

Business Capabilities: A Systematic Literature Review and a Research Agenda

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Abstract—The omnipresent need for business transformations, be it digital, agile, or lean, forces organizations to make good choices regarding their optimal business capabilities. Business capabilities can provide the link between strategy (the ‘why’) and implementation (the ‘how’). Currently, a comprehensive view on business capabilities is missing. We conducted a systematic literature review on business capabilities. We identified 720 scientific studies, of which 20 were analyzed in-depth. In this review, we investigate how business capabilities are defined, what business capability frameworks are available, and what future research has been suggested for business capability research. From this literature review emerges a new definition for business capabilities, an extensive analysis on the state of art in business capability research, and a potential research agenda for future research.

Keywords—*Business Capabilities, Business Capability frameworks, Capability-Based View, Systematic Literature Review, Information and Communications Technology (ICT)*

I. INTRODUCTION

In this age of increasing change, organizations need to reinvent their business capabilities frequently in order to survive. Ongoing transformations such as the shift towards digital [1] and agile ways of working [2] require organizations to understand and assess their capabilities to make good strategic choices. Organizations need to decide on ‘how’ activities are performed [3], and ‘what’ activities are performed [4], [5] — the latter often referred to as ‘business capabilities’.

After decades of scientific work a comprehensive view on business capabilities is missing [6]. As of yet there is no agreed upon definition of business capabilities. Wißotzki [6] notes that existing literature is (1) fragmented, (2) lacks clear categorization of capability types, and (3) no overarching view across different capability types exists.

In order to address this situation we have performed a systematic literature review. Based on an original selection of 720 articles, we provide an overview of scientific literature on business capabilities. Our main contribution is:

- an extensive analysis on the state of art in business capability research
- a focused and aggregated definition for business capabilities
- a potential research agenda for future research

In the remainder of this article we work towards an extensive overview of business capability research. In section II the relevant literature is presented. We provide a brief overview of the history of business capability research, followed by an overview of related concepts, and an overview of related literature reviews. The objective of this research is presented in section III. This literature review follows a systematic literature review approach [7]. Section IV details the approach we used for this paper. The results are presented in section V. In section VI we discuss the definitions of business capabilities, the existing business capability frameworks, and the potential research agenda. In section VII we answer the research questions and state our contributions.

II. BACKGROUND AND RELATED WORK

The notion of business capabilities has been on the agenda of researchers and professionals for a long time already. It has been a topic of discussion, because of its role in discovering the sources of an organization’s competitive advantage [8]. Surprisingly, a clear and agreed upon definition is missing for business capabilities [6].

Capability research in business environments dates back to 1987 when Ulrich introduced the term organizational capability [13]. His main goal was to introduce people management as a fourth mean to create competitive advantage in addition to financial, strategic and technological management. Subsequently, specific types of capabilities have been introduced in literature, such as enterprise architecture capabilities and dynamic capabilities [6]. One particular type of capabilities are so called ‘business capabilities’, the topic of this paper.

Business capability research has its origins in two dominant literature streams, namely the Resource-Based View and enterprise architecture. Prior to Ulrich, the concept of activities/abilities crossing operating divisions was already mentioned in the Resource-Based View (RBV) of the firm [12]. In RBV research, capabilities refer to a bundle of skills and the knowledge that is strategically important to manage assets and coordinate activities effectively [8].

Enterprise architecture research describes the notion of business capabilities as the combination of process, technology, economic goods and persons [14], [15]. Business capabilities are also a key component of The Open Group Architecture Framework (TOGAF) [16], which is extended by Barroero et

Concepts	Dictionary	Literature
Capabilities	the facility or potential for an indicated use or deployment [9]	the capacities or abilities within a firm, which can be linked together as business processes, in order to enable a specific purpose or outcome [4]
Skills	the ability to use one's knowledge effectively and readily in execution or performance [9]	N/A
Competences	the quality or state of being competent; having requisite or adequate ability or qualities [9]	Competences are the set of skills and production techniques [10]
Processes	series of actions or operations conducting to an end [9]	the routines or activities of an organization [11]
Resources	a source of supply or support :an available means [9]	(tangible and intangible) assets which are tied semi-permanently to the firm in the RBV-theory [12]

TABLE I: Related concepts of business capabilities

al. to make the bridge to the data, application, and technology architecture [17].

As of yet these two research streams have not aligned into a converged and comprehensive view on business capabilities. This results in confusion and misinterpretation when discussing business capabilities. In this paper we provide a converged definition and view on business capabilities.

