvement of more stakeholders than necessary could prevent timely and effective decision making which is the main role of the project governance body. On the other hand it is imperative that the stakeholders who are left out of the decision-making forum, be sure that their needs would be addressed through appropriate stakeholder management mechanisms. 4- "Ensure separation of project governance and organizational governance structures". As mentioned earlier, the reason projects need their own governance structures is that the standing corporate governance framework of the base organization is not adequate for these temporary organizations. Garland states that it is important that the project governance bodies, which coexist within the governance structure of the parent organization, have the requisite authority to make final decisions about projects and that these decisions would not have to be further ratified by executives in the base organization, thereby reducing the number of decision-making layers ([27]). In line with Garland, Zwikael and Smyrk also stress the importance of keeping the project's governance structure separate from the governance framework in the parent organization. They base their argument on the fact that project governance has the purpose of providing a framework which shows the arrangement of roles and reporting lines within the project organization rather than how projects are managed within the base organization ([78]).

## 2.4.2 Project governance framework

Zwikael and Smyrk proposed a generic project governance framework which is comprised of nine project roles within four divisions of steering, delivery, reference, and assurance. In the steering division, the steering committee, which is comprised of powerful project supporters and chaired by the project owner, have the ultimate responsibility for approving the business case and the project plan in the first place and then leading the delivery division throughout the whole execution phase in order to ensure target benefit realization.

The delivery division- comprised of four roles, the control group, the project manager, the project administrator and the project team- is ultimately responsible for producing the project outputs according to the baseline documentations. The project control group is comprised of senior managers of the organizational departments which provide resources to the project and is chaired by the project manager. The control group has the role of leading and guiding the project team throughout the whole execution phase. In the case that the project administrative work – also called “above-the-line work”- requires more time and effort than the project manager and related team members can dedicate, a project administrator is nominated. Zwikael and Smyrk define project above-the-line work as maintaining and updating the project’s scope documentation, including definition of outputs together with a list of “fitness-for-purpose” features, supporting implementation of stakeholder management processes, overseeing the project’s WBS and schedules of milestones, resource management, risk management, and issues management. The project team comprising of designated organizational staff, external contractors, suppliers, and consultants all work together under the project manager’s leadership to deliver the outputs ([78]). The reference division is comprised of stakeholders or specialists whose inputs

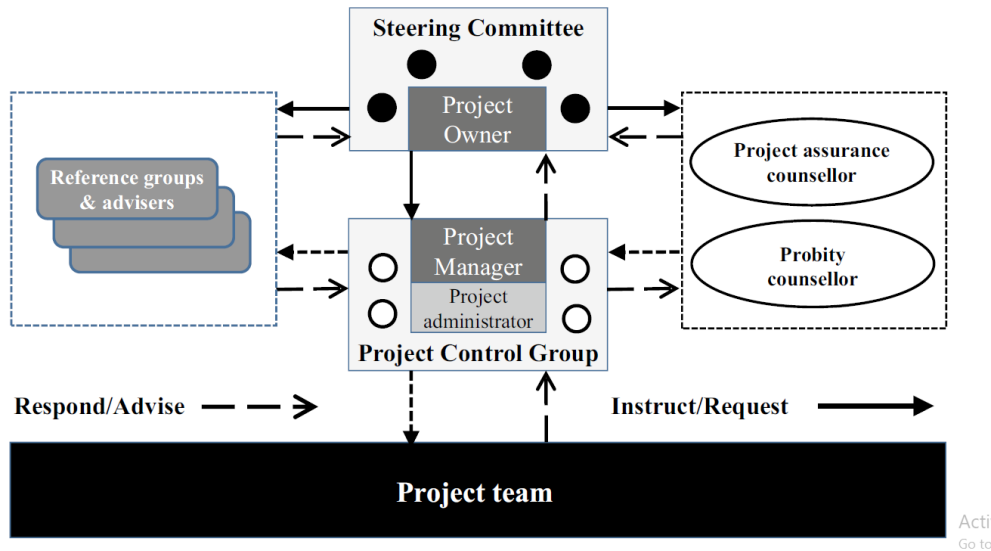


Figure 9: The generic project governance framework showing nine roles within 4 divisions

Source: [78]

could be of value for either the steering committee or the project team. For instance, the stakeholders who were not appointed in the steering committee, should also be able to voice their inputs and the creation of reference groups is one way projects can engage these stakeholders. Another example is appointment of external advisors such as lawyers -who are not part of the project teams because their work is not subject to supervision by the project managers- in order to offer specialised input to projects. The assurance division is made up of independent counsellors who monitor the project on behalf of the steering committee and provide guidance and advise for project managers when they need it. The two common counsellors, project assurance counsellor and probity counsellor, are hired to ensure that the project work and related commercial dealings with external contractors are being undertaken according to the project management framework and commercial guidelines chosen by the steering committee on behalf of the funder ([78]) Musawir et al. conducted a survey of 333 projects across various industries to investigate the interrelationship between project governance- focusing on the strategy-oriented view- and benefit



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management and their effects on project success. Their research found strong evidence that EPG lays the necessary foundation for implementing benefit realization management practices and the combined effect of EPG and BRM is improving success in the three dimensions of project management, project ownership, and project investment. EPG has the ultimate goal of realizing projects' target benefits through aligning project goals with organizational strategy in the first step and then making sure that the projects deliver the necessary outputs and outcomes that lead to generation of benefits. Musawir et al. state that EPG facilitates successful adoption of benefits management in practice. They base their argument on the fact that EPG establishes a framework of accountabilities for benefit management that clearly defines relevant roles and responsibilities. For instance, in an EPG system the project owner and the project board take on two major responsibilities; 1- the responsibility to provide project teams with their required resources together with top management support 2- the responsibility for continuously monitoring strategic organizational objectives and making sure that projects' goals and benefits stay aligned with them. Furthermore, EPG sets benefit-related objectives for projects that could, in turn, provide the project owners with incentives to own benefit realization management and even commission the development of lacking organizational processes that could facilitate implementation of benefit management approaches in practice ([42]). Serra and Kunc:

### **2.4.3 Theoretical perspectives of project governance**

The following theories have been dominant in the literature regarding project governance: Agency theory, and Transaction Cost Economics (TCE) ([40],[10]). Agency theory in the context of corporate governance, refers to the fact that shareholders in a company- the principals- delegate the decision-making authority to the managers- the agents. This delegation of authority could lead to potential problems in the relationship between the two parties in the absence of proper contractual laws aligning the interests of the agents with the principal. The following problems could result from the potential conflict of interest between the principal and the agent if both are trying to maximize their own utility and benefits: 1- during the pre-contractual phase, the "adverse selection problem" emanates from the fact that the principal has more information, compared to the agent, about the task that is supposed to be carried out by the agent, this is referred to as information imbalances between the two parties. 2- after the terms of the contract have been negotiated and accepted by both parties, the "moral hazard problem" could result due to the information asymmetries between the principal and the agent. The first consequence is that the principal cannot have complete information on the performance of the agent and as a result could not monitor his/her performance fully or at least without bearing costs- referred to as "agency costs". The second consequence is that the agent would naturally have access to more task-related information than the principal due to closer involvement with the project activities ([40]and[41]). In the context of projects, the same principal-agent type relationship could exist between the project owner as principal and the project manager as agent who has been delegated the responsibility for output delivery through day-to-day management of the project on behalf of the principle. As a result of the information asymmetry, meaning that the project manager has more information about the project than the owner and can make decisions on behalf of the owner, the principal-agent theory claims that unless the interests of the project managers are aligned with the ones of the owners, there is potential that the managers would act on their own best interest and opportunistically try to maximize their economic position. To prevent this problem, the agency theory suggests using contracts that create incentives for project managers to take actions that are in line with the owners' interests. In the corporate governance context,

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TCE is used as a basis on which, ‘make or buy’ decisions in the organization are made. TCE can help organizations identify the most appropriate governance structures that allow decreasing the impact of the drivers of transaction costs by the use of contractual agreements and risk sharing practices, thereby achieving the minimum possible transaction costs. In the context of project governance, with projects being considered as transactions, TCE could have applications for the make or buy decision- whether projects should be undertaken internally or bought in the market- followed by the choice of contracts- aiming for minimizing governance and transaction costs ([41],[40]). In line with the TCE and agency theory, Zwikael and Smyrk stress the importance of distinguishing between the roles of a ”purchaser” and a ”provider”. They argue that based on the fact that a project is a form of transaction during which the buyer- the project owner on behalf of the funder- purchases the required outputs from the supplier- project manager, it is imperative that for the sake of clarity and transparency, accountability and responsibilities of these two entities be separated ([78]. TCE claims that the choice of proper contract type should depend on which side, the project owner -as buyer- or the project manager -as supplier, controls the risk. For instance, in projects that the major risk lies in the execution process, a fixed price -lump sum-contract would be suitable as the delivery side controls the risk. On the other hand, in projects that the major risk lies in the design specification and definition of the output and quantity of the work is hard to determine, re-measurement contracts in which the delivery side bears the minimum risk and the owner controls the risk are typical. ([40],[10],[41]).

#### **2.4.4 Relationship between project manager (delivery side) and project owner (funder) in light of principal-agent and TCE theories**

The importance of an effective relationship between the project owner and the project management for success of projects has been emphasized in the literature. For instance, Bryde stated that in order for project owners to be able to successfully accomplish their tasks as the interface between the project ownership -commissioning party- and the delivery side -executing party, it is important to maintain cooperative relationships with project managers ([15]). Both project owners and project managers are dependent on this effective communication in order to obtain the necessary information for undertaking their accountability. The project owners need project managers to provide them with information on the project’s progress to assess if the appropriate process and control mechanisms are being followed enabling the project to produce the required outputs within budget and schedule requirements. More importantly the project owner needs to monitor project’s KPIs throughout the whole life-cycle to make sure that utilization of the end deliverable would result in generation of target outcomes. The quality of these assessments is highly dependent on project managers’ reporting accurate information to the project owners in a timely manner. On the other hand, the kind of information and input the project manager need to obtain through effective communication with the owners depends on the project phase. For instance, during the planning phase the project managers need as much information as possible about the owner’s requirements, priorities, and business strategic objectives together with the actual context of the project and potential constraints in order to develop a good overall understanding. During the execution phase, the project managers need owners to monitor and review the performance of projects up to that point and approve the deliverable or offer recommendations and help guide project managers. At the close-out, the project owners receive the produced outputs from the project managers and should provide them with further insights and overall feedback enabling project managers to draw lessons for future projects —[41]). Muller [39] studied the communica-

tion structures existing between the project owners and managers across 200 projects and developed the following model accordingly.

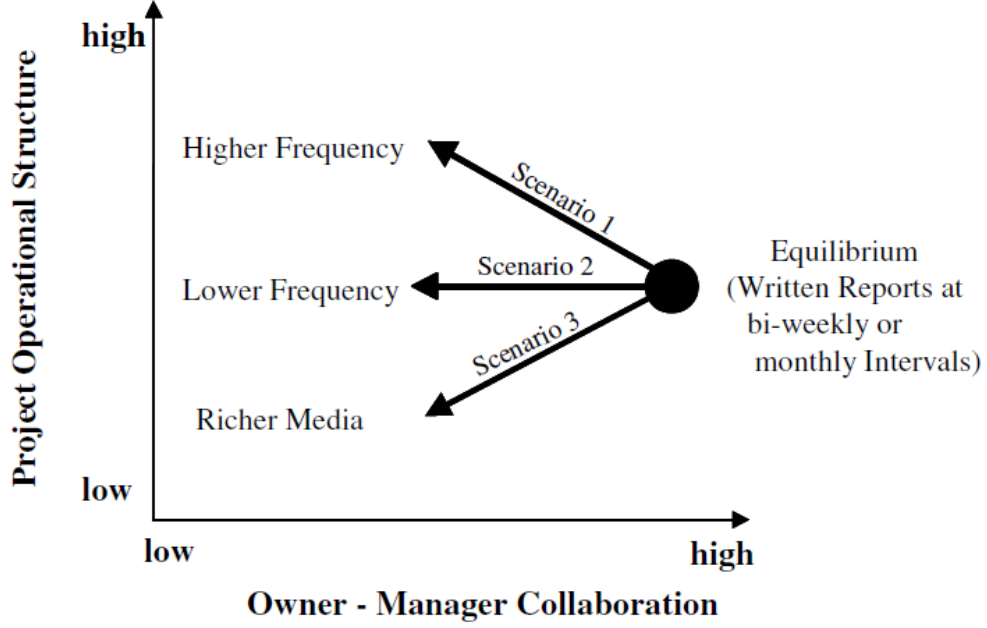


Figure 10: Underlying communication structure in the relationship between project owners and managers

Source: [41]

The horizontal axis represents the level of collaboration between the owners and the managers and the further right on this axis indicates more frequent, flexible, and proactive information exchange between them. The vertical axis represents the level of organizational bureaucracy existing in the reporting structure that the project managers should adhere to in their communication with owners. The equilibrium point which corresponds to "highest levels of collaboration and medium levels of structure", is derived from the underlying communication structures of the most successful projects ([41]).

