

An Overview of the Understanding and Use of Assessment Methods in Benefits Management

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Abstract—Evidence suggests that benefits management is critical for enabling greater value and for enhancing the positive impact of programs, projects, and portfolios. However, many organizations only focus their efforts on identifying the intended benefits, without conducting a proper follow-up through ongoing assessment or evaluation to ensure benefits realization. For this reason, this study aims to obtain an overview of the actual use of the assessment methods in benefits management, through a compilation and analysis of the literature following the Systematic Mapping Study methodology. The results and findings obtained show a significant gap in the interplay between the fields of assessment methods and benefits management. Based on this, we suggest opportunities for improvement, such as developing audit guides and frameworks for enhancing the monitoring of the benefits, strengthening the focus on external benefits of organizations, and for adapting benefits assessment to the changed perceptions of intended benefits, in line with continuous improvement.

Keywords—Assessment, Benefits Management, Project Management, Literature Review, Literature Analysis

I. INTRODUCTION

Over the past decades, different guides have been developed and refined to manage the entire program/project lifecycle (such as the PMBOK Guide [1]). These guides address the management of different areas or aspects, such as scope, time, costs, risks, etc., with the intent to ensure that the programs/projects fulfill their purposes in an effective and efficient manner, regardless of their field of application.

These purposes or goals that organizations seek through programs/projects should result in a set of benefits, i.e., outcomes that have a positive impact on different areas. However, mainly in the field of Information Technology (IT), it was observed that, although the goals of, for example, developing and implementing certain software had been achieved, it did not provide the benefits that were supposed to be achieved [2]. Therefore, the need arose to focus on benefits management and to address it in a specific way to ensure that the desired benefits were actually achieved.

Benefits management primarily seeks to establish a process for the identification, assessment/evaluation, and realization of benefits [3] [4]. However, this mission has not gained the impetus one might have wanted, as it has been observed through several studies that the consideration of benefits tends to be marginalized once the program/project has been given the go-ahead to start [5]. In other words, there is a tendency toward focus benefits management activities on the early phases of programs/projects to justify their purposes and obtain funds [6] [7], but, after that, the vast majority of organizations forget about this and do not adequately monitor and measure the benefits through ongoing assessment that allows proper realization of benefits [8] [9].

Then, it can be said that the bottleneck is in the assessment that should be performed in the benefits management. But why are the benefits not assessed? As Li et al. [10] stand out, this is normally due to the fact that there are no clear evaluation criteria in this regard, as well as a lack of benefit specifications in projects or initiatives or of benefit metrics; perhaps a result of a lack of benefit assessment schemes or guides. Paraphrasing management guru Peter Drucker, “*if you cannot assess it, you cannot manage it*”, it has been suggested that benefits of programs/projects can only be properly achieved/realized if they are constantly and systematically assessed and managed throughout the entire life cycle of those programs/projects [11].

Therefore, the present study aims to shed light on the field of assessment methods in benefits management through a compilation and analysis of the current literature. We wish to review the status in this regard, and, moreover, obtain an understanding of the main gaps and opportunities that may serve as a foundation for the progress and development of the assessment of benefits in programs/projects of all kinds.

The rest of this study is organized as follows: Section II contains the background about the fields of assessment and benefits management; Section III presents the research methodology followed to analyze the state of the art in this regard; Section IV shows an overview of the results obtained; Section V discusses the findings, implications, and limitations; and, finally, Section VI contains the conclusions and lines for future work. Also, Appendix A includes the list of references of the primary studies selected; Appendix B shows the answers to the established research questions from each of the primary studies; and Appendix C offers an overview of the topics covered in each primary study.

II. BACKGROUND

A. Assessment

Doing a quick search on the term “assessment” we can observe a wide variety of definitions depending on the field of application in which this term is being addressed. Focusing on the scope of this study, the assessment must be analyzed from the organizational point of view. In this regard, “organizational assessment” can be defined as “*a process guided by a series of methods or tools through which the collection, review, and use of information related to processes, structure, products/services, and/or environment of an organization is performed in a systematic manner for the purpose of planning, improvement, and decision making*” (adapted from ISO [12] and ISACA [13] [14]).

One of the most stringent assessment methods in the organizational field is the audit [14] [15] [16]. This is a trustworthy and thorough method that allows assessing different aspects and contexts (financial, strategic, quality, etc.) of organizations [17] [18]. The audit process is mainly based on conducting a series of interviews/meetings with

those responsible involved, on-site verification/observation, and collection and analysis of appropriate evidence. Audits can be both internal and external, the main difference being that the latter are conducted by an independent entity, outside of any bias in this regard, and, therefore, are the method used for certification and accreditation of organizations, for example, in ensuring compliance with an international standard [12].

Complementing audits, another assessment method used is maturity models [19] [20]. These mainly consist of a series of maturity levels, in which, for example, a set of processes is distributed so that those most basic processes or those that must be addressed first are at the lowest levels, while those more complex processes and usually oriented towards optimization and continuous improvement are found at the highest levels. Thanks to this, the assessment or audit of a specific area can be conducted in a progressive manner, through different phases or iterations [21] [22], identifying the level of compliance of an organization at each maturity level and improving through these levels.

Finally, several methods and techniques for estimating and assessing benefits exist within the IT development and software engineering context [23] [24] [25] [26] [27] [28] [29] [30]. These include methods that focus on the benefits obtained from the development process and/or on the benefits of the system under development.