A. Capabilities, skills, competences, processes and resources

Business capabilities are closely related to the concepts of skills, competences, processes, and resources. Table I shows an overview of the definitions of these concepts from the Merriam-Webster dictionary as well as from literature. Skills refer to the abilities of persons, while capabilities, processes, and resources refer to organizational components. Competences comprises of both the personal and organizational elements.

The Merriam-Webster dictionary [9] provides three definitions of capabilities, namely (1) "the quality or state of being capable", (2) "a feature or faculty capable of development", and (3) "the facility or potential for an indicated use or deployment". There is also a distinction in the essence of the definitions. The first definition refers to the level of capability, while the latter two definitions refer to the availability of a capability. This difference also adds to the confusion on (business) capabilities.

B. Understanding of business capabilities in previous reviews

To further understand and determine the current state of art of business capabilities, we explored academic literature for reviews. Surprisingly, we could not identify any literature reviews specifically on business capabilities. We did identify three reviews that are closely related, namely: (1) WiBotzki's review on capability research [6], (2) Barreto's review on dynamic capabilities [18], and (3) Wu and Liu's review on E-business capabilities [19]. We now summarize these three reviews.

An overview of capability research was given by WiBotzki [6]. In total WiBotzki identified 184 relevant articles in the period 2000 to 2014, by using 'capability' and 'capabilities' as search terms. WiBotzki found that research fields were very diverse. Therefore, he categorized them into 8 research subjects, namely; Business Strategy Management, Software Development, Knowledge Management, Project Management, Architecture Management, IT-Management, Supplier and Contract Management, and Development and Assessment processes. Within these research

subjects, he categorized five capability types, namely Dynamic Capabilities, Core Capabilities, Business Capabilities, EAM Capabilities, and IT-Capabilities. The first capability type is an external capability, while the latter four refer to the internal operations of the organization. According to WiBotzki, capabilities can best be described by the following elements: resource, (enterprise/business) context, goals, processes, information/knowledge, and role/actor. He states future work is still required to further define a clear categorization of capability types.

Barreto [18] found 1534 articles that mentioned 'dynamic capabilities' in the period from 1997 to 2007. He identified 40 articles that were published in leading management journals. He found differences in the conceptualization of dynamic capabilities, through the definitions of dynamic capabilities by several authors. Key contributors to these differences were: the nature of dynamic capabilities (ability versus capacity), and the outcomes of dynamic capabilities (direct versus indirect effect on performance). These differences also lead to Barreto stating that the dynamic capabilities approach is not yet a theory. Barreto summed the literature review up as that even though there is a large body of knowledge on dynamic capabilities, dynamic capability research has been disconnected.

Wu and Liu [19] performed a systematic literature review on E-business capability research. They found that E-business capability research is divided into three streams: innovation diffusion model, net-enabled theory, and resources complementary theory. Wu and Liu state that existing literature on E-business capabilities provide a better insight in the relationship between E-business technology and organizational performance. However, they found that E-business capability research is mainly focused on the acceptance of the systems. They concluded that E-business capabilities is the driver of the success of E-business strategy by linking investment and value of E-business technology.

III. OBJECTIVES OF THIS REVIEW

Although many academic, as well as professional, literature uses the term *business capability*, it remains vague what is meant. Currently, a comprehensive view on business capabilities is missing. Existing literature [6] is (1) fragmented, (2) lacks clear categorization of capability types, and (3) has no overarching view across different capability types. Barreto [18] describes that, for dynamic capabilities, as the literature being disconnected. This is hindering further research.

The goal of this research is to identify the current state of art in business capability research. To reach this goal, we pose

the following research questions:

- 1) How are business capabilities defined?
- 2) What frameworks are discussed in academic literature to assess or improve business capabilities?
- 3) What future research has been proposed in the field of business capabilities?

IV. REVIEW METHOD

This systematic literature review is based on the guidelines provided by Kitchenham [7]. Systematic literature reviews aim at providing trustworthy, and verifiable evaluation of an existing research topic using a rigorous methodology. Following the guidelines, we organized the review in three stages: (1) protocol development, (2) conducting the review, and (3) analysis and reporting. In this section, we first present the search strategy. Second, the inclusion and exclusion criteria for the different stages are presented. Third and last, we detail out the data extraction and analysis process.

A. Search strategy

Based on our research questions, we created and tested search terms. The search key is decomposed as follows: the main concept — business capabilities, the scope – frameworks and models, the usage, and the relevant literature streams. The relevant literature streams is based on the segmentation for capabilities as identified by Wißotzki [6]. We identified the selected streams as most relevant for business capabilities.

