


ORIGINAL RESEARCH

Realising benefits in public IT projects: A multiple case study

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Abstract

Information Technology (IT) investments in the public sector are large, and it is essential that they lead to benefits for the organisations themselves and wider society. While there is evidence suggesting a positive connection between the existence of benefits management practices and the realisation of benefits, less is known about how to implement such practices effectively. The aim of this paper is to provide insights into when benefits are most likely to be realised, and how benefits management practices and roles should be implemented, in order to have a positive effect on the success of projects in terms of realising benefits. We collected data relating to 10 public IT projects in Norway. For each project, information on benefits management was collected from project documents by interviewing the project owners and benefits owners and via follow-up surveys. The benefits with the highest degree of realisation were those internal to the organisation, while those with the lowest degree were societal benefits. Projects assessed as having more specific, measurable, accountable, and realistically planned benefits were more successful in terms of realising benefits. Benefit owners were most effective when they were able to attract attention to the benefits to be realised, had a strong mandate, and had the domain expertise.

KEYWORDS

benefits management, cost-benefit analysis, project management, software project

1 | INTRODUCTION

The success of Information Technology (IT) projects has traditionally been measured as success in delivering within the cost on time and with the specified functionality and to a lesser extent based on the stakeholders' benefits [1]. However, there has recently been a shift in focus, with increased emphasis on the strategic role of IT projects in realising benefits [2], such that the main goal of IT projects is to result in something useful for someone rather than simply to produce technical artefacts. This study addresses this essential criterion for the success of IT projects and the management processes and roles required to enable success in realising benefits for the stakeholders.

Benefits management in IT projects is defined by Ward et al. as “[the process of organising and managing so that the potential benefits arising from the use of IT are actually realised”

[3], p. 214]. Ward et al. present the Cranfield process model for benefits management, which consists of five elements: (i) identifying and structuring benefits; (ii) planning the realisation of benefits; (iii) executing the benefits realisation plan; (iv) evaluating and reviewing the results; and (v) finding potential for further benefits beyond what was originally planned. More recent studies have found that the implementation of benefits management practices contributes to the realisation of benefits in IT projects, as summarised in a systematic literature review by Holgeid et al. [4]. Benefits management practices that have been documented as associated with success in terms of realising benefits include identifying and structuring benefits (e.g., [5–7]), planning the realisation of benefits (e.g., [3, 8–10]), ensuring responsibility and incentives for realising benefits (e.g., [5, 11–15]), implementing benefits management practices during the execution of the project (e.g., [6, 10, 16]), and evaluating and reviewing the realised benefits ([5–7]).

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The abovementioned evidence for the usefulness of the benefits management practices mainly relates to whether or not a benefits management practice is established, and less to how it is executed and how that may depend on the type of benefit (e.g., internal/external to the organisation). This formed the motivation for our focus in this study on examining not only whether or not a project involved implementing a practice but also how such practices are implemented and how differences in the implementation may affect the degree of success in realising the benefits. The paper focuses on two central benefits management practices: (i) the identification and structuring of benefits and (ii) ensuring responsibility for the realisation of these benefits.

The initial identification and structuring of benefits are frequently conducted as part of a cost-benefit analysis, such as when establishing a business case for investment in developing software. The existence of a high-quality business case seems, according to previous research, not to be in itself a strong indicator of success in terms of realising the benefits [6, 13]. This may be explained by the tendency not to use the business case as a means of supporting benefits management, but instead solely as a way of getting the project approved [17, 18]. The observation that benefits tend to be overstated [5, 8, 19–21] provides further support for the argument that the focus may be on project approval rather than benefits management. We have found few studies connecting the success of projects in terms of realising benefits with the characteristics of the benefits described in the business case, or with the characteristics of how the identified benefits were used to support the benefits management. Two exceptions are the study by Ul Musawir et al. [7], who found a positive effect on investment success from the practice of having *measurable* benefits and the study by Ward et al. [5], who found that organisations were more effective in realising benefits when they included a *wider set* of types of benefits that have generally been used.

Several researchers have found that including the role of benefits owner (a role that entails responsibility for benefits realisation management) is related to a better ability to realise benefits. Thomas et al. [11] found that the practice of assigning responsibility for benefits realisation was the most important aspect of benefits management in terms of achieving investment success. Their finding is supported by similar findings by other researchers, including Ward et al. [5] and Badewi [13]. However, beyond indications that the benefits owner is central to the realisation of benefits, the literature seems to provide few insights into how the benefits owner can best fill the role and the effectiveness of the processes that they can use to realise benefits.

To gain more knowledge about the two practices mentioned above, we formulated the following research questions to guide the data collection and analyses in our empirical study:

- RQ1: What are the characteristics of the identified (planned) benefits (RQ1a), and how are they connected to the realisation of these benefits (RQ1b)?
- RQ2: How are benefits managed during and after project execution (RQ2a), and how is the management of benefits connected to their realisation (RQ2b)?

- RQ3: What are the responsibilities and characteristics of the benefits owners (RQ3a), and how are these connected to the realisation of benefits (RQ3b)?

The rest of this study is structured as follows. Section 2 describes the research method. Section 3 presents and discusses the results. Section 4 reflects on the limitations of our study. Finally, Section 5 suggests some implications of our findings and provides concluding remarks and suggestions for future work.

2 | RESEARCH METHOD

We designed the study as a multiple case study, with 10 public IT projects as our cases. A multiple case study of this size has the potential to allow us to identify patterns of behaviour that are connected with the success of benefits realisation across the different cases, while at the same time enabling an acceptable level of in-depth analysis of each case. The study design is depicted in Figure 1 and described in more detail below.

2.1 | Selection of projects

Our selection of public sector projects included those that had applied for and succeeded in securing government funding through a scheme administered by the Norwegian Digitalisation Agency (NDA), which covered up to 50% of the cost of the IT projects. The applications for NDA funding were evaluated based on the net present value of the project, the assessed realism of the business case, and the benefits realization plans amongst other things. The benefits identified in the business cases for the projects were typically combinations of benefits to the project owner's organization (internal benefits), other government entities.

(external benefits—other governmental organizations)¹ and benefits to businesses and private persons (external benefits—societal). The internal benefits, if monetised², led to a budget reduction equivalent to 50% of the planned monetised benefits, typically spread over a period of 10 years. The NDA required documentation of the project outcome, including the benefits realised after project completion, no later than March 1 of the year after completion.

The 10 projects included in the study, all of which had received funding in 2017 had budgets of between Norwegian krone (NOK) 9.6 million and NOK 106.3 million

¹Where we use the term “external benefits” without specifying whether these are benefits to other public organizations or societal benefits, we mean the sum of these two types of external benefits.

²In this study, we distinguished between monetized and non-monetized benefits. Whereas all monetized benefits are quantitative, non-monetized benefits are normally non-quantitative, but may be quantitative.

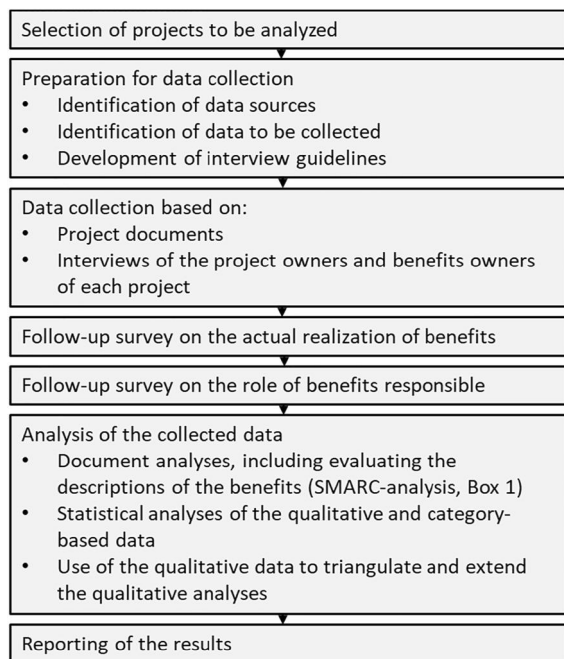


FIGURE 1 Design of the study

(approximately EUR 1–11 million). The projects had start dates in 2017 or 2018 and planned end dates in 2019.