In this study, we aim to survey benefits assessment in a wide context, and wish to keep an exploratory mode as to how and in what areas benefits assessment is applied in benefits management. We thus intend to specialize the general term “assessment” above according to what we find in this study.

We postulate that benefit assessment methods are a key element within organizations both when it comes to achieving and improving proper levels of effectiveness and efficiency in different areas, as well as when making decisions and managing the business.

B. Benefits Management

Benefits management (also known as benefits realization management) is one of the areas affecting program/project management. Its origin took place in the 1990’s in the IT context, due to the difficulty and low success that this field had when it came to generating or achieving the expected benefits for the business (the information paradox) [2].

Nowadays, benefits management is extended throughout all areas of knowledge, helping to identify, control, and realize different types of benefits [3]. Among these different types that can be used to categorize benefits (such as external or internal, direct or indirect, etc.), the two main groups [31] that are usually identified are: 1) tangible, related to benefits that are easily quantifiable in physical terms, such as, e.g., those related to a financial level, organization assets, or users, among others; and 2) intangible, referring to benefits that are difficult to quantify or whose nature is non-physical, such as, e.g., reputation, satisfaction, knowledge, etc.

The life cycle of the benefits management process [4] starts with the conception and **planning** of a program/project, where the benefits to be achieved are identified (“target benefits” [32]) and a series of indicators are established to assess and analyze them.

During the execution or development of the program/project, benefits management implies the ongoing control, monitoring, and **assessment** of benefits, in order to detect possible risks that may affect them and make decisions in this regard, as well as to identify new benefits not previously considered and that emerge during this phase (“fortuitous benefits” [32]).

And, in the final phase of the program/project, i.e., at its closure, a final assessment is conducted that leads to the benefits **realization**. This helps organizations to know the value generated and if the benefits expected and identified at the beginning of, or during, this program/project management process have been achieved.

However, as noted by Winter et al. [33], it must not be forgotten that the benefits extend beyond the management process (initiation, planning, execution, monitoring, and closure) of a program/project, since the product or service developed will be useful and will provide value over time for its users. So, it is also important to consider and analyze these long term or *ex post* benefits.

From the point of view of the assessment/evaluation of benefits, more and more studies highlight the importance of this [34]. As reported by Mohan et al. [35], the assessment and review of benefits throughout the entire program/project management process is a factor that positively influences the benefits realization. This is in line with the findings obtained by Jørgensen [36] on the positive effects on the outcomes of programs/projects due to the assessment of benefits. Thus, while identifying the benefits at the beginning of a program/project is a very important task, it is even more important and critical to assess the benefits throughout the entire program/project. This will not only make it possible to maintain a clear vision of what is to be achieved, but also to perform better control and decision-making, enhancing the results and positive impacts of the program/project.

It is relevant to differentiate between “benefits assessment” and “assessment in benefits management”. The first considers the periodic assessment on the realization of the benefits, while the latter (on which this study is focused) has as objective the assessment from the perspective of the processes and practices applied in benefits management (covering “benefits assessment/audit” as a process in this regard [37]).

Finally, we must keep in mind that a significant part of the existing literature on benefits management mistakenly treats the term “benefits” interchangeably with the term “success”. It is important to reflect on this and understand that both terms do not mean the same thing, even if they have a certain level of relationship; but this is outside the current scope and should be dealt with in another study with a more in-depth analysis.

III. RESEARCH METHODOLOGY

To conduct the collection, analysis, and categorization of the existing information and knowledge on a specific field, what are known as methodologies for literature analysis or review are usually followed. In the specific case of this study, we have decided to adopt the aspects of the Systematic Mapping Study (SMS) methodology, as established by the guidelines defined by [38] and considering examples of application such as [39]. Likewise, we have also followed the lessons learned for data extraction and analysis identified by [40]. Thus, the following subsections show the aspects defined for the planning and execution of the SMS of this study.

A. Planning Stage

1) *Research Questions*: The main objective of this study is to identify and analyze the current state and knowledge on the assessment methods used in benefits management from the point of view of program/project management. For this purpose, the information found in this regard will be categorized and mapped in order to answer the research questions (RQs) defined in the Table I.

TABLE I. RESEARCH QUESTIONS

Research Question	Motivation
RQ1. What kind of studies exist on assessment methods in benefits management?	Identify the types of study, as well as the number and trend over the recent years within the scope of assessment methods in benefits management.
RQ2. What assessment methods are suggested in benefits management?	Compile the methodologies and/or techniques that are followed to assess and control the benefits in programs and projects, identifying, at the same time, the frequency of these assessments.
RQ3. What are the main themes that are assessed in benefits management?	Determine the themes that are considered when assessing the benefits in programs or projects, that is, the types of benefits that are assessed.
RQ4. What are the main areas for which the benefits are applied and assessed?	Find out the areas in which the benefits are used or applied (application areas) and, therefore, are assessed.
RQ5. What are the main effects of using assessment methods in benefits management?	Discover the advantages and drawbacks of the assessment methods with respect to the expected results/benefits of the programs and projects.