## 2.5 Flexibility management and chasing opportunities

Opportunity management is a topic closely related to benefit realization management ([37]). Johansen et al. defined opportunities as "factors, variations and events that may lead to higher value or benefit for the project owner during the execution of the project" ([38]). In the previous definition, the term "value" stands for economic value in terms of higher NPV while "benefit" stands for non-financial gains such as improved functionality. Opportunities could be looked upon from three different perspectives; the perspective of the project management, project owner view, and society view. The first perspective considers opportunities as related to the triple constraints; creating value in terms of time savings, cost savings, or improved quality within the same budget and schedule. The project owner is more interested in opportunities leading to creation of value or benefits for him/herself in the production phase. The last perspective considers opportunities as value/benefit generation in an overall societal landscape ([37]). In practice, exploiting opportunities is not considered an easy task as it usually requires changes in scope and the

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original plans that were once regarded as the best possible solution ([38]), which leads us to the topic of project flexibility. Flexibility has been a controversial topic in project management literature as it has been considered beneficial by some stakeholders while regarded highly unfavourable by some others. Perceptions of flexibility also varies depending on the project phase; while flexibility is typically regarded valuable in the front-end of projects where there exists room for maneuvering, after the front-end phase when the project is under execution, flexibility is avoided as it entails change requests leading to high cost overruns ([43]). Olsson conducted a study to investigate different aspects of flexibility in large investment projects in Norway ([47]). His findings proved in practice that the stakeholders on the demand side of projects, the owners and users, consider the long-term perspective of projects and have incentives to request scope changes throughout the whole life-cycle and, as a result are supportive of flexibility. on the other hand, the supply side of projects, project management and contractors, manifest a clear shift in their perception of flexibility from positive in the front-end phase to less positive in the planning phase and absolutely negative in the execution phase. The reason for this shift could be that they are responsible for the cost side of projects and change requests on the side of owners or users could have severe cost implications when the project is well underway ([47],and[43]). Olsson distinguished between planned flexibility and actual flexibility as he noticed that approaches to flexibility changed during most of the projects in the case study. Projects which had planned for low or medium levels of flexibility in the decision process had to adopt more flexible approaches such as iterative, incremental planning and decision making in practice ([47]). He also made a distinction between internal and external flexibility stating that "internal project flexibility relates to flexibility within a defined scope – how requirements are to be met while External project flexibility refers to the adjustments in the project scope – what requirements are to be met".([46]). Project flexibility has been discussed in relation to the two trends in project management literature, namely, the governance perspective and agile perspective. As discussed earlier, the project governance looks at projects from an effectiveness perspective and aims at aligning project goals with the strategic organizational objectives. Project ownership is discussed within this effectiveness perspective and is concerned with maximizing generation of long-term benefits for the owners and users. In this context, also considering the dynamic uncertainty present in the business and project environment, it is clear that owners seek as much flexibility as possible in order to keep the project deliverables aligned with changes in the business. The agile perspective looks at projects from an efficiency perspective, aiming at producing the same project deliverables-same quality and scope- with improved performance in terms of cost and time. As mentioned earlier, project managers and contractors are most interested in this internal perspective. Two of the methods used for increasing flexibility in the execution phase are concurrent engineering and lean construction. Concurrent engineering aims at undertaking project tasks in parallel so that time-to-market is minimized and lean construction will be further elaborated in the next section ([46]).

### **2.5.1 Flexibility approaches in the construction industry**

Prior studies have identified three key management practices that contribute to flexibility in complex projects: increased collaboration among stakeholders, exploratory learning and adaptation ([23]). Collaborative procurement strategies and partnering arrangements have been suggested as tools for facilitating collaboration among the complex, inter-organizational network of stakeholders in large construction projects ([14]). Collaboration fosters stakeholders' joint decision-making and problem-solving which is essential due to the highly interdependent and related nature of the construction project

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tasks([24] and [23]). Exploratory learning is a core aspect of the flexible project management model. Explorative learning stands for continuous search for new knowledge and technologies through stimulating creativity in order to achieve better solutions. Radical innovations and technology developments could follow as a result of explorative learning ([24] and [23]). Flexible project management approaches have a reactive adaptation perspective in order to accommodate changes. Reactive adaptation necessitates modification of plans, technological solutions and/or different aspects of the chosen conceptual solution as the project unfolds and new demands arise. For instance, regarding hospital buildings, demands may change due to new forms of medical technology, changes in regulations, demographic changes, or changing epidemiological patterns ([22] and [24]). The traditional control-focused approaches of project management in construction industry are based on two assumptions. First, they assume that the identity of the users is known from the beginning of the projects and/or that the occupants are constant along the building's lifetime. However, in practice it is quite common that the initial users are not necessarily known from the start of the project. For instance, the initial tenants of the shopping malls or office buildings are usually identified later when the project is already under construction and the design phase has passed. Second, the users are both aware of all their needs and requirements, and capable of clearly defining them at the design stage. As a result of this assumption, all final design decisions are forced to be made and approved by the clients before start of the construction phase ([61]). According to Eriksson et al. [23], changes are inescapable in complex construction projects as a result of factors such as unpredictable weather and ground conditions, price fluctuations, duration of activities such as fabrication and installation, poor design solutions and incomplete drawings, clients' learning curves and following scope changes. These changes and uncertainties necessitate a shift from the control-focused approaches of project management in the construction industry to more flexible, organic approaches. Literature review showed that the following approaches could enable flexibility in the context of construction projects: Real options Analysis (ROA), Late-locking, flexibility in the design of the final product and Lean construction. In the highly competitive environment of construction industry, it is essential that companies capture as much value from their projects as possible. Companies that do not adopt strategic flexibility, fail to recognize and exploit the latent project value present in dynamic uncertainties. Ford et al. [26] highlight the importance of using real options analysis in strategic planning of construction projects facing dynamic uncertainties. A project is said to face dynamic uncertainty when the choice of the optimal strategy during the planning phase depends on how the uncertain conditions evolve over time, considering that the stakes are high if you go with the sub-optimal alternative. One of the applications of ROA is enhancing the practice of project valuation. The traditional approaches for project valuation are only based on the net present value (NPV) and discounted cash flow (DCF) analysis. A pure NPV analysis underestimates the value of an investment project as it makes implicit assumptions regarding an expected scenario of cash flows and ignores the possibility to change the course of actions after the decision to finance the project has been made ([20]). In other words, approaches based purely on NPV and DCF are not sufficient because they do not provide management with flexibility to revise and adapt later decisions in response to recently available information or unexpected market and/or technological developments. On the other hand, the real options approach to capital budgeting provides management with flexibility to adapt its operating strategy along the way in order to exploit potential opportunities and mitigate risks and financial losses ([31]).

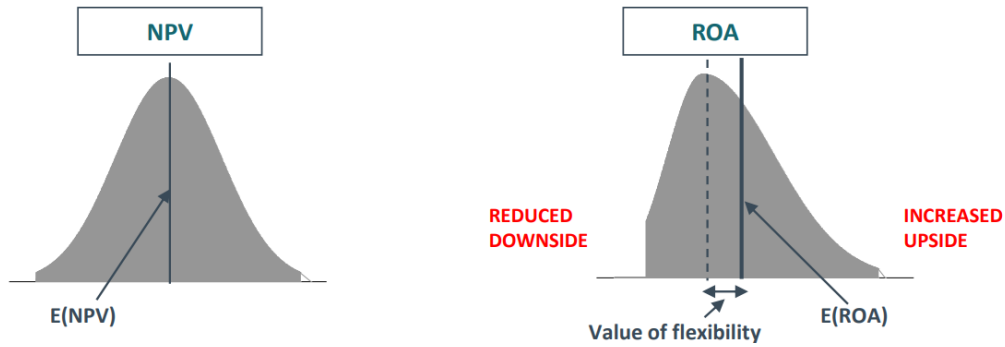


Figure 11: How ROA adds value compared to NPV

Source: Lecture Powerpoint

Hartmann et al.[30] distinguished between two approaches to the use of real options analysis. The first approach is limited to real options reasoning (ROR) which is related to the innovative management philosophy of ROA keeping it to the conceptual manner rather than using its calculation methods. ROR provides management with the opportunity to have a more holistic picture of the project features based on the option's perspective. The second approach builds on the first one and further employs the real option methodology for project valuation through real options pricing (ROP). Two common techniques for ROR have been identified: The Black/Scholes equation and the binominal lattice model ([30] and [70]). There are two different aspects of flexibility regarding projects: 1-flexibility in the decision process and 2-flexibility in the final product ([47]). Olsson identified three strategies to achieve flexibility in the decision process. First strategy is late locking of project specifications until the end of an iterative, exploring front-end analysis. After specifying the projects concepts, objectives and organization, the project is locked and executed based on the traditional control-focused paradigms ([35] and [47]). The second strategy could be exemplified by the Stage-gate approach, which is based on gradual, incremental decision making. Instead of giving full commitment after the front-end analysis, commitments are made sequentially over episodes- at decision gates- during the project life cycle ([17] and [47]). The third strategy for increasing flexibility in the decision process could be the use of contingency plans. Contingency plans are additional alternative plans that could be activated in case the defined base plans could no longer be useful as uncertainties unfold during the project life cycle ([35] and [47]). Flexibility in the product means that the design of the final project output can accommodate possible future changes in functional use or client requirements. If a building is not flexible enough and poorly adaptable to different uses, this will limit its later use and future value ([47]). The Norwegian Building Research Institute has defined three aspects of adaptability in the physical design of buildings: generality, flexibility and elasticity. A building construction with high generality can accommodate possible future demand changes of the owner or users without the need to change its physical properties. A highly flexible building can adjust its construction and technical properties relatively easily with minimum cost in response to changing functional user or owner needs. Elasticity is the ability of a building construction to extend/reduce in size or be partitioned related to shifting owner and users' requirements ([4]). One of the examples of flexibility in the final product is the open building principle. Open building is one of the approaches for the design of buildings that factors in the possible need for changing or adapting buildings, in accordance with changes in function, use and technology. The open building concept aims at increasing flexibility through dividing the building into subsystems which have minimum inter-dependencies with each other. As

a result, these subsystems can be transformed and adjusted without redesigning or renewing the entire building. This approach gains especial significance in today's construction industry as it favours sustainable development principles ([61]). Another approach for the management of flexibility in the decision process could be the Lean Project Delivery System Model (LPDS) introduced by Ballard and Howell ([8]). According to the lean design philosophy, decisions should be postponed until the last responsible moment providing the room to explore alternative solutions. Managing construction projects according to traditional approaches was based on two separate disciplines of project management and operations management. While operations management focused on each activity individually, project management handled the interactions between these activities. Lean construction on the other hand, combines these two efforts and leads to better performance outcomes. Lean construction, inspired by lean production, focuses on eliminating waste, reducing cycle time and variability through pull production control, continuous flow, and continuous improvement ([50]). The last planner production control system, as shown in the figure below, is one of the commonest techniques used in lean construction. The last planner refers to the individual or group that performs detailed planning of the physical, specific work right before execution. This system consists of two components: production unit control and workflow control. The production unit control has the mission of continuously improving the quality of the plans at the operations unit level through feedback and learning. A high-quality plan consists of assignments that are sufficiently described with clearly defined completions, have the right and logical sequence, contain the right amount of work based on the planners' judgement of capability of the production unit, and the work itself is sound or practical meaning that all prerequisite tasks have already been done and the needed resources are available. One of the key components of the last planner system is the Percentage of Promises Completed on time (PPC) which measures planning effectiveness and is calculated by dividing the number of completed planned activities by the total number of planned activities ([9]). Improved project planning results in better matching the production resources to the actual demand for them, which in turn prevents waste and increases productivity ([5]). The look-ahead plan has the mission of workflow control or in other words, causing work to move through production units in a desired sequence and rate. The look-ahead process in the last planner system has more functions than just specifying what should be done in the near future. Its functions include Shaping work flow sequence and rate, making sure workflow and capacity match, decomposing the master schedule activities, developing detailed execution methods, maintaining ready-work backlog, and revising higher schedules when needed. The last planner system postpones detailed scheduling of the work until the last moment possible and offers a more realistic plan by involving the workers and evaluating their performance based on their ability to achieve their commitments ([62] and [9]).



Figure 12: The last planner production control model

Source: lecture powerpoint

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### 3 Methodology

In this specialization report, in order to study benefit realization management in projects, an extensive literature review was conducted. Around 80 sources, including articles, conference papers, books and journals, which seemed relevant to the emerging topic of benefit realization management in projects were studied in depth. In order to find the relevant sources, the following keywords were searched using the two databases of "Google Scholar" and Norwegian University of Science and Technology's online library called "Oria". Keywords include: project success, project evaluation, project benefit management, uncertainty management, risk/opportunity management, value creation in projects, project ownership, project governance, project sponsorship, flexibility in projects, real options analysis, lean construction, last planner production control, change management, the logical framework, project appraisal, construction projects and etc. Another main approach for finding relevant sources was citation searching, in which the reference list of the most relevant articles/books were studied to find out based on which resources, the authors wrote their literature sections and to get a full understanding of the theoretical background of the researches. Summary of the most important points/topics discussed in the studied sources has been provided in the theory section.

In the section called 'Main findings', the author has classified the important topics related and/or essential for successful benefit realization management in projects into four categories, namely, 1- front-end management and benefit identification, 2- project governance and ownership, 3- flexibility management and chasing opportunities and in the end 4- the challenges of benefit management in practice. The choice of the categories and their contents are purely based on the author's theoretical understandings which is gained through carrying out the literature review.

In order to address the second research question and apply the theoretical findings in the context of Sykehusbygg's projects, in the first step, the guidelines which are available on the health trust's website have been studied and analysed. In the second step, all the aspects and topics that were related to the benefit realization management process were studied with more depth and the questions or ambiguities that the author had were gathered in a document which formed the basis for the questions that were asked from the interviewees. Three consultants working at Sykehusbygg HF were interviewed in order to shed more light and provide clearer information on the benefit realization management process at the health trust. The author's understanding of these interviews are reflected in the fifth chapter. Instead of writing two different chapters, one dedicated to the points learned from the interviews and one dedicated to the points learned from the guidelines, both of them were compiled in the fifth chapter based on their relevance. Meaning that under each sub-section of the fifth chapter, both the points from the interviews and guidelines which were relevant to that sub-section were compiled together.