2.2 | Data collection

We prepared for and carried out data collection in the following sequence:

- (1) Based on our research questions (see Section 1), we prepared a questionnaire and data collection guide³ for the document review and interviews.
- (2) We examined the documentation for all the projects. This included collecting data about project demographics (project budget, planned and actual duration and main deliverables), the planned benefits (i.e., the benefits identified in the business case and included in the benefits plan), the realised benefits (i.e., the benefits that were realised up to the point of data collection, which was approximately 1 year after the actual end date of the project) and the total benefits (i.e., the benefits that were already realised plus the benefits that were expected to be realised in the future). For each benefit, we collected several data points, including its size, whether it was monetised or non-monetised, whether it was internal or external (other governmental organizations/societal) and its ownership. The descriptions of the benefits were analysed and characterised according to the framework

proposed in Section 2.3. We also examined the project funding applications, with their associated benefit-realization plans and business cases and the final project reports.

- (3) We conducted interviews with the project owners, who had the overall responsibility for the results of the project and played an important role in monitoring the realisation of the benefits (e.g., [22, 23]). In addition, we conducted interviews with the benefits owners, who had the operational responsibility for the realisation of the benefits. Both internal benefits owners (from the organisation owning the project) and external benefits owners (from other organisations realising benefits from the project) participated in the interviews. The interviews focussed on collecting information that was missing from the written documentation, verifying the collected information (data source triangulation), gaining a more in-depth understanding of the processes and roles used for benefits management and gaining a better understanding of the degree of success in terms of realising benefits. The interviewees were promised anonymity in order to encourage open and frank dialog. Each interview lasted for approximately 60 min, and we interviewed a total of 17 project owners and benefits owners. It should be noted that we used only one response per project per data item, even when we had responses from both the project owner and the benefits owner, as there were significant differences in their responses in only a very few cases. In those cases, we used the response from the interviewee we assessed as having been most involved and having the most reliable knowledge. The interviewees were experienced professionals: all 17 had more than 10 years of work experience, and 11 (65%) had more than 20 years of experience. The interviewees had either some prior experience (71%) or extensive prior experience (29%) of benefits management.
- (4) Follow-up 1: For the purpose of our analysis, the final project reports did not include sufficient information about the extent to which benefits were realised or were expected to be realised in the future, and our interviews did not fully cover this information. In an attempt to acquire a complete overview of the realisation of the benefits, we sent out a survey questionnaire to the project owners in which we asked about the actual realisation of the benefits. For each planned benefit, the respondents gave two scores on a scale from 0% to 100%, which represented the proportion of the planned benefit that had already been realised (benefits realisation score 1), and the proportion that was expected to be realised in the future (benefits realisation score 2). We received responses for all 10 projects.
- (5) Follow-up 2: From our preliminary analysis of the role of the benefits owner, we identified a need for more information on how different role characteristics affected the success of benefits realisation. We therefore sent out another survey questionnaire requesting information about the perceived importance of the role of the benefits owner, their personal characteristics and their professional

³The questionnaire and data collection guide focused on questions that were relevant to this paper, but also included some additional questions, such as the type of development method used and the type of contract. The questionnaire and data collection guide will be sent to interested readers upon request.

knowledge and skills. The survey was distributed to both project owners and benefits owners. We received a total of 10 responses, representing nine of the projects.

To improve the quality of the abovementioned data collection, we carried out data source and observer triangulation.

2.2.1 | Data source triangulation

Central aspects of the information about the benefits management practices were collected from more than one source, which enabled us to compare the consistency of the information between the project documents, the interviews and the surveys. We observed small discrepancies in the information from the different data sources.

2.2.2 | Observer triangulation

Two researchers conducted the document reviews independently, and at least two researchers were present during each interview. After the interviews were concluded, two researchers independently assessed the notes from the interviews and extracted and coded the data elements to allow for comparison between cases. They then compared the coded data elements and resolved any differences by playing back the recorded interviews and discussions until a consensus was reached. To ensure that the relevant information was extracted from the interviews, all recordings were rechecked at least once.

2.3 | Analysis

Analyses of the quantitative data were performed and, where relevant, these were supported by analyses of the qualitative data. The aim in each case was to address the research questions, and both descriptive analyses and statistical tests were included. The statistical analyses consisted of the non-parametric Kruskal-Wallis test of differences in mean values and the Spearman's correlation coefficient. Assessments of the robustness of the findings and the relevance of the effect sizes were based on the statistical tests, qualitative data from the interviews and project documentation and previous research. In this study, where we present the results of statistical tests of differences for which we had a prior expectation of the direction of the difference, we show *p*-values based on one-sided tests; otherwise, we present *p*-values based on two-sided tests.

We use the terms 'realised benefits' and 'total benefits.' Realised benefits are those actually realised at the time when we sent the survey questionnaire, which was approximately 1 year after the planned completion date of the project. All of the project plans projected the realisation of all (or close to all) of the benefits by that time. Accordingly, a value of less than 100% realisation at that time means that the project had not (yet) been fully successful in the realisation of the planned

benefits. The total benefits consist of the sum of the benefits actually realised and the benefits expected to be realised in the years to come. This expectation may be affected by optimism bias about the future realisation of the benefits and should be interpreted accordingly.

Our review of the benefits realisation plans included an assessment of the quality of the formulation of the benefits. This assessment was made with the use of our proposed Specific, Measurable, Accountable, Realistic and Comprehensive (SMARC) framework, which is described in Box 1.

SMARC scoring was done independently by two researchers, who did not know the degree to which the benefits had been successfully realised to avoid a biased evaluation. The researchers compared their assessments and, where necessary, the evaluation process was iterated until a consensus was reached. A third researcher then performed an assessment based on the consolidated view of the first two researchers, and comparisons were again iterated until a consensus was reached.

3 | RESULTS

Section 3.1 presents descriptive results for the projects. Sections 3.2 to 3.4. report and discuss the results in relation to the three research questions.

3.1 | Projects

The projects included in our study were all owned by government agencies. The projects were established in the period 2017–2018, were initially planned to finish in 2019 and were actually finalised in either 2019 or 2020. The main deliverables, cost and duration of each project are listed in Table 1.

We asked the project owners for information about the degree to which the planned benefits (i.e., those from the initial business case) had been realised, as well as the proportion of the planned benefits that was expected to be realised in the future. For each benefit, the project owners were asked to score the degree to which the realisation had occurred for a given planned benefit as follows: (1) no benefits have been realised (0%), (2) some of the planned benefits have been realised (ca. 25%), (3) about half of the planned benefits have been realised (ca. 50%), (4) most of the planned benefits have been realised (ca. 75%) or (5) all the planned benefits (or more) have been realised (100%). Two further options were that the planned benefit had been found irrelevant and had been removed from the business case during the execution of the project and that the degree of realisation could not be assessed. The same scale was used for the planned benefits that were expected to be realised in the future. We were able to collect these data for all but five of the 98 planned benefits. As we lacked a score for the degree to which realisation had been achieved (or was expected to take place) for these, some of the analyses presented in the following do not include all 98 benefits. The number of benefits included is clearly stated in each table, showing the results of the analyses.

BOX 1 SMARC—Specific, Measurable, Accountable, Realistic and Comprehensive

The SMARC framework used in the study assesses the degree to which the benefits are specific, measurable, accountable, realistic and comprehensive. Benefits are specific when there is a clear description of what is to be achieved and the timing of their realisation is included. Benefits are measurable when they are attributable to the output of the project and the way in which they should be measured is specified. Benefits are accountable when benefits owners have been assigned. Benefits are realistic when they have a reasonable level of ambition, with documented uncertainty assessments and assumptions. Finally, benefits are comprehensive when they are anchored in the overall goals and strategies of the organisation and represent the objectives of various stakeholder groups. Each criterion has a set of sub-criteria, which were used in this study to structure an evaluation of the benefits.

