Perceived Challenges in Benefits Management—A Study of Public Sector Information Systems Engineering Projects

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***Abstract*—The field of benefits management gives guidelines on how to plan and realize benefits throughout the life-cycle of a system. However, realizing benefits from information systems projects has proven to be challenging in practice. In this paper, we investigate specific benefits management challenges as perceived by practitioners involved in information systems engineering projects. We conducted 22 interviews with respondents representing nine public sector projects, where challenges in managing benefits were elicited and identified. We elicited six specific benefits management challenges: A - *Identifying and describing benefits*, B - *Alignment of work with planned benefits*, C - *Reception and acceptance of the planned benefits*, D - *Organizational issues*, E - *Alternative or competing solutions*, F - *Measuring and evaluating benefits*. Overlaying these challenges with current normative models on benefits management, we find that: 1. Normative models on benefits management lack sufficient guidance on operative work on how to create information systems fit for realizing benefits and how to introduce these solutions to ensure benefits realization, and 2. Normative models on benefits management do not explicitly leverage the rapid project learning promoted by modern engineering methods. We conclude that more specific benefits management models should be elaborated, which are integrated into modern information systems engineering practices. This will enable best practices on the continuous adjustments of cost and scope according to evolving knowledge in projects to also be adapted to the management of benefits.**

***Index Terms*—Benefits management challenges, Benefits management models, Information systems engineering, Public sector**

I. Introduction

While several studies report low success rates in information systems (IS) development projects in terms of the "iron triangle" control mechanisms of *cost*, *scope* and *time*; see [1]–[4], arguments have been made that *benefit*, and, perhaps more to the point, the *benefit/cost ratio* must be included in the success criteria [3], [5], [6]. Benefits management, defined in [7] as, "The process of organizing and managing such that potential benefits arising from the use of IT are actually realized" is obviously a good idea, but even though benefits management in the large has been reported to lead to increased perceived project success [2], [3], [7], [8], adoption of its practices remains low [9]–[11].

Only recently has academia started to delve into how benefits management is actually performed and what challenges practitioners are facing [9]. It remains unclear what practices are performed and which challenges practitioners encounter when working with benefits management.

Our research objective has been to increase the understanding of how to succeed with managing benefits, and the focus of this paper is to identify and characterize the challenges encountered by practitioners in their work related to managing and realizing benefits. Identifying and understanding the challenges of managing and realizing benefits is important, because benefits are the reason IS are created. Delivering the agreed functionality on time and budget is futile, unless this results in realized benefits.

In the following, we explore the challenges encountered when applying benefits management in IS engineering projects. We report from a study of nine projects in the public sector, where we elicited and identified practitioners' perceived challenges on benefits management.

This paper is organized as follows: In Section II, we give a brief overview of benefits management and present the problems that motivated the field of benefits management. We also review research describing challenges encountered by practitioners when applying benefits management. In section III, we describe how the challenges practitioners encountered when applying benefits management in public sector IT-projects were identified and analyzed. The resulting challenges are described in section IV, before presenting a discussion (in section V) and conclusion (in section VII).

II. Background and related work

A large part of the literature on benefits management is normative – describing how practitioners ought to act. We give a brief overview of the central elements of the normative models of benefits management, before describing the problems that benefits management intends to solve. The last part of this section presents related research on challenges encountered when conducting benefits management in practice.

A. Benefits management – a brief overview

The normative models on benefits management start from the perspective of investments and focus on how business change enables realization of benefits from these investments [12]. The models are primarily designed to work alongside program and portfolio management [13], [14]. Although there are several process models for benefits management, the main prescribed activities are similar. The activities are summarized and described in [15], and are 1. *identify and specify benefits*, 2. *plan benefits realization*, 3. *execute benefits plan*, 4. *review and evaluate realization*, and 5. *identify potential for further benefits*. Existing benefits management process models are mostly stated at the strategic or enterprise level, providing guidance on business management. While

such models do highlight the importance that work should be guided by the identified benefits [14], [16], they tend to not give guidance on how to operationalize benefit management in daily IS engineering work.

By now, there is consensual awareness that providing an IS solution is not sufficient in order to realize benefits. To realize benefits, human process behaviour also needs to change and adapt [16]. Several benefits management models reflect this dual nature of benefits realization by stating that projects are responsible for delivering enablers (such as IS solutions), while business managers (such as project and product owners) are responsible for utilizing those enablers to ensure benefits realization [22]. Still, there is not much guidance on how to introduce IS solutions to stakeholders, to ensure that human behaviour is changed, and benefits are realized.