2) *Search Strategy*: To conduct the search of the studies, we identified the most relevant and used terms/concepts, first, in the context of assessment and, second, in the field of benefits management. These terms have been put together in a search string that will be applied to the title, abstract, and keywords of the studies (*TITLE-ABS-KEY*), using the *Scopus* database. We only consider this database since it includes all the relevant venues (from sources like *IEEE Xplore*, *ACM Digital Library*, *ScienceDirect*, etc.) in the scope of this study. In addition, *Scopus* is a reliable database in terms of the fact that the indexed works meet quality standards and have been peer-reviewed before publication.

Likewise, publications from the last two decades will be taken into consideration, that is, from 2002 (*PUBYEAR* > 2001), since we consider that this period is sufficiently broad and adequate to find updated content on the established scope. Thus, the search string devised is as follows:

TITLE-ABS-KEY ((*Assess** OR *Audit** OR *Evaluat** OR *Analy** OR *Control** OR *Monitor** OR *Track** OR *Plan**) AND (“*Benefits Manag**” OR “*Benefits Reali**” OR “*Value-based Software**”)) AND *PUBYEAR* > 2001

3) *Selection Criteria*: With the aim to identify and select the relevant studies, first, a preliminary analysis will be conducted on the title and abstract of each study (which will determine the potential studies, i.e., those that should be analyzed in more depth to know if they are really relevant to the scope of this study), and second, for those selected potential studies, a more detailed analysis of the entire study will be conducted (resulting in the primary studies). For this, the inclusion criteria that will be followed to identify and select the studies will be the following:

- **I1.** Full studies in English within the scope of assessment methods in benefits management (with a focus on the materialization or realization of the benefits rather than on their identification or prediction).
- **I2.** Studies published between 2002 and 2022 in books, journals, conferences, or workshops, with peer review process.

Conversely, those studies that meet any of the following exclusion criteria will be automatically discarded:

- **E1.** Studies whose main contribution is not related to assessment methods in benefits management or that do not describe in detail how to perform the assessment in this regard.
- **E2.** Discussion, exploratory, or opinion studies, as well as those that are only available as abstract or presentation.
- **E3.** Duplicate studies (only the most complete and recent study will be considered).

Likewise, in addition to the studies found through the main search, studies referenced in those selected as primary studies will also be considered for their possible inclusion, i.e., the snowballing approach [41] will be applied.

4) *Data Extraction*: All the selected studies will be analyzed and categorized following the same data extraction criteria, based on the answers to the RQs shown in Table II. It is important to highlight that these categories have been refined throughout the execution stage of this SMS, i.e., we defined a set of possible answer categories to the RQs during the planning (based on our knowledge and experience), but during the execution, while analyzing and categorizing the primary studies, we identified new categories in RQ5 and refined and better defined the categories in RQ2, as well as redefined RQ4, based on relevant data that we obtained. In other words, we followed an inductive approach to content analysis, but based on an initial categorization to get started [42]. The categorization was performed independently by the two authors, incrementally reaching consensus.

TABLE II. CLASSIFICATION SCHEMA

Research Question	Categories
RQ1. What kind of studies exist on assessment methods in benefits management?*	a. Literature analysis b. Proposal c. Case study
RQ2. What assessment methods are suggested in benefits management?	a. Audit b. Maturity model c. Goals/indicators analysis d. Prediction/decision model
RQ3. What are the main themes that are assessed in benefits management?***	a. Organizational b. Environmental c. Social d. Economic
RQ4. What are the main areas for which the benefits are applied and assessed?	a. Product or system effect/value b. Project or portfolio success c. Organization performance
RQ5. What are the main effects of using assessment methods in benefits management?	a. Increase in project success b. Continuous improvement c. Provision of higher value d. Monitoring issues

* The categories to RQ1 follow the idea of the example of [39]

** The last 3 categories to RQ3 have their root in the 3 sustainability perspectives [43]

B. Execution Stage

For the execution stage, the protocol and aspects defined in the planning were applied through three main phases:

- **First Phase (Identification of Potential Studies).** During this initial phase, the search string was applied in the *Scopus* database, obtaining a total number of 1,977 studies. The established selection criteria were applied to these studies by the first author, considering the title and abstract, and a total of 221 *potential studies* were obtained (10 of them from snowballing).
- **Second Phase (Selection of Primary Studies).** After identifying the potential studies, a more detailed analysis of these studies was performed by the first author, applying the established selection criteria, but, this time, throughout the entire content of each study. This led to the selection of a total of **12 primary studies**, that is, the studies that are relevant according to the scope of the present SMS and that will answer the RQs. It is noteworthy that we also included studies that, although they do not deal directly or specifically with the assessment methods that should be applied in benefits management, include a series of aspects that must be considered when identifying and assessing the benefits of programs/projects, showing examples of their application and acting as a guide in this regard (which turns them into an assessment method itself).
- **Third Phase (Analysis and Assessment of Primary Studies).** Finally, after selecting the primary studies, in this final phase a categorization of said studies was conducted by both authors to answer the established RQs, as well as to obtain an overview that enables us to discuss the state of the art and existing gaps in the field of assessment methods in benefits management.

IV. RESULTS

An overview of the results obtained after the execution of the present SMS is shown below, structured according to the established RQs. To complement this, Appendix A includes the list of references of primary studies, Appendix B shows the mapping of the answers to the RQs from the primary studies, and Appendix C contains a summary of the topics addressed by each of the primary studies.