The framework was inspired by Doran [24], who suggested the now well-known SMART (specific, measurable, attainable, relevant and time-targeted) characteristics for goal setting. Chih and Zwikael [25] developed this further, suggesting that in addition to the SMART criteria, benefits should be comprehensive and accountability for their realisation should be assigned. Zwikael et al. [23] proposed three dimensions to represent all of the abovementioned characteristics: specificity, attainability and comprehensiveness.

In line with Ref. [24], our variant of the framework, called SMARC, includes specificity as a characteristic, with the difference that we include time-targeting as part of this characteristic. We have kept measurability as a separate characteristic, as it is closely linked to the term ‘benefits’ (see, for example, the definition of benefits provided by the UK Office of government commerce [26]), and is based on the finding of a possible positive relation between measurability and investment success [7]. We have also kept accountability as a separate characteristic, as several researchers have found it to be essential in realising benefits (e.g., [5, 13]). We have also kept the characteristic of realism, which may be seen as a generalisation of the attainability characteristic in SMART. In line with Ref. [25], we have included the characteristic of comprehensiveness.

In our study, the S, M, A and R criteria for each benefit were given a score of between one (the lowest) and six (the highest). The C criterion was assessed on the same scale, but referred to the benefits of a project as a whole. The SMARC sub-criteria were inspired by Ref. [23] and the scale applied by Volden [27]. For more information on the use of the SMARC framework, see the [Appendix](#).

The results reported in this study (see Section 3) suggest that SMARC scores can be related to success in realising benefits. This indicates that the SMARC framework may be useful in guiding and evaluating descriptions of the planned benefits from the projects.

TABLE 1 Summary of projects

Project ID	Main deliverables	Budget (million NOK)	Duration
A	IT system for an efficient analysis of data related to public security, including risk analyses required by the state and local government authorities	30	2017–2020
B	IT system for case management, including functionality allowing for citizen self-service	37	2017–2020
C	IT system for tracking public grants	9.6	2017–2020
D	IT system for supporting the management of a national register	18	2018–2020
E	IT system for management and analysis of measurements collected from sensors	15.7	2017–2019
F	IT system for supporting administrative processes	15	2017–2019
G	System for customer relationship management	6.9	2017–2019
H	IT system to support effective work processes	9.7	2018–2020
I	IT system for reporting and management of concerns related to the welfare of citizens	13.8	2017–2019
J	IT system for citizen access to welfare services	106.3	2018–2019

Abbreviations: IT, Information Technology; NOK, Norwegian krone.

We found large variations in benefits realisation across the 10 projects. Figure 2 shows the realised benefits and the total benefits (realised benefits plus those expected to be realised in the future). At the time of data collection, the projects had

on average realised 45% of the planned benefits; however, the interviewees reported an expectation that 92% of the planned benefits would be realised in the future. For six of the benefits in the business case of Project C, the project

owner was not able to give information about the degree of realisation, which explains the low degree of benefits realisation for that project. This lack of knowledge about the degree of realisation may be indicative of a low degree of realisation and hence the data on benefits realisation for that particular project are uncertain.

3.2 | What are the characteristics of the identified (planned) benefits (RQ1a), and how are they connected to the realisation of these benefits (RQ1b)?

3.2.1 | Characteristics of the planned benefits

In this section, we examine the main purposes of identifying the benefits of each project, the interpretations of 'estimated benefits' and the characteristics of the identified benefits.

Purpose of identifying benefits

We asked the project owners about the importance of the different potential purposes of the work carried out to identify benefits. As shown in Figure 3, interviewees from all projects responded that an important purpose of the work done to identify benefits was to demonstrate to decision-makers that the benefits would be higher than the investment costs required. The importance of identifying all of the important benefits (three positive responses) and contributing to benefits management during project execution (two positive responses) were assessed as being much lower. This was confirmed in the qualitative part of the interviews, when one interviewee claimed: "The business case is just something we need in order for us to get project approval. It is not for anything else." Another interviewee said: "It makes no sense to craft detailed benefits plans at the outset of projects. By the time we have finalised the plan, the world will have moved on." Other interviewees stated the following: "We put together some benefits to get the project

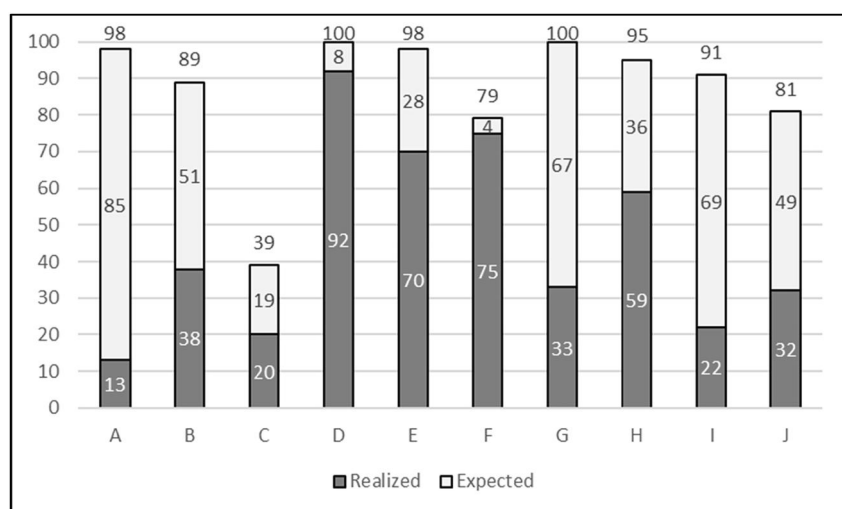


FIGURE 2 Realised benefits (as a percentage of the total benefit) at the time of interview for projects A–J

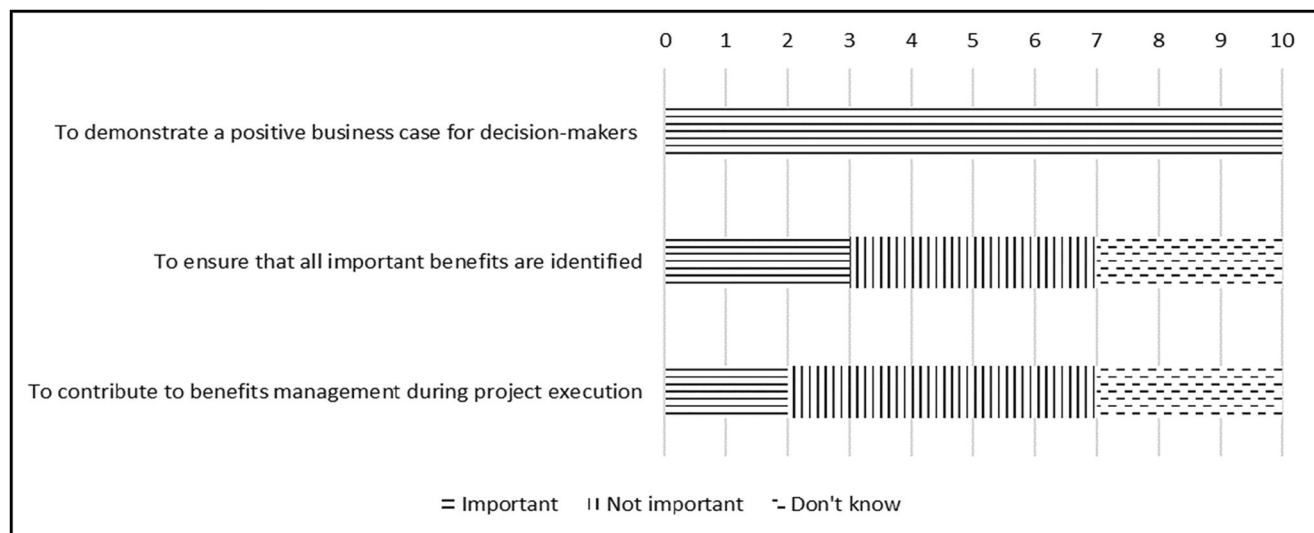


FIGURE 3 Purposes of the work carried out to identify benefits and their importance

approved,” “we had to document a positive business case even though the investment was a no-brainer,” and “the benefit estimates were based on fantasy and wishful thinking.” Overall, the responses suggested that the main purpose of the business case had been to secure project approval and to a lesser extent to facilitate the realisation of benefits. This finding is in line with the results from previous studies (see Section 1), but it may also point to a potential for improvement. As indicated by Ward et al. [5], identifying a wider set of benefits may lead to more realised benefits from the project. In addition, in accordance with the results reported by Jørgensen et al. [16], actively managing the benefits identified in the business case during project execution is connected to a better realisation of benefits.