TABLE I
OVERVIEW OF PROBLEMS MOTIVATING THE NEED FOR BENEFITS MANAGEMENT

Problem	Reference
The planned benefits from investments are not sufficiently realized	[13], [14], [16]–[19]
Stakeholder and recipient resistance to solution or benefits	[13], [16], [18]
It is challenging to define the changes necessary to realize benefits / there is a disconnect between changes and benefits	[13], [16], [18]
Difficult to make the intended organizational changes happen	[14], [18]
Deciding on the right projects to fund	[13], [14], [16], [18]–[20]
The myth that enablers (e.g., software solutions) generate benefits by themselves	[13], [16]–[19]
Unclear link between investments and business results	[18], [20]
Focusing on enablers without being clear about the goal	[13], [16]–[18], [21]
Lacking commitment from management	[13], [16]
Unclear objectives or differing understanding of what the system/project will achieve	[13], [16], [20]
Stakeholders that are not committed to the benefits or the necessary changes	[16], [17]
Difficult to quantify and show the benefits and return on investments	[13], [14]
Projects fail the benefit-cost test	[14]
IS are becoming more complex and sophisticated requiring increasing levels of skills from managers and employees in order to realize benefits	[13], [18], [21]
The context (commercial and social) where investments are made changes rapidly (globalization, increased use of IT by individuals and more frequent organizational changes)	[13]
Types of benefits are becoming increasingly diverse, and more difficult to identify, describe, quantify and measure	[13]
Organizations' focus on short-term financials keep them from realizing long-term benefits	[13]
Benefits are overstated in order to ensure project funding	[13]
The need for changes in ways of working (in order to realize benefits) is overlooked	[13], [19]
It is difficult to establish the relationship between IT spending and measures of economic value	[18]
"Benefits rarely happen according to plan"	[18, p. 22]

TABLE II
OVERVIEW OF CHALLENGES ENCOUNTERED WHEN PRACTICING BENEFITS MANAGEMENT

Challenge	Reference
Practitioners find it difficult to identify and specify the expected benefits	[11], [15], [24], [25]
Selection (funding) of the wrong projects	[26]
Lack of ownership for benefits and enabling changes	[24]
Lack of understanding of the necessary enabling changes and business changes	[24]
"Cause-and-effect relationships along the benefits chain are usually complex" [11]	[11]
Staff not engaging in new ways of working	[27]
Technical inhibitors (poor design of reports and slow system response times)	[27]
Stakeholders' interest in different benefits varies	[11]
The word benefit is sometimes not understood by practitioners	[15]
Practitioners find it difficult to measure benefits	[15]
Inability to achieve the intended cost savings	[26]

B. Problems that benefits management is intended to solve

The ideas of benefits management were elaborated in the late 1980s and early 1990s as a response to organizations investing in business changes based on ICT solutions not achieving the expected benefits [10], [12]. Table I summarizes problems stated in the literature that benefits management is intended to mitigate. From this table, the outright lack of realization of benefits and deciding on the right projects to receive funding, are the most commonly described problems motivating benefits management.

C. Current research on challenges encountered when applying benefits management

There are few empirical studies on organizations applying benefits management in the context of IS [23]. Table II lists the challenges encountered by practitioners that we have found in the literature. This list is quite short, and there are few reported occurrences of each challenge. The most commonly reported challenge is that practitioners find it difficult to identify and specify the expected benefits. This challenge is interesting, because it must be solved in order to solve the two most common problems motivating benefits management. The planned benefits from investments into IS can not be realized if the benefits are not identified or understood. The same goes for funding decisions. One can not make sound investment decisions without understanding the benefits of those decisions. We believe there is a need for further exploration of the challenges encountered by practitioners when applying benefits management.

III. RESEARCH METHOD

The research presented here is part of a larger study on benefits management in public-sector IS engineering projects. Here, we present the research specific to the elicitation and identification of challenges that practitioners face when employing benefits management. Focusing on one topic from the

larger study, allows us to further explore and understand the overarching topic. This approach is supported by [28].

Specifically, the present study was conducted using the stepwise deductive induction (SDI) method [29]. The SDI method is a way of creating conceptual models, and building or refining theories, that are grounded in empirical data [28]. As we do not intend to develop new theories as such, we adopt only the parts of the method that are relevant to building and explaining concepts (that are grounded in empirical data). The concepts developed here are categorizations of concrete challenges that practitioners encounter when employing benefits management.

The following subsections describe how the SDI method has been applied to build these concepts.

1) Case selection and data generation: The particular focus of identifying benefits management challenges was part of a larger study on benefits management with several other foci. For this, one needed to find organizations that actively employ benefits management, which is challenging, since there is varying adoption of benefits management practices [4]. The Norwegian Digitalization Agency administrates a funding program for public-sector organizations, where one of the requirements for funding is the explicit and planned use of benefits management. In the program, IS engineering projects are limited to three years, while benefits realization can, of course, take place over further years. Funding is granted to a maximum of 50 percent of the net project cost, with an upper bound to funding at NOK 15 million (approx. USD 1.9 million). We invited all organizations in this program who received funding in 2016 to participate in the study. Contact information to the respondents were obtained from The Norwegian Digitalization Agency. Nine out of the eleven projects that received funding agreed to participate. No incentives were given to the participants.

The participating projects were all projects with goals to digitalize public-sector processes. Some of the projects resulted in new services, while most of them included automating work that had previously been done manually, including information collection from the public and other organizations, data storage and data sharing. All projects lasted for three years, except one project which had a duration of two years.