We used the following search terms, each combined using an *AND* operator:

- (“business capability” *OR* “business capabilities”)
- (map *OR* model *OR* framework *OR* classification)
- (improvement *OR* assessment)
- (“Business Strategy Management” *OR* “Architecture Management” *OR* “IT Management” *OR* “Business and IT Alignment”)

B. Inclusion and exclusion criteria

In the first stage we excluded titles that were clearly not related to this review. If there was doubt whether an article should be excluded based on its title, the article was always included for the next stage. We also cleansed the list from duplicates and non-English literature in this stage. In the second stage we collected the abstracts of these articles. We excluded articles of which the abstract did not clearly refer to any capability type. In the third and last stage, we read and conducted an in-depth analysis of the articles which referred to business capabilities in their abstract.

C. Data extraction and analysis

We entered the search key into Google Scholar in January 2016, which resulted in 720 articles. The citations of these articles were imported into and managed in Mendeley. We exported the citations, via JabRef, to Excel. For each subsequent stage, separate Excel sheets were created.

In the first stage we cleansed the articles and removed articles based on their title. This yielded a result of 355 articles. In the second stage we identified 103 articles that referred to a capability type in the abstract. We categorized each of these 103 articles to the capability type that was the focus of the abstract (e.g., including dynamic capabilities, E-business, enterprise architecture, and organizational capabilities). For these 103 articles we collected the full documents. Per capability type, we parsed the PDF documents with QDA Miner. We used the QDA Miner addon Wordstat to text mine the articles in order to determine word distribution. In Wordstat we used substitution, so that conjugations such as capability and capabilities are counted as the same word, and we used Wordstat’s standard exclusion list, so that words such as ‘and’ were excluded.

Twenty articles referred to business capabilities in their abstract. In the third stage we used an Excel-based data extraction form [20], to collect the relevant information for our research from these 20 articles. We extracted information on study description, research design, and study findings. As part of the study description we retrieved the keywords, the journal or conference, year, the authors and their institutes, and the research field. Research design section was used to capture the study aims, design of the study (quantitative/qualitative), data collection, and the classification of papers [21]. Study findings comprised the definition of business capabilities, the findings and conclusions, the validity, the relevance to practice and academia, and future research.

V. RESULTS

In this section we present the results of our analysis. First, we present the authors and institutes. First, we give an overview of capability types. Second, we present the definitions of business capabilities and other capability types. Third, we provide an overview of business capability frameworks. Towards the end, we show the identified future research.

A. Overview of capability types

In stage 2 of our systematic literature review, we reviewed 355 abstracts. In 103 abstracts a capability type was mentioned. In this phase we identified other capability types next to business capabilities. Only 9% of the 103 abstracts focused solely on business capabilities, as shown in Figure 1. Whilst 40% of the 103 abstracts mentioned IT capabilities and 12% dynamic capabilities. E-business capabilities, organizational and enterprise architecture capabilities were mentioned, respectively, in 6%, 5% and 4% of the abstracts. The other category, which comprises 24%, contains capabilities type that were mentioned less than four times, such as strategic capability or team capabilities.

B. Research question 1: How are business capabilities defined?

In this subsection we present the definitions of business capabilities and the other capability types. In Table II we have listed the definitions per capability type, the source, and the emphasis of the definition. Per capability type we have sorted the definitions based on the number of articles that referred to the definitions.

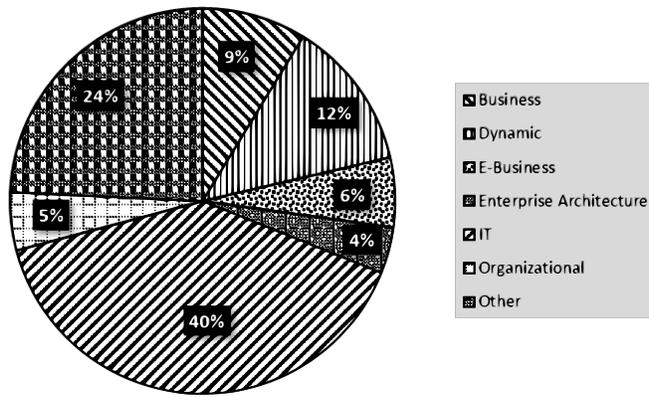


Fig. 1: Classification of capability types

There is no dominant definition of business capabilities or a common emphasis on what business capabilities are. Homann [22] and Wißotzki [6] even contradict each other in their view on resources as part of the definition of business capabilities. Homann states that capabilities are regardless of the resources, while Wißotzki includes resources as an element of a business capability. Although there is also no dominant definition of E-business capabilities, the emphases of the definitions are closely related. Key concepts are Internet, resources, and value. enterprise architecture capabilities have one dominant definition, but this definition has been proposed by the same author, namely Wißotzki.