Interpretation of ‘benefits’

We asked the interviewees, “Which of these understandings of benefit do you consider closest to the one used in your benefits analysis?” with the predefined response categories “Most likely benefits,” “Benefits that occur if nothing unexpected happens,” “Other interpretation” and “Don’t know.” Interviewees from five of the projects believed that their estimates were based on the understanding of the estimated benefits as “Most likely benefits”; from four of the projects as “Benefits that occur if nothing unexpected happens”; and from one project as “Don’t know.” The interpretation of benefits as “Benefits if nothing unexpected happens” is an indication of (perhaps deliberately) optimistic benefit estimates in four of the projects. The response “Most likely benefits” may also be considered as indicating optimistic estimates, if we assume that the distribution of benefit outcomes is negatively skewed (left-skewed) (i.e., where the expected benefits are lower than the most likely benefits) [28]. These findings are consistent with a systematic bias, stemming from how benefits are understood, towards overoptimism in terms of the benefits estimation.

A follow-up analysis of the awareness of the effect of benefits uncertainty on the business case, through an examination of the business cases and other relevant documents, revealed that none of the 10 projects had included a quantified uncertainty assessment of the estimated benefits and only considered high-level qualitative aspects of the benefits realisation risk. This lack of uncertainty analyses provides further support for a tendency towards an optimistic assessment of the individual benefits. The finding that the actually realised benefits, as assessed 1 year after project completion, were substantially lower than the planned benefits (see Figure 2), provides further support for a tendency towards overoptimism in the benefits estimates.

Types of benefits identified

The estimated monetised return on investment (estimated net present value per NOK or EUR invested) and the distributions of the monetised and the non-monetised benefits are presented in Table 2. The proportion of monetised benefits per type of benefit (i.e., internal benefits, external benefits—other governmental organizations and external benefits—societal),

were calculated based on the monetary value of the benefit. For non-monetised benefits, we present both the number and the size (large, medium and small) for each type of benefit. The sizes of the non-monetised benefits were stated in the benefits plans. We were unable to find any common definition of the criterion for categorising a benefit as large, medium or small; in other words, the projects might have based their definition on different understandings of size, and the size categories may be mainly project-internal indicators of the relative sizes of the non-monetised benefits.

The business cases included a total of 98 benefits, of which 33 (34%) were monetised and 65 (66%) were non-monetised. On average, a project was associated with 10 identified benefits. The largest of the estimated monetised benefits, as relative values, were external benefits to other governmental organisations (on average, 49% of the monetised benefits were to other governmental organisations), although there were also substantial estimated internal benefits (30%) and external benefits to society (22%). Of the non-monetised estimated benefits, most were internal (on average, 45% of the non-monetised estimated benefits were internal), but many were also external benefits to other governmental organisations (22%) and external benefits to society (34%). Of the non-monetised benefits, 5% were considered small by the applicants, 38% medium and 57% large. When the monetised and non-monetised estimated benefits were taken together, we found that 39 (40%) of the estimated benefits were internal, 25 (26%) were external to other governmental organizations and 34 (35%) were external to society.

The interviews revealed that the project funding scheme may have had an effect on the type of benefits identified and included in the business case. While the identification of external or non-monetised internal benefits did not lead to a budget cut, the organisation receiving funding from NDA experienced a budget cut of 50% of the internal monetised estimated benefits (see Section 2). Not surprisingly, this may have provided incentives to emphasise the identification of benefits other than the internal monetised ones. As stated by one of the interviewees, “Since the government set savings requirements [budget cuts] for all projects with internal benefits, we did not describe the additional internal benefits.” Much of the research on information systems assumes that managerial actions are rational, and are intended to maximise efficiency and effectiveness [29]. Casey et al. [30] suggest that the organisational dynamics of benefit realisation and the strategic behaviour of organisation members need to be considered in order to understand benefit realization practices. This is consistent with our finding that the funding scheme had contributed to projects based on business cases (and corresponding benefits plans) that did not include all of the important benefits. The incompleteness of the identified benefits, in at least some of the business cases, may to some extent also explain why many of the interviewees did not see work on the identification of benefits as important in terms of facilitating the realisation of benefits (for further discussion of this point, see Section 3.3).

TABLE 2 Return on investment (monetised benefits) and distribution of monetised and non-monetised benefits

Project ID	Return on investment	Distribution (based on monetary value) of monetised benefits			Distribution (based on number and size) of non-monetised benefits									
		External benefits			External benefits									
		Internal benefits	Other government organizations	Wider society	Internal benefits				Other government organizations				Wider society	
					L ^a	M ^b	S ^c		L	M	S	L	M	S
A	27.0	1%	99%	0%	1	0	0		3	0	0	2	0	0
B	65.2	0%	36%	64%	0	1	0		2	1	0	3	0	0
C	0.8	32%	68%	0%	2	0	0		2	0	0	1	1	0
D	19.6	2%	98%	0%	0	0	0		2	1	0	1	0	0
E	18.0	8%	25%	67%	3	6	1		1	0	0	0	0	0
F	15.2	64%	36%	0%	2	2	0		0	1	0	0	2	0
G	9.0	98%	0%	2%	1	2	0		0	0	0	1	0	0
H	1.6	91%	0%	9%	2	1	0		0	0	0	1	2	0
I	9.2	0%	100%	0%	0	0	0		1	0	0	4	2	0
J	7.3	0%	24%	76%	1	2	2		0	0	0	1	1	0
Mean	17.3	30%	49%	22%	1.2	1.4	0.3		1.1	0.3	0	1.4	0.8	0

^aL – large.^bM – medium.^cS – small.

SMARC scores for the identified benefits

Figure 4 shows a boxplot (where the box includes 50% of the observations and displays the median) of the total variation in the SMARC score across all projects (left) and the variation in the mean SMARC scores between the projects (right).

From an assessment of the descriptions of the benefits using the SMARC framework, we observed that many benefits were only vaguely described and lacked information about how to follow up and measure them (as reflected in the scores for specificity and measurability). In some cases, the benefits owners were not named, and there was frequently a lack of evidence of planned active benefits ownership (reflected in the accountable scores).

A low score for realism was partly caused by a lack of references to evidence from previous projects or to other sources as context for the benefit estimates. Several projects had low scores for comprehensiveness due to a skewed focus on the benefits that were easiest to measure and follow up, and some of the benefits had low scores for relevance and strategic alignment and did not cover all relevant stakeholder groups.

Overall, as shown in Figure 4, there was a considerable variation in the scores, both within each of the S, M, A, R and C characteristics and between the projects (mean scores). This provided an opportunity to study the relationships between the SMARC scores (i.e., the quality of the description of the benefits) and the realisation of benefits.

3.2.2 | Relationships between benefit characteristics and realization of benefits

In this section, we examine how the characteristics of the benefits were connected with their realisation.

Degree of realisation versus where benefits were realised

We evaluated the extent to which the degree of realisation was connected with whether a benefit was expected to be realised internally (i.e., by the public organisation owning the project), externally in other public organisations or in wider society.

Table 3 shows the resulting mean benefits (as a percentage of the planned benefits of each type) realised for each of the types, together with the results of a test of the difference in mean value.

As shown in Table 3, internal benefits were realised to a higher degree than the other types, and the benefits to other governmental organizations were realized to a higher degree than societal benefits. The mean realised benefits were significantly different ($p = 0.01$) depending on where they were realised.

