TOWARDS A REFERENCE VALUE CATALOGUE FOR A COMPANY-SPECIFIC ASSESSMENT OF THE IT BUSINESS VALUE – PROPOSING A TAXONOMY TO SELECT IT IMPACTS FROM EXISTING CATALOGUES

Sarah Seufert
*University of Duisburg-Essen*, sarah.seufert@icb.uni-due.de

Tobias Wulfert
*University of Duisburg-Essen*, tobias.wulfert@icb.uni-due.de

Jan Eric Wernsdörfer
*University of Duisburg-Essen*, jan.wernsdoerfer@gmx.de

Follow this and additional works at: [https://aisel.aisnet.org/ecis2021_rip](https://aisel.aisnet.org/ecis2021_rip)

Recommended Citation
Seufert, Sarah; Wulfert, Tobias; and Wernsdörfer, Jan Eric, "TOWARDS A REFERENCE VALUE CATALOGUE FOR A COMPANY-SPECIFIC ASSESSMENT OF THE IT BUSINESS VALUE – PROPOSING A TAXONOMY TO SELECT IT IMPACTS FROM EXISTING CATALOGUES" (2021). *ECIS 2021 Research-in-Progress Papers*. 34. [https://aisel.aisnet.org/ecis2021_rip/34](https://aisel.aisnet.org/ecis2021_rip/34)

This material is brought to you by the ECIS 2021 Proceedings at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2021 Research-in-Progress Papers by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
TOWARDS A REFERENCE VALUE CATALOGUE FOR A COMPANY-SPECIFIC ASSESSMENT OF THE IT BUSINESS VALUE – PROPOSING A TAXONOMY TO SELECT IT IMPACTS FROM EXISTING CATALOGUES

Sarah Seufert, University of Duisburg-Essen, Essen, Germany, sarah.seufert@icb.uni-due.de
Tobias Wulfert, University of Duisburg-Essen, Essen, Germany, tobias.wulfert@icb.uni-due.de
Jan Eric Wernsdörfer, University of Duisburg-Essen, Essen, Germany, jan.wernsdoerfer@icb.uni-due.de

Abstract
Despite a general agreement on the business value of information technology (IT), the determination of the link between organizational performance and IT investments is still a challenge. Organizations worldwide heavily invest in IT without evidence of productivity improvements. We propose value catalogues as a starting point for the identification of IT business value in an organization. Since the values vary depending on the organizational context, a company-specific value catalogue is necessary. To avoid the repeated development of a catalogue for each new IT investment, a company-specific reference value catalogue is required. Applying a design science research method, we identified four steps to develop this reference value catalogue: catalogue selection, impact selection, hierarchy establishment, and quantification determination. In this paper, we focus on the first step, which resembles the rigor cycle, and develop a taxonomy for 32 existing IT value catalogues, which form the basis for the next three steps.

Keywords: IT Business Value, IT Investments, Reference Value Catalogue, Taxonomy, DSR.

1 Introduction
IT business value can be defined as the impact of information technology (IT) on organizational performance (Mooney, Gurbaxani and Kraemer, 1996; Devaraj and Kohli, 2003; Melville, Kraemer and Gurbaxani, 2004), which is widely established in the literature (Pathak, Krishnaswamy and Sharma, 2019). Although there is general agreement about what an IT business value can be and the topic has been discussed for many years in the information systems (IS) discipline, “the relation between IT investments and firm performance remain elusive” (Masli, Richardson, Sanchez and Smith, 2011, p. 82). It is still unclear what the returns and concrete values generated by IT investments are (Wang, Liang and Zhong, 2012; Pathak et al., 2019). For this reason, determining the value contribution of IT is difficult. In this paper, we use the term value to describe the monetary assessment of an impact. An impact in turn describes – depending on the method used – an observation, measurement, or interview with employees for actual or expected changes caused by a new or modified IT system compared with the initial situation (Schütte, Seufert and Wulfert, 2019). Hence, observing the impacts of IT systems is a prerequisite for determining their value. As values can also become apparent after years, they are not taken into consideration at the beginning, which then leads...
to an incorrect determination of the overall value of the IT system. This time delay was also discussed in the 1990s under the term “productivity paradox”. Nowadays, the opinion has become accepted that IT generally has a positive influence on company productivity (Brynjolfsson and Hitt, 2003). Many authors have addressed the topic during this time and have also targeted software tools to support the research (Kesten, Müller and Schröder, 2007; Schubert and Williams, 2013), but it seems that the research has stalled without providing such artifacts to determine IT’s contribution to business goals. Schütte et al. (2019) call for a formalized process. Although the problem still exists that the variance in the return (positive and negative) on IT investments is still high and the IT business value is therefore still difficult to predict, huge portions of organizational budgets are invested in IT.