Dynamic capabilities and IT capabilities both have one dominant definition and all of the definitions emphasize common concepts. Six articles referred to the definition of dynamic capabilities by Teece et al. [23]. This definition emphasizes competences and the changing environment. The other definitions emphasize mainly on routines and resources, with the context of change. Four articles on the topic of IT capabilities referred to the definition by Bharadwaj [24]. Bharadwaj emphasized resources, infrastructure, skills, processes, and competitive advantage. Other definitions emphasized routines, strategy/management, and value. Organizational capabilities also has a dominant definition, but only one article within our scope referred to that definition.

In our data there are two key distinctions between the definitions, namely the view on resources and competitive advantage. Beimborn et al. [4] does not refer to resources as being part of a capability. In contrast to that, Bharadwaj [24] and Wißotzki [25], [6] emphasize the role of resources in their definitions of, respectively, IT and business capabilities. Beimborn et al. [4] also does not make a judgement of value in his definition of capabilities. In contrast to that, Bharadwaj [24] emphasizes the competitive advantage of IT capabilities. Thus, there is no alignment in the definitions among the different capability types.

Frequency of words per capability type. Using a text-mining approach, we identified the frequency of words used in the articles per capability type. This resulted in a top 50 of most frequent words. We compared this top 50 per capability type, to see which words overlap and which words are only mentioned

per capability type. Table III shows the (1) overlap of words for each capability type, and (2) the words only used in articles the specific capability types.

C. Research question 2: What frameworks are discussed in academic literature to assess or improve business capabilities?

In this subsection we present the identified business capability frameworks. When analysing the articles in-depth, we noticed almost no specific frameworks were mentioned. Only Vermeulen et al. [58] provided a list of business process capability frameworks. Therefore, we did an additional search on "business capability framework" in Google Scholar to identify any frameworks that we missed. Table IV shows the list of identified capability frameworks. We identified seven capability frameworks. Two of these can be categorized as business capability frameworks [59], [16]. The other ones can be categorized as process frameworks [60], maturity models [61], [62], and e-business capability frameworks [63], [47].

We found two business capability frameworks in literature [59], [16]. Brits et al. [59] provided a conceptual framework for modeling business capabilities and a capability construction feedback loop. In their research they propose that business capabilities are modeled over perspectives (external environmental knowledge, ends, international environmental knowledge, and means) and abstractions (elements of guidance, business processes, resources, technology, and people). TOGAF's capability based planning [16] provides an approach on how to model business capabilities in the business domain of an enterprise architecture. As the capability based planning is part of the overall enterprise architecture methodology, it provides a good overview of how to get from strategy, to capabilities, to implementation (building blocks).

D. Research question 3: What future research has been proposed in the field of business capabilities?

In this subsection we present an overview of the future research that has been proposed in the articles. We identified three main directions of future research, namely: (1) future research into frameworks, (2) future research into finding empirical evidence, and (3) future research into related fields. The connection to other fields is the result of the aggregation of the individual fields (the rows below). The mapping of the articles and future research is show in Table V.

In four articles to further improve proposed frameworks and to converge frameworks within this field. In 10 articles it was proposed to find (additional) empirical evidence for the findings. In 7 articles, authors identified the relation to other fields and proposed to further investigate these relations.

VI. DISCUSSION

In this section we will discuss the current state of business capability research. First, we will discuss the definitions of business capabilities and delineate the definitions of the other capability types. Second, we will discuss the existing business capability frameworks. Third and last, we will propose a research agenda.