In order to better understand this finding, we first examined whether the planned time for the realisation of benefits differed across the three types of benefits; for example, if the internal benefits were scheduled to be realised earlier than the external ones, our finding of internal benefits being realised to a larger extent 1 year after project completion would not be surprising. Secondly, we asked the interviewees whether the realisation of internal benefits was perceived as being easier than for the other two types of benefits. Finally, we looked for other potential differences between the three types of benefits. Our observations included the following:

- (1) With two exceptions, the realisation schedule of the benefits was similar for all three types of benefits. Hence, the higher degree of realisation of internal benefits compared with the two other types does not seem to be due to differences in the realisation schedules.
- (2) Internal benefits were perceived as easier to realise for only three of the projects. The respondents for the other projects reported either that these were not easier (two projects) or “Don't know/not applicable” (five projects).
- (3) There were differences in the adoption of the practice of having benefits owners across the types of benefits. We found indications of a less active project participation by external benefits owners compared with those responsible for internal benefits (see the results presented in Section 3.4.1). This may to some extent explain why external benefits were not realised as successfully as internal benefits. Further evidence for this explanation is given in Section 3.4.2.

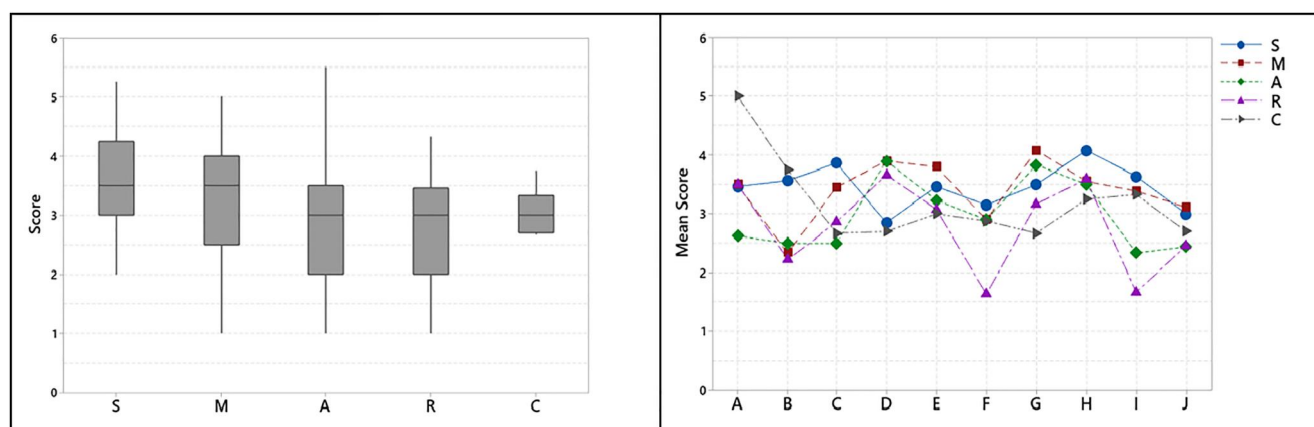


FIGURE 4 Total variation in SMARC scores (left) and variation in mean SMARC scores between projects A–J (right)

TABLE 3 Degree of realisation versus where benefits were realised, in terms of monetised and non-monetised benefits, size of benefits, quality of the description of the planned benefits and the existence of benefits owners

	<i>N</i>	Mean benefits realized (%)	Two-sided Kruskal-Wallis test of difference (<i>p</i> -value)
Degree of realisation versus where benefits were realised			
Realised benefits			
Internal	39	56%	0.01
External to other organisations	25	41%	
External to society	34	32%	
Realised + expected realised benefits			
Internal	39	91%	0.70
External to other organisations	25	88%	
External to society	34	96%	
Degree of realisation versus monetised and non-monetised benefits			
Realised benefits			
Monetised	26	39%	0.30
Non-monetised	57	47%	
Realised + expected realised benefits			
Monetised	23	90%	0.30
Non-monetised	56	94%	
Degree of realisation versus size of benefits			
Realised benefits			
Small and medium	35	49%	0.10
Large	42	38%	
Realised + expected realised benefits			
Small and medium	34	92%	0.97
Large	39	94%	
Degree of realisation versus quality of description of planned benefits			
Realised benefits			
Low quality benefit description component score	41	38%	0.03
High quality benefit description component score	40	51%	
Realised + expected realised benefits			
Low quality benefit description component score	38	86%	0.01
High quality benefit description component score	39	97%	
Realisation versus the existence of benefits owners			
Realised benefits			
The benefit had a named benefits owner	31	56%	0.01
The benefit did not have a named benefits owner	52	38%	
Realised + expected realised benefits			
The benefit had a named benefits owner	30	94%	0.15
The benefit did not have a named benefits owner	49	90%	

The proportion of total (realised + expected) benefits did not differ significantly between the types of benefits (a Kruskal-Wallis two-sided test of difference gave a p -value of 0.70). This result might have been affected by many of the interviewees' high (and possibly unrealistic) expectations for the realisation of almost all of the remaining benefits in the future. On average, we found that 91% of the total internal benefits, 88% of the total external benefits to other governmental organisations and 96% of the total external societal benefits were expected to be realised. Some of the interviewees reported uncertainty related to the external societal benefits, as exemplified by one interviewee: "We are relatively certain we can realise the internal benefits. However, the societal benefits are less certain, and although the description of the societal benefits is OK, their estimates are highly uncertain." Although in some cases, the expected realisation of external benefits seemed to be associated with high uncertainty, the expected realisation of these was not very different from the high expected level of realisation of internal benefits. Thus, the main difference may be that it takes more time to realise external benefits than internal ones, not that they are less likely to be realised. More research is needed to examine the extent to which this is the case.

Degree of realisation versus monetised/non-monetised benefits

The possible monetised benefits were realised to a different degree than the non-monetised benefits, as shown in Table 3. The results showed weak (and not statistically significant) indications that the non-monetised benefits were realised to a higher degree than the monetised ones. One possible reason for this is that most of the non-monetised benefits were internal benefits (see Section 3.2.1), which were realised to a higher degree than the other types of benefits (see Table 3).

Degree of realization versus size of benefits

In all projects, the non-monetised benefits were categorised in terms of size, as small, medium or large. To allow for a joint analysis of monetised and non-monetised benefits, we used the same size categories for the monetised benefits. For the monetised benefits, the size categories were based on their relative monetary size, with equal numbers of monetised benefits in the categories of small, medium, and large. Only a few non-monetised benefits were categorised as small, and we therefore combined small and medium benefits into a single category to enable a more robust analysis. Table 3 shows the extent to which the size of benefits, which is associated with its importance, was connected to the degree of its realisation. The results in Table 3 suggest that small and medium-sized benefits were realised to a greater extent ($p = 0.10$) than the larger and presumably more important benefits. There were almost no differences in the degree of realisation when the expected realised benefits were included ($p = 0.97$).

Degree of realization versus the quality of the descriptions of the planned benefits (SMARC scores)

To examine the extent to which the quality of the description of a planned benefit, as measured by the SMARC scores, was

connected with the degree of realisation, we constructed a component consisting of the first four characteristics of the scores (S, M, A and R). For this purpose, we used the principal component analysis, which reduces the number of variables while preserving as much information as possible. The comprehensiveness characteristic (C) was not included, since this score was given for the project as a whole rather than for each individual benefit (see Section 2, Box 1). The resulting component had a loading of 0.58 for the measurability characteristic, 0.60 for accountability, 0.55 for realism and 0.065 for specificity; in other words, the component score was mainly driven by a benefit's measurability, accountability and realism. Based on the loadings, each benefit was given a score (a z -score). The score was then categorised as "high" or "low," depending on whether it was among the highest or lowest 50% of the component scores. Based on previous results (see Section 1), we expected that benefits with a "high" quality description (i.e., a high SMAR component score) would be more likely to be realised than benefits with a "low" quality description (i.e., a low component score). The results of the test of this expectation are presented in Table 3. As expected, and as shown in Table 3, benefits with high SMAR component scores had significantly higher realized benefits ($p = 0.03$) and total benefits ($p = 0.01$) compared with the benefits with a low component score.