It is worth noting that the purpose of our sampling strategy is to study projects with a high density of information on benefits management in practice. This has resulted in a sample with small variations in project budget and duration, and only projects in the public sector. When evaluating the generalizability of the results, there are three factors that we hold are especially relevant – benefit types, project budget and project duration. The studied projects all had internal and external benefits. Internal benefits in the public sector are likely to have many similarities to internal benefits in private organizations (e.g., improved efficiency, service, data quality, etc). However, many of the external benefits associated with public-sector projects differ, ostensibly at least, from those associated with private-sector projects. While external benefits in the private sector are often focused on increased sales, external benefits in the public sector are usually associated with societal goals; often focused on improving services to the public or enabling other organizations to improve services or make savings. It is possible that the differences in external benefits affect which challenges are encountered.

Data was collected using semi-structured face-to-face interviews, in Q4 2019 and Q1 2020. The interview questions are available at https://tinyurl.com/challengesbm. Followup questions were asked when the respondents discussed relevant topics not covered by the questions. The respondents were professionals involved in the studied projects. Their roles included those of project manager, product manager and other informal roles responsible for realizing benefits. In total, we conducted 22 interviews.

All interviews were conducted with two researchers and one respondent, except for five interviews (where four interviews were conducted with one researcher and one respondent, and one interview had one researcher and two respondents). Interviews varied in length from 25 to 120 minutes. All interviews were recorded using an audio recorder, following informed and formal consent. Due to strict confidentiality regulations, the audio files and their transcriptions are not made available.

2) Processing of raw data: All audio files from the interviews were transcribed, resulting in 612 pages of transcribed text. Quality assurance of the transcriptions was subsequently conducted by listening through the audio recordings while reading the transcribed texts.

3) Coding: The transcribed interviews were coded using NVivo (release 1.6.1) by the first author resulting in 396 codes relevant to challenges when using benefits management. To ensure that the codes represented the respondents' statements and to reduce biases/subjectivity of only using one coder, a two-question test of the codes, as suggested by [29], was used while coding:

Question 1 – Could the code have been created prior to coding? If yes: a priori (unnecessary) coding – create another code. If no: potentially good coding close to empirical data.

Question 2 – What does the code alone say? (a) puts data segments into themes (e.g., what was talked about): unnecessary sorting codes – create another code. (b) reflects concrete content (e.g., what was said): keep the code.

4) Code grouping: To organize the benefits management challenges identified in the interviews, all codes were grouped into code groups. When grouping codes, the following grouping test was used: If codes could be added to a group, and the content of the group would still be consistent and the group would still thematically differ from other groups, the code would be added to the code group. If not, another group was created.

5) Concept development: Concepts (high-level descriptions) of the challenges were developed using abduction [30]; that is, an abstraction process that develops concepts from data based on finding plausible explanations for what is observed. In our case, this amounts to sorting and compiling code groups into themes viz. concepts, using one's domain understanding to make conceptual sense. After the concepts were created, they were compared to the code groups, to verify that the

high level descriptions of the concepts actually represented the codes and code groups.

IV. Results

The stepwise deductive induction method described above produced a number of code groups, which, through the final abductive step, resulted in a conceptualization in terms of *benefits management challenges*. The challenges are:

A: Identifying and describing the planned benefits of a solution
B: Ensuring that project work is aligned with the planned benefits
C: Ensuring the reception and acceptance of the solution and the planned benefits
D: Handling organizational issues related to realizing benefits
E: Maintaining an overview of whether the benefits can be realized by other solutions or mechanisms
F: Measuring and evaluating realized benefits

In the following sections we describe these six conceptual challenges and the code groups that gave rise to them. We use excerpts from the interviews to elaborate on, and exemplify, the data that the code groups are built upon[1]. We will also provide brief discussions along the way to put the results into context and to indicate the researchers' domain understanding that fuels the abductive step. The excerpts are anonymized for compliance to confidentiality regulations.

A. Identifying and describing planned benefits of a solution

This challenge is based on two code groups:

1) Benefits identification challenges: Respondents report that, in many cases, it is not possible to identify all benefits before starting a project; for example,

> [...] but to me it seems, perhaps a bit limiting, or a little naive, that you are supposed to discover all [benefits] in an early phase of a project [...]

This statement is supported by multiple respondents who reported benefits that were not identified when the projects started. This perception of having to identify all benefits at inception time is likely triggered by the context of the funding program which champions a traditional business case-style justification for funding. However, modern development methodology and management fosters project learning. Although this learning has perhaps traditionally been targeted toward adapting functionality (scope) and cost to evolving knowledge, project learning can also apply to the understanding of benefits [31]. This is evident in the following excerpt, where benefits and the understanding of new value chains are uncovered iteratively:

> And this iterative process that also happens in our organization, when some [group of professionals] discuss with colleagues in [country name] and other places: "Can we make this thing happen here?" And then product development happens through small projects over time, until this is seen in a larger context, that subject matter experts might not be good at seeing, where you can say: "Ok. Let us make a [solution], that also includes other public agencies." The result is a whole new value chain.