Definition	Source	Cited in	Emphasis
Capabilities			
Capabilities are what the business does (e.g. pay employee or ship product) regardless of what resources being used or how those resources are configured (e.g. whether it is in-sourced or outsourced, or manual or automated).	Homann [22]	[26]	what, business, regardless of resources
A capability represents a manageable unit of change and supports incremental development through an explicit distinction between systems and their capabilities	Becker et al. [27]	[27]	change and development
Business Capabilities			
A particular ability or capacity that a business may possess or exchange to achieve a specific purpose or outcome.	Homann [22]	[26]	ability, capacity, purpose, and outcome
Referred to a corporate business goal the aim of business capabilities is to activate, use and maintain resources for specific business activities	Wiřotzki [6]	[6]	business goal, resources, and activities
Dynamic Capabilities			
The firms ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.	Teece et al. [23]	[28], [29], [30], [31], [32], [33]	competences, changing environments
Organisational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die	Eisenhardt and Martin [34]	[30], [35]	routines, configurations, strategy
The capacity of an organisation to purpose fully create, extend, or modify its resource base	Pult and Manwani [36]	[36]	resource base
IT Capabilities			
The ability to effectively combine and apply IT resources, including IT infrastructure and human IT skills, to organizational processes, is a source of competitive advantage	Bharadwaj [24]	[37], [38], [39], [40]	combine, resources, infrastructure, skills, processes, competitive advantage
The ability to execute stable and repeatable patterns of IT management activities in support of value creation.	Curley [41]	[41]	patterns, management activities, value
The focused strategic deployment of IT resources and competencies in support of the organizations goals in summary, it is what the IT organisation can collectively do for the enterprise.	Curley [42]	[42]	strategy, resources, competencies, goals
An organizations capacity to utilize and structure information in a meaningful fashion that supports decision making	Dutot et al. [39]	[39]	information, decision making
Combinations of IT-based assets and routines that support business conduct in value-adding ways	Sambamurthy & Zmud [43]	[40]	assets, routines, value
E-business Capabilities			
The application of information and communication technologies to conduct business activities along value chains	Bi et al. [33], based on Lin & Lin [44] and Zhu & Kraemer [45]	[33]	ICT, business activities, value chain
A firm's ability to interact with its customers and business partners and conduct businesses over the Internet	Kevin Zhu [46]	[47]	interaction, Internet
The combination of e-commerce technology resources, e-commerce managerial skills and business networks	Chu Jan Tow Lawrence [48]	[47]	resources, managerial skills, business networks
High-performance routines that can reside within and between organizations and confer a firm with a temporary competitive advantage	Andersson Kaplan [49]	[47]	routines, competitive advantage
Mobilize and deploy Internet-based resources, in combination with or in the presence of other valued resources	Soto-Acosta and Meroo-Cerdan [50]	[47]	Internet, resources, value
A strategic ability to use Internet to share information, promote transaction, improve customer service and enhance supplier linkage.	Wu and Liu [19]	[19]	Strategy, Internet
Enterprise Architecture Capabilities			
The specific combination of know-how in terms of organizational knowledge, procedures and resources able to externalize this knowledge in a specific process with appropriate resources to achieve a specific outcome for a defined enterprise initiative	Wiřotzki [25]	[51], [25], [52], [53]	organizational knowledge, resources, outcome
Organizational Capabilities			
A companys abilities to perform a set of,tasks, while utilizing organizational resources.	Hwang [54] based on Barnett and Helfat [55], Carmeli and Tishler [56], and Peng et al. [57]	[54]	tasks, resources

TABLE II: Definitions

Capability types	Frequent words
Business, Dynamic, E-business, EA, IT	resource, business, system, research, process, model, information, management, capability
Business	work, flexibility, product, article, hypothesis, time, software, year, pepsiamericas, china, chinese
IT	high, infrastructure, alignment, acquisition, integration, item
Dynamic	case, manager, ESR, relate, ability, CRM, respond, competence, organisation, sense, ESS, organisational, enable, oa
E-business	theory, partner, competitor, table, growth, environment, adoption, commerce, small, doi, fit, impact, orientation, present, smes
EA	framework, approach, identify, specific, method, literature, paper, artifact, function, block, maturity, EAM, science, design, EA, building, practice, element, assessment, wiřotzki, each, action, object, architecture, concept, evaluation, MMDP, state, context

TABLE III: Most frequent words per capability type

A. Definition of business capabilities and the delineation of capability types

In our data we found two definitions for business capabilities, namely: (1) A particular ability or capacity that a business may possess or exchange to achieve a specific purpose or

outcome [22], and (2) A corporate business goal the aim of business capabilities is to activate, use and maintain resources for specific business activities [6]. There is no dominant definition for business capabilities. The definitions by Homann and Wiřotzki [22], [6] do not align with the most frequent words used in the articles related to business capabilities, as shown in Table III. However the definitions do align with the most frequent used words in articles across all capability types. Therefore, we propose the following definition for business capabilities, which is based on Homann's and Wiřotzki's definitions [22], [6]: **"A particular ability that a business may possess or exchange to achieve a specific corporate goal"**.

To illustrate this definition we provide examples and counter-examples of business capabilities.