This connection between the quality of the description of a planned benefit and its realisation was further supported by a follow-up analysis of the benefits at the project level. The mean component score per project, across all benefits for that project, was positively correlated with both the mean realised benefits ($r = 0.24$, $p = 0.26$) and the total benefits ($r = 0.77$, $p < 0.01$). These results indicate that a component based on SMAR values may be useful for predicting success in the realisation of benefits. They also suggest that project managers should ensure that their planned benefits are described in ways that allow them to be measured, that accountability for the realisation of benefits is clarified and that the benefits are realistic.

A follow-up analysis of the correlations between the S, M, A and R scores and the realised benefits revealed that the strongest correlations were for accountability (A) ($r = 0.30$, $p < 0.01$), realism (R) ($r = 0.14$, $p = 0.11$) and measurability (M) ($r = 0.10$, $p = 0.18$). These are the characteristics with the highest loadings in the quality component. The characteristics with the strongest correlations with total benefits were measurability (M) ($r = 0.29$, $p < 0.01$), realism (R) ($r = 0.28$, $p < 0.01$) and accountability (A) ($r = 0.10$, $p = 0.20$). In other words, these were the same characteristics as for the realised benefits, but with different rankings. All other correlations were lower than 0.1.

To summarise, our findings suggest that the characteristics of the descriptions of the benefits are important and that the measurability, accountability and realism of these are of particular importance. However, the observational nature of our analysis means that these results must be interpreted with caution; for example, it is possible that those responsible for high-quality formulations of benefits and consequently high SMARC scores for these benefits are also better at following up the benefits. Thus, the observed relationship is mainly correlational and not causal.

3.3 | How are benefits managed during and after project execution (RQ2a), and how is the management of benefits connected to their realisation (RQ2b)?

3.3.1 | Benefits management during and after project execution

In this section, we aim to provide a better understanding of the management of benefits during and after project execution.

Changes to planned benefits during execution

The interviews and project documents revealed that during project execution, the planned benefits and associated plans were changed (beyond minor adjustments) in only two of the 10 projects. This was the case despite the fact that the projects lasted two to 3 years, with several of the interviewees reporting that the early production of detailed benefits as input to the business cases made little sense (“the world had moved on”) and despite the fact that the projects claimed to work with agility, where flexibility in requirements was a central element.

The process for gaining funding for the project, which meant that substantial changes to the benefits plan needed approval from the NDA, may have contributed to the limited changes to benefits during project execution. One of the interviewees stated: “We should have the flexibility to deviate from what was initially planned,” suggesting that this had not been perceived as the case in reality. Another reason may be that the use of benefits management plans was novel to some of the projects. Some of the project owners had learnt from the process, as reflected in the statement: “Recently, I realised that the benefits plan can be a living document [...], a document that can be useful.” Changes to planned benefits may also include adding benefits, such as the use of feedback or insight acquired from the project execution to identify new benefits.

The interviews revealed that none of the projects had established roles or procedures for identifying new or additional benefits.

Measurement of realized benefits

The funding scheme required that the project owners measure the realised benefits and compare the findings with the planned benefits. We asked the interviewees whether they agreed or disagreed with the statement “Many of the benefits are hard to measure in a meaningful way.” Interviewees from six of the 10 projects agreed, with those from the remaining four projects disagreeing. One interviewee stated: “We find it hard to explain what the benefits really are and how to measure them [...] this [the benefits and how to measure them] has been rather abstract for many project participants.” Five of the projects had stakeholders who found it “hard to know if the realised benefits were caused by the project deliverables”. Another interviewee stated: “When measuring benefits, we feel like we have to come up with something in order to comply with the requirement of documenting our benefits [and] going back and documenting benefits [...] was more of a formality that was rather awkward.” The interviews revealed that only two of the 10 projects had a written plan for how to measure the benefits, two had a partial plan and the rest had no written plan at all. Our results indicate that measurement of the realised benefits appeared to be challenging for several of the projects.

3.3.2 | Relations between benefits management during and after project execution and realisation of benefits

Figure 5 shows the interviewees' responses to the question of the importance of different benefits management practices in terms of the realisation of benefits.

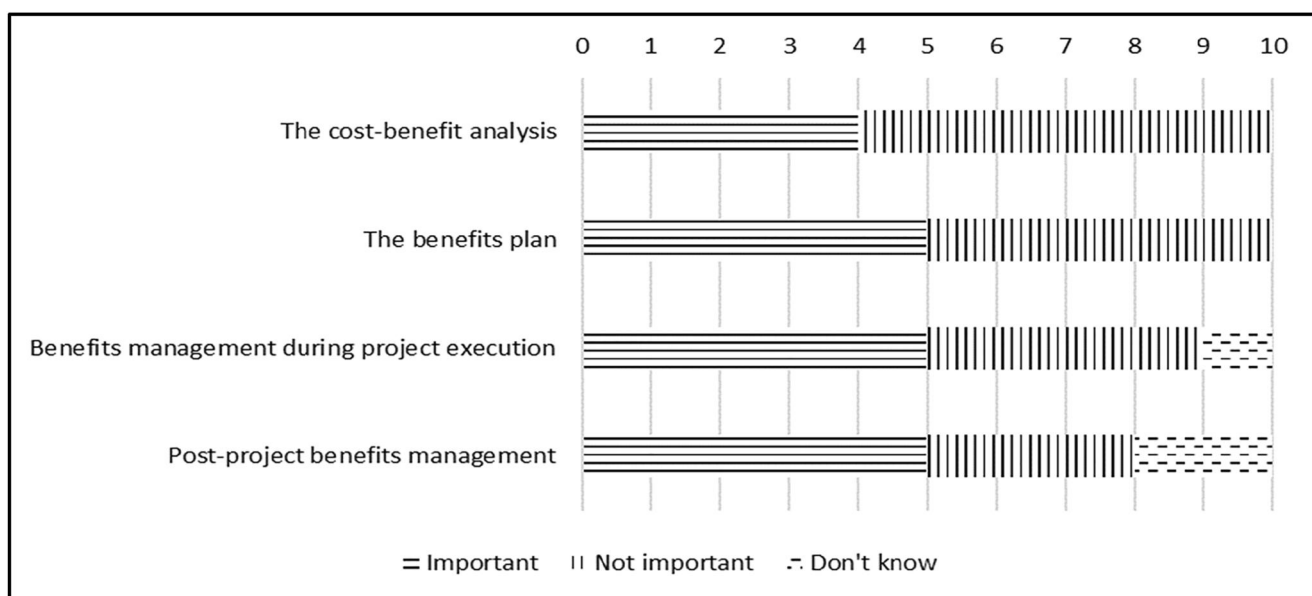


FIGURE 5 Benefits management practices and their importance for the realisation of benefits

Most respondents considered that a cost-benefit analysis was not important for the realisation of benefits. This finding corresponds well with what they reported as the main purpose of identifying benefits, as discussed in Section 3.1. The benefits plan was considered slightly more important for realising benefits, as half of the respondents considered the benefits plan important. This finding seems to correspond well with the statements made during the interviews that the benefits plan quickly became outdated after the project had started (see Section 3.2.1) and, consequently, as one interviewee unequivocally stated: “[The benefits plan] was thrown in the dustbin.” A similar level of perceived importance was attributed to benefits management during project execution and post-project benefits management (i.e., practices for following up the realization of benefits after the project was completed).

3.4 | What are the responsibilities and characteristics of the benefits owners (RQ3a), and how are these connected to the realisation of benefits (RQ3b)?

3.4.1 | Benefits owners

The inclusion of a benefits owner (i.e., a person with particular responsibility for the realisation of the planned benefits) was required to receive governmental project funding. We examined the responsibilities and characteristics of the benefits owner, as implemented in the projects. This examination was based on interviews with 17 project owners and benefits owners and follow-up studies (see Section 2). Of the 17 interviewees, nine were benefits owners; all nine had more than 10 years of work experience, and five (56%) had more than 20 years. All benefits owners had some prior experience of benefits management, and three had extensive experience. Eight of the nine benefits owners interviewed were line managers.