The above excerpt describes how iterative insights are utilized on a portfolio level, but respondents also described iteratively identified benefits utilized within ongoing projects. One such example occurred when a project manager talked with a manager representing an organization expected not to be much influenced by the new solution they were working on. It turned out that the organization would receive important benefits from the new solution, and that perhaps other organizations would as well. Together, the manager and the project manager found multiple organizations that ended up benefiting from the new solution. These insights evolved iteratively, after discussing with people from different organizations that were affected by the solution.

2) Benefits specification challenges: Practitioners report that it is difficult to assign reliable numeric values to benefits; especially to external benefits and benefits that are of a qualitative nature. It was a prerequisite in the funding program to conduct a socio-economic analysis of the foreseen benefits of the project, but substantial uncertainty persisted even after such analyses.

> It can happen that you hit [the targets] perfectly, and it can happen that you miss substantially, even when acting in good faith and preparing well.

Also, practitioners find it difficult to obtain reliable data to predict how many end users and which user groups will use the solution.

> [...] sometimes it is difficult to quantify. I received numbers from [external organization A] [...] And I have used the same numbers for [external people in role B] [...] There is little interest out there to put effort into [providing numbers] [...]

When historical data is available, practitioners try to predict user behavior based on how previous solutions were used, but they struggle to predict the change in user behavior when introducing a new solution.

> Before this solution was introduced, very few responded to the requests we sent to them [...] perhaps between 15 and 20 percent [...] We made some estimates based on these response rates, but as we see, when the solution is deployed [...] that users we had never heard from before, started using the new digital platform [...]

In addition, quantifying qualitative benefits is reported not to provide reliable figures.

> As there were many qualitative benefits, we had trouble assigning a monetary value [...] Later, it turned out that, although we felt that we were extremely restrictive and adjusted all numbers downward, our numbers were very high.

Respondents report that the benefit plans (where the benefits are specified) were useful for convincing their managers to fund their projects, and that they were used for project reporting. There was variation on the perceived usefulness for the project itself, of specifying the benefits. While some respondents perceived it not to be useful, other reported

[1]Interviews were conducted in Norwegian, the excerpts were translated by the authors

that specifying and documenting the benefits was useful for understanding the project purpose and for steering the project.

For challenge A as a whole, the observation that practitioners find it challenging to identify all benefits before initiating a project, has been reported earlier [3], [12], [21], [32]. What is notable is that the normative models of benefits management mainly describe benefits identification during the project planning phases. We found one referral in a process model to a more agile approach to benefits management: "During implementation, further benefits may also be identified and, again, the business project manager should obtain agreement on appropriate action to revise the plan to accommodate the benefit or defer any action until step 5 [Establish the potential for further benefits]" [13, p. 78]. Concrete guidance on how to ensure that further and other benefits are understood and acted appropriately upon as project learning builds, seems to be lacking. Normative models of benefits management should provide guidance on how to best act upon changes to benefits during all phases of IS projects.

Other research into benefits identification and specification has reported that practitioners overstate benefits in order to increase the probability of project approval [7], [8], [32]–[34]. To reduce this problem, researchers have suggested that those specifying the benefits should be evaluated according to realization of the benefits they have predicted [14]. However, we found that those identifying and envisioning benefits have a tendency to change roles by the time benefits are to be realized in an organization (see section IV-D1). This makes it difficult to implement the idea of continuous responsibility for benefits that would mitigate benefits overspecification.

B. Ensuring that project work is aligned with planned benefits

This concept is based on the following code group:

1) Challenges with links between project tasks and benefits: Although the majority of respondents do not report any challenges in linking project tasks with benefits, some respondents do express the concern:

> The benefits must be very well connected to the tasks you have defined [...] If not, you are spending time on tasks that do not necessarily give any benefits at all [...].

Another respondent reported that

> [...] it is easy to twist a deliverable into becoming something other than intended.

Linking tasks to benefits was mostly done by product managers (or similar), who had a strong understanding of the planned benefits. These product managers were embedded into the IS engineering teams, and often used the regular team meetings to ensure that the teams focused on tasks that would enable benefits realization. One respondent reported that they prioritized user stories and epics' according to benefits.

Linking project activities and benefits has been found to be a success factor in realizing benefits [3]. Still, there seems to be a disconnect between research and practice in this area. While a central element in benefits management is linking project outcomes to business strategy [18], we have been unable to find much advice in the normative benefits management models on how to ensure the link between project tasks and benefits. While respondents see themselves as successful in linking project task with benefits by embedding a product manager (or similar) into the project teams, it is uncertain if this suffices in more complex projects. Outside of the benefits management models, several techniques and methods have been presented for linking project work to benefits [35]–[37]; more specifically, *Large Scale Scrum* (LeSS) [38], *Scaled Agile Framework* (SAFe) [39], [40] and *Benefit Points* to link product elements to project objectives and to link project objectives to business goals [5]. For the last-mentioned, a plugin for the project management tool Jira was developed and evaluated [41]. Such methods are not yet in general use, however, and none of the respondents mentioned any use of such methods.