- *Examples:* electronic service delivery [16], Sarbanes-Oxley compliance [16], human resource management [64], develop product or service [65], and customer management [6]
- *Counter-examples:* resources (e.g., people or assets),

Framework	Goal	Perspective	Domain
TOGAF's capability based planning [16]	Planning, engineering, and delivery of business capabilities	Operationalizing strategy	Enterprise Architecture
The business capability model by Brits et al. [59]	Organizational analysis and supporting the architecture of an agile organization	Assessment and architecture	Business Capabilities
American Productivity and Quality Centre (APQC) Process Classification Framework [60]	Common language and defining work processes	Performance management	Best practices and processes
Capability Maturity Model [61]	Maturity assessment	Process improvement	Software development and business processes
Crosby's Quality Management Maturity Grid [62]	Measuring and benchmarking quality management	Maturity	Quality Management
E-business capability framework [63]	Identifying factors affecting business performance of a firm	Strategy	E-business
E-B capability model [47]	Assessing a firm's competence	Strategy	E-business

TABLE IV: Capability frameworks

strategy, processes

In the next paragraphs we will delineate the definitions for each type of capability. Based on the definition of the business capability we discuss whether we agree with the dominant definition in our data. In case we did not agree with the definition, we propose a new definition.

1) *definition of dynamic capabilities*: Teece et al. [23] defined dynamic capabilities as "The firms ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments". In our scope this definition of dynamic capabilities is seen as the dominant definition. It emphasizes the ability of an organization and competences to address the changing environment. This emphasis is also in line with the frequent used words in the dynamic capabilities' articles, namely *ability, respond, and competence*. The definition does not contradict the other definitions of dynamic capabilities, and follows a similar breakdown structure as the definition of business capabilities. Therefore, we agree with this definition of dynamic capabilities.

2) *definition of IT capabilities*: Bharadwaj's definition of IT capabilities [24], referred to by 4 articles within our scope, is the dominant IT capabilities' definition. Bharadwaj's definition is "The ability to effectively combine and apply IT resources, including IT infrastructure and human IT skills, to organizational processes, is a source of competitive advantage". The emphasis of this definition is in line with the frequent used words in the IT capabilities' articles, namely *infrastructure, alignment, and integration*, where we interpret alignment and integration as the *combine* emphasis of the definition. The definition is however not regardless of the level of performance. Based on Bharadwaj [24] and our definition of business capabilities, we therefore propose the following definition: "The ability to effectively combine and apply IT resources, including IT infrastructure and human IT skills, to organizational processes."

3) *definition of E-business capabilities*: As stated before there is no dominant definition for E-business capabilities. As Bi's definition [33] is based on multiple definitions, it gets our preference. Bi defined E-business capabilities as "The application of information and communication technologies to conduct business activities along value chains". The frequent word *commerce* is the only one that is mentioned in most of the definitions. Even though Bi's definition is based on multiple

sources, it misses the 'ability' element in its definition. We propose to alter the definition to: "The ability to apply information and communication technologies to conduct business activities along value chain".

4) *definition of EA capabilities*: In our scope there is only one definition of Enterprise Architecture capabilities [25], which has only been referred to by the same author. He defined EA capabilities as "The specific combination of know-how in terms of organizational knowledge, procedures and resources able to externalize this knowledge in a specific process with appropriate resources to achieve a specific outcome for a defined enterprise initiative". This definition refers to the most frequent words *specific, EAM, architecture, and EA*. To align the definition of EA capabilities with the definition of business capabilities, we propose to remove "with appropriate resources" from the current definition. This results in the following definition: "The specific combination of know-how in terms of organizational knowledge, procedures and resources able to externalize this knowledge in a specific process to achieve a specific outcome for a defined enterprise initiative"

B. Existing business capability frameworks

Through this research we identified the breadth of literature discussing capability frameworks, which is also supported by Bernoider et al. [29]. However, we only identified two business capability frameworks [16], [59]. We found limited empirical evidence in scientific literature of the application of the framework by Brits et al. [59]. As the capability-based planning approach [16], is an part of the TOGAF methodology it is harder to pin-point the specific implementation of the business capability framework.

Although we identified only two frameworks to model and implement business capabilities, we were able to identify many more business capability maps, such as IBM's Component Business Models [64] and Microsoft's capability map [65]. A business capability map is a set of business capabilities, often composed of different levels of detail, that are applicable for a certain industry or specific organization. APQC's process classification framework [60] has also be applied as a business capability map [73], taking the level one processes as capabilities. These maps are often part of a capability approach in which software vendors or consultancy firms use the maps to assess organizations. These approaches and frameworks are often not publicly accessible.