In order to address the third research question and study the New Hospital in Drammen project, the documents and records which were provided to the author from the project office of the mentioned project were thoroughly studied and analyzed. The main reason that this specific project was chosen in the first place, was the availability of these documents which also showed that this project paid careful attention to the benefit realization management process. This level of attention and following documentations are exemplary according to the experiences of the interviewed Sykehusbygg HF's consultants. According to the consultants, it is very rare that hospital building projects define benefits and specifically create a benefit realization plan and discuss to a detailed-level how they plan to follow-up these benefits. The purpose of the sixth chapter is mainly to compile the steps



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and processes the NHD project has taken to ensure realization of benefits in the project so that it could be a learning basis for future hospital building projects. One point worth mentioning is that since the NHD project is currently under construction and definite conclusions on the extent to which the project has been successful in realization of its benefits cannot be made, one cannot be sure that these steps and processes will definitely lead to project success. It could only be mentioned that the processes, procedures and steps that the NHD project has taken fits very closely to the best practice mentioned in the literature. The ultimate valid conclusions; however, can only be drawn during the ex-post evaluations of the project a couple of years after the project termination and when the hospital has been in operation for a while. Therefore, this could be seen as a weakness of this master's thesis as the results are not still reliable. On the other hand, it could also be looked upon as a stepping stone for further research of a peer to continue the work of this author in the future when the evaluations of the NHD project becomes available.

## 4 Main findings of the literature review

The main findings of this master's thesis for the first research question can be classified in the following three categories; front-end management and benefit identification, project governance and ownership, flexibility management and chasing opportunities. In the end, the identified challenges of benefit realization management in practice have been summarized in the last sub-section.

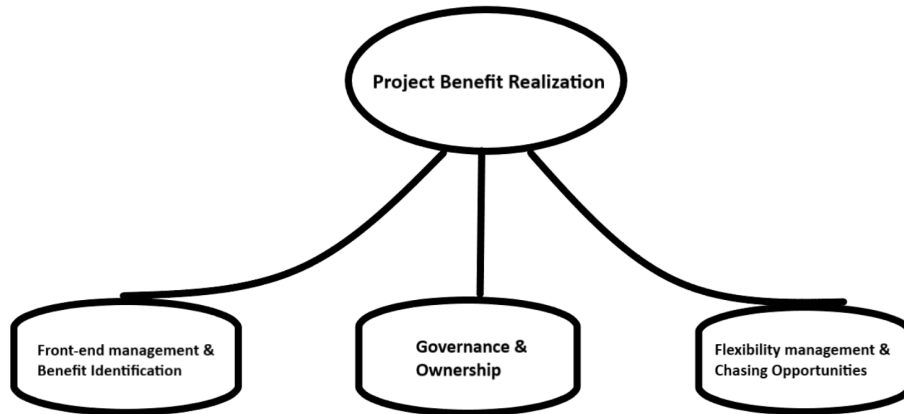


Figure 13: Important topics related to benefit realization management

### 4.1 Front-end management and benefit identification

PMI's Pulse of the Profession survey results showed that 74 percent of projects whose benefits have been identified in the business case, realize target benefits and business results compared to 48 percent of projects whose benefits have not been clearly identified in the front-end phase ([53]). The significance of front-end management cannot be overstated as one of the most critical decisions -the choice of the project concept that has long-term consequences- takes place in this phase ([64]). Moreover, as the greatest flexibility and room for maneuvering exists in the front-end phase, it is only logical to spend resources for gathering as much information as possible to reduce uncertainty and analyze different conceptual solutions in order to select the most viable concept. After the project concept

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has been chosen and project specifications have been locked, cost of making amendments increases exponentially ([47]and[64]). Identifying benefits of projects or programs from the outset has the following advantages: 1- Discussions about the end results of projects in the form of brainstorming sessions among the key stakeholders fosters better decision-making about which projects to initiate and what is the best way of prioritizing projects in the organization’s portfolio of initiatives ([52]). 2- These front-end discussions also help organizations maintain focus on the final value and benefit the project or program is intended to deliver. It is important because sometimes organizations just focus on the short-term project goals such as producing the deliverables on time and within budget which corresponds to the project management perspective of project success, while it has been proved that project management success is inferior to product success and it is much more detrimental if a project fails in strategic terms ([63] and[53]). 3- Discussions about target benefits and how projects are to deliver value to the intended beneficiaries, also help shed light on the actual needs that the project is intended to satisfy- the rationale behind the project- and how utilization of the project outputs is going to lead to generation of target outcomes ([53]and[78]). Two methods that can assist project decision-makers in the front-end phase are the Logical Framework(LFW) and the Input-Output-Transformation (ITO) model of project execution. The LFW is based on defining a hierarchy of project objectives in which, achievement of objectives at each level paves the way for achievement of higher-level objectives. Through the use of the LFW, decision-makers can assess the validity of the cause-and-effect linkages between the objectives in different levels, meaning that for instance starting from the highest level objective - the project goal- and moving backwards to the objective at the lowest level – the project inputs - there must exist clear “how” relationships between them. The same logic applies when starting from the project input objectives and moving forwards towards the project goal objectives; there must exist clear “why” relationships between the different level objectives ([6]). The ITO model of projects implies that outputs are generated to be utilized by project customers in order to result in generation of target outcomes and flow of value to project beneficiaries. The ITO model could be considered complementary to the LFW method as it also explains the utilization mechanism that causes outputs to turn into target outcomes and benefits. The ITO model also presumes that the left-hand of the model (transformation of inputs to outputs) has strong causality, meaning that one can almost be certain that when the project execution is finished, the desired outputs would be created. On the other hand, the right-hand of the ITO model has weak causality, meaning that the production of outputs does not necessarily lead to realization of target outcomes and flow of value ([78]). This weak causality implies how challenging and significant the choice of the right project concept is. 4- As was mentioned in PMI’s Pulse of the Profession report, “Without properly identifying benefits, there is no measure for project success”([53]). Regarding success measurement, the revised version of evaluation criteria offered by OECD DAC is a good example that can be used by decision-makers for determining and assessing the worth, merit, and value of projects. These criteria consisting of relevance, coherence, effectiveness, efficiency, impact and sustainability, look at projects from different lenses and therefore provide a complete picture for monitoring and measuring success ([19]).

## 4.2 Project governance and ownership

The study conducted by Musawir et al. empirically proved that Effective Project Governance (EPG) supports implementation of benefit realization management in practice ([42]). Knowing that “ensuring a single point of accountability for success of the projects” has been described as one of the underlying principles of EPG ([27]), it could be reasonably

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argued that EPG improves benefit realization management through defining a framework of accountabilities in which all the roles and responsibilities necessary for project success and realization of target benefits are clearly defined ([42]). In this context, the important question that needs to be addressed is that who should be explicitly held accountable for benefit realization in projects. The general consensus in literature is that the project owners should be assigned a clear point of accountability for achievement of the intended results defined in the project's business case ([76], [78], [41], [28], [54], [51], [45] and [37]). Although different terms such as senior responsible owner (SRO)[28], project sponsor[54] and business owner[51] have been used by different project management organizations, they more or less describe the same role of project ownership. Several arguments have been made in the literature in favor of delegating the accountability for benefit realization to project owners rather than other stakeholders such as funders/CEOs, project managers or operations managers. The argument against holding project funders accountable is based on the fact that these senior executives who are located in the highest organizational positions, neither have the time nor the expertise to closely involve and monitor the work at the level of individual projects ([74]). According to Olsson project owners as the stakeholders who have both control and the resulting profit liability regarding projects, have the opportunity and incentives to weight the costs against benefits and ultimately maximize value generation ([45]). Project managers' perspectives are typically limited to the delivery of outputs according to the triple constraints and have efficiency incentives rather than functionality and effectiveness, so they might make decisions that favor project's tactical performance at the expense of realization of long-term target benefits ([42]and[74]). Even in some cases, project managers might behave opportunistically and take advantage of their positions to prioritize personal or organizational benefits ([41] and [45]). Moreover, the project managers are usually introduced to the projects after the front-end phase has passed, meaning that they are left out of the benefit identification and strategic decision-making processes ([74] and [53]). Another point is that project managers play transient roles regarding projects and commonly lose contact with the project after the outputs have been delivered. Therefore, it does not sound very logical to hold project managers accountable for benefit realization in projects. However, the significance of the role the project managers should ideally play during the execution phase for ensuring target benefit realization cannot be overstated ([51]). Based on the agency theory applied to the context of projects, the project owners(acting as the principals) delegate the responsibility for day-to-day management of projects to the project managers(the agents) ([41], [10] and [77]). Delegation of daily management, plus the requisite decision-making authority, to project managers has the information asymmetry and potential for mistrust as a consequence in the relationship between the owners and managers ([41]). Therefore, it is essential that the project managers be fully aware of the project's target benefits and become well-informed about how the project at hand is supposed to create value in the long-term for the intended beneficiaries. However, awareness alone might not be sufficient and the use of appropriate contractual agreements that align the interests of the project managers with those of the owners has been recommended ([41]). Moreover, as Muller's study showed ([39]), in successful projects the relationship between the project owners and managers is based on high levels of collaboration and medium levels of structure. High collaboration and cooperation is essential, knowing that project managers have first-hand opportunity for tracking benefit-related metrics and project performance indicators and should timely report them together with risks and other critical information to project owners ([51] and [41]). Project owners are dependent on the information the project managers provide them in order to monitor the performance and progress of projects and to determine whether they are on track for realizing the target benefits ([51]).

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### 4.3 Flexibility management and chasing opportunities

Olsson describes flexibility as a double-edged sword, implying that a stakeholder's opinion of flexibility depends on which side of the project they reside. While stakeholders on the demand side- the owners and users- are in favor of flexibility and ask for the maximum 'room to maneuvering', the supply side of projects- the project organization and contractors- prefer clear project definitions and stability. This difference emanates from the fact that the demand side of projects are more interested in the longer-term effects and value creation of projects, or in other words effectiveness, on the other hand the supply side are preoccupied with improving efficiency, delivering the outputs on time, within budget and according to predefined scope and technical aspects ([43], [47] and [63]). As defined in the theory chapter, project efficiency is linked to the project management component of success and effectiveness in projects is linked to product success. According to Baccarini ([6]), project management component of success aims for achieving the output objectives while the product component of success aims for realizing the goal objectives. As shown in the logical framework (LFW), in the hierarchy of project objectives, the goal objective- benefit realization- is in a higher level compared to the output objective, proving that project management success is inferior to product success ([6]). As a result, project flexibility, especially in the front-end phase, is desirable as far as benefit realization is concerned. However, it is also mentioned in theory that both aspects of success should be strove for ([6]) and in exercising flexibility this would have the implication that late scope changes which lead to immense cost-overruns and erode efficiency of projects, should be avoided if they do not improve effectiveness to a comparable level. Moreover, Johansen et al. stress the importance of chasing opportunities in projects and separating the opportunity management process from the risk management process. They emphasize that in effective uncertainty management, both aspects of uncertainty, the upside-opportunities- and the downside- risks- should be analysed to the same depth; however, in practice opportunities are rarely sought as they are not the focus of the project. One reason that projects do not exploit opportunities, especially in the execution phase, is that seeking an opportunity usually necessitates changing the plans, contracts, or even in some cases abandoning the whole project concept and work that has already been done. This means that the opportunity should potentially create significantly more value and benefits than the previous solution because the cost of making changes is high and it grows exponentially with time ([37] and [43]). In the context of construction industry the following approaches have been recommended in the literature as they promote flexibility: Real options Analysis (ROA), Late-locking, flexibility in the design of the final product and Lean construction. Each of these approaches have been introduced in the theory chapter.

### 4.4 Challenges of benefit management in practice

Some factors have been identified in literature that hinder proper implementation or effectiveness of benefit realization management in practice. This report has collected 6 of the most cited factors; 1-lack of an effective project governance system in the organization ([51] and [42]) 2-lack of a clear point of accountability/ownership for benefit management ([42],[51],[29],[7],[53], and[74]) 3-lack of a formal and structured approach for BRM ([13],[53], and[36]) 4-lack of top management support ([42],[18],[15]) 5-Unrealistic business cases as a result of unreliable/uncertain benefits or Optimism Bias- to be discussed more in the following paragraphs. ([16],[36], [25]) 6- Flaws in the theoretical underpinnings of benefit realization management- to be explained more in the following ([36],[12]) Breese questioned validity of the "modern paradigm" theories that underlie benefits management

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in practice as they are rooted in the mechanistic view of organizations and; therefore, fail to reflect the reality in organizations. These underpinning theories consider projects as planned rather than emergent change initiatives, since they do not factor in complexity, ambiguity, and uncertainty inherent in the business environment of organizations. The modern paradigm is based on the following themes: 1-Logic; meaning that logical and rational decision making would lead to desirable outcomes, for instance, applying economic rationality assumptions for financial appraisal of projects. 2-Linear thinking; the benefit realization management follows a predefined series of sequential steps, starting with benefit identification to monitoring benefit-related metrics over the project life-cycle and finishing when target outcomes are generated. 3-Quantification; in order to select and prioritize between the many projects competing for the limited organizational resources, projects' target benefits need to be as measurable and quantitative as possible, for instance, through the use of financial metrics. 4- Cause and effect; establishing direct causal links between events and their results and identifying their time-order, for example, the use of the logical framework (LFW) or benefits maps. 5- Reductionism; emphasizing on some basic end effects as the most important ones and ignoring the remaining wider impacts. 6-Split between thinking and doing; meaning that there is a gap between the strategic decision-making side who are responsible for benefit identification and planning, and the delivery side- project teams and contractors/suppliers. 7- Control; the exercise of rigid control in order to reduce deviations from the expected progress identified in the business case without keeping track of the shifting circumstances in business environment and the potential risks or opportunities ([12]). In order to offer a more realistic theoretical underpinning for benefit management, Jenner and Breese ([36]) suggested the following modifications of the modern paradigm: 1- focus on applying logic in decision-making would not necessarily bring about the intended benefits. In order to increase success of business change initiatives, attention to the behavioral changes and stakeholder involvement is essential. 2- instead of relying on a linear benefit realization process, feedback loops- in the form of project reviews and decision gates- should be incorporated into the benefit management process to enable learning throughout the project life-cycle and beyond (transmission of lessons learned for future projects). 3- instead of reliance solely on financial metrics, a complete set of indicators including qualitative measures, both leading and lagging should be developed. 4- events in real life do not necessarily follow our envisioned claims of causal and effect and as a result we must accept that the underlying assumptions are usually uncertain and dynamic. 5- focus should be on the overall performance of the projects in a wide societal perspective rather than some specific indicators. This could be managed through use of forward-looking, wide-ranging indicators that measure the complete picture of performance and provide timely feedbacks aiming towards generation of benefits. 6- in order to close the gap between strategic planning and project executions, senior managers should stay closely involved with the project teams and monitor effective delivery of projects. 7- rather than exercising control through comparing actual progress with planned progress, attention should be focused on getting insights from the feedback loops and chase emergent opportunities in the business environment ([36]).