C. Ensuring the reception and acceptance of the solution and the planned benefits

This concept is based on the following code groups:

1) Challenges in the followup of benefits realization: The challenges in following up benefits realization seem different when the benefits are within (internal benefits) or outside (external benefits) the organization that is developing the solution. When benefits are internal, some respondents report that line managers who have been given responsibility for realizing benefits, do not do their part. Sometimes the person responsible for the benefits has changed multiple times during the project.

Challenges for external benefits were often not explicitly stated as such by the respondents, but we coded them as such based on their descriptions. As can be seen in the following statement from a respondent, some organizations do not finish the required work in order to realize the benefits, even when they know they have *not* done all that is needed.

> And, as I said, there remains quite a lot of information sharing and such, in order to realize the benefits, where we have said there would be benefits. [...] But we have at least done what we have said we would do for them to realize the benefits.

This statement is supported by respondents who report that benefits recipients in municipalities can be busy with other important tasks, and that information about a new IS solution might not come high enough up on their priority list for them to do the work necessary to realize and receive the benefits.

2) (Perceived) negative effects of the new solution or benefits: Sometimes benefits have negative effects for the recipient. This is often in the form of loosing something, or perceiving that something will be lost. This has been observed for both internal and external benefits. A typical example of perceived negative effects is that the prototypical statement "We are going to make the organization more efficient" is seen as "I will lose employees. I will lose resources." The following is an example of perceived negative effects based on a fear among external stakeholders that the suggested benefits would lead to reduced budgets for the municipalities.

> [...] could not stand by the benefits, because there would be benefits for the municipalities, and they were afraid that

> this would lead to reduced budgets in the municipalities [...] Because that happens all the time.

3) Lacking willingness to invest to receive benefits: Sometimes the realization of benefits requires adjustments to external solutions. This can be an impediment if the receiving organization is not willing to invest or spend the effort needed.

> [...] they have no interest in investing in their own systems, so they want us to take those investments.

4) Recreating old ways of working: Sometimes the people who are required to change their work patterns, recreate their old ways of working in the new system. This even happens when the work does not need to be done.

> They recreate their work process in a modern architecture. While in reality, the end user can do the work by self service.

Normative approaches for ensuring the reception and acceptance of a new IS and benefits follow mainly two approaches. 1. Assigning accountability for realization [18], [42]–[44], and 2. Methods for prioritizing and influencing stakeholders [13]. The results presented here suggest that both approaches are vulnerable to organizational changes. Assigning accountability for benefits realization seems less successful when those responsible move to other positions. A new person might take over, and might not accept accountability for benefits realization. Influencing stakeholders seems to be especially difficult when the people in other organizations (to be influenced) change positions (as seen in Section IV-D1 below). There might be a need to start the relationship building or infuence work from scratch, with potentially fewer interaction points than with people working in the same organization.

It seems that responsibility that is assigned, is not easily accepted. After conducting and analyzing the interviews, we are left with an impression that some of the respondents cared genuinely about the benefits they worked toward realizing, and that having a personal interest in, and enthusiasm about, the benefits is an important success factor in ensuring acceptance and realization of benefits. We found it difficult to test this impression without leading questions. Instead, we looked for examples in the interview material of actions that support or contradict our impression. We did not find any evidence contradicting our impression, but found some evidence supporting it. Examples of support can be found in section IV-A1 above, where a project manager and manager in an external organization work together to identify and realize benefits for other organizations, when they both could have chosen not to. In this situation, accountability was clearly *taken*, rather than assigned formally. Another example, can be seen in section IV-C1 above, where we take the excerpt "But we have at least done what we have said we would..." to indicate that they are unlikely to do the remaining work, although it is formally their job to do so.

This issue of taking or accepting responsibility is, to some degree, addressed by [22], who suggests assigning the responsibility for benefits realization to a project owner, rather than assigning accountability to senior managers who often do not have the time or skills necessary. This way of placing responsibility is, in fact, a common configuration in practice, where the project owner holds responsibility for benefits realization, and the project is responsible for delivering solutions. Aside from the issues we have already raised on *assigned responsibility*, an additional concern is that it is unclear how this responsibility should manifest itself in practice. It has been argued that the responsibility for benefits realization should rather be a *shared endeavour*, initiated already at project inception time. The idea being that, by involving and committing all relevant stakeholders to decisions about benefit from the start, the responsibility and accountability of generating and realizing benefit is seen as a team effort, rather than hinging on any single individual [6], [45].