A. RQ1. What Kind of Studies Exist on Assessment Methods in Benefits Management?

RQ1 aims to identify the kinds of study that currently exist in the field of assessment methods in benefits management. This will help to determine which are the most relevant studies in relation to, e.g., the identification of a background based on analysis of the literature, or proposals that serve as support or on which new ideas and/or future research can be developed.

Fig. 1 shows the results obtained in this regard, where we can observe that the 12 selected primary studies include some type of *Proposal* related to aspects that should be considered when assessing the benefits and how to conduct this process (establishing a guide or method to follow). However, only 6 of the studies ([S01], [S03], [S04], [S07], [S09], and [S10]), i.e., 50 %, validate their proposals through a *Case Study* or practical application. It should also be noted that 5 of the 12 primary studies ([S01], [S03], [S04], [S08], and [S12]), i.e., 42 %, include a detailed *Literature Analysis* on the rationale for the research/proposal they address.

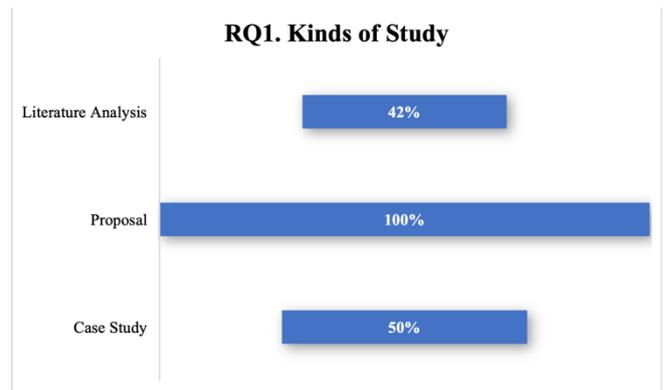


Fig. 1. Results for RQ1 (percentage of studies in each of the three kinds of study)

Likewise, another important characteristic related to the analysis of the results from RQ1 is the evolution of the publication of studies over the last few years. Fig. 2 shows the numbers in this regard, where we can see that from 2020 more focus is being placed on issues related to methods for assessing benefits in programs/projects.

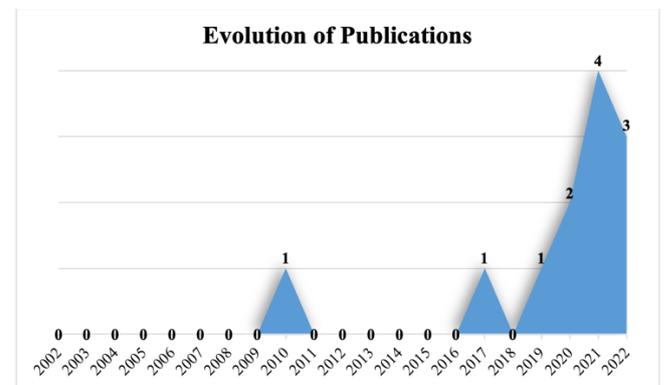


Fig. 2. The evolution of the number of publications on assessment methods in benefits management

B. RQ2. What Assessment Methods are Suggested in Benefits Management?

The objective of RQ2 is to categorize the main assessment methods suggested for benefits management. These methods refer to the processes or tools applied, through which it can be identified if the benefits in a program/project are being achieved or not, as well as what types of improvement can be implemented to enhance said benefits or if there are risks or threats that may affect benefits realization.

The results related to this RQ2 are shown in Fig. 3, where the most common assessment method category is *Goals/Indicators Analysis*, appearing in 7 of the 12 primary studies ([S04], [S07], [S08], [S09], [S10], [S11], and [S12]), i.e., 58 %. After this, with 4 studies (33 %), there are methods categorized as *Prediction/Decision Model* ([S01], [S02], [S03], and [S06]). And finally, appearing in 1 study (8 %), is a method categorized as *Maturity Model* ([S05]). It is noteworthy that *Audit* has not been found in any study as an assessment method in benefits management.

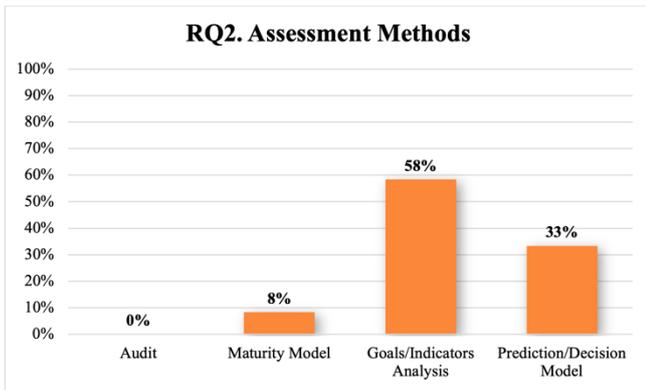


Fig. 3. Results for RQ2 (percentage of studies in assessment methods suggested in benefits management)

C. RQ3. What are the Main Themes that are Assessed in Benefits Management?

The scope of RQ3 pertains to the themes on which benefits management is focused and, therefore, must be assessed. In other words, they are the different types of benefits that are usually identified in programs/projects.