## 5 Implications for Sykehusbygg's projects

The purpose of this section is to put the theoretical knowledge that the author of this report has gained through conducting literature review regarding BRM for the first research question, in the context of Sykehusbygg HF's projects in order to compare what has been defined or recommended in the theory with what is happening in practice. In each

subsection, in the first step the author’s understanding of the conditions and structures, based on both the conducted interviews with Sykehusbygg HF’s personnel and the descriptions in the guidelines which are publicly available at Sykehusbygg HF’s website, are offered. In the second step, how these practices relate to -either are similar or contradict- the theoretical knowledge, gained from literature review, are discussed.

### 5.0.1 Front-end management and benefit identification

In the guidelines for the front-end phase of Sykehusbygg’s projects, it is stated that success of their construction projects depends on choosing the right project concept- the right hospital building- and ensuring successful project execution ([67]). It becomes clear from their definition of success that Sykehusbygg HF distinguishes between the two separate components of project success, namely, product success and project management success ([6]), which provides a good starting point. Furthermore, it is mentioned in Sykehusbygg HF’s evaluation report ([3]) that a hospital building project pursues three levels of goals: Resultatmål, Effektmål and Samfunnsmål which correspond to project outputs, goals and purpose according to Samset’s description of the hierarchy of project objectives.

<b>Resultatmål</b>	outputs: delivering the finished hospital building according to the predefined scope, time frame and budget
<b>Effektmål</b>	direct, first-order effects: more efficient work processes and logistics, increased treatment capacity, improved patient services and offerings, enhanced space utilization, improved financial benefits
<b>Samfunnsmål</b>	long-term value creation for society: improved and future-oriented patient treatment in that region, enhanced research and education

Figure 14: Three levels of goals defined for Sykehusbygget’s building projects

Source: Based on[3]

The figure below shows the front-end management process which consists of four decision points, as shown in the yellow circles. One point worth mentioning is that according to

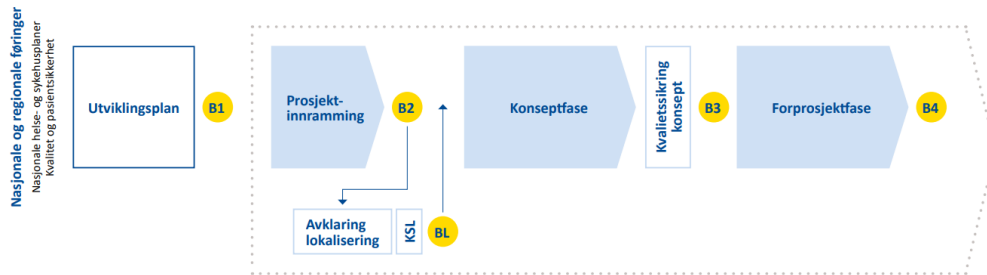


Figure 15: Front-end process of building projects in Sykehusbygget

Source: [67]

a consultant at Sykehusbygg HF, there should be a distinction between the effektmål and benefits. The effektmål could be looked upon as a basis for what the project wants to achieve at the other end. The effektmål describes the picture of the to-be state, therefore it is a good basis for working with the benefit plan. Benefits; however, are the detailed formulation of these effektmål. For instance, in a benefit plan -gevinstrealiseringsplan- all the changes that have to be implemented including the exact delegation of responsibility for each point of change should be clearly defined. While the effektmål is typically not yet quantified at the early stages of a project and has mainly the purpose of providing the input for the benefit identification process, in the sense that during the benefit identifica-

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tion process, these effektmål are lifted over and formulated in terms of changes that need to be made in the benefit plan. The problem is that these kinds of detailed benefit plans which include exact delegation of responsibility for each change to one name/role, are very rare and that is more of how things should be done in the ideal world but not what usually happens in reality. In reality, it is much more common that the benefit identification process stops after defining the effektmål and they typically do not get formulated in terms of benefits. This point has been mentioned by all the interviewees as a major room for improvement. According to the guideline for work with the development plan ([66]), every health trust is supposed to have a development plan with a typical time horizon of 10-15 years. This development plan explains how the health trust will develop its business in order to meet future healthcare demands and challenges. Preparing the development plans for each health trust, falls within the planning responsibility of the regional health trusts (RHF) who own that specific health trust. In the case of Sykehusbygget, with all the four regional health trusts acting as co-owners, the planning responsibility for the development plan is considered a shared task among RHF. The development plan, based on 1- the national and regional guidelines and 2- the health trust's overall strategy, explores the opportunity space and determines alternative path choices regarding business content, structure and organizational models of the health trust. These alternative path choices are then analysed, in terms of both risks and opportunities, and based on the chosen evaluation criteria of the health trust, ranked and prioritized. After the main solution has been chosen, its objectives and the necessary measures for achieving it - often in terms of projects or programs of projects- are described in the development plan ([66]). After the need has been identified in the development plan, it should be decided whether the project organization (Sykehusbygget) would be given a mandate for starting the front-end phase (decision point B1). It is also necessary that project strategy which is described in a governance document (styringsdokument) together with the criteria for evaluating alternative conceptual solutions, be approved at the decision point B1. The governance document should at a strategic level, describe all the key issues regarding the project so that the internal/external stakeholders develop an overall understanding of how the project is going to contribute to realization of the goals and strategies defined in the development plan ([67]). If the mandate is approved, the project enters the framing phase. In the framing phase some of the issues that should be addressed are as follows: for instance, if the project is part of a program, the interdependencies between the project and the rest of the projects in the program and how the end-results of the project would influence performance of the program as a whole, should be identified. This issue is similar to OECD DAC's evaluation criterion of "coherence" according to which, the project's compatibility with the rest of the organizational initiatives should be assessed ([19]). Another issue would be financial feasibility of the project. In order to conduct a feasibility study, the financial framework conditions of the projects are analysed to assess financial sustainability of the project. It should also be addressed if the choice of the project's location - site of the hospital building- has been made or not. If the location has already been decided upon, then it should be clearly specified and if not, it should be clarified in which phase of the project this decision is going to be taken care of. In small and medium-sized projects, the decisions made at B1 and B2 could be combined into one decision point; however, still it is essential that the project's strategy, goals, prerequisites and frameworks be fully described in the governance document and the criteria that are going to be used for evaluating different alternatives later in the concept phase, be developed beforehand in the framing phase. After the governance document and the evaluation criteria for assessing alternatives have been approved (decision point B2), the project enters the "location clarification" phase. The purpose of this phase is to investigate the best location and site for the hospital building. The choice of the location should

be made before the start of the concept phase, while the choice of the exact geographic spot of the hospital within the selected location could be postponed until before the start of step 2 of the concept phase ([67]). After the choice of the location has been made, the project enters the concept phase. The concept phase consists of two steps with a decision point (B3A) separating them. In the first step the premises of the building in terms of business content, required dimensions, together with overall functional and technical requirements for buildings, outdoor areas, equipment and infrastructure based on the development plan would be described in a document called main program (Hovedprogram). After the project's premises, prerequisites, and proposals for land use in an overall level have been described in the main program, alternative physical solutions would be recommended by different architectures. The main program is included in the tender documents based on which the architectures could offer their physical solutions and compete with one another to win the contract. It is important that a zero alternative also be studied to the same depth as other alternatives to ensure the best possible decision basis. It is stressed in the guideline ([67]) that the alternatives should be real and clearly distinguishable from one another which is in line with Samset's recommendation that "the concepts should be genuine alternatives in the sense that they are mutually exclusive" ([63]). After the alternative physical solutions have been identified, they are visualized -through the use of Building Information Modelling (BIM)- in meetings with users, employees and the owners and then compared to one another and ranked based on the predefined evaluation criteria. The final choice of the conceptual solution among the studied alternatives falls within the responsibility of the project owners at the decision point B3A. In the second step of the



Figure 16: The two-step concept phase of building projects in Sykehusbygget

Source: [67]

concept phase, the chosen alternative will be further elaborated through detailed sketches and modelling and associated calculations for instance, of the expected cost of the project. For projects with an expected cost of more than 500 MNOK, an external quality assurance of the choice of concept must be carried out (KSK) ([67]). According to a consultant at Sykehusbygg HF, concept phase is the earliest and first stage during which the hospitals start to identify the types of benefits each alternative could potentially offer and start to measure the effects of each benefit point. However, it should be pointed out that at this



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early stage, concept phase, identification of benefits takes place only at an overall level just to get an overview of the different alternatives. In practice, experience of the interviewees shows that the main focus of the concept phase is on the financial analysis; investigating if the alternative is financially feasible. Financial feasibility is essential to the health trusts because they have to make sure that the investment sum can be paid down by savings and reductions in the day-to-day operational costs of the hospital. The goal for them is to find the right balance, figuring out which alternative could offer the highest cost cuts -increased efficiency- in daily operations of the hospital per year considering the initial investment sum required for the alternative. Very rarely, hospitals identify the changes that need to be made and pinpoint who is going to be responsible for execution of each of them at this early stage. At the decision point B3, the concept report and the KSK report are processed and a final decision on which conceptual solution is to be processed further in the next phase (pre-project phase) is made. Moreover, a proposal for a mandate for the pre-project phase must be decided upon by the board of the regional health trusts. In the pre-project phase, the selected concept and associated calculations are further processed, detailed and quality assured so that they provide a solid basis for making the decision on whether to continue and implement the project or cancel it. Decision B4 is typically considered the last possible time to kill the project ([67]). In 2018, the ministry of health and care services assigned the regional health trusts to develop a foundation for evaluation of hospital building projects. It is mandatory that all projects be evaluated after completion with the purpose of assessing to what extent the identified benefits have been realized. Sykehusbygget also participated in development of the evaluation framework. According to the evaluation framework, six areas are assessed: 1-The planning and construction process (process evaluation) 2- Organizational development related to hospital buildings 3- Achievement of outputs (Resultatmål) 4- Achievement of first-order effects/goals (Effectmål) 5- Achievement of long-term societal objectives/purpose (samfunnsmål) 6- Sustainability. For each of the areas, different evaluation criteria -inspired by OECD's evaluation criteria and Concept Research Program's structures- have been defined ([3]).

After conducting interviews with some of the Sykehusbygg HF's consultants regarding the guidelines, it becomes clear that Sykehusbygg HF and the regional health trusts are well aware of the importance of front-end management and choosing the right conceptual solutions for their investment projects. The needs or development opportunities which are identified in Sykehusbygg HF's development plans, have to go through a staged-gate front-end process before being described in terms of specific technical solutions. The adopted top-down approach, starting with identification of societal healthcare needs and long-term goals at the top and slowly moving down towards identifying lower-level objectives to the choice of the best location and detailed design of the hospital buildings, is in accordance with the methods that have been recommended in the literature. For instance, the logical framework and the ITO model of project execution are two examples of the top-down approaches that emphasize the importance of taking the cause-and-effect relationships between the hierarchy of defined objectives into consideration. In the previous studies, the use of a 'project sponsor' has been recommended in construction projects with the main purpose of translating the needs and requirements of the demand side to the supply side. It is stated that the demand side (the client/users) typically use a different language - business language- from the supply side (the project management and contractors) which use a building and architectural language ([44]). This difference might lead to a lot of noises and misunderstandings in their relationship.