Despite the corona virus pandemic, global IT spending was about $3.4 trillion in 2020 (Gartner, 2020), and it can be assumed that IT budgets will increase over the next few years. Irrespective of so much investment, it is still the case that IT projects do not achieve the desired results and are therefore seen as failures. One reason for this may be that there is an unclear, incomplete, or incorrect idea of the value contribution of IT investment in management (Wiese, 1998). Therefore, it remains unclear whether and to what extent IT investment contributes to overall business objectives. This knowledge can then also serve as a basis for deciding whether an IT investment should be made at all and is therefore a key issue for goal-oriented IT management (Schütte et al., 2019).

We propose value catalogues as an important starting point for the identification of IT business value in a specific organization. A value catalogue is a reference list of values and pre-economic impacts that can be associated with the use of IT systems (Schütte et al., 2019). IS research does not provide any approach to support IT management regarding a reference value catalogue for a company-specific assessment (Brynjolfsson and Hitt, 2003) of the IT business value. Although the need has existed since the discussion about the productivity paradox and more and more value catalogues have been added, the research gap has not yet been adequately addressed (Schubert and Williams, 2013; Seufert, Wulfert, Wernsdörfer and Schütte, 2021). For this reason, we support the development of a reference value catalogue to integrate the company-specific assessment into the IT management. This is the overarching goal of our research. We derived four steps for the development of the reference catalogue from the literature: catalogues selection, impact selection, hierarchy establishment, and quantification determination. With the help of a reference value catalogue, IT investment decisions in companies can be reflected in a structured way and are comparable to each other, for example, whether a project prioritization is necessary (Becker, 2011). Moreover, the entire process of identifying potential impacts does not have to be repeated for every new IT project. The first step, “catalogues selection,” is to identify possible impacts from the literature and is the focus of this paper. Based on this, a company can take existing value catalogues into account when creating its own individual reference value catalogue. Since there is also no unified name for searching, the selection of appropriate catalogues in practice is difficult. Additionally, the value catalogues vary in the number, definitions, and granularity of categories. This research-in-progress paper examines the following question: “Which criteria can be used to differentiate between existing value catalogues to ultimately identify the relevant impacts for a particular IT investment in a company?” We would like to answer this question by developing a taxonomy that will be valuable for researchers and practitioners because it represents the first step in the overarching process of developing a company-specific value catalogue.

The remainder of the research in progress is structured as follows. First, we briefly sketch the related literature concerning value catalogues. Second, we describe our research approach, which is based on design science, according to Hevner et al. (2004), and especially the development of a taxonomy, following Nickerson et al. (2013) as a first step. Third, we provide initial research results for developing a reference process for the development of a company-specific catalogue of values using the developed taxonomy before discussing these first results and subsequent steps.

2 Related Literature: Value catalogues and their requirements

As already mentioned, a value catalogue is understood to be a reference list of values and (pre-economic) impacts that can be associated with the use of IT systems (Schütte et al., 2019). The
literature already contains a number of reference lists. To develop a reference value catalogue, it is helpful to analyze how catalogues have been developed so far. The processes of creating a catalogue are built upon an initial literature analysis to conceptualize IT business value and identify general impacts. For example, Riggins (1999) used Hammer and Mangurian’s (1987) predefined value catalogues to extend the existing catalogue with specific aspects of e-commerce. The identification of specific impacts is often supplemented by additional identification methods, such as interviews (e.g., Andresen et al., 2002), surveys (e.g., Gable et al., 2008) or case studies (e.g., DeLone and McLean, 2003), which are then analyzed to extract impacts and impact categories (Schubert and Williams, 2009a). Upon those findings, a catalogue of values (e.g., Shang and Seddon, 2000) or an abstract model of IT impacts (e.g., Gregor et al., 2006) can then be created (with the valuation pending).

However, the existing lists vary in their focus, number of impacts, definitions, and granularity of categories; thus, the selection of an appropriate catalogue for a practical application is difficult. An applicable catalogue of values should meet the following requirements.