While one normative model suggests making plans on how to influence stakeholders and benefits recipients according to the type of stakeholder they are [13], this approach does not seem common among practitioners. Although the benefits plan should normatively contain a plan for how to realize the planned benefits, including the actions needed to address stakeholder issues [13], most of the benefits plans for the studied projects did not include the planned actions to ensure benefits realization. As a consequence, impediments to reception and acceptance of benefits are usually stumbled upon, rather than planned for. It is easy to argue that the suggestions in the normative models make sense – that practitioners should plan and prepare the actions necessary to address stakeholder issues. Still, when seeing that many of the projects experience changes in benefits and stakeholders, planning these actions might be a wasted effort. Normative models on benefits management might instead provide an understanding of how types of benefits, solutions and relationships affect what actions and efforts that are necessary in order to address stakeholder issues.

D. Handling organizational issues related to realizing benefits

Organizational issues in benefits management seem to be common. The challenges are often related to organizational change, both internally and externally. In addition, respondents report that there is a need to handle tasks that fall between chairs. The following code groups constitute this challenge:

1) Organizational change: When asked about the largest challenges in the project, one of the respondents replied:

> Changes in management [...] And lacking continuity in management

Many of the organizations reported that managers responsible for the project, changed during the project.

> In the final report from the project, I am listed as the benefits responsible, but I have not been involved in the project the whole time. Because [person 1] that, actually it started with [person 2] when this [project] started. Later [person 1] was in charge here. He resigned before the final report was sent in, so I had the role for a few months this winter.

Organizational changes can also have a negative effect on realization of external benefits. In the following example, we see an external project manager who was set to receive a solution that would help the organization realize benefits, but

who was replaced by another project manager, resulting in no interest for the suggested solution.

> This would have improved the knowledge base and reduced uncertainty for the project [in the receiving organization ...] The project manager in the [external organization] was very interested in this, and intended to include this in the project [...] The external project replaced the project manager [...] when following up with them, they replied that [the suggested benefits] were not of interest to them.

The personal relationship that was essential for realizing the benefits, was no longer effective, because the person had taken on a different position.

It is worth noting that organizational change can also have positive effects on benefits management. One respondent reported that when merging with a larger organization, the other organization helped them learn and improve their ways of working with benefits management.

2) Taking responsibility for tasks that fall between chairs: After describing a problem a third party was having when introducing a new solution, the respondent and interviewer had the following dialogue:

> Respondent: It's not our problem either, but we have to find a solution. We have a good collaboration with [organization], and they need a solution. Interviewer: [...] you are saying that there are people here that help out in solving problems, where they could easily have said, "not my problem"? Respondent: Yes.

E. Maintaining an overview of whether the benefits can be realized by other solutions or mechanisms

Even when respondents report spending large efforts on the identification of benefits, some of them still experience that parts of their planned benefits are realized by other solutions.

> [...] they have already developed functionality for [service 1], which is so related to the [service 2] that we worked on. We started talking together, and found out that it is much more cost efficient the way they do it.

Challenges in maintaining an overview of whether the benefits can be realized by other solutions or mechanisms is covered in the business management literature, but not much discussed in benefits management. It is worth noting that in the private sector, actors providing the same or similar benefits are considered competitors. When the same situation occurs in the public sector, it is considered to be a waste of taxpayers money, rather than competition. As a consequence, decision making and motivation for identifying the situation can differ in private and public organizations. It is unclear to us how public organizations should work to ensure early identification of multiple parties working separately to provide the same benefits. The topic warrants further investigation to reduce wasted effort and investments in the public sector.

F. Measuring and evaluating realized benefits

This concept is based on the following code groups:

1) Cost versus benefit of measuring benefits realization: Some respondents indicate that the cost (or time required) to measure benefits realization is large compared to their available resources. One respondent indicates this by saying:

> How much time should a small organization spend on that [measuring realization]?

Others suggest that steering, reporting and documenting is not value-creating activities:

> [...] steering, reporting and documenting. That is not where you create value.

As such, it seems that some practitioners believe that measuring benefits realization, is not justified when evaluating the costs versus benefits of the task. Other respondents do, however, consider measurement and evaluation of benefits realization to be important.

2) Dependency on others to provide data: Measuring external benefits can be dependent on the benefits recipients' ability to provide data on benefits realization.

> I don't think it is possible for us, and also not useful for us, to spend resources on evaluating this [realization of benefit]. Because I believe the [external] organizations will not be conscious about the degree of benefits they have realized.

3) Difficult to observe saved time: It seems some types of benefits are difficult to observe and measure. In particular, some respondents have trouble pointing out what benefit time-savings have resulted in.

> [...] we save an hour in reporting. That hour is given a price, multiplied by the number of organizations, resulting in many hours and many kroner [Norwegian currency]. But it is impossible to point to what profit-increasing effort this extra hour is used for, in the different organizations.

This particular issue with time is especially relevant for our respondents, since the funding program's template for specifying benefits uses saved time as an example. This has resulted in many organizations focusing on this particular type of benefit in their applications.

4) Unknown users: In some situations, practitioners do not know if they are aware of all users and user groups of the solution. As one respondent comments:

> The big question right now, is: Is anyone using this that we don't know about?

If the benefits recipients are unknown, practitioners can not evaluate realization of benefits for these recipients.

5) Lacking access to data: Sometimes evaluating the realization of benefits requires accessing data that the organization is not allowed to access.