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### 5.0.2 Governance and ownership

After the interviews conducted with consultants working at Sykehusbygg HF, it has become evident that the regional health trusts (RHF), as owners of Sykehusbygg HF's projects, have overall responsibility for investment and operation of the hospitals built by Sykehusbygget on behalf of the ministry of health and care services. The ministry of health and care services as the funder, has allocated the decision-making responsibility and the requisite authority to the regional health trusts to prioritize, plan and initiate various investment projects in the regions. It is assumed that the regional health trusts have the necessary decision-making competence to adapt the projects within a holistic, professional and financial framework, making sure that future costs can be handled when the investment is completed ([66]). Based on the information gathered through interviews and the publicly-available information provided in the guidelines, the figure below shows the generic governance framework of hospital building projects conducted by Sykehusbygg HF. Since the importance of appointing clear responsibilities for realization of identified

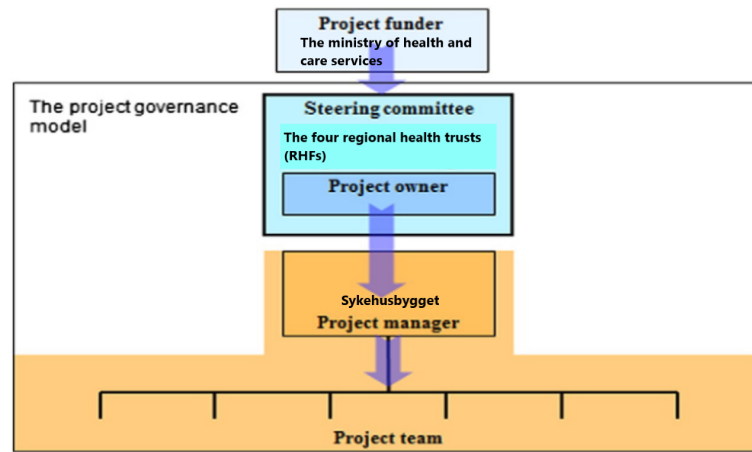


Figure 17: presumption of a generic governance framework of Sykehusbygget's projects

Source: based on [77]

benefits have been stressed in the literature, a special focus was given to this issue during interviews with consultants at Sykehusbygg HF. According to the interviewees, the responsibility for realization of the benefits have been exclusively delegated to the project owners as it is also stated in the guidelines. This means that if Sykehusbygg HF has a role in the benefit realization management process, it is only as a facilitator and it is the project/hospital owners who have this ultimate point of responsibility. Sykehusbygg HF can be looked upon as a consultancy company that could help these health trusts with realization of benefits. A general rule is that for projects with investments sum of more than 500 million Norwegian Kroner, Sykehusbygg HF should be involved in the process so that the health trusts can take advantage of this center of knowledge. Regarding the governance structure within which Sykehusbygg HF operates, the interviewees response has been summarized below;

According to the interviewed consultants, these public organizations active in the healthcare sector in Norway have a bureaucratic structure with the 4 regional health trusts (RHF) situated at the highest level of the hierarchy. Each regional health trust owns some health trusts (HF) working below and reporting to them. Each health trust (HF) has one or several , up to 7 or 8, hospitals operating under their auspices. For instance, Helse Midt-

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Norge RHF is a regional health trust responsible for operating the hospitals in the counties of Nord-Trøndelag, Sør-Trøndelag and Møre og Romsdal in Norway ([72]). The regional health trust operates five health trusts which have responsibility for the operation of nine hospitals in total. For example, Nord-Trøndelag Hospital Trust is a health trust owned by the Helse Midt-Norge RHF and it has been delegated the responsibility for the two hospitals of Namsos and Levanger.

The reporting lines within this hierarchical structure is based on vertical coordination. For instance, if a hospital faces the problem that they have more patient-needs that they can satisfy within their current facility, they report this issue to the health trust that owns them. Then there would be usually held a board-meeting at the responsible health trust to work out different conceptual solutions for the problem at hand. In the second step, the health trust notifies the regional health trust at one level above, who owns that specific health trust, about the potential project and the different alternative solutions that they have worked out so far. Therefore, providing the input, including the different alternative solutions which should also consist of the zero-option, is the responsibility of the health trust. Here, different rules accrue depending on the regional health trust. Since the consultants who were interviewed for this thesis were all hired by Helse Sør-Øst RHF, they were only sure of the regulations in their own regional health trust and stressed that these regulations could vary from one regional health trust to another. For instance, to show an example of the delegation of responsibility, there is a rule that if the investment sum needed for the solution that the board at any health trust under the auspices of Helse Sør-Øst RHF, comes up with is below 500 million Norwegian Krone then the health trust can go ahead with the project and does not need to involve Helse Sør-Øst RHF in their decision. Therefore, the health trusts are delegated some level of decision-making authority. However, if the initial investment sum is equal or above 500 million Norwegian Krone, then the health trust must notify a board-meeting at the Helse Sør-Øst regional health trust. At these board-meetings, the regional health trust then decides if the health trust can go ahead with the project or not. So several layers of governance could be found meaning that even though projects are owned by the health trusts, since the health trusts themselves are owned by the RHF's, the RHF's could be looked upon as the real project owners in the end. Typical for these projects is that their steering committee -styringsgruppe- is also chaired by a representative from the regional health trust. As mentioned before, the input to these board-meeting at the RHF's is provided by the responsible health trust. Usually, the health trust represents the different alternative solutions it has worked on, including the estimated cost -investment sum- and the potential estimated savings in operational costs -per year- at these board meetings.

### 5.0.3 Flexibility management

According to Olsson et al.([44]) flexibility is considered a key issue especially in the context of hospital building projects. Considering that hospitals are typically planned from 10-20 years beforehand and are expected to have a lifespan of at least 40 years, the buildings should certainly be able to accommodate shifting demands on the infrastructure ([44]). The infrastructural demands could change due to ever-evolving technology, newly discovered medical treatments, changes in regulations and governing factors and etc ([44]); therefore, it is essential that in hospital building projects a structured approach to flexibility be adopted in order to tackle this dynamic uncertainty.

In the context of Sykehusbygget's projects, unfortunately the guidelines do not provide much information on how hospital building projects should prepare for and manage flex-

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ibility, as a result it is not possible to conduct a complete analysis. However, one point worth mentioning is that it is clear that the front-end management is a step-by-step process in which planning starts at an overall level with incremental commitment at each phase and ends with the detailed choice of location and design specifications. This exploratory front-end phase with continuous locking could be considered an example of options thinking that at the end of each phase the decision-makers have to make a go/kill decision about the project. Another point is that since some general guidelines for management of flexibility in hospital building projects are not available, each health trust should think of ways they can prepare for and accommodate flexibility in their own projects at hand. This could be looked upon as a room for improvement in a way that Sykehusbygg HF can compile and gather knowledge obtained from experiences of previously conducted hospital building projects and turn them into a standardized practice and set of guidelines for managing flexibility that future hospital building projects can take advantage of.

## 6 New hospital in Drammen (NHD) project

In this chapter, a closer look at the project New Hospital in Drammen is taken. In the first step a short introduction on the project is provided to give the readers a background. Then the governance framework of the project which is set by the Helse Sør-Øst regional health trust is introduced and analysed. As the importance of front-end analysis in projects have been mentioned in the work with benefit realization management in the literature, the concept phase of the NHD project is investigated and analysed in depth in the second sub-section. In the following sub-sections, how the NHD project planned for realization of its benefits through the use of organizational change management is discussed in depth. In the last sub-section, what measures the NHD project took in order to prepare for flexibility and management of uncertainty is explained.

The board of Helse Sør-Øst regional health trust (HSØ RHF) decided to build a new hospital in Drammen in a board meeting on 14 March 2019. The new hospital in Drammen would be the local hospital for areas of Drammen, lier, Hurum, Røyken and Sande and would offer health care functions for all the residents within the entire Vestre Viken health trust's coverage area. The establishment of radiation therapy has been planned for the new hospital and it is also prepared for integration of the somatic and the psychiatric sections. The new hospital will be located at Brakerøya and replace the current Drammen hospital and Blakstad hospital[68]. The decision also contained the following ([34]: The board notes that the new hospital is not financially sustainable at project level, but is dependent on efficiency measures throughout Vestre Viken HF in order to be implemented. Furthermore, it is stated that Vestre Viken HF's work with benefit realization plans has not come as far as is desirable for a pre-project. Due to this background, the board sets the following pre-requisites for Vestre Viken HF:

- a) Vestre Viken HF establishes an organizational development project and through this prepares the organization for change, adapts work processes and achieves positive results in advance of moving into the new hospital so that the financial preconditions for the development are met.
- b) Vestre Viken HF prepares a detailed benefit realization plan and concrete measures to achieve the necessary financial development while maintaining the quality of patient care. The plan will include staffing development in the years leading up to the completion of the building.

c) The board requests that a separate case be presented with the result of the work under item a) and b).

## 6.1 Helse Sør-Øst regional health trust

Helse Sør-Øst RHF states in their guidelines for benefit realization and change management that many projects implemented within the public sector in Norway get criticized for not having delivered the expected benefits they set out to create ([59]). Therefore, they emphasize the strong need for follow-up and documentation of benefit realization for all of the health trust's initiatives and investments. The figure above is based on HSØ

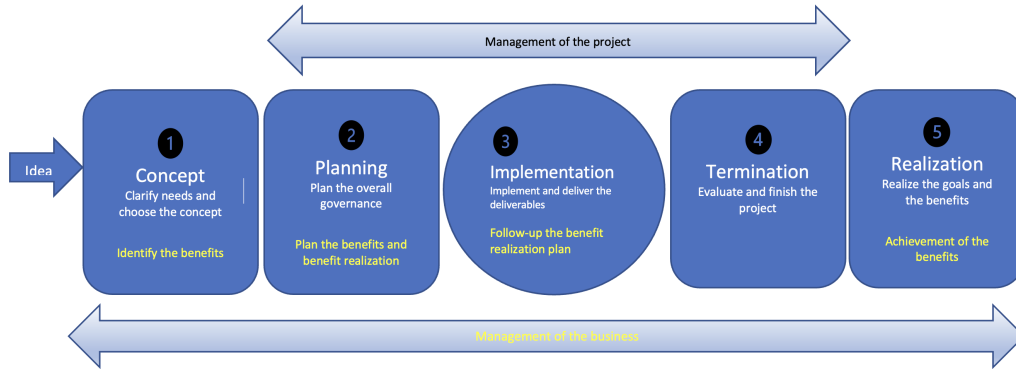


Figure 18: Business and project management process in HSØ RHT

Source: Based on[59]

RHF's description of the process of benefit realization and it shows that the benefit realization process resides within management of the business and not of the project. Helse Sør-Øst defines benefit realization as "achievement of Helse Sør-Øst's strategic goals with an overall perspective on technology, business processes, and organizational development".

Helse Sør-Øst RHT has categorized their strategic objectives into the following five classes of goals; ensuring patient security and increasing the quality of health care services offered to them, increasing the efficiency of health care services, increasing efficiency of the regional ICT-deliveries, supporting cooperation, meeting societal expectations. Digitalization is mentioned as a tool for achieving improvements and realization of benefits within each of the strategic classes of goals. Therefore, digitalization is not seen as a strategic goal in itself ([59]). For instance, it has been emphasized in the guidelines that implementation of ICT systems alone would rarely lead to generation of the expected benefits. The figure below shows that there is need for another element to realize the benefits and that element is improvements in the business processes of the organization. Therefore, it can be concluded that benefit-driven developments in an organization are supported by ICT projects and systems; however, they should be accompanied by adaptations in the way the work and processes of the organization are managed, i.e., change management. Therefore, benefit realization management involves identification, implementation, achievement and evaluation of the necessary initiatives and activities- change management- in order to ensure that the organization achieves the desired quality, efficiency and economic effects ([59]). It is essential to identify and implement necessary changes in order to achieve improvements, for instance, it must be identified from before hand, who/which entities would be influenced by the changes, which business processes should be stopped, changed, or started and so on. It is the collected effect of the improved business processes, ICT sys-

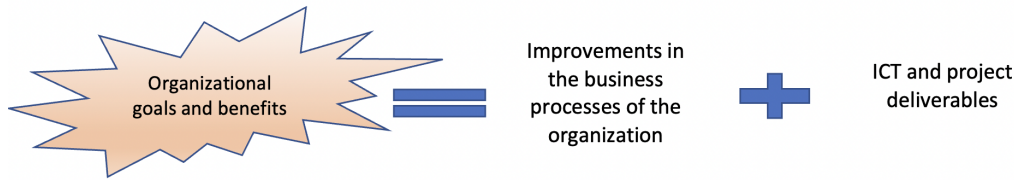


Figure 19: Benefit realization and ICT systems

Source: Based on[59]

tems, and adjusted roles and responsibilities that contribute to the realization of benefits. Another point that has been stressed in the guidelines of Helse Sør-Øst RHF is the importance of involving the end-users in the whole process of benefit realization management. In benefit-driven development, high involvement of users in the whole process is essential as it is the managers and the health care personnel who are dealing with implementation of the business process improvements and the ultimate realization of the benefits. The involvement of the end users is critically essential in the identification phase where the goals, utility effects, benefits, improved business processes and medical developments are being decided upon ([59]).

Some of the obstacles and challenges that are common with changes in work processes are as follows; inadequate knowledge locally about the new regional solutions which could lead to resistance and employees' low acceptance, local managers' uncertainty about how the employees should be guided through the changes, lack of predefined systems for performance measurement and evaluation and it is quite demanding to obtain key figures, room for maneuvering locally is limited (low flexibility) and changes in the distribution of roles and responsibilities can be experienced as rigid and cumbersome. However, clarification of the goals, expectations and the need for changes to the end-users, can contribute to managing and dealing with these challenges more easily and with less friction. Therefore, benefit realization is dependent upon good and lasting change management. It is the responsibility of the line organization, with help and cooperation from the project organization, to make sure that the changes are successfully implemented. Research and experience on change management has shown several elements that must be in place in order to succeed with change management and ultimately benefit realization management. Some of the well-known elements are as follows ([59]); 1- recognized need for the changes, meaning that the needs that trigger implementation of these changes must be valid and justified. 2- clear goal picture, the end result should be clearly defined so that it can provide direction for the changes. 3- engagement of the top-managers, the initiatives are properly anchored in the top management as role models for the employees. 4- involvement of the employees, making sure that employees agree with the changes. 5- supportive structure and processes 6- evaluation and follow-up of the results of the changes. Lack of one or several of these measures constitutes a risk for success and duration of the changes. Since it is the line organization that initiates these improvement projects and also acts as the end-user of the output and beneficiary of the ultimate outcome of these projects, it is the line organization that is responsible for all phases of the benefit realization management process. However, it is often appropriate that the line organization delegates the responsibility for the activities within benefit realization management process to the project organization as long as the project is being run. Therefore, the process of benefit realization is carried out by cooperation between the line organization and the project organization and during which the gradual transition of responsibility from the project to the line organization takes place.