(1) It is important for the evaluation of IT investments to first know the possible impacts so that the impacts can be observed in reality. Without the guidance of value catalogues, IT investments are likely to be characterized as impact defect problem situations, as it is not possible to describe the impact of the investment alternatives on the projected targets by variables (Witte, 1979; Rieper, 1992; Adam, 1996). The value catalogues can be utilized as a checklist for a specific IT investment (Andresen et al., 2002) so that, at least from the perspective of this list, all impacts from the list can be assessed (Wiese, 1998). Therefore, the scope and context of the catalogues are crucial for a proper IT business value assessment (Kesten et al., 2007). Moreover, IT reference value catalogues are an option to avoid having to determine the impacts again in every new IT investment situation. The list of impacts, which should also be related to the objectives for further analysis, forms the basis for the evaluation of each IT investment. However, directly quantifiable economic effects (values) are often considered, and the differentiated examination of the impacts is skipped (Pathak et al., 2019), which can lead to effects not being examined carefully and thus also being incomplete. For a more detailed consideration of the subject area, it is important to gain an understanding of when, where, and how IT will impact a firm. To observe something, it is necessary to conceptualize in advance what is to be observed.

(2) Such a general catalogue of IT values only provides a starting point for the assessment of a specific IT investment (Becker, 2011). To account for an individual context of the IT investment, the creation of a customized catalogue is necessary (Schubert and Williams, 2009a). This can be achieved by carefully selecting suitable value catalogues from the literature and applying methods to identify and quantify company-specific impacts (Schubert, 2013). Currently, several processes exist for creating value catalogues (Schubert and Williams, 2009a) or evaluating IT investment based on such impacts (Andresen et al., 2002; Kesten, Müller and Schröder, 2013). While those processes contain important aspects for creating a company-specific value catalogue, such as methods to identify and monetize IT impacts, some other important aspects have not yet been considered.

(3) A company-specific value catalogue must consist of those observable impacts on the bottom, which can be hierarchically aggregated based on their value contributions to create a quantifiable hierarchy tree of impacts (Schütte et al., 2019). This hierarchy tree must culminate in a one-dimensional target dimension, which allows the evaluation of the overall IT investment (Schumann, 1992; Gregor et al., 2006; Gable et al., 2008). The hierarchical structure, with its one-dimensional target dimension, avoids a target-defective problem situation. A frequent cause for this defect is the inability of the decision-maker to assess the target contributions in terms of type, amount, time reference, and certainty or a lack of knowledge on the part of the decision-maker about the objectives in general (Witte, 1979; Rieper, 1992; Adam, 1996).

(4) Existing catalogues in the literature usually do not distinguish observed impacts from (monetary) estimated values. Although the determination of IT business value is the goal of assessing IT investments, observed impacts form a prerequisite for estimating the values of an IT system. Therefore, impacts should be quantifiable.

Seufert, Wulfert and Wernsdörfer / Towards a reference value catalogue
3 Scientific Approach

To develop a process for the creation of a reference value catalogue specific to an industry or organization, we apply a design science research (DSR) methodology (Hevner et al., 2004). Our artifact is a new solution for an already known problem (IT productivity paradox at the firm level (Brynjolfsson and Hitt, 2003)) and thus resembles an improvement (Pfeffers, Tuunanen, Rothenberger and Chatterjee, 2007). According to Hevner and Chaterjee (2010), a DSR should go through three cycles. While the focus of our overall research is on the development and evaluation of the aforementioned process (design cycle), in this research-in-progress paper, we present a first draft of this reference process and focus on structuring the existing knowledge base on IT impacts in general, IT value catalogues in particular, and their relevance for the reference catalogue creation process (rigor cycle). For the relevance cycle, we will conduct interviews with decision-makers and responsible IT staff, as well as employees involved in IT investment decisions, and derive possible IT values from practice. As the development of an artifact using a DSR methodology can be understood as a knowledge contribution (Gregor and Hevner, 2013), the taxonomy as a partial artifact can also be used by both practitioners and researchers. Our research endeavor is sketched in Figure 1.

