Copenhagen Business School
MSc in Business Administration and Information Systems

Big Data Partnerships for Sustainable Development: The Role of Multinational IT Corporations

A Case Study of SAP's Engagement in the Global Partnership for Sustainable Development Data

Preface

This thesis was prepared at Copenhagen Business School and supervised by Associate Professor Stefan Henningsson, Department of Digitization. It was prepared to acquire the Master of Science degree in Business Administration and Information Systems. This thesis is equivalent to 30 ECTS.

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ABSTRACT

The emergence of big data has long exerted its influence in the business sector. Inter-organizational information sharing (IOIS) has become an increasing trend. As a result, an increasing body of research literature exists on IOIS in private sector alliances and in public-private partnerships. Yet, a new trend has not been in the spotlight of research so far: the emergence of complex multi-stakeholder networks bringing together actors from all three sectors (social, public, private) to leverage IT and data sharing for sustainable development. This study takes a first step in exploring these multi-stakeholder networks through the lens of collective action theory, by focusing on the role of multinational IT corporations within these networks and their reasons for participation. Through a case study analysis, it is revealed that these corporations are strategic members of high relevance, because they bring in unique resources complementary to those of other members and have the potential to catalyze collective action. Yet, their diverging interests pose a challenge for the governance of the collective action. Within the network, the role of multinational IT corporations is still evolving and continues to be formed externally and internally through an interplay of the collective action organizers, the other actors within the collective action, the companies themselves and the involved individual employees. The individual employees are primarily motivated by philanthropic, normative reasons while on a company level these new networks are understood as an opportunity to create shared business and social value.

Key Words: Big Data, Sustainable Development, Big Data for Development, Collective Action, Shared Value, CSR, Multi-Stakeholder Network

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RECURRENTLY USED TERMS

Multinational IT corporations are corporations that are registered and operating in more than one country at a time. Their core business is based on **Information Technology** which refers to the electronically enabled processing, storage and presentation of information. Some of these companies engage in **Big Data**, extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations. Data sets can be increased through **Inter-Organizational Information Sharing**, which involves sharing across firm boundaries, and is often needed since organizations are unable to generate all of their required resources internally. Big data is relevant for **Sustainable Development**, which is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In recent years, a research stream has emerged around the topic, even inventing an own acronym called **Big Data for Development**. Data sharing requires collaboration. When partners from different sectors come together and organize themselves in a complex network, this is referred to as a **Multi-Stakeholder Network**. In the context of sustainable development, these collaborations can be described through the lens of **Collective Action Theory**, as this theory focuses on groups which collaborate to provide mostly non-exclusive, public goods. Different theoretical approaches exist that explain motivations to take part in collective action for sustainable development: **Philanthropy** is generally described as an active effort to promote human welfare. **Corporate Social Responsibility** is defined as a view of the corporation and its role in society that assumes a responsibility among firms to pursue goals in addition to profit maximization. **Creating Shared Value** is defined as policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates.

ABBREVIATIONS

BD4D: Big Data for Development

CA: Collective Action

CAT: Collective Action Theory

CSR: Corporate Social Responsibility

CSV: Creating Shared Value

GPSDD: Global Partnership for Sustainable Development Data

ICI: Inter-Organizational Communication and Information

IOIS: Inter-Organizational Information Sharing

IS: Information Systems

IT: Information Technology

IT MNC: Multinational IT Corporation

LMIC: Low & Middle-Income Country

PPP: Public-Private Partnership

SDGs: Sustainable Development Goals

UNIDO: United Nations Industrial Development Organization

UN: United Nations

1. SETTING THE STAGE

> "I urge all partners and stakeholders to work together to ensure that the necessary investments are made, adequate technical capacity is built, new data sources are explored, and innovative processes are applied to give all countries the comprehensive information systems they need to achieve sustainable development."
>
> Ban Ki-moon, former United Nations Secretary-General, at World Statistics Day 2015

The emergence of big data has long exerted its influence in the business sector and is expanding its reach into other fields such as academia, public institutions and the social sector (McKinsey Global Institute 2011; Jin et al. 2015). The value of big data investments was estimated at $57 billion only in 2017 and is expected to grow further (Research and Markets 2017). A McKinsey report finds that only 10 – 20 % of the potential value of big data has yet been captured in the public and health sector (McKinsey Global Institute 2016).

To enhance the benefits gained through big data, collaborations aiming at inter-organizational information sharing (in the following: IOIS) have for many years been formed between private sector companies (van den Broek & van Veenstra 2015; Barrett, Konsynski 1982). The large research stream on private IOIS has identified a range of benefits, e.g. innovation potential and reduced costs, as well as major challenges of the practice (Samaddar et al. 2006, Reuver et al. 2015). Multiple theories have been applied to understand all aspects of IOIS collaborations, among them collective action theory which is especially suited for IOIS when the availability of the produced goods is not limited to collaboration members, such as for example in the development of industry wide software standards (Zhao et al. 2011).

Advantages of big data and data sharing are not limited to the private sector, but can be leveraged to benefit society as a whole, for example when applied for enhanced reporting and decision processes in international sustainable development (e.g. Gabay & Ilcan 2017). The field of big data for development is just emerging, and suitable application areas have yet to be determined and severe challenges need to be overcome (e.g. Flyverbom et al. 2017). As crucial capabilities and resources in this interdisciplinary field are partitioned between various actors – such as humanitarian organizations, academia, public institutions, data scientists or private organizations – collaboration is necessary to address those needs (e.g. Sarfaty 2017).