The responsibilities of the benefits owners varied across the projects and included the following: identifying benefits, establishing and updating the benefits realisation plan, evaluating the realisation of benefits, participating in decision-making processes related to the functional scope of deliveries and involving the project stakeholders through communication and marketing activities. One interviewee explained the role of the benefits owner as follows: “It is all about stimulating others to start realising the benefits. We must transfer the responsibility to those who wear the shoes [with reference to the expression “Only the wearer knows where the shoe pinches”] and help them to see that this is in their own interest.”

The authority of the benefits owner varied across the projects, and one project did not have anyone filling this role. One benefits owner with limited authority stated: “I have zero authority over the municipalities [where the benefits are to be realised], but I am dependent on goodwill from these municipalities.” Another interviewee stated: “We have no authority to exert leverage over the municipalities that possess the right to self-government [and] we therefore have to fight for their

attention [...] [T]his illustrates an important difference between some public and private organisations.”

We examined the benefits ownership of each planned benefit and considered input from both the interviews, including input from the internal and external benefits owner of each project and the documented benefits plans. For most benefits (63 of the 98 identified), there was no actual named benefits owner in the benefits plan. There were also benefits for which a department was the named benefits owner. With the exception of one project, none of the external benefits were associated with the named benefits owners in the benefits plan. As stated by one of the interviewees: “It is more important to involve external parties in developing the solution than to give them the roles of benefits owners, as that would lead to more bureaucracy.” This lack of clarity about the external benefits owners for the individual benefits may have been reflected in the lack of involvement from external parties in identifying the benefits they were supposed to realise. Only two of the 10 projects involved external parties in the identification of benefits. One interviewee stated: “It is impossible to say when the [external] benefits will be realised, but we do believe benefits will be realised down the road.”

To summarise, in all but one of the projects there was someone in the role of benefits owner, typically with an extensive relevant experience. The responsibilities of the benefits owner were not always clarified, and the authority to exercise these responsibilities varied a great deal across the projects. There were no named benefits owners with responsibility for most of the individual benefits and particularly for the external ones, and this may have had a negative impact on the follow-up and management of these benefits.

3.4.2 | Relationship between the benefits owner and the realization of benefits

We examined how the existence and the characteristics of the benefits owner were connected with the realisation of the planned benefits.

Existence of benefits owners and realization of benefits

During the interviews, we asked “To what extent did you find the role of the benefits owner to be of importance for the realisation of the benefits?” The responses revealed that the role of the benefits owner was viewed as important in realising the benefits for the majority of the projects (“important” in six projects, “not important” in three projects and “did not have benefits owners” in one project).

A comparison of the differences in the realisation of the benefits with and without a named benefits owner is presented in Table 3. As expected based on the previous research (e.g., [11, 13]), the results of one-sided tests revealed that having a (named) person responsible for the realisation of benefits was associated with higher levels of benefits realisation.

Table 3 shows that where named benefits owners existed, the benefits were realised to a significantly higher degree

($p = 0.01$) than when there were no named benefits owners. In addition, the total benefits were higher in cases where there were benefits owners, although the results were not statistically significant ($p = 0.15$).

Characteristics of successful benefits owners

Table 4 shows the characteristics that the interviewees indicated were important in helping to realise the benefits. The mean values represent the level of importance (on a scale from 1 = low importance to 5 = high importance) from our survey-based follow-up study (see Section 2), which received 10 responses relating to nine projects.

Importance of having the ability to persuade, attract attention and carry out marketing

As shown in Table 4, the characteristics of the person in the role of benefits owner that were considered most important were the ability to persuade and sell (with a score of 4.3) and the ability to attract the attention of others to the benefits to be realised (with a score of 4.3). The respondents also highlighted the importance of having the ability to carry out marketing and to convey, inform and communicate (with a score of 4.1).

These findings were supported by reports from three of the interviewees that they emphasised marketing and communication activities to keep their stakeholders and end users informed and engaged. For this purpose, the benefits managers held webinars, seminars, conferences and courses to demonstrate how the new solution would contribute to the achievement of benefits. One interviewee suggested that the benefits owner should take on the role of “chief of marketing,” while another stated that they had hired an “evangelist” to carry out marketing activities directed towards municipalities. In one project, an advertising agency was hired to disseminate newsletters and promotional material, such as water bottles and writing pads, to the end users.

Importance of understanding the users' needs and how IT projects can enable the realization of benefits

As shown in Table 4, an understanding of the users' needs (score 4.3) and how IT projects can contribute towards benefits realisation (score 4.2) were among the most important characteristics of effective benefits owners. One interviewee said: “The person responsible for benefits must understand the users' needs, have subject matter competence and have an

TABLE 4 Importance of benefits owners' role and characteristics (sorted by relative importance within each category)

Characteristic	Mean
Role and mandate	
Must have a clear and powerful mandate	4.2
Must have support from management (i.e., sponsored by management)	4.2
Must be accountable and held to account for the realization of benefits	4.0
Must have the authority to make decisions (e.g., related to the prioritisation of scope)	3.9
Must be a line manager	3.9
Should be part of the project leadership team or the steering committee	3.8
Personal characteristics	
Ability to persuade and sell	4.3
Ability to attract the attention of others to the benefits to be realized	4.3
Stayer/“never give up” attitude	4.2
Ability to carry out marketing, convey, inform, and communicate	4.1
Ability to establish trust and to be trustworthy	4.1
Ability to motivate, encourage, and stimulate others to realize benefits	3.9
Ability to find ways to collaborate and create good conditions for collaboration	3.9
Professional knowledge/skills	
Understanding of the users' needs	4.3
Understanding of IT projects (how they can contribute to benefits realization)	4.2
Subject matter knowledge (i.e., professional knowledge of the domain to be addressed by the project)	3.8
Informed about trends (e.g., technology trends and changes in users' needs)	3.6
Marketing (including, for example, the use of marketing techniques)	3.5
Informed about developments in other organizations (e.g., municipalities, other external organizations, research institutions), in order to learn how to realize more benefits	3.4

Abbreviation: IT, Information Technology.

impact on design and functionality,” as it was important to remove “nice to have” and to focus on the core of what helped to contribute to the realisation of benefits. Another interviewee stated: “One must not only talk about benefits from a strategic perspective and at a high level, but must link it closely to the subject matter.”

Importance of support from management and a powerful mandate

Effective benefits owners were associated with strong support from the management, with a clear and powerful mandate (score 4.2, Table 4). According to one interviewee, benefits owners must have the authority to “put their foot down when necessary in discussions about the project scope.” One project owner said:

She [the benefits owner] is responsible for the benefits, but she does not possess the authority to realise the benefits. If you have the burden and risk [of owning benefits], you should have the influence on what is happening, but here she has no authority, only burden and risk. We have not been able to change this, and consequently we are struggling to realise benefits.

Benefits owners left with soft measures were advised to have a “never quit” attitude (mean score 4.2, Table 4), as reflected in the statement by one interviewee: “Do not give up, things take more time than you think.” The importance of this attitude was also highlighted by an interviewee who followed up benefits realisation in other organisations by relentlessly “calling and calling and pushing and pushing.”

In summary, our findings indicate that the respondents perceived successful benefits management to be particularly supported by benefits owners who could persuade, sell and attract the attention of others to the benefits to be realised, and who had an understanding of users' needs and how IT projects could contribute to benefits realisation. In addition, they should have strong support from the management and be given a clear and powerful mandate.

4 | LIMITATIONS

Our multiple case study had a number of limitations that should be considered when assessing the validity of our findings.

There is a risk that the interviewees had different understandings of the terms used in the interviews (e.g., the terms ‘benefit,’ ‘business case’ and ‘benefits plan’). We consider this risk to be partly mitigated by the fact that all 10 projects adhered to the same governmental templates and procedures, meaning that the interviewed project owners and benefits owners had previously been exposed to the terms used in our interviews and surveys. To allow for some preparation ahead of each interview, the project owners and benefits owners were given a copy of our semi-structured interview guide, in which the central terms were put into context and explained.