![Adapted Approach for Design Science Research (Hevner et al., 2004).](image)

For the structuring of the existing literature as a first step within the process of developing a reference value catalogue, we developed a taxonomy following Nickerson et al.’s (2013) approach to taxonomy development in the IS discipline. The taxonomy serves the description objective from a research perspective by providing transparency about this important aspect of IS research (Gregor, 2006). We identified 32 catalogues of values from related literature for the development of the taxonomy. These catalogues were published between 1983 and 2016. Examples of this literature sample are presented in chapters 4 and 5. We started our literature research on major IT business value (and the German equivalent) literature. Due to the lack of a common generic term, a search string query was difficult; therefore, the forward and backward search was much better and resulted in a set of distinct value catalogues (Webster and Watson, 2002; Vom Brocke et al., 2009).

For the taxonomy development, we apply the methodology proposed by Nickerson et al. (2013), using a hybrid approach that includes conceptually and empirically derived dimensions. The taxonomy should describe and be used to classify existing value catalogues. As a meta-characteristic, we applied the following: support the IT business value assessment by proposing appropriate IT business value catalogues. To determine the ending of the iterative development process, we apply the ten objective and five subjective ending conditions, as proposed by Nickerson et al. (2013). Although we have defined mutually exclusive as an objective ending condition, it is possible that several characteristics are simultaneously fulfilled in the dimensions by one IT value catalogue, as shown in Table 1. These combinations form a distinct characteristic in the formal taxonomy tuples that are not represented in Table 1 for reasons of graphical simplification (Wulfert, Seufert and Leyens, 2021). Before each iteration, in the third step, the researchers can choose between an inductive empirical-to-conceptual approach and a deductive conceptual-to-empirical approach for the development of the taxonomy. The dimensions and characteristics were derived independently by three researchers knowledgeable in the
context of IT business value and IS impacts and discussed afterwards via electronic communication media. The majority of dimensions are derived deductively within the first three iterations using samples from the 32 previously identified value catalogues. For these empirical-to-conceptual iterations, we randomly selected eight value catalogues and derived dimensions and characteristics accordingly. The Overall Objective (8) dimension and the Methods to Supplement the Procedures Under Certainty characteristics of the Method Recommendation (10) dimension were inductively derived from the literature in the fourth iteration. After each iteration, the taxonomy is checked for the fulfillment of the defined ending conditions. Our development process stops after the fourth iteration.

4 First Research Results: Taxonomy for Value Catalogues

The developed taxonomy for value catalogues has 10 dimensions, with a total of 33 characteristics. In the following, we present the determined dimensions and characteristics (Table 1).

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure (1)</td>
<td>list hierarchical</td>
</tr>
<tr>
<td></td>
<td>less than or equal to three main categories</td>
</tr>
<tr>
<td></td>
<td>more than three main categories</td>
</tr>
<tr>
<td>Scope (2)</td>
<td>rudimentary (up to nine values)</td>
</tr>
<tr>
<td></td>
<td>more detailed (10-26 values)</td>
</tr>
<tr>
<td></td>
<td>very detailed (more than 26 values)</td>
</tr>
<tr>
<td>IT system (3)</td>
<td>system-independent</td>
</tr>
<tr>
<td></td>
<td>ERP systems</td>
</tr>
<tr>
<td></td>
<td>systems for e-commerce</td>
</tr>
<tr>
<td>Industry (4)</td>
<td>industry-independent</td>
</tr>
<tr>
<td></td>
<td>retail</td>
</tr>
<tr>
<td></td>
<td>construction</td>
</tr>
<tr>
<td></td>
<td>production</td>
</tr>
<tr>
<td></td>
<td>credit institute</td>
</tr>
<tr>
<td>Application (5)</td>
<td>abstract specific</td>
</tr>
<tr>
<td></td>
<td>evaluation through interviews surveys</td>
</tr>
<tr>
<td></td>
<td>case studies</td>
</tr>
<tr>
<td>Methodical foundation of the catalogue (7)</td>
<td>no additional method</td>
</tr>
<tr>
<td></td>
<td>method besides literature analysis</td>
</tr>
<tr>
<td>Overall objective of the identification of values (8)</td>
<td>not mentioned</td>
</tr>
<tr>
<td></td>
<td>performance</td>
</tr>
<tr>
<td></td>
<td>financial</td>
</tr>
<tr>
<td></td>
<td>product and market</td>
</tr>
<tr>
<td></td>
<td>social</td>
</tr>
<tr>
<td>Method recommendation for the identification of values (9)</td>
<td>no recommendations</td>
</tr>
<tr>
<td></td>
<td>empirical analysis of the companies</td>
</tr>
<tr>
<td></td>
<td>use of value chains</td>
</tr>
<tr>
<td></td>
<td>catalogue as checklist</td>
</tr>
<tr>
<td>Method recommendation for the quantification of values (10)</td>
<td>no recommendations</td>
</tr>
<tr>
<td></td>
<td>static methods</td>
</tr>
<tr>
<td></td>
<td>dynamic methods</td>
</tr>
<tr>
<td></td>
<td>qualitative methods</td>
</tr>
<tr>
<td></td>
<td>methods to supplement the procedures under certainty</td>
</tr>
</tbody>
</table>