Roles and responsibilities in the the work with benefit realization: Helse Sør-Øst RHT has, in collaboration with other health trusts, developed a tool for change management which is educational and also simple to use and includes critical success factors for realization of benefits. These success factors include, for instance, top management anchoring, clear needs and goals, involvement of the users, right communication in the right time, continuous improvement. The following figure is based on a figure in the above-mentioned change management tool developed by the RHF and shows the distribution of responsibilities between both the managers at the health trust and the managers responsible for the program/project, and it clarifies how these managers should ideally collaborate and support each other in the work with benefit realization management. The "overall benefit

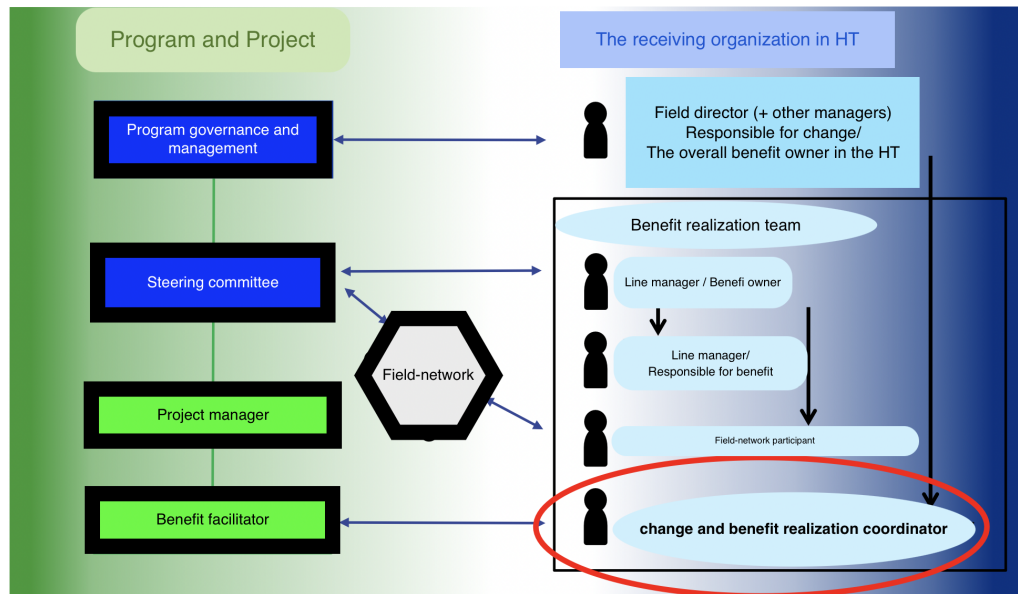


Figure 20: The line organization's responsibility for benefit realization and its connection to the governance of the program

Source: Based on[59]

owner" is a role delegated to the field director, either alone or in cooperation with other managers, on behalf of the administrative director of the Helse Sør-Øst RHT. The overall benefit owner is typically a member of the program's steering committee and has the responsibility, at a holistic level, for monitoring and ensuring that the change and benefit realization process is implemented and followed up as part of the usual management of the business. Here, there is emphasis that the work with change and benefit realization management be included as a common task in the governance of the business as a whole in the health trust. The role of "benefit owner" is delegated to a line manager in the health trust, also typically a member in the program steering committee, and has the responsibility for achievement of the results of the work with change and benefit realization management. This benefit owner manager should also make sure that the zero-point measurements and the follow-up evaluations and measurements be conducted. Here, same as the responsibility of the overall benefit owner, there is also emphasis on inclusion of the change and benefit realization work as a common task in the governance and management of the health trust. The "benefit responsible" is a role that is delegated the responsibility of collaborating with the management on holistic planning, coordination, and follow-up of the work the health trust is going to do to realize the benefits. The benefit responsible manager also should support the project with benefit realization and change management. The role of the "change and benefit realization coordinator" is to develop and construct

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the necessary underlying structures and frameworks for implementation of all activities and tasks related to benefit and change management in the health trust. Through providing support to the "benefit owner" and "benefit responsible" roles, the change and benefit realization coordinator ensures continuous follow-up and monitoring of the activities related to change and benefit realization management. He/she should also make sure that performance evaluations take place and measurements of the KPIs are reported regularly according to plans and the realization of the benefits are followed-up. "field-network participants" act as a support function and driving force to the line managers and provide them with professional consultancy when needed.

## 6.2 Concept phase of the NHD project

The aim of the concept phase for the NHD project was to develop a professional basis that provides sufficient certainty for choice of the alternative which best satisfies the goals and needs for hospital services and is according to the strategies of Vestre Viken health trust. The set of vision, values, and strategies that is valid for the Vestre Viken health trust until 2025 is called "Strategy 2025- Vestre Viken HF" and is demonstrated below. The vision has been defined as "the provision of good and equal health care services to everyone who needs them regardless of age, ethnicity, sex, and financial status" ([33]).

In the strategy document, 8 main strategies have been defined in order to achieve the health trust's vision until 2025. They include: providing better quality and patient security, strengthening locally-based services, establishment of binding relationships with the community health services, strengthening and combining emergency service functions and food supplies, identification and co-location of specialised functions, strengthening and co-location of offers and services within cancer treatment, co-locating the somatic and psychiatric services, strategic real estate development. As mentioned above, the "strategy 2025- Vestre Viken HF" lays down a number of guidelines for the development of the NHD project and emphasises, for example, on the division of functions between different hospitals in the Vestre Viken health trust and recommends greater integration between the somatic and psychiatric functions. Based on the strategies of the Vestre Viken health trust and according to the guidelines set by the Helse Sør-Øst regional health trust, the following categories of goals have been set for the NHD project;

The societal goals (samfunns mål) of the project have been defined as "ensuring long-term solutions for achieving a high-quality and socio-economically effective hospital offer to the population in the receiving area considered as a whole".

The effect goals (effekt mål) of the project should reflect the effects the measure has on the users. The users are defined as the ones who are directly affected by the measure. Users are primarily defined here as patients and employees, but can also include the nearest family and external and internal partners. The effect goals must support the societal goals and are summarized in the table below.

The result goals (resultat mål) specify the deliverables, and shall be included as targets for the implementation of the project and are formulated in the pre-project phase ([33]).

The analysis of the current hospital solution (as-is analysis) clarified the need for either significant upgrades of the current hospital building or the construction of a new hospital in order to replace the old buildings that are in poor conditions and certainly unsuitable for future hospital operations. Also the need for constructing new buildings in order to meet the increased capacity needed in the future, due to the population growth and especially



Number	Effect Goal	Indicator	Users
1	Flexibility in order to meet future increased demographic needs and developments in the patient treatments	1- Elasticity of the building 2- Construction opportunities at the location (Option to extend) 3- Adaptability of the building structure	1- Patients 2- Near families 3- The employees
2	High quality in patient treatment	1- Degree of infection control and reducing the risk of infection 2- Improvement and optimization of the order and logistics of the treatment procedures (from the first patient contact until the end of the treatment) 3- Effective and efficient working relations	1- Patients 2- Near families 3- The employees
3	Support better interaction and cooperation	1- Degree of chances for general multi-disciplinary cooperations 2- Degree of chances for cooperation between somatic and psychiatric functions	1- Patients 2- Near families 3- The employees
4	Appear as an attractive hospital for patients, the employees, and the near families	1- Good work relations 2- Recruitment opportunities	1- Patients 2- Near families 3- The employees
5	Easily accessible for patients, the employees, and near families	1- Traffic hub 2- Public transportation 3- Good parking opportunities	1- Patients 2- Near families 3- The employees
6	Support environmental goals	1- Reduced CO2 emissions as a consequence of less transportation between the somatic and psychiatric sections because they would be co-located 2- Use of public transportation	1- Patients 2- Near families 3- The employees

Figure 21: Tabel - Effect Goals of NVVS

Source: Based on[33]

the increased proportion of the elderly people who are going to be frequent users of the health care services, has been identified.

Based on the needs identified in the as-is analysis, three issues/questions needed to be thought of in the concept phase ([58]).

First, whether it was more socio-economically beneficial to rehabilitate the current hospital solution in comparison with building new hospital buildings to replace the unsuitable current buildings and to meet the future's increased need for hospital services.

Second, whether it was most socio-economically beneficial to replace the current hospital solution with a new hospital in which the somatic and the psychic sections are gathered together in one place.

Third, whether it was most socio-economically beneficial to rehabilitate or upgrade the existing hospital buildings to meet current requirements while building new buildings to

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replace unsuitable buildings and meet the increased future need for hospital services while at the same time, gather the somatic and psychiatric functions in the same location at the current hospital location.

In addition, in preparing the alternatives some guidelines and prerequisites were established in the concept phase which are as follows ([56]) ;

- 1- Kongsberg hospital should continue offering the functions and services as existing today.
- 2- The planning horizon chosen is until 2030
- 3- The somatic and psychiatric services should become co-located.
- 4- The buildings must have as many standard solutions as possible.
- 5- There should be emphasis on high-quality functional solutions in order to optimize patient and work processes and also the solutions must be economically sustainable, robust, and future-oriented.
- 6- The alternatives should be studied and analysed to the same depth (as each other), with the possibility for further testing/ adjustments in capacities, needs for equipment, technology and ICT.
- 7- External quality assurance (KSK) of the chosen alternative must be carried out according to the guidelines for the front-end phase of hospital projects with estimated investment sum over 500 million Norwegian kroner, and it should be noted that the adjustments made after the external quality assurance must be taken into account.

These considerations led to the following alternatives formulated below ([33]);

- 1- Zero options
- 2- Alternative 1 : Somatic and psychiatric sections be gathered in the new hospital
- 3- Alternative 2 : Same as alternative 1, but with psychiatry for elder people added to the Bærum hospital
- 4- Alternative 3 : The somatic and psychiatric sections be gathered in the today's existing hospital location at Bragernes

For the zero option, three alternatives have been studied; 1.1: The zero alternative that necessitates the minimum possible investment sum before switching to one of the other alternatives in practice. This alternative in practice is a postponement option where one seeks to make only absolutely necessary improvements as long as it is possible.

1.2: The zero-plus alternative is equivalent to new building construction alternatives in which it is sought to rehabilitate today's buildings first and then build new ones where it is necessary or in order to cover the need for increased capacity. This alternative is considered to have the same lifespan as the new buildings construction options.

1.3: The third zero alternative is the same as zero-plus alternative which also includes psychiatric and substance abuse functions. This alternative is built up on the zero-plus alternative and also moves the psychiatric section from Blakstad and Valbrottveien to the existing hospital location at Bergernes.

The different conceptual alternatives dealt with factors such as; the technical condition of the building, functional suitability and adaptability of the today's building, and the

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issue of lack of capacity to handle population growth in the future. In order to compare these alternatives, a comprehensive socio-economic analysis was carried out. The analysis considered both financial and non-financial effects. The financial analysis was based on calculating the present value of the investment sum, the operating costs and potential incomes and the net present value in the end. The non-financial analysis included the assessments of the fulfillment of the qualitative objectives ([34]). The reports on each of the alternatives must have been sufficiently detailed and comprehensive to the extent that they could provide a secure basis for choice of the final solution and also clearly document the (potential negative) consequences of the choice of each alternative.

At the following dates, 9.5.2016 (board meeting at Vestre Viken health trust) and 16.6.2016 (board meeting at Helse Sør-Øst regional health trust), the concept report was accepted with the underlying conditions (these conditions should be met before moving forward to the pre-project phase) ([34]); 1- The board ascertains that there be two development alternatives for the new hospital in Drammen, which both represent a functional, operationally efficient, and high-quality hospital solution. The board of Vestre Viken HF suggests that the hospital be constructed at Brakerøya. At the same time it is determined a total budget of 8.2 billion Norwegian Kroner for the project.

2- The board suggests that alternative 1 (Brakerøya) be used as a basis for further work.

3- The board of Helse Sør-Øst RHF requires that some measures be implemented to adapt the project to the planning prerequisites. Measures such as; a- General optimization of the present sketch project b- Reassessment of the Vestre Viken's current internal distribution of functions and capacities c- Assessment of the staged development and progress requirements d- Greater degrees of self-financing

4- The board requires that radiation therapy be included as function in the new hospital. It is assumed that the addition of the radiation therapy increases the investment requirement with 433 million Norwegian Kroner.

5- The project will take place in accordance with national and regional strategic guidelines, including the health trust's BIM strategy and climate and environmental goals such as requirement for energy class A.

The board requires that the work with acquisition of the land takes place within the economic frameworks which are presented. It is also assumed that the residual uncertainty related to the pollution or any potential danger of sub-sea landslides be clarified before the land acquisition takes place.

6- In accordance with guidelines for the governance of big projects in Helse Sør-Øst RHF, the responsibility for further completion of the project would be transferred to Helse Sør-Øst RHF. The board also requires that Sykehusbygg HF be engaged in governance and management of the project organization, on behalf of the Helse Sør-Øst RHF.

7- The board of the Helse Sør-Øst RHF sets as a requirement that Vestre Viken health trust works further on how the activities in the new hospital are going to be organized, including the further development of the operating concepts, concrete staffing plans based on the economic calculations performed, and also that an overall benefit realization plan be made available alongside the pre-project.

8- The board asks the administrative director to apply for a loan from the ministry of health and care services in accordance with the current guidelines, so that the project is secured financing at the planned start of the pre-project in early 2017. Start of the

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pre-project requires the board's approval.

Furthermore, the following conceptual guidelines and principles were used as a basis for the physical design of the new hospital ([57]); 1- All bed rooms in the hospital should be single-bed rooms with separate bathrooms inside

2- Co-location of the somatic and the psychiatric health care functions which facilitate integration and interdisciplinary collaboration. It is set up in a way that these functions can share and jointly use medical service functions, common functions such as kitchen, research facilities, meeting areas, and the like.

3- Outpatient clinics should be organized in a way that easy accessibility for the public is considered.

4- Standardization of rooms allowing greater flexibility and patient safety

5- Universal design

6- The choice of technical and logistical solutions should be based on optimizing functionality.

### **6.3 Plan for benefit realization**

According to the concept report ([57] and [33]), in order to realise both the financial and non-financial utility effects described earlier, it is essential to focus on three areas.