Fig. 4 represents the results obtained for RQ3. The *Organizational* theme (related to the benefits that are internal to the organizations) is the most addressed, found in 8 of the 12 primary studies ([S01], [S03], [S05], [S06], [S07], [S08], [S09], [S10], [S11], and [S12]), i.e., 83%. The themes on the three perspectives of sustainability (more oriented towards the external context of the organizations, but also applicable to the internal context) seem to have a secondary focus. In this regard, being considered in 6 (50%) and 5 (42%) studies respectively, there are the *Economic* ([S02], [S03], [S06], [S07], [S09], and [S11]) and *Social* ([S02], [S04], [S06], [S07], and [S09]) themes; while only being considered in 1 study (8%) is the *Environmental* theme ([S02]).

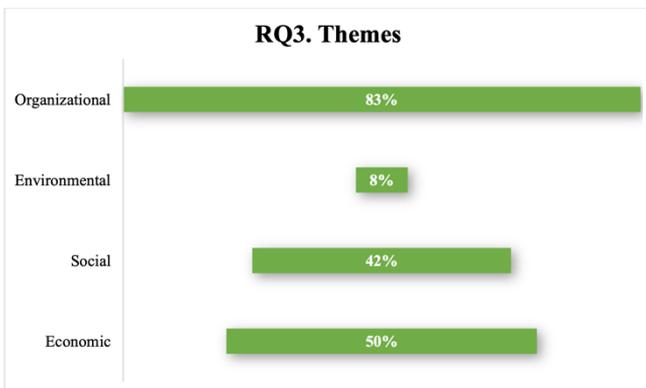


Fig. 4. Results for RQ3 (percentage of studies in the main themes assessed in benefits management)

D. RQ4. What are the Main Areas for which the Benefits are Applied and Assessed?

When assessing the benefits, it is important to know what area they are oriented towards (i.e., what is their target), since the understanding and scope of the assessment will depend on it. That is why RQ4 aims to identify the main areas in which the benefits are currently applied and, therefore, assessed.

Fig. 5 includes the results for RQ4. These results show that the internal-oriented areas are the ones on which benefits management focuses the most (included in the 75% of the studies); with *Project or Portfolio Success* appearing in 5

studies or in the 42% ([S01], [S02], [S03], [S08], and [S12]), and *Organization Performance* appearing in 4 of the 12 studies ([S05], [S06], [S07], and [S11]), i.e., 33%. In terms of external application areas, *Product or System Effect/Value*, i.e., the value of the final solution developed in the program/project, is present in 42% of the studies, or, in other words, in 5 of them ([S04], [S06], [S07], [S09], and [S10]).

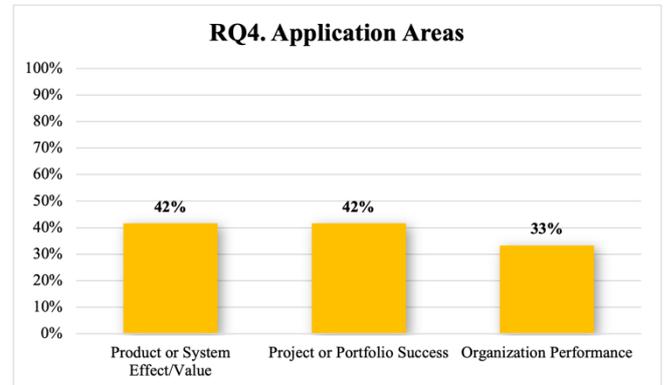


Fig. 5. Results for RQ4 (percentage of studies in the main areas for which the benefits are applied and assessed)

E. RQ5. What are the Main Effects of Using Assessment Methods in Benefits Management?

Finally, RQ5 aims to identify the main effects that organizations experience due to the application or use of assessment methods in benefits management. In this way, the implications of the assessment methods can be known, especially when seeking to address or improve a specific aspect in the programs/projects.

The results of RQ5 are shown in Fig. 6, where, being included in 6 of the 12 primary studies (i.e., 50%), *Monitoring Issues*, i.e., the assessment methods are oriented to serve as a means of monitoring the state of the benefits throughout the programs/projects ([S04], [S06], [S07], [S09], [S11], and [S12]), is the most addressed. In second place, *Increase in Project Success* appears in 5 of the studies or in 42% of them ([S01], [S02], [S03], [S08], and [S12]). After these, with 4 (33%) and 3 (25%) studies respectively, the implications of the assessment methods are analyzed from *Provision of Higher Value* ([S02], [S06], [S08], and [S10]), i.e., helping to obtain better results in final solutions thanks to the use of assessment methods, and *Continuous Improvement* ([S01], [S03], and [S05]).

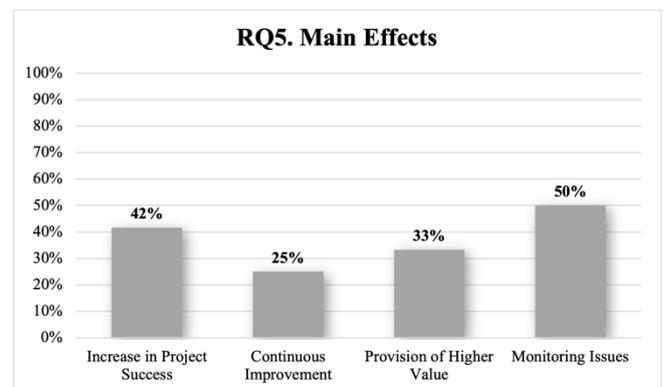


Fig. 6. Results for RQ5 (percentage of studies in the main effects of assessment methods in benefits management)

V. DISCUSSION

A. Principal Findings

The principal findings obtained after analyzing the results of the SMS are included below. These findings allow us to identify existing gaps on assessment methods in benefits management, as well as to make certain statements and speculations about the status and opportunities in this regard.