Table 1. Final Taxonomy of Value Catalogues.

A catalogue can be structured as a simple list of impacts. Another possibility is a structure (1) in the form of a hierarchy. This has the advantage that the relationships between the individual impacts become clear, and the target defect can be avoided. Thus, the authors believe that in the end all values should be summarized to a final category that represents the root node to allow for a comparison of different IT investments. However, this ideal form does not exist in any catalogue of values examined. For this reason, hierarchical structures of up to three main categories (e.g., Kurniawan et al., 2016; Samulat, 2015) and over three main categories (e.g., Schubert and Williams, 2009b; Schulze, 2009) were developed to be able to make an approximate statement. The main categories differ per catalogue. Mirani and Lederer (1998), for example, name three main categories: strategic benefits, informational benefits, and transactional benefits. A slightly different classification was made by DeLone and McLean (2003): system quality, information quality, service quality, usage, user satisfaction, and net benefits. The mentioned main categories are then further divided into lower values.

The scope (2) includes the number of impacts at the lowest level of the catalogue called leaf nodes. This dimension already allows a statement to be made about the precision of the catalogue. While some catalogues are very rudimentary (up to nine values) (e.g., Bartsch, 2015), there are some other catalogues that are more detailed (10-26 values) (e.g., Gregor et al., 2006). There are also catalogues that are very detailed (more than 26 values) (e.g., O’Leary, 2004). The classification was based on the average of the results in this dimension of the value catalogues considered, which are 18 values.
Regarding the type of IT system (3), the IT value catalogues can be differentiated between system-independent (e.g., Lucas, 2000) and system-dependent. If system-dependent impacts are distinguished, they can be divided into ERP systems (e.g., Shang and Seddon, 2000) or systems for e-commerce (e.g., Riggins, 1999). It should be noted that this is not an exhaustive list of IT system types, but only these two variants were found in the examined sample of catalogues.

Analogous to the type of IT system, the type of industry (4) can also be distinguished between industry-independent (e.g., Vanlommel and De Brabander, 1975) and industry-dependent. Four industries were identified in the analyzed sample of IT value catalogues, which then considered the effects in this context: retail (e.g., DeLone and McLean, 2003), construction (e.g., Andresen et al., 2002), production (e.g., O’Leary, 2004), and credit institute (e.g., Anselstetter, 1986).

The application (5) describes whether the catalogues examined are rather abstract (e.g., Mooney et al., 1996) or specific (e.g., Schumann, 1992). Specific here means that the impacts can be applied practically and directly. The assignment is based on the statements of the authors of the catalogues. Nevertheless, it should be noted that the authors have not necessarily classified all the specific catalogues marked here in the same way. Specific catalogues of impacts should be directly measurable.

In addition to the development of the catalogue, the evaluation (6) can also be considered to determine whether the catalogue is applicable in practice. In the literature, either no evaluations (e.g., Weill and Broadbent, 1998) were made or interviews (e.g., Vanlommel and De Brabander, 1975), surveys (e.g., Gable et al., 2008), or case studies (e.g., Parsons, 1983) were used.

The methodical foundation of the catalogues (7) was done in different ways. However, all authors use existing literature as the basis for their catalogues. The review of the literature did not necessarily follow a literature review method, such as that of Webster and Watson (2002). Rather, it followed selective processing and was therefore not structured. Furthermore, no additional methods (e.g., Hammer and Mangurian, 1987) were applied, and no additional information from interviews (e.g., Andresen et al., 2002), surveys (e.g., Kesten et al., 2007), or case studies (e.g., Porter and Millar, 1985) from practice was used. The understanding of what a value is may differ significantly, as described in the previous chapters, because the focus can be set differently, for example, internal or external processes.