Furthermore, during the interviews, we clarified terms when necessary. We performed more than one interview for most of the projects, and in situations where the project owner and benefits owner from the same project clearly had opposing views, we iterated the process to determine whether these differences were real or based on misunderstandings.

As discussed in Section 2, we carried out data source triangulation and observer triangulation to ensure the quality of our data. However, with qualitative data, there is always a threat that the respondents' subjective interpretations and assessments may influence the results. The data on benefits realisation (realised benefits and benefits to be realised in the future, see Figure 2) were retrieved from the project owners and in most cases were not verified through benefits measurement or more objective assessments by those actually realising the benefits. Consequently, there is a risk that the project owners wanted to position their project in a good light by overstating the realised benefits. Despite the possibility of bias due to the assessments of the realised benefits being too positive, our impression was that interviewees were open and honest when discussing their projects, perhaps because they were aware that they would be anonymised and that we were researchers rather than governmental evaluators.

Another possible threat to validity is the extent to which the interviewees were able to give meaningful answers to our questions about the degree to which the estimated benefits had been realized. We studied projects that had been completed fairly recently (all had been completed less than 2 years before our interviews), which turned out to be slightly too early for some of the benefits to be fully realised; we therefore included the project owners' estimates of the benefits they thought would be realised in the future. Waiting even longer after completion of the project to examine the actual realisation would have led to other threats, such as interviewees experiencing greater difficulties in recollecting what had happened during the project period. We considered that the collection of benefit data one to 2 years after completion of the project represented a meaningful trade-off between being able to collect data about the realization of benefits and data collection not being too distant from the project execution.

The observed connections between benefits management practices and the realisation of benefits may have been due to factors that were not included or analysed in our study, that is, due to confounding factors. For example, an organisation's ability to manage IT projects and to produce high-quality software may be the underlying reason for its success in realising benefits, meaning that all the benefits management practices and skills analysed here may not be essential and may simply happen to correlate with the project management and delivery ability of the organisation. While our results indicate associations between the benefits management practices studied here and the successful realisation of benefits, we cannot claim causal relationships based on our observations alone. Nevertheless, we are of the opinion that the patterns found in our study and especially those supported by experience as reported in the interviews, suggest that there are associations that are of interest for organisations to consider

when aiming for a successful realization of benefits. At the very least, such patterns may be used as indicators or predictors of whether or not the project is likely to be successful in realizing benefits.

The SMARC framework appears to be a useful means of assessing to the extent to which the way benefits are described contributes to their successful management. While we believe that the SMARC framework may be useful in terms of both guiding and evaluating descriptions of planned benefits and a major contribution of this study, there is a need for further validation before we can be confident about its usefulness and ease of use in other contexts.

Our sample consisted of medium-sized Norwegian governmental projects. The creation of benefits management plans was required for these projects, suggesting that there may have been a stronger focus on benefits realisation than in many other IT projects. Both the sample itself and the potentially stronger emphasis on benefits management limit the extent to which it is possible to apply our findings in other contexts. Despite this, we consider that since this mechanism potentially explains our findings, such as those connecting the high-quality formulation of benefits (the SMARC scores) and the degree of realisation, it is to some extent robust and useful for other contexts and projects.

5 | CONCLUSIONS

In this study, we have aimed to provide insights into how the roles and practices of benefits management in public IT projects are implemented, and how they are connected with the success of a project in terms of realising benefits. While prior studies on benefits management have focussed on the extent to which a given benefits management practice or role is present or not, our studies analysed *how* these practices and roles are implemented. We find that the different ways of performing benefits management in a project are connected with different degree of success in realising the benefits.

The results of our analyses contribute insights of practical importance for the planning and execution of software development projects. The most important contributions may be the following.

Descriptions of benefits that score highly on measurability, accountability and realism are more likely to be realised. This observation is based on our use of a novel evaluation framework for the benefit description, called SMARC. We believe that this framework can be used by organisations to guide and evaluate benefits descriptions, and allow these descriptions to contribute to successful benefits management.

Organisations should implement the role of a benefits owner. This person should be integrated into the project and should be skilled in communicating and marketing the planned benefits to both the project members and the users. We also found it to be essential that the benefits owner had support from management, clarity regarding their responsibilities and a strong mandate.

While we hope our findings will provide better insights into how to design benefits management practices and the role of the benefits owner, there is a strong need for more research. The current body of empirical research on benefits management mainly consists of papers focussing on whether or not particular benefits management practices are adopted, with less emphasis on how they are adopted. We hope that further research will be carried out to follow up the findings in this study and to gain more insights into how to design essential benefits management practices and roles. In particular, we consider it important to provide more support for how to identify and describe benefits, the management of benefits during the execution of the project and the design of the role of the benefits owner.

AUTHOR CONTRIBUTIONS

Knut Kjetil Holgeid: Conceptualisation; Data curation; Investigation; Project administration; Writing – original draft. **Magne Jørgensen:** Conceptualisation; Investigation; Methodology; Supervision; Validation; Writing – review & editing. **Gro Holst Volden:** Conceptualisation; Data curation; Investigation; Methodology. **Helene Berg:** Data curation; Investigation; Project administration; Validation.

ACKNOWLEDGEMENT

This research received no external funding.

CONFLICT OF INTEREST

No conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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How to cite this article: Holgeid, K.K., et al.: Realising benefits in public IT projects: A multiple case study. *IET Soft.* 1–18 (2022). <https://doi.org/10.1049/sfw2.12079>

APPENDIX SMARC

Criterion	Subcriteria	Score	
		1	6
S = Specific	S1. To what extent is it clearly described what is to be achieved? (i.e., sufficiently quantified or described in another way. Vague formulations vs. concrete goals and indicators)	No clear description of what is to be achieved	Very clear description of what is to be achieved
	S2. To what extent are effects defined at the correct level (i.e., formulated as desired effects and not as technical deliverables or properties of the system)?	Technical deliverables only	Emphasis on desired effects (benefits)
	S3. To what extent are the benefits time-bound (not at all, only roughly, or specified per benefit and justified)?	No specification of timing	Timing is specified for all benefits
	S4. To what extent is a specific level of ambition stated, in contrast to terms such as “increased” and “better”?	No level of ambition stated	Level of ambition is specified for all benefits

(Continues)

APPENDIX (Continued)

M = Measurable	M1. To what extent will the benefit be attributable to the project's delivery/Can it be distinguished from other reasons (measurement should be described in a way as described by the actors involved control)?	No benefit is attributable to the project's deliverables	All benefits are attributable to the project's deliverables
	M2. To what extent will it be easy to verify the result afterwards (i.e., to what extent is there a sensible process/plan for measurement)?	No description of plans or processes to evaluate results	Well described plans and processes to evaluate all benefits
A = Accountable	A1. To what extent is it specified where the benefit is to be realized (e.g. which sector, organization, which department), and are there plans for benefits realization with commitment from the parties involved?	No specifics provided	Well specified where all benefits are to be realized, with a commitment plan from all involved parties
	A2. To what extent is responsibility for benefits assigned?	No responsibility assigned	All benefits have "responsibles" (that is, persons responsible for benefits)
R = Realistic	R1. To what extent is a reasonable level of ambition set (something to strive for, but not unrealistic)?	No link between the project's deliverables and desired effects	Understandable link between project's deliverables and effects
	R2. To what extent are the estimates well-founded, uncertainties assessed, lacking in optimism (among other things)?	No description of uncertainties/lack level of ambition	Well-founded estimates with described uncertainties
	R3. To what extent are assumptions about enabling benefits realization included in the plan?	The plan does not include assumptions	The plan contains assumptions to achieve all the benefits
C = Comprehensive	C1. To what extent are benefits and indicators linked?	No link between benefits and indicators	All benefits and indicators are linked
	C2. To what extent are benefits plans detailed for all types of benefits?	No plans	Detailed plans for all types of benefits
	C3. To what extent has good anchoring in overall goals and strategies been ensured?	No described link to overall goals and strategies	All benefits are anchored in overall goals and strategies
	C4. To what extent are benefits prioritised/ranked (goal structure should not contain unresolved goal conflicts)?	No prioritisation of benefits	Benefits are prioritised