- **A significant gap in the development of assessment methods in benefits management.** Many of the potential studies analyzed during the execution of the SMS highlighted the importance of assessing the benefits in programs/projects. However, very few (of those selected as primary studies) define or include guidelines with a sufficient level of detail on how to conduct these assessments and the aspects that must be considered in this regard. The evidence from only 12 primary studies is not enough to conclude, but there should be more research and proposals that help to assess such a relevant and critical aspect of the programs/projects as are the benefits. If the different types of benefit that may exist are not systematically and adequately assessed and measured throughout the programs/projects, it will never be possible to know if they are really being achieved, much less to implement different types of improvement, such as, for example, to enhance the positive impact of benefits. That is why, as pointed out by Coombs et al. [44] from the IT field, assessment of benefits is an area that has been neglected and remains underdeveloped. However, there are green shoots, since, as we have seen in Fig. 2, interest in this area has grown in recent years, and the trend is that more research is being conducted.
- **A need to perform more validations.** When developing a proposal, especially in an area such as program/project management, it is critical to validate it to ensure that it is useful in practice. Although half of the primary studies of this SMS (cf. Fig. 1) somehow validate the proposal they put forth, there are still studies that do not go beyond the presentation of a merely theoretical proposition. For this reason, whenever a proposal is developed that is oriented to a practical context, an essential criterion should be to provide its validation, since it is the only manner to verify that what has been theorized has relevance and impact on a real environment.
- **The relevance of the use of *Goals/Indicators Analysis* as an assessment method in benefits management.** The *Goals/Indicators Analysis* category represents methods based on assessing benefit against given criteria, perhaps using metrics. One example is Key Performance Indicators (KPIs) that allow the monitoring of relevant aspects at a strategic level in programs/projects to achieve satisfactory compliance with the established goals and requirements. Ways of structuring criteria and metrics include balanced scorecards [45], to which some of the primary studies refer. In this way, it is possible to have a quick overview of the status of programs/projects, which helps to make decisions in a more agile and accurate manner. Therefore, with the appropriate objectives and metrics, it becomes an appropriate method when it comes to assessing and controlling the benefits of programs/projects. This is reflected in the fact that it is the most considered assessment method in the primary studies of this SMS (cf. Fig. 3). However, it should not be the only assessment method that is implemented in this regard, but rather it should be supported and reinforced by other methods that verify and confirm the inputs and outputs obtained, such as, for example, the application of maturity models [19] [20] and audits [46] [47] [48] to ensure that the entire benefit assessment process follows proper implementation and management and the results correspond to reality.
- **A relevant gap in the use of *Audit* as an assessment method in benefits management.** Audits represent a thorough and reliable method for assessing different aspects and contexts within organizations [46] [47] [48]. Its relevance is even greater when it comes to external audits [49] [50] [12], since they allow an independent entity to certify that what is being assessed really complies with what is established, avoiding possible biases that are generated internally in organizations. Therefore, it is an interesting result that *Audit* is not currently considered as an assessment method in benefits management (cf. Fig. 3). This represents a relevant gap and an opportunity to develop guidelines or frameworks in this regard that allow the assessment of benefits in programs/projects in a rigorous and systematic manner through audits.
- **Sustainability perspectives are relegated to a secondary focus in benefits management.** Sustainability has become essential nowadays, and there are more and more efforts being made from public and private institutions to achieve sustainable development [51] [52] [53] [54]. However, based on the results of this SMS, the three perspectives of sustainability (*Environmental*, *Social*, and *Economic*) [43] take a back seat when it comes to assessing the benefits in programs/projects (cf. Fig. 4). It seems that organizations are more concerned with pursuing benefits at the internal level (*Organizational*) than those more related to creating an impact at the external level (such as those related to sustainability). For this reason, it is important to start balancing the scales, and organizations must commit to achieving sustainable development both internally and externally. They need to look beyond their own internal benefits and identify the ways in which they can create a positive impact on the environment, society, and economy.
- **A scarce focus on assessing aspects directly related to users and the value offered to them.** From the results obtained in this SMS, it seems that it is more important for organizations to focus on application areas of the benefits that are oriented towards their own operations, such as *Project or Portfolio Success* and *Organization Performance*, than those that consider and add value to end users, such as *Product or System Effect/Value* (cf. Fig. 5). This is also in line with the fact that the effects or implications of the implementation of assessment methods in benefits management are more focused toward *Increase in Project Success* and *Continuous Improvement* than toward *Provision of Higher Value* (cf. Fig. 6). Undoubtedly, it is important that the programs/projects yield benefit to the organizations in different aspects,

since in this way they support the survival of these. However, a scant focus on aspects that benefit users, through the assessment and improvement of their satisfaction and the value provided to them, poses a great risk to the stability and growth of the business [55] [56] [57]. Therefore, these types of aspects should be considered more, and organizations should always include metrics that allow them to be analyzed.

B. Implications

As we have observed, the interplay between the fields of assessment methods and benefits management is at a very early stage of development, due to the very few studies and proposals that currently exist. That is why conducting an analysis, such as this SMS, is of great relevance to establish the foundations that guide both research and practice.