Thus, the understanding already provides a direction that reflects the overall objective of the catalogue (8). While some catalogues have no mentioned understanding (e.g., Dos Santos, 1991) of the impacts, others focus on different objectives. In line with corporate objectives, these are performance (e.g., Kütz, 2013), financial (e.g., Baumöl and Ickler, 2008), product and market (e.g., Porter, 2001), and social (e.g., Gable et al., 2008) aspects. The catalogues list a wide range of different impacts, but these must then be specifically identified for a company and a particular IT investment.

For this reason, it is examined whether there are methodological recommendations for the identification of values (9). While many catalogues make no recommendations (e.g., Gammelgård et al., 2006), some authors recommend using the catalogue as a checklist (e.g., Shang and Seddon, 2000). Further possibilities include an empirical analysis of the company (e.g., Petrovic, 1994) and the use of chains of impacts (e.g., Kesten et al., 2007). After the impacts have been identified, they must be quantified to calculate an IT business value.

For this purpose, we analyzed whether method recommendations for the quantification of values (10) have been made. Either there were no recommendations (e.g., Melville et al., 2004) or methods of investment calculation under certainty were used, for example, static methods (e.g., Farbey et al., 1995) (e.g., profitability calculation), dynamic methods (e.g., Andresen et al., 2002) (e.g., net present value method), or qualitative methods (e.g., Kütz, 2013) (e.g., cost–benefit analysis). Some catalogues also mention methods to supplement the procedures under certainty (e.g., Dos Santos, 1991) (e.g., risk analysis).
5 Towards a Reference Value Catalogue

The process for the development of a company-specific value catalogue can be divided into four steps based on the findings of the related literature (Figure 2). The steps are briefly described in general terms below, and then the findings from the taxonomy are applied to the individual steps.

**Figure 2. Process for Developing a Company-Specific Value Catalogue.**

**Step 1 – Catalogues Selection (almost completed):** At the very beginning, catalogues selection has to be conducted to develop a value catalogue that is both suited to the context to which the IT system is applied and sufficiently complete. We argue that an initial assessment of the context in which an IT system is to be used is required, that is, an identifying industry (e.g., O’Leary, 2004) or IT system-specific (e.g., Andresen et al., 2002) review. Based on the context, the appropriate existing value catalogues can then be selected. Therefore, the taxonomy contains a selection of different manifestations of the two contexts mentioned, providing corresponding IT value catalogues. The step is almost completed with the development of the taxonomy, as only the evaluation of the taxonomy is still pending. **Findings:** The IT business value depends on both the type of IT implemented or introduced and the specifics of the company introducing it (Brynjolfsson and Hitt, 2003). With 81% of the catalogues in our sample being system-independent (IT system) and 84% being industry-independent (industry), the catalogues focus on higher levels of abstraction in which the IT business value tends to be equal for various types of IT and different industries (Kütz, 2013). However, these values at higher levels of abstraction cannot be directly assessed for the IT investment decision. They need to be further detailed for step 4. Only 38% of the IT value catalogues of our sample were empirically evaluated using surveys, case studies, or interviews (evaluation). Thus, the applicability of the analyzed IT value catalogues, in general, and their benefit for the companies, in particular, is often not evaluated. An evaluation after the release of a contribution would have led to a new iteration of the catalogue. Although we have scanned the literature for these iterations, they do not exist, at least, in scientific contributions, except for Schubert and Williams (2009a). Nevertheless, there are catalogues that build on each other and thus represent further iterations by other authors. While 22% of the catalogues analyzed do not mention the overall objective of the identification of values, the majority of authors (41%) focus on a performance perspective when assessing the IT business value (objective). Justifying IT investments using highly regarded and evaluated IT business catalogues may support decision-makers in considering a huge set of relevant impacts possible by future IT investment.