The set-up of such collaborations involving many different actors is a complex task, considering diverging characteristics in e.g. goals, resources and internal processes (Selsky & Parker

2005). Similar challenges have frequently been investigated in the related research fields of public-private partnerships sharing data and IT resources (Klievink & Janssen 2014), and of multi-stakeholder initiatives in general (Koschmann et al. 2012). Research in all three related fields has identified member involvement and motivation as a major challenge (Reuver et al. 2015; Medaglia et al. 2017b; Babiak & Thibault 2007).

The emergence of collaborations connecting stakeholders from all three sectors (social, public, private) to leverage big data and data sharing for sustainable development has not been a focus area in research yet. Throughout this thesis, the authors will refer to these emerging networks as big data for development multi-stakeholder networks (in the following: BD4D multi-stakeholder networks).

Practitioners in BD4D multi-stakeholder networks mention difficulties especially in the involvement of multinational IT corporations (in the following: IT MNCs): While these corporations hold important resources, their motivation, internal processes and expectations toward the network are particularly difficult to understand for other partners of the networks who are rather used to working with non-commercial organizations (e.g. United Nations Foundation 2017). The objective of this research is therefore to investigate the collective action in BD4D multi-stakeholder networks by focusing on the role of IT MNCs, and to explore why and how IT MNCs take part in these initiatives. A theoretical framework based on the theory of collective action and the concept of creating shared value is presented and applied for the description of an exemplary BD4D multi-stakeholder network. The findings are complemented by an exploratory investigation into a multinational IT corporation's reasons for participating in the network.

1.1 Research Question

Considering the research problem, and its practical and scientific relevance outlined above, the research question that shall be addressed in the present thesis is:

> *Through the lens of collective action theory, how can the role of multinational IT corporations in big data for development multi-stakeholder networks be described,*
>
> *and why do these companies take part?*

The engagement of IT MNCs thereby forms the research phenomenon while the BD4D multi-stakeholder network is the context in which the phenomenon is embedded. The goal is to understand the phenomenon itself, its context and the relation between them.

The first part of the question aims to describe one exemplary set-up of a BD4D multi-stakeholder network looked upon through the lens of collective action theory. The specific role of IT MNCs is thereby emphasized.

The second part of the question builds on this, when zooming in on the internal company perspective. The "why" question can be understood in two ways: It refers in the first instance to the underlying motivations which promote company engagement, and secondly to the events and internal processes which lead to the engagement.

1.2 Delimitation and Research Methodology

The topic of this thesis is delimited to the investigation of BD4D multi-stakeholder networks with an emphasis on the role of IT MNCs, and of the engagement of IT MNCs in these networks in terms of motivations and processes. It does not include a holistic investigation into these networks considering all stakeholders' perspectives in equal shares, though their roles are to some extent outlined. It furthermore does not include a political normative analysis of the desirability and risks that an involvement of the private sector holds for the field of big data for sustainable development, though the topic is touched upon in chapter 2.1.3.

When investigating private sector engagement, this thesis is limited to the role of multi-national corporations – corporations "registered and operating in more than one country at a time" (Encyclopaedia Britannica 2018, p. 1) – in the field of IT. Other relevant private sector participants, such as IT start-ups, are not part of this investigation.

As the aim is to investigate a research phenomenon in a rich contextual setting, with a small literature base yet available on the topic, a single case study approach was adopted for this research. This limits the scope of the research to one single IT MNC (*SAP*) and its engagement in one BD4D multi-stakeholder network (*Global Partnership for Sustainable Development Data)*, which to some extent inhibits the ability to generalize the obtained results.

The empirical research design – following a literature review on relevant related research fields and suitable theories – comprises the investigation of the single case of SAP's engagement in the GPSDD. Data is derived from primary data collection in form of semi-structured

interviews and non-participant observation, complemented by secondary data. A deductive data analysis approach is taken to descriptively respond to the first part of the research question. A mix of inductive and deductive analysis is used to explore the second part of the research question.

1.3 Thesis Outline

First, the current state of relevant research related to the new phenomenon investigated in this thesis will be presented in chapter 2. This includes a literature review of the emergence of big data and data sharing networks as well as their relevance in promoting a sustainable development, and a review of multi-stakeholder networks in general and public private partnerships sharing data in specific. The research phenomenon is thereby embedded in existent literature, and research gaps in related areas are highlighted.

The underlying theoretical framework of the research is developed in chapter 3: The theory of collective action will be presented, and its main propositions evaluated based on a thorough literature review. The application of collective action theory in information systems research will be discussed and the theory will then be complemented by the concept of creating shared value.

Chapter 4 provides a detailed overview of the research design and steps taken for this research. This is followed by the presentation of results and analysis in chapter 5: First, the context of the phenomenon is described; second, the phenomenon itself is explored.

Contributions to research and recommendations for practice are subsequently stated in chapter 6. Chapter 7 forms the conclusion with the response to the research question, statement of limitations and suggestions for further research.

The thesis outline is illustrated below.