1- Business and process development: In order to achieve the defined utility effects, the business development process should be well planned and include concrete and scheduled measures for realizing goals. Also the distribution and delegation of responsibility and ownership for the identified utility effects must be clarified from the beginning to ensure realization of the measures.

2- Change management: Good change management is essential for preparing, implementing and evaluating the business development process.

3- Follow-up of goals and results: There should be follow-up of the goals and results in order to ensure the realization of the effects. Follow-up could also help identify the need for implementation of new and different measures if that is necessary for ensuring realization of benefits.

It is the top management of the health trust (Helse Sør-Øst RHF) that has the overall responsibility for ensuring that the realization of the benefits takes place. The project has only responsibility for making sure that the benefits are well-defined and concrete and that plans for realizing them exist. The ownership of the benefits and responsibility for their realization lies with the line organization. In order to secure implementation of measures, the expected effects/benefits must be categorized based on the previous classification - the financial non-financial- and the ownership and responsibility for each benefit-area should be delegated to specific roles/managers of the line organization ([57] and [33]).

Regarding the time perspective for benefit realization, it is obvious that the full realization of the defined benefits above can only take place after moving into the new hospital. However, in order to realize the benefits as fast as possible after moving in to the new hospital, it is necessary to prepare for them properly from before through business development process that prepares the organization for operations in the new hospital building. In or-

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der to secure benefit realization, it was decided that a concrete plan for benefit realization be developed. The planning should start the same time as the pre-project phase begins so that the work with assessment of benefits in the concept phase will be continued. The following structure and order of tasks was suggested;

- 1- Development of governance documents for the benefit realization
- 2- Identification of the benefit owners, i.e., persons/roles responsible for benefit realization per benefit area.
- 3- Development of plans for realization of benefits for each and every of the benefit areas, i.e., measures in form of business development projects. These plans should include description of measures, plan for 0-line measurement and measurements up to a defined point of time in which the effects are going to be realized.
- 4- The business development projects should be owned by the line organization, however it must be secured that they are governed, coordinated and actually implemented. This should be described in the management documents. It should be pointed that the assessment and follow-up of the achievement of the results is the responsibility of the each of the benefit owners for each benefit area; however, the overall responsibility for follow-up rests with the project owner.

### **6.3.1 Financial sustainability**

According to ([34] and [55]), improving efficiency and benefit realization are two key areas to succeed with in order to ensure financial sustainability. When presenting the pre-project report for NHD, it was requested to distinguish between the two above-mentioned concepts. Traditionally, it can be discussed that benefits are realized as a natural consequence of an investment being taken in use, while improving efficiency can be done on an ongoing basis regardless of the investment. Construction of NHD project will entail both of these concepts. In the concept phase, this approach was used as a basis, without specifying efficiencies and benefits. Through the pre-project, Vestre Viken health trust acknowledged that a larger downsizing related to moving in to the new hospital will be difficult to implement, at the same time as it will be difficult to ensure financial sustainability. The health trust; therefore, used an approach where in the period up to moving into the new hospital, measures will be implemented to adapt the staff to operations in NHD in the current hospital as far as possible. This means that greater savings are planned before moving in. An example here is the merging of the hospital psychiatry at Lier and Blakstad into Blakstad hospital. The purpose of this approach is to ensure financing capacity and financial sustainability. At the same time, it is considered to be the most realistic approach. In this work, Vestre Viken health trust will look at its overall business. New technology that will be used in a new hospital will also be able to be used in the other hospitals. This also applies to new working models. The health trust will work with measures that cover the entire organization, and with measures that are specific to the part of the business that will be included in the new hospital building in 2025. It is emphasized that during the period there will be a clear basic premise that measures should not entail increased risk for patient treatment. The profit margin on which the financing capacity is based, is between 8 percent and 9.5 percent from 2027. This margin is significantly larger than the current level- in today's hospital- and significantly higher than other comparable health trusts. If Vestre Viken health trust fails to realize the assumed margin development, or the investment in NHD exceeds the specified cost framework, the health trust will face problems maintaining financial sustainability. Given that the

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preconditions for increased efficiency and profit realization are met, Vestre Viken health trust has the financial sustainability to handle both the construction of a new hospital in Drammen and upgrading of Bærum, Ringerike and Kongsberg hospitals, as well as the building construction within mental health care/drug abuse outside hospital level and pre-hospital services.

### **6.3.2 Non-financial benefits**

Co-location of somatic, psychiatric and medical diagnostics will provide good collaboration opportunities across the disciplines. It will facilitate the strengthening of the work with good and safe patient treatment processes. This will result in high levels of patient satisfaction and safety. Many of the concepts in the new hospital provide high quality benefits for patients, and will increase the efficiency of operations. Single-bed rooms in the common areas lead to reduced risk of infection, and a reduced frequency of infection will result in shortened length of patient's stay in the hospital. Single bed rooms also simplify some conditions in patient treatment, unless there is need for moving patients. It will be easier to handle patients in need of isolation, and it will be possible to carry out more examination and treatment procedures in the rooms than today. Private rooms provide a basis for better capacity utilization by preventing patients in need of private rooms from occupying a multi-bed room. It will also result in reduced need for transfers of patients between different rooms in order to reach a comfortable configuration in which patients residing in the same multi-bed rooms fit together. Single beds can be personnel-demanding when there is a need for permanent guards and when treating patients with special monitoring needs. There will; therefore, be built multi-bed rooms on each floor with the possibility of group monitoring to take care of such patients. The new building will improve the patient's experience of the hospitalization due to the contemporary standard and design of the areas. This will be a major improvement compared to the current situation in old buildings. New building with adapted areas and a good indoor climate will give the employees a better working environment as well. New hospital will entail an upgrade of medical technology and other equipment. It will be inspiring and stimulating for the employees to be able to use new technology that will make patient treatment faster and more efficient. It will also provide improved opportunities for digital collaboration between parties in the health service and simplify everyday work. The new hospital in Drammen is planned with great flexibility and collaboration opportunities. It will provide opportunities for efficient patient logistics, increased quality of patient care and efficient working conditions. These non-financial effects are considered to support and contribute to the realization of the societal goals and the objectives for good hospital operations. At the same time, the new hospital will appear as an easily-accessible and attractive hospital for patients, employees and near families ([34] and [57] and [55]).

## **6.4 Organizational development**

According to the ([34] and [55]), It is well recognized that the requirements for future profit margin cannot be achieved relying on requirements for increased productivity alone. Vestre Viken health trust has to go through several changes in the business processes. Changes such as finding other ways of working, and other ways of planning the business operations year by year. Taking into use just a new hospital building, will not lead to success unless it is accompanied with thorough preparations of the organization. In the board meeting at Helse Sør-Øst regional health trust, It was decided that Vestre Viken

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health trust must establish an organizational development project and through this, the organization prepares for changes, adapts the working processes and achieves positive results prior to moving into the new hospital building, so that the financial preconditions for the development are met. For those parts of the business operations that are going into the new hospital, much of this will be taken care of through the reception project-mottaksprosjektet which will be clarified in the following subsection. For the entire health trust, this is taken care of through the ongoing work with organizational development, which includes the whole health trust. The management in the health trust is responsible for coordinating and securing measures across the health trust. It is a prerequisite that the goals are known throughout the whole organization, and that everyone sees their share of the responsibility for contributing to goal achievement. This requires openness in information sharing and communication, and clear messages to all employees about how the health trust's values and culture characterize the daily work. Managers must convey clear expectations for good corporate governance. A culture characterized by openness to learn from failures and unpleasant past events and contributing to improvement and learning is a continuous work, which must be consistent in all parts of the business. Vestre Viken health trust has a zero vision of that no patients should be injured. This patient safety culture shall form the basis for all activities in the organization. The three values of quality, security and respect are implicit in Vestre Viken's organizational culture. This means that it is essential and of absolute importance to involve users, follow the best practice, conduct proactive risk management and staff and hire personnel as needed. Team work and learning from one other is another important element of the organizational culture in Vestre Viken. All managers take responsibility for their decisions and the patient safety culture is considered an important contribution to a good working environment and a positive reputation among people ([34] and [55]).

#### **6.4.1 The Reception Project NHD**

Vestre Viken health trust has established a Reception Project under the project organization for the new hospital project (NHD), which includes organizational development in connection with the usage of the new hospital building. Emphasis has been placed on defining concepts and operating models for the new hospital that give the health trust a long-term and sustainable development. The organizational development work in the reception project is an important premise for achieving the benefits that have been used as a basis. The organizational development work shall be based on the patient treatment process. Development of good and coherent patient treatment processes, with the associated work packages, will provide organizational and operational benefits, as well as higher quality and patient satisfaction, which is the core of the process of adapting operations to the concepts. The administrative director at Vestre Viken health trust is the project owner with his own steering group led by the project director of the new hospital in Drammen. The clinical directors of the affected clinics are part of the steering group, along with the director of technology and the director of medicine. The health trust representatives, clinical representatives for the chief physicians at Drammen Hospital, the chief safety representative and the user representatives are also members in the steering group ([34] and [55]). The benefits associated with the new hospital will be specified through the work with the organizational development. To ensure a predictable and controlled process, the clinics must prioritize time use and make the necessary clarifications so that the reception project's requirements for progress and quality are met. The individual clinic directors are delegated overall responsibility for implementation and follow up of measures in their own department and section. Even though the main responsibility lies with the line organiza-

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tion, resources from central staffs in the health trust are necessary to carry out the work. The steering committee has an overall responsibility for following up that the expected benefits for the new hospital are realized. In addition to the organizational development, the reception project is responsible for planning and arranging training for the employees, both with regard to getting to know the new building and also the use of the new equipment. Furthermore, the project, in collaboration with PNSD, is responsible for planning clinical usage and the relocation process ([34] and [55]). Regarding the usage of the new building, it is expected that the employees will be able to utilize both the building and the new solutions that come with it. Technological solutions involve integration between both construction equipment and medical equipment. Complexity in integration and coordination and new operational methods in NHD project will require new areas of expertise. The clinics must make training plans and ensure that employees receive the necessary training before moving into the new hospital building. Vestre Viken health trust will ensure that training is going to be included as part of the procurement plan for the NHD project. The line organization must plan for availability of the right competences in the various operating organizations in the new hospital. Some of the benefit areas will require a division and distribution of tasks between employees or that new functions must be solved in new ways ([34]). Continuation of the benefit realization work from the pre-project NHD shall be an on-going, continual task that continues until the gains are achieved in the new hospital. It is therefore assumed that the project organization for the reception project will last until for 12-18 months after moving in. This is to ensure that the planned benefits are realized. In this way, the project organization will follow up and support the clinics in the first operational phase in order to introduce the new concepts, patient flows and work processes that are defined in the OU process prior to moving in. The benefit realization plan shall be coordinated and followed up as part of the shared responsibility between the project owner and the steering committee of the reception project. This will also be a natural part of the ordinary financial follow-up in the individual clinics. An ongoing progress plan has been made for the implementation of the various sub-projects that must be carried out in the organizational development work in the reception project. Progress is coordinated with the enterprise plan, equipment procurement and ICT plan, as well as ongoing and planned internal projects in Vestre Viken health trust ([34] and [55]).

## 6.5 Introduction of new technology

One focus area for Vestre Viken health trust is to use technological solutions that provide better and more efficient health services. Five areas have been identified with a significant potential for benefit realization through the introduction of new technology ([34] and [55]):

- 1- ICT solutions for better information flow and process management: The NHD project is planned with the assumption that modern ICT systems will be established to achieve efficient work processes and identified benefits. This especially applies to systems such as health logistics, sterile centers and tracking/localization. The same ICT solutions are planned to be introduced at the other hospitals in Vestre Viken health trust. It is expected that the introduction of health logistics will lead to optimization within:

- Resource management and planning
- Communication flow and alerts
- Ordering and handling service functions
- Check-in and settlement processes

Models for process management-forløpsstyring- support planning and governance in hospitals based on a flow perspective and optimized use of resources. Optimization with a focus on flow will give patients a better experience of the encounter with the health service, as the unnecessary waiting as a result of bottlenecks in the hospital is reduced. Good process models show information flows which will assist managers at different levels to govern work tasks, resources and



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flow of patients in real time. Furthermore, managers at senior levels will receive a real-time overview of the flow in the hospital across departments and units. This means that resources can be pushed where the resource demands are greatest, considering optimal flow of patients.

2- Mobile solutions: Mobile solutions will free up time for the personnel by making information available to a greater extent wherever they are. Vestre Viken health trust already has several mobile solutions in use, such as mobile X-ray machines and "Jonathan Clean" (solution based on iPad for cleaners). In 2019, the health trust launched a new app for secure identity control for blood transfusions on bedposts, BedsideId. A number of measures are underway for several mobile solutions, and in 2020 investment funds have been set aside for new projects. The introduction of a regional solution for health logistics will create a need for investments in mobile units in the health trust.