> We have statistics on [metric], but we do not have statistics that say: "This [metric] comes from this user group." We need to find out who sends this data to us, but we can't extract that from our data, because we are not allowed to.

6) Challenges in assigning credit for benefits realization: Respondents report that when measuring realization of benefits, they find it difficult to evaluate which change or solution contributed to realization, and to what degree.

> The problem is that we have done so many things that affect the same calculations [of realized benefits]. So we

> have to try to define which benefit to assign to which project.

Respondents report that this does perhaps not matter, because it is the total benefits for society that matters.

7) Did not consider measurement when specifying the benefits: One possible reason for challenges in measuring realization of benefits could be due to practitioners not considering how they will measure, while specifying the benefits.

> We have been able to quantify the benefits, but how will we measure realization? And we hadn't thought much about that when specifying the benefits. We had a long list of benefits, and on many of the benefits we registered that: We do not see that this is measurable [...] and I think it is right to ask [...] Qualitative benefits is one thing, but if you quantify a benefit, you must be able to verify it at a later point in time [...]

The evaluation of IS investments and their returns is considered essential for organizations to learn and improve their benefits delivery [16], [46]. Although the normative literature on benefits management has suggestions on how to solve some of the difficulties with evaluating benefits, such as handling intangible benefits, practitioners still encounter serious challenges. We are left with an impression that the normative literature considers the act of evaluation to be binary; that it is either done or not. One suggestion, that seems especially appropriate for evaluation of benefits, is the suggestion by Jenner [14] that "...the benefits of benefits management should exceed the costs of benefits management". In the context of evaluation, we suggest that *the benefits of evaluation of benefits realization should exceed the cost of evaluation.* Considering the results on cost versus benefits of evaluation (section IV-F1), it seems that evaluation and review should be considered on a *continuum*, rather than an activity that is done or not done at all; see also [47]. Some organizations might choose to spend small efforts on evaluation, while others spend more. The effort spent would depend on the expected benefits of evaluation. It would be useful, then, if normative models would help practitioners see what they gain from differences in effort spent on evaluation, including advice on how to conduct varieties of light-weight to more heavy-weight evaluations.

V. Discussion

Our results suggest that practitioners encounter challenges when applying benefits management. Despite the good intentions in benefits management models, it is vital to understand which parts of these models practitioners find difficult to implement in practice, and why. In Figure 1, we place the activities from the benefits management process models (1–5 Section II-A) and the identified challenges (A–F) relative to a common frame of reference. This frame of reference is represented by the three work domains in the lower part of the figure denoted *Business Management* (which concerns strategic decisions on returns on investment etc. on the enterprise level), *IS Engineering* (which concerns work on the systems(s) under development) and *Introducing the IS solution to stakeholders* (which concerns deploying and integrating the system(s) into the work and life processes of the affected stakeholders). As depicted, Business Management is the overarching domain, of which IS Engineering and the Introduction to stakeholders are means to achieve business goals, and where IS Engineering and the Introduction to stakeholders overlap to a large degree in line with incremental development.

In Figure 1, the benefits management activities (1–5) are shown as clearly delineated entities, belonging to particular parts of the three work domains, in line with how the normative models describe these activities in terms of distinct

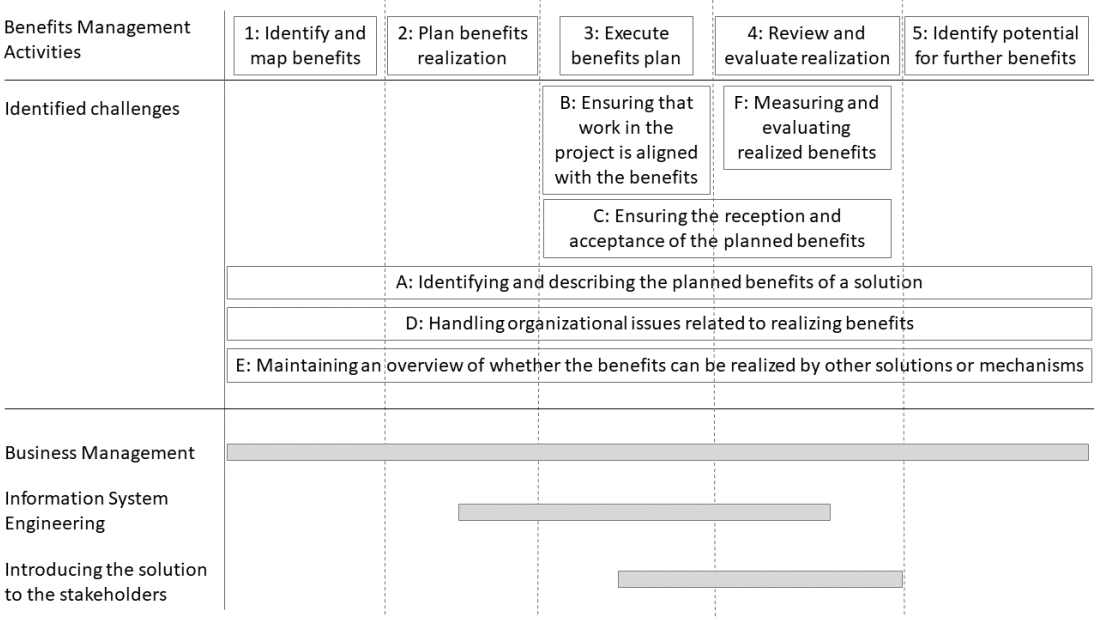

Fig. 1. Benefits management activities (adopted from [15]), benefits management challenges (from Section II-A), and how these relate to each other with reference to three work domains.