On the one hand, through this SMS, the research now has a compilation of relevant literature. This will allow researchers to not only identify new lines of work, but also current projects that can serve as support to expand, reinforce, and/or improve several research lines. The different gaps and possibilities identified in the previous section represent a starting point for new ideas, but without forgetting that the proposals identified also need further development and collaborations to reach a high level of maturity.

On the other hand, this SMS represents a roadmap for practice since the existing problems when assessing the benefits in programs/projects and the need to address them have been exposed. Therefore, professionals now have a clear and direct identification of these problems, which will allow them to have a better awareness of them and progressively implement the necessary measures to achieve more satisfactory results in this regard.

Finally, it is noteworthy that one of our intentions with this SMS is to demonstrate the importance of assessment methods in benefits management and thus attract new researchers and professionals who develop new ideas.

C. Limitations and Threats to Validity

With the aim to identify the limitations that may affect the reliability of this SMS, the threats to validity are analyzed below, applying the practice followed by Runeson et al. [58].

1) *Construct Validity*: This type of validity pertains to how accurately the study reflects and evaluates the concepts or ideas for which it has been defined. The main threat in this study is that the scope and elements defined during the planning (cf. Section III.A) might not have been adequate and therefore led to an erroneous or incomplete evaluation. To mitigate this threat, two main measures were conducted: 1) a pilot test was performed, in which we applied the search string in the *Scopus* database and we analyzed the titles and abstracts of the first 200 studies to test the adequacy of the scope and terms used, as well as the possibility of including new terms and refining the search; 2) an independent review of the planning was performed by the authors, identifying possible points for improvement and reaching a consensus. These measures allowed us to verify that the scope that we intended to investigate and the objectives in this regard have an adequate logic and are relevant, as well as that the elements established during the planning are precise enough to obtain a detailed analysis and results.

Likewise, although having a single search string is often enough to get an overview of a field, using different search strings that are more specific can be beneficial in finding more accurate and complete results. For this reason, although this study tries to make a first approach on assessment methods in benefits management, future work might address the RQs more specifically by employing tailored search strings for each of them.

2) *Internal Validity*: In the case of internal validity, the threats are related to the possibility that factors not considered or beyond the control of the researchers may affect the results of the study. In the present study, the main threat in this regard is that some literature has been overlooked or that some more recent evidence on the selected primary studies has not yet been published or indexed at the time of this study. Thus, with the aim to mitigate this type of threat, we decided to apply the snowballing approach [41] on the primary studies, through which we identified another 10 potential studies that we did not find indexed in the main search (in addition to several references to literature already included among the potential studies). The present study covers the publications between the beginning of 2002 and the end of 2022; therefore, outside of that period, the search and results of this SMS must be updated in future studies.

3) *External Validity*: This validity refers to the relevance and applicability of the results and findings obtained to different contexts. With the aim to keep this study at a more general level, we decided to establish the assessment methods in benefits management as a scope without making a specific reference to fields such as IT, architecture, engineering, or any other field of application. Therefore, the results obtained are applicable to an interdisciplinary level in program/project management, thus addressing a much broader context. Likewise, another measure that we implemented regarding external validity is to document and publish all the aspects defined during the entire process of this SMS. In this way, other researchers or professionals can replicate this study with the same variables or adapting those they deem appropriate to obtain new results and, if appropriate, compare them with those obtained in the present study.

4) *Reliability*: This aspect is related to the extent to which the analysis of the data obtained is biased by the authors. To mitigate this threat, the analysis and categorization of the selected primary studies has been performed independently by the authors of the present study, after which a consensus has been reached on the final results. From the independent analysis, prior to consensus through a joint analysis, we have reached the same results in approximately between 40-80 % of the categorizations in the different RQs, partially the same between 20-40 %, and completely different between 0-20 %. Likewise, thanks to the documentation and publication of the relevant aspects of the planning and execution of this SMS, other researchers or professionals are also allowed to replicate and verify the results obtained in this study.

VI. CONCLUSIONS AND FUTURE WORK

Benefits management is an area that has been neglected since its inception [5]. Most organizations have interpreted this area as a mere identification process [6] [7], through

which they just define the benefits they intend to achieve and, once the necessary funding and resources are obtained, forget about the main purpose of benefits management, i.e., ensuring that the identified benefits are achieved/realized through ongoing monitoring and assessment [8] [9].

That is why this study aims to boost the area of benefits management, stressing and emphasizing the importance of the application of assessment methods in this regard. The results obtained, far from being ideal, show an important gap in this field of assessment methods in benefits management, in part due to the small number of studies that currently exist. Further, a series of relevant aspects and opportunities have been identified, such as the need to develop and implement audit frameworks in this regard that not only help with control/monitoring and assessment, but also to focus on continuous improvement and to enhance the benefits more related to the external level of organizations.

Therefore, our intention is to continue working in this area and use the foundations achieved through this study to develop new proposals that help organizations to perform a proper and complete benefits management. In this regard, we are currently developing an assessment framework, identifying the processes and practices that organizations should follow/apply, as well as defining the aspects, indicators, and tools that can be used to assess the benefits and disbenefits through the main phases where they are established and materialized, i.e., planning, execution, monitoring, and closing of programs/projects, and also in continuous open-ended product-centered approaches. Once developed, we intend to apply it in different organizations and programs/projects of various kinds, auditing the processes and practices followed in benefits management and helping (through a maturity model [20] and improvement plans [21]) organizations to implement an adequate identification, assessment, and realization of benefits.