	[26]	[27]	[29]	[66]	[67]	[68]	[69]	[63]	[70]	[47]	[40]	[36]	[71]	[72]	[6]	[19]	total
Frameworks			X						X		X	X					4
Empirical evidence	X		X		X	X		X		X		X	X	X	X		10
Connection to related fields		X	X	X			X				X			X		X	7
Reference architecture		X															1
Transformation projects			X												X		2
Changing business conditions			X														1
IT governance			X														1
Enterprise Architecture				X													1
Strategy				X							X						2
Post-merger							X										1
IT ambidexterity							X										1
Investments							X							X		X	3

TABLE V: Identified future research

Capability-Based View versus Resource-Based View. The Capability-Based View is closely related to the Resource-Based View. However it is unclear how what the overlap and the distinction is between the two views. Table VI provides an overview of the Capability-Based View (CBV) and the Resource-Based View (RBV). The RBV is a more broadly researched and applied concept compared to the CBV. However the RBV has its limits [26]. The definition of resources in the RBV is very broad, making it a tautology [74]. Another limitation of the RBV is that source of competitive advantage is only based on internal resources.

The RBV looks at the organization from a ‘how’ perspective, i.e., making it specific which processes, which resources are used to achieve the strategy. The CBV looks at the organization from a ‘what’ perspective [22], abstracting from the implementation. Therefore, a business capabilities does not entail a certain structure for an organization. It also does not entail a certain structure for an organization. This is visualized in ???. In the RBV visual there is no overlap between the silos, while the CBV has an overlapping capability ‘human resource management’. This ability is present within the product, department, project and process.

C. Potential research agenda

Based on the findings of our literature study we will now discuss a potential research agenda. Based on Table V, we particularly identified three different directions, namely: (1) The designing of an open-source business capability framework, (2) Empirical evidence of business capability research findings, and (3) the connection to related fields.

Designing of an open-source business capability framework

We mentioned before that the RBV provides an all-inclusive definition on resources and the firm, which leads to a tautology. Business capabilities tend to be more exclusive in what it comprises and more stable over time, which makes it more convenient for analyzing an organization’s performance [26], [22]. *To what extent do business capabilities explain the difference in performance between organizations compared to the Resource-Based View?* To answer this question a business capability framework would be useful. However, there is no business capability framework publicly available that prescribes how to model a business capability, apply a business capability map, and that prescribes the approach of deriving the appropriate set of business capabilities from strategy and implementing the business capabilities. We propose to create an open-source business capability framework.

We identified two approaches to model business capabilities, one by TOGAF and one by Brits et al. [16], [59]. These approaches should be incorporated into the open-source business capability framework. *How can we integrate TOGAF’s capability based planning and Brits et al. conceptual business capability framework [16], [59]?*

- *Soft aspects of organizations.* Currently, business capabilities research and frameworks are quite focused on the hard aspects of an organization, while the soft aspects organizations, such as culture, ways of working, and change management, are increasingly being researched and are becoming more important for professionals [76]. *To what extent can the soft aspects be covered in the current view on business capabilities? What extensions will be necessary to the business capability framework to incorporate soft aspects in order to improve the assessments of organizations?*

- *Measuring and evaluating.* Business capabilities frameworks can be used to analyze and improve organizations [58], [22]. To do this analysis and improvement properly, the business capabilities need to be measured. *How can we measure business capabilities?* Khalid et al. [63] designed a framework which uses structural equation modelling to evaluate E-business strategic capabilities. As E-business capabilities are closely related to business capabilities, we believe that structural equation modelling could possibly be used to evaluate business capabilities as well. *How can we apply structural equation modelling to evaluate business capabilities?*

Empirical evidence of business capability research findings.

Business capabilities research show promising results in alignment of business and IT [16], improvement of communication [26], and investment decisions [19]. However, this is often based on literature or single case studies. Therefore, we suggest to further validate these findings in practice.

- *Alignment of business and IT.* Alignment between business and IT is still a high priority in organizations [77]. The concept of business capabilities is argued to improve alignment between business and IT, by assisting architects to focus on business value [16]. *Does the alignment of business and IT improve through the application of business capabilities? What are the benefits for business and IT alignment when applying business capabilities?*

- *Improvement of communication.* One key aspect of the misalignment between business and IT is the communication between business and IT, especially between senior management [78]. It is hypothesized by Amiri et al. [26] that

	Capability-Based View	Resource-Based View
Source of competitive advantage	Internal and external	Internal
Focus	Capability building	Resource picking
Perspective	What an organization does	How an organization does it
View on the firm	N/A	Bundle of resources
View on resources	Resources are executing capabilities	all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness [75]
View on capabilities	‘What’ an organization does regardless of the resources used [22](i.e., capabilities are distinguished from resources)	Bundle of skills and knowledge to manage assets and activities effectively [8] (i.e., capabilities are a type of resource)
Organizational aspects	Hard and soft	Hard
Keywords	End-to-end, goal-oriented, stable	Silo, assets, implementation
Examples	Order fulfillment, HR management, Procurement, Resource Management and Development, Innovation Management	People, Buildings, Machinery, Processes, Cash
Counter-examples	People, Buildings, Machinery, Processes, Cash	Strategy