stages in a benefits management process. In contrast, from our material, respondents see the challenges A–F as occurring in larger parts of the work domains. In particular, challenge A is perceived as a cross-cutting concern, whereas the normative models tend to place the corresponding activity (activity 1) at a designated spot in the process. Challenges D and E are also cross cutting, as is challenge C to a lesser extent. This might suggest that benefits management activities should not be presented as stages in a process, but rather as continuous activities to be attended to in daily work.

The perception of the cross cutting nature of these challenges is in line with the present-day understanding of the dynamic environments in which investments in IS occur. Benefits identification and specification challenges can occur during all phases of the benefits management process models, because new insights and understanding can happen at any time. The same goes for challenges in handling organizational issues and maintaining an overview of whether the benefits can be realized by other solutions or mechanisms. When it comes to challenges cutting across work domains, we consider this to be a strong indication that benefits management should be a collaborative effort between those working with business management, IS engineering and those introducing solutions to the stakeholders. This collaboration is necessary, because new insights are often gained by those creating new IS or working to introduce the new solutions to stakeholders. When information affecting benefits or costs arises, business decisions must be made on how to adapt to this new information.

When comparing the challenges identified in our study with challenges reported in other studies on practitioners using benefits management (see Table II), one can see that they are, for a large part, concordant; except for one challenge that we did not elicit: *the selection (or funding) of the wrong projects*, which was reported in [26]. This challenge is also formulated as a common problem motivating the field of benefits management (see Table I). It is unclear from [26], to what degree the studied organizations actively used benefits management. As such, we do not know if the adoption/increased adoption of benefits management could mitigate this problem. Some authors posit that active benefit management on the portfolio level will enable practitioners to prioritize between projects and, further, end projects in time when they are no longer producing enough benefit, to the advantage of other projects [5], [48]. This would then work to fund the right projects at the right time. However, in light of how frequently the understanding of benefits change, and how challenging it is to manage benefits, it is still an open question how this particular challenge, and the other challenges uncovered in our study and elsewhere, can be handled efficiently.

The benefits management challenges uncovered in this study and the perception of when they occur, suggest that existing benefit management models do not adequately address the challenges practitioners encounter when setting out to manage benefits. This would imply that several of the initial problems motivating the field of benefits management are left unsolved.

The normative literature on benefits management is primarily focused on business management. Hence, there is not much operative guidance in benefits management on how to work and manage benefits in IS engineering projects, or how to actually ensure the adoption of the new solution to stakeholders. A large part of the guidance to business management is focused on how to complete the work of each benefits management activity, somewhat detached from actual development and adoption work.

VI. Limitations

Respondents to the study are not randomly sampled. In the outset, this poses threats to generalizability. Our samples are, in principle, convenience samples, and are, on the one hand, particularly relevant to the topic of interest, which increases relevance of the responses. This is advantageous for conceptual development, which is our aim in this study. On the other hand, our samples may be biased by special interest in the topic. To validate the challenges and the further conceptualizations of them presented here, further studies should be conducted on randomized samples. Secondly, the studied projects are exclusively from the public sector. Assuming that the high-level objective of the public sector is to create benefits for society, it is reasonable to assume that there are differences in the benefits they focus on, compared to the private sector. As a consequence, it is possible that the benefits management challenges encountered in the private sector are different from those encountered in the public sector. Nevertheless, we assert that our findings are valuable as the basis for further study, as input to further work on benefits management models and as initial advice to practitioners in IS engineering initiatives.

VII. Conclusion

To increase the benefits of benefits management, we conclude that there is a need for more refined business management models that embody modern incremental IS engineering with frequent and super-frequent releases, so that the rapid learning that occurs in such development can also be applied to benefits understanding. Secondly, we conclude that benefits management models should be completely integrated into present-day engineering process models rather than presented as separate models. There is a need to include operative guidance to those creating IS and those introducing these solutions to stakeholders, and as shown in our study, the challenges that come with managing benefits are more persistent and omnipresent than what can be handled in isolated stages.

In general, challenges encountered by practitioners should guide the efforts of researchers. For the particular challenges uncovered in our study, we call for research that deepens our understanding of the challenges and of how they may be met in daily work in concrete terms. We also call for research that explores the challenges in other contexts; such as projects in the private sector, projects and initiatives with varying size and duration, etc. For now, we hope an awareness of these challenges may help practitioners recognize patterns that may need attending in benefits management.

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