**Step 2 – Impact Selection (ongoing):** Based on the impacts identified within the existing literature, a customized assessment of IT impacts must also identify the impacts that apply to the specific company (Brynjolfsson and Hitt, 2003) to allow for a goal-oriented IT management (Seufert et al., 2021). Those cannot be derived from external sources but by analyzing previous projects or benchmarking existing processes. To support this step, we are currently conducting interviews with decision-makers and IT staff regarding the strategies, structures, culture, and processes of their organization to understand the various impacts that are not yet reflected in the literature but greatly affect the overall IT business value. Within an interview with the COO of a large discounter in Germany, the specific expectations of an IT system became clearer (e.g., guaranteed availability of goods in the shop and procurement more in line with demand). Steps 1 and 2 should result in a collection of impacts, which must be checked in terms of its completeness and the relevance of each impact it contains. **Findings:** It should be discussed that 60% of the value catalogues are only based on literature research (Methodical foundation) and thus do not cover possible impact from current practice. To add further aspects to the existing catalogues of impacts, a further analysis is necessary.
Step 3 – Hierarchy Establishment (pending): As mentioned before, the assessment of the IT business value requires a hierarchization of impacts to map relationships and resolve target defects. The goal is to create a detailed hierarchy consisting of different levels of abstractions from the leaf impacts towards a single root impact (Schütte et al., 2019). Findings: None of the analyzed IT value catalogues aggregates the IT business value to a one-dimensional root value that is properly monetarily quantified. Our sample of IT value catalogues varies between two (e.g., Gable et al., 2008) and six nodes (e.g., DeLone and McLean, 2003; Schulze, 2009) on the highest level of aggregation (structure), with another six catalogues proposing a plain list instead of a hierarchical aggregation of values (e.g., Bartsch, 2015; Lucas, 2000; Weill and Olson, 1989). Nevertheless, it can be noted that over 50% of the value catalogues specify a maximum of three main categories. Hence, these value catalogs can support decision-makers with possible IT business values for an IT investment but do not result in single objectively comparable root values. Although decision-makers must pay attention when attributing IT system impacts to the categories proposed within IT value catalogues, a specific IT business value should only be included in one impact category. Otherwise, a possible double accounting would distort the IT business value assessment. This assessment defect can only be avoided by mutually exclusive and well-described impacts in the IT value catalogues.

Step 4 – Quantification Determination (pending): This structure of aggregated impacts allows the defining of one overarching target dimension, such as the ROI, by which the overall benefit of the IT system can be determined. To determine the overall business value of the IT system, each leaf impact must be quantifiable and converted to monetized values. If this is the case, the process of developing a company-specific reference value catalogue is complete. Findings: For 38% of the IT value catalogues, the authors claim that they are specific enough to be directly applicable for IT business value assessments (application). For this dimension, we have extracted the authors’ opinions as written within their contributions. We would question their claim, as on the one hand, 72% of the IT value catalogues do not suggest a method for the identification of business impacts caused by IT systems. Only 12.5% of the IT value catalogues provide methods for the quantification of impacts under uncertainty (quantification). As IT investment decisions are characterized as situations of uncertainty, most of the analyzed catalogues do not provide methodological support.

6 Conclusion

In this paper, we highlighted that an IT reference value catalogue should be used as heuristics to cope with impact defect IT investment decisions. As the circumstances are totally different in companies, we recommend developing a reference value catalogue for a company-specific assessment of IT business value. This development includes four steps: catalogues selection, impact selection, hierarchy establishment, and quantification determination. The developed taxonomy (result of step 1) for an IT value catalogue selection has implications for both practitioners and researchers. Our sample of IT value catalogues provides an overview of potential catalogues that can be applied in a company based on the process towards a company-specific catalogue of values. For practitioners, the taxonomy should further simplify the selection of an appropriate IT value catalogue for the IT business value assessment, or it can be used for classifying an existing catalogue for reasons of comparability. However, the developed taxonomy has its limitations. First, the identified sample (32 catalogues in total) of IT value catalogues does not raise a claim for completeness. Because we focused on scientific literature, we excluded practitioner contributions to IT value catalogues, which may be more industry-specific. Second, the proposed evaluation of the quality of the taxonomy developed by Nickerson et al. (2013) is pending. In addition to the development of a company-specific value catalogue to evaluate IT investments, it is also important to take a holistic approach to controlling the values. Future research may include IT value catalogues into more holistic approaches to IT business value assessment. It may also include even the transfer of IT business value assessment from a snapshot of the investment decision to a continuous control that reaches in the productive operation. This controlling should be integrated into existing procedure models.
Seufert, Wulfert and Wernerboth / Towards a reference value catalogue

References


Kesten, R., A. Müller and H. Schröder. (2013). IT-Controlling. IT-Strategie, Multiprojektmanagement,


Seufert, Wulfert and Wernsdörfer / Towards a reference value catalogue