TABLE VI: Capability-Based View versus Resource-Based View

using the Capability-Based View will improve communication between senior management, especially focused on the communication of the CIO towards the other members of the management team. *Does the capability-based terminology improve communication in senior management [26]? How are other organisational levels benefiting from the capability-based terminology?*

- *Investments.* There is a trend emerging of shifting investments on technical resources to investments on capabilities [19]. *To what extent does a capability-based approach improve investments? What is the role of business capabilities in future technology investment strategies?*

Connection to related fields. As business capabilities cover the entire organization, it is related to many other research fields. In our data we identified three related fields, namely digital transformations, strategy, and changing environments.

- *Digital transformations.* Bernoider et al. [29] argue that improved understanding on aligning IT governance effectively with IT driven business transformation projects is necessary. As discussed before, business capabilities could make this alignment easier. *How can a business capability framework make business/digital transformation easier for (project) managers [29]? To become a Digital Master, an organization has to develop new capabilities [1], but by going through such a transformation not only will there be new capabilities developed, current capabilities will also be affected. How are IT/Digital transformations affecting the capabilities of an organization? What are the benefits of IT/Digital transformations driven by a change in business capabilities?*

- *Strategy.* Business capabilities provide a missing link between the strategy and implementation of an organization [16]. However, it is not fully clear on how the alignment between strategy and implementation is. *What is the role of business capabilities between strategy and implementation? How can we formalize this role in the business capability framework? Is there an optimal set or balance of capabilities in for an organization?*

According to its definition, business capabilities can be exchanged between organizations. In IT capabilities we see

the phenomenon of sharing IT capabilities [40]. This could also be the case for business capabilities. *What are the mechanisms underlying the strategic consequences of shares business capabilities?*

The relationship between ontology and implementation has already been given form through organization implementation variables [3]. Business capabilities have resembles with the ontology of an organization. *How do business capabilities differ from the ontology of an organization? What are the conditions in which business capabilities are preferred as to the ontology of an organization?*

- *Changing environments.* Organizations are increasingly dealing with internal and external changes. This requires them to be flexible. However, business capabilities are stable [26], [22]. *What is role of business capabilities in an increasing changing organization? How can business capabilities be altered over time?* To deal with these changes, the topic of (IT) ambidexterity is increasingly being researched [70]. *How can we apply IT ambidexterity theory to business capabilities?*

- *Organizational Routines as a Source of Capabilities.* Salvato [79], [80] and others explore the role of routines, concrete patters of day-to-day activity, in capability evolution. He argues for a shift of focus in understanding capabilities as aggregated entities, to that of practical micro activities. *How can we better understand the connection of business capabilities and organizational routines? How can business capability frameworks account for more fine-grained perspectives on capabilities so help accounting for their development?*

VII. CONCLUSION

The goal of this research was to identify the current state of business capability research. In order to do this we performed a systematic literature review, based on guidelines by Kitchenham [7]. We identified 720 articles of which 103 were subject to a broad analysis, including using text mining to identify the distribution of words used in the articles, and we did in-depth analysis of 20 articles.

Our main contributions in this paper are: (1) an extensive analysis on the state of art in business capability research, (2)

a focused and aggregated definition for business capabilities, and (3) a potential research agenda for future research.

We found that there are only two business capability frameworks available in literature and limited empirical evidence on these frameworks. This is in contrast to professional literature, where there are more approaches on business capabilities available. In our analysis, the number of definitions for business capabilities were limited and they were also not aligned. Therefore, we propose the following definitions for business capabilities: "A particular ability that a business may possess or exchange to achieve a specific corporate goal".

For future research we proposed a potential research agenda with three different directions, namely: (1) Designing of an open-source business capability framework, (2) Empirical evidence of business capability research findings, and (3) the connection to related fields. For each of the directions we posed possible research questions such as (1) To what extent do business capabilities explain the difference in performance between organizations compared to the Resource-Based View?, (2) Does the alignment of business and IT improve through the application of business capabilities?, and (3) How are IT/Digital transformations affecting the capabilities of an organization?

Based on our analysis we conclude, that business capabilities and the Capability-Based View provide a stable view on organizations and their performance, regardless of the resources implemented. The research directions given in this article can help fill the gap between strategy and implementation and provide better analysis tools for comparison between organizations.

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