3- Distance compensating technology: Vestre Viken health trust has initiated measures to increase the use of distance-compensating technology, both for communication with patients and for communication between health personnel. The program for medical distance follow-up coordinates activities for the introduction of new services within self-registration, video consultations and sensor measurements. In 2019, Vestre Viken introduced the possibility of self-registration of one's own state of health for epilepsy patients. In addition, the health trust has extensive use of electronic meetings internally within the company and externally with partners. Self-registration from patient, video consultations and sensor measurements: Medical distance follow-up is expected to have significant effects both for patients, the health trust and for the society. PA Consulting Denmark has prepared a business case for six different patient treatment processes which shows that the largest gain is related to the omission of consultations in person (reduction of between 6 and 31 percent). The regional health trusts have provided a joint input to the work on the National Health and Hospital Plan, which has looked more closely at the proportion of patients who may be suitable for medical distance follow-up, based on analyzes of four different patient groups (epilepsy, diabetes, prostate cancer and HIV). Based on outpatient consultations carried out without procedure codes (in excess of 32 percent), it is assumed that a minimum of 16 percent will be suitable for follow-up by means of self-registration. Based on this, as well as the fact that advancements in technology more and more make it possible to carry out procedures at home (sensor measurements and sampling), and combined with high-quality image and video communication, there is a general expectation of 20 percent reduction in physical -in person- consultations by 2030. Helse Sør-Øst regional health trust, in the regional development plan, has set a goal that the need for physical consultations is going to be reduced by 20 percent through the use of medical distance follow-up or online consultation. In 2019, 415,000 somatic physical consultations were carried out at Vestre Viken health trust. A reduction of 20 percent of the physical consultations until 2030 would equal approximately 83,000 consultations per year. If expected effects as a result of the implementation of medical distance follow-up are realized, this will greatly contribute to reducing the growth in outpatient activity inside the hospital. It is important to note that this does not mean a reduction in the total number of consultations, as the proportion of the 20 percent who do not show up at the outpatient clinic must still be assessed by a nurse or a doctor, but then based on self-registration or supplemented by telephone - or video consultation. However, it is reasonable to believe that built-in logic in the digital solutions will contribute to clinical decision support, which in turn will reduce the need for manual clinical assessments in some cases. Reduction in resource use: A change in operations from attendance in person to telephone and video consultation is expected to result in a reduction in resource use with a corresponding reduction in costs. A study conducted by the Danish Cancer Society

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examined changes in the cost of outpatient follow-up of patients with lung and prostate cancer as a result of the implementation of TelePROM (PROM = Patient Reported Outcome Measures). Data for three different departments showed an average reduction in costs of between 55 and 64 percent. Telephone and video consultations can be carried out more efficiently, clinical personnel have access to patients' data in advance and can thus make the consultations more efficient, and systematic delegation of tasks e.g. from doctors to nurses and other health personnel can be carried out. In sum, this results in a reduced total cost per consultation. Experiences so far with the use of self-registration for epilepsy patients at the neurological department in Vestre Viken shows reduced use of resources and the shifting of tasks from doctors to nurses. The epilepsy nurse handles all received answers and assesses whether the patient needs contact with a neurologist, either by telephone or by attending a consultation at the neurological outpatient clinic. Another effect of this is the omission of tasks among the office staff, because they now do not set up ordinary checks at the outpatient clinic. Overall assessment of the use of distance compensating technology: Advantages from the use of distance-compensating technology are thus related to a reduction in physical consultations, a significant increase in the use of video and telephone consultations, as well as a more appropriate use of resources as a result of both these conditions and the shifting and delegation of tasks. This will free up capacity, which in turn will be a significant factor in handling future growth.

4- Automation (robotization): Automation is about introducing software that replaces manual processes with Robotic Process Automation (RPA). Manual, repetitive, standardized and high-volume digitized processes are particularly suitable, such as the transfer of data from one computer system to another. Sykehusbygg health trust has introduced automation in several human resources (HR) processes, and in 2019 a Competence Center for process automation was established in Sykehusbygg HF. The experience with Helse Vest IKT has shown that in such changes the investment sum is earned after a few months of operation. Automation will significantly support the effects of ARP.

5- Artificial Intelligence: There is a great potential for increasing efficiency through the use of artificial intelligence (AI). AI has many usages, for example in medical diagnostics. AI has been implemented at several radiology centers both in Europe and in the rest of the world. The technology has come a long way, and several suppliers have this technology ready for implementation in clinical operations. Internationally, the use of AI has shown to result in positive effects in radiological operations, such as reduced description time -beskrivelsestid- and faster responses, prioritization of patients with positive test results, fewer errors (reduced number of false positives/negatives), shorter hospital stays and faster clarification in the emergency sections. A national project has been established which is called, "Better use of AI in the health service", led by the health minister in Norway. Following a review of relevant AI projects, Vestre Viken's service innovation project called, "Use of AI in imaging diagnostics" has been submitted by Helse Sør-Øst regional health trust as the specialist health service's selected project in the national level. Vestre Viken health trust has also applied to HSØ RHF for 1.5 million Norwegian Kroner in service innovation funds, and a response to the application is expected early 2021. In the project, it is planned, after necessary clarifications regarding information security, privacy, ethics, law and technology, to acquire and test an off-shelf, ready-for-market AI solution. Furthermore, the project will prepare a cost/benefit analysis and evaluate the solution. In the procurement process, emphasis will be placed on efficiency potentials of each solution. The National Center for E-Health Research is also planning to research both the implementation process and the potential effects/gains.

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## 6.6 Risk and Uncertainty management

Best practice in reducing risk and preventing unwanted variation Considering medical advancements and changes in treatment methods, great emphasis has been placed on standardization of rooms and increased flexibility in the building. For example, all outpatient clinics are gathered in their own buildings, which facilitates good collaboration and capacity utilization across functions and disciplines. In complex buildings such as hospitals, it is important to use common standards from similar buildings in addition to developing your own standards. Experience transfer is an important source for achieving the best solutions. Based on Sykehusbygg HF's standard room catalog, it has been prepared a database for standard rooms in the project. The standard rooms are based on relevant experience and competence in focus and professional groups. The standard rooms have been adapted to the project's requirements and geometry. All rooms, of which at least two of exist in the hospital, are basically standardized in terms of furnishings and equipment used. As much as possible, the rooms have also been drawn geometrically similar. This results in that technical installations are planned the same way for all the standard rooms. The threshold for deviating from these must be high so that the solution is as flexible and purposeful as possible. Standardized choice of materials will be important in relation to operation and maintenance. For example, standardized use of surfaces can simplify maintenance and result in fewer different methods of cleaning. Standardized design and installation of fittings, equipment and other elements ensures quality of workmanship and provides predictability for maintenance and future changes. Standardized design results in knowledge of solutions, no matter where in the hospital an employee or visitor is. Common standards and common methods provide security in the form of recognition and understanding of how one room or function must be used, even in new situations. For employees, standardized solutions will be time-saving, which can be especially important in an emergency situation. It has been documented that standardization of work processes and reduction of unwanted variation leads to fewer unintended events. Best practice is knowledge-based, and necessitates that everyone follows national guidelines, common professional procedures and improves work processes, meanwhile patients should be involved both in the development of the services and in their own treatment. National quality registers and systematic use of management data are the basis for benchmarking. It can be documented that training and working in interdisciplinary clinical teams and learning from each other, leads to improved patient safety. Establishment of professional networks across clinics and departments in Vestre Viken health trust will enable and contribute to a more standardized practice and a reduction of unwanted variation. It is well documented internationally that the proportion of patient injuries is between 15 and 20 percent. It is estimated that 30-50 percent of these can be prevented. At the same time, management data in Vestre Viken health trust shows that there is variation between the clinics in the proportion of re-admissions of patients, the proportion of patients in the corridors, the occurrence of re-operations, and in length of patients' stay in the hospital. There is good reason to strengthen quality and patient safety through systematic improvement work to reduce unintended events and unwanted variation. Continuous improvement and the improvement model have been chosen as the methodology for improvement work throughout the health trust. The systemics and essence of improvement knowledge can be used widely, including small improvement work to large organizational change projects. The methodology can also be used to identify areas for improvement. Improvement knowledge uses good statistical methods providing real-time data. The improvement model is research-based and it stimulates teamwork and mobilizes each employee to engage in improving his/her own practice. Major improvement work across clinics and departments should; however, be organized as a learning network. Systematic and long-term efforts to reduce adverse events and unwanted variation will

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lead to better treatment results, increased patient safety and more satisfied patients. This will provide financial benefits for both Vestre Viken health trust and the society. An extra day of stay in the hospital is estimated to cost somewhere between 15,000 and 25,000 Norwegian kroner, if support functions such as an intensive care unit and operating unit are included. An infection in connection with an operation often results in many extra stay days in the hospital. In addition, re-operation may be necessary, which is a burden and risk for the patient, but also a cost for the hospital and the society in general. In some periods, the beds in Vestre Viken have a large under-capacity for patients. Under-capacity is a risk to patient safety in addition to the fact that it entails a risk for corridor patients and increased variability in labor costs. Under-capacity of the bedposts can be reduced through measures within several phases of the patient's treatment process. Good communication with health personnel in the primary health service, e.g. GPs, the emergency rooms -legevakt-, and nursing homes can result in fewer number of patients who need to be sent to emergency rooms -akuttmottak . Good work processes and routines in the emergency rooms are important for quick clarification of the patient's situation and starting with the treatment. This will lead to shorter hospital stays, and contribute to more patients being released without hospitalization.

## 7 Summary

This master's thesis had three main research questions to investigate and find answers for. As mentioned in the introduction chapter, the first research question dealt with identification of the best practices recommended in the literature for improvement of realization of benefits in projects. In order to do so, more than 80 sources which were either directly related to the topic of BRM or in some ways referred to it, were studied to provide a rather comprehensive theoretical foundation. Based on the author's understanding of the literature, the three topics/practices of: 1- Front-end management and benefit identification, 2- Project governance and ownership and 3- Flexibility management and chasing opportunities, could be related and/or essential for ensuring generation of target benefits in projects. The first essential step in the process of BRM is identification and documentation of benefits from the outset of the project, as early as in the concept phase. The second step in the BRM process is clear delegation of responsibility for generation of these identified benefits. The consensus in research is that realization of project benefits should be appointed to the project owners on behalf of the funders. The third issue that has been stressed in the literature is the importance of distinguishing between two aspects of uncertainty -risk and opportunity- and not limiting ourselves to avoiding risks but also proactively chase opportunities in projects.

The second research question which was raised, intended to apply the theoretical knowledge basis obtained from the first research question to the context of Sykehusbygg HF's projects. In order to do so, first, the author went through the instructions provided in the guidelines- which are publicly available on Sykehusbygg's website- to find information on how these hospital building projects should be planned and implemented in practice. In this context, two important points could be mentioned; First of all, the instructions in the guidelines were mainly recommended and are not mandatory. This has an important implication as the reality might not exactly mirror the information provided in the guidelines. Second, even if these instructions were mandatory, one could not be entirely sure that the exact same situation and conditions took place in practice. One way to gain more reliable information upon which a proper analysis could be based, was to involve more closely with the health trusts and conduct interviews with the consultants working

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at Sykehusbygg HF. Therefore, in the second step, three consultants working at Sykehusbygg HF were interviewed in order to shed more light and provide extra information on the aspects and topics related to benefit realization management described in the guidelines which needed more clarification and deeper explanations. One essential point that can be drawn from the interviews is that as Sykehusbygg HF is never the owner of any of these hospital building projects, the responsibility for realization of benefits cannot be delegated to them and in the end, it is not Sykehusbygg HF that will be held responsible if the identified benefits are not generated. However, this does not mean that Sykehusbygg HF's role in generation of benefits in the projects in which they are involved is not significant. Sykehusbygg HF plays quite an important role in the whole process of BRM due to the fact that Sykehusbygg, as a repository of knowledge, has information on what projects could do better based on experiences from where the previous projects have gone wrong. For instance, the consultants working at Sykehusbygg always try to ensure that the health trusts have enough focus on creation and follow-up of the benefit plan -*gevinstrealiseringsplan*- and also that each benefit point has been given a clear role/name that is responsible for its realization. Even though it is mandatory, according to the rules set by the Norwegian ministry of health and care services that Sykehusbygg HF gets involved in projects costing more than 500 million Norwegian Krone, it is clear that Sykehusbygg only has an advisory role and does not have direct authority over the decision-making of the health trust who is the owner of the hospital project. Regarding flexibility management, it was concluded that due to a lack of general guidelines for managing risks and chasing opportunities, each health trust has to decide on their own how they want to proceed with management of flexibility in their projects. Therefore, there is room for Sykehusbygg HF in the work with standardization and creation of a common set of practices that all hospital building projects can consider and follow.

The third research question dealt with investigation of the processes, procedures and methods that the New Hospital in Drammen project uses to ensure realization of benefits. In the first step, a closer look at the strategies and organizational goals set by the owner of the NHD project, namely Vestre Viken health trust in the first layer and Helse Sør-Øst regional health trust in the higher layer, was taken. Helse-Sør Øst RHF has prepared a clear set of guidelines for measures and steps that should be taken for benefit realization and change management in projects conducted under its auspices. Therefore, the existence of these standardized and pre-defined set of tools was a clear sign that Helse Sør-Øst RHF emphasizes the importance of the identification and follow-up of the projects' benefits in order to realize its organizational strategies and objectives. Furthermore, a set of probable obstacles and challenges that could get in the way of organizational change measures has been prepared by the regional health trust that also shows the compilation of knowledge learned from previous experiences with projects or based on best practice mentioned in the literature. In the NHD project emphasis has also been given to the delegation of clear points of responsibilities for realization of each benefit/change to a specific person or role. Since the importance of the concept phase has been stressed in the literature, this phase of the NHD project was analysed with more focus and the goals of the project and how these goals were defined in terms of alternative conceptual solutions was discussed in depth. Another important factor that distinguishes the NHD project from the majority of hospital building projects is the existence of the benefit realization plan which clearly defined both the financial and non-financial effects expected from the project. All three interviewed consultants highly praised the work of this project with the benefit realization plan. In this project, emphasis has also been given to the importance of organizational change and how the introduction of new technology is not enough on its own for realization of benefits. As mentioned before, a standardized guideline for the

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management of flexibility in hospital building projects does not exist and this is seen as a room for improvement in the future, however, the NHD project has taken important steps to ensure using best practice in reducing risk and preventing unwanted variation. For instance, they have prepared a database for standard rooms based on Sykehusbygg HF's standard room catalog. In sum, it can be concluded that since Sykehusbygg HF does not have decision-making authority over the health trusts, it is mainly up to the health trusts to take advantage of the knowledge compilation that Sykehusbygg provides for them and the projects that are good at using these recommendations would probably be better at realization of benefits in their projects.

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