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APPENDIX A. PRIMARY STUDIES SELECTED

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APPENDIX B. PRIMARY STUDIES MAPPING

TABLE III. ANSWERS TO THE RESEARCH QUESTIONS (RQs) FROM THE PRIMARY STUDIES

ID	RQ1			RQ2				RQ3				RQ4			RQ5			
	a	b	c	a	b	c	d	a	b	c	d	a	b	c	a	b	c	d
S01	X	X	X				X	X					X		X	X		
S02		X					X		X	X	X		X		X		X	
S03	X	X	X				X	X			X		X		X	X		
S04	X	X	X			X				X		X						X
S05		X			X			X						X		X		
S06		X					X	X		X	X	X		X			X	X
S07		X	X			X		X		X	X	X		X				X
S08	X	X				X		X					X		X		X	
S09		X	X			X		X		X	X	X						X
S10		X	X			X		X				X					X	
S11		X				X		X			X			X				X
S12	X	X				X		X					X		X			X

APPENDIX C. PRIMARY STUDIES TOPICS

TABLE IV. OVERVIEW OF TOPICS COVERED IN THE PRIMARY STUDIES

ID	Topic
S01	The study identifies and proposes 8 critical success factors in implementing Lean Six Sigma projects in healthcare. To this end, 62 completed projects have been analyzed by a review team of practitioners and academics, conducting a series of brainstorming sessions and workshops. The success of these projects was assessed against each of the identified factors on a five-point Likert scale, based on whether the project met its stated goal(s) and achieved the Key Performance Indicators (KPIs). Finally, the correlations of the rating of each success factor against the success of the project have been analyzed to validate the relationship.
S02	A proposal for an evaluation method to determine and ensure the project success (judging success as benefits realization), called i3d3, is presented. Through this proposal, the G20 policy framework on quality infrastructure investment has been analyzed, mapping its objectives against the different aspects established in i3d3 (framed in the financial, social, ethical, and environmental consequences of a project).
S03	Proposal and validation (through a structural verification test and extreme conditions test in a virtual environment) of a systematic assessment model to analyze and optimize the project portfolio benefits. The model is split into four parts: 1) financial benefits subsystem, 2) internal synergy subsystem, 3) stakeholder subsystem, and 4) portfolio growth potential subsystem. For each part, the main indices that must be considered when evaluating the benefits are identified, as well as the interdependencies.
S04	The study presents an innovative proposal through a multi-case study (in 2 metro rail projects) on the potential use of social media for assessing benefit realization in transport infrastructure projects. Thanks to the perceptions of the users reflected through their posts and comments on social media, it is observed that this proposal can be a useful tool for organizations to, mainly, monitor operational issues and realize the value creation.
S05	Proposal of a holistic framework for digital transformation performance assessment, consisting of 4 digital transformation stages (or maturity levels), as well as 9 key assessment parameters. The main goal of this framework is to ensure that the benefits are realized in the digital transformation projects, continuously improving the performance in this regard.
S06	Proposal and application in several organizations of a model that provides a methodology and principles to assist organizations in estimating and evaluating their projects benefits in terms of economic ROI and social ROI. This model would assist business managers and decision-makers to make better decision of investment projects, ensuring that the causes of the real problems that affect the organizations are quickly identified so that solutions can be more effective.

ID	Topic
S07	The study proposes and tests (using non-reactive data from an operational collaboration platform) a method for developing and applying “metrics profiles” to Enterprise Collaboration Systems (ECS), which makes it possible to evaluate the benefits over time through a balanced scorecard. This method includes the identification of 313 Benefits Realization Management questions (organized into 5 main categories and 12 sub-categories) for which the quantitative metrics provide answers that give an indication of whether (or not) benefits have been realized.
S08	Proposal of a model to measure and reflect on the different factors interfering with project value (benefits) recognition over project phases, whose indicators can be integrated into a management dashboard. This model consists of three dimensions for measuring value: 1) time evolution (project phases); 2) stakeholders; and 3) type of project value. In this way, it is intended to align stakeholders’ needs, increase stakeholders’ satisfaction, and thus realize successful projects.
S09	Following an established model, namely Information System Impact (IS-impact) model, this study proposes and validates (through an empirical study) a modified evaluation model to assess the benefits and success of Information Systems (IS) in the healthcare field. This model includes six constructs: 1) individual impact; 2) organization impact; 3) provincial alignment impact; 4) system quality; 5) information quality; 6) and service quality.
S10	Proposal and validation (through an empirical study of thirteen cases) of a subjective BIM (Building Information Modeling) benefits evaluation model designed with the aim of evaluating project-based benefits through three different stages: 1) pre-project evaluation, 2) in-progress evaluation, and 3) post-project evaluation. The model identifies and analyzes different success factors that must be evaluated in this type of BIM implementation projects.
S11	The study presents a proposal on the integration of Benefits Management in Balanced Scorecards, combining the best characteristics of both approaches to improve the management and monitoring of business-related benefits, as well as ensure that the investments done through the different projects lead to forecasted benefits realization.
S12	Proposal of a tool for assessing and monitoring the strategic performance of the portfolio of projects (based on the effects of materialized risks and opportunities). This tool contributes to the analysis on the value a project creates for contributing to the realization of key benefits, supporting decision making during the management of the projects to achieve those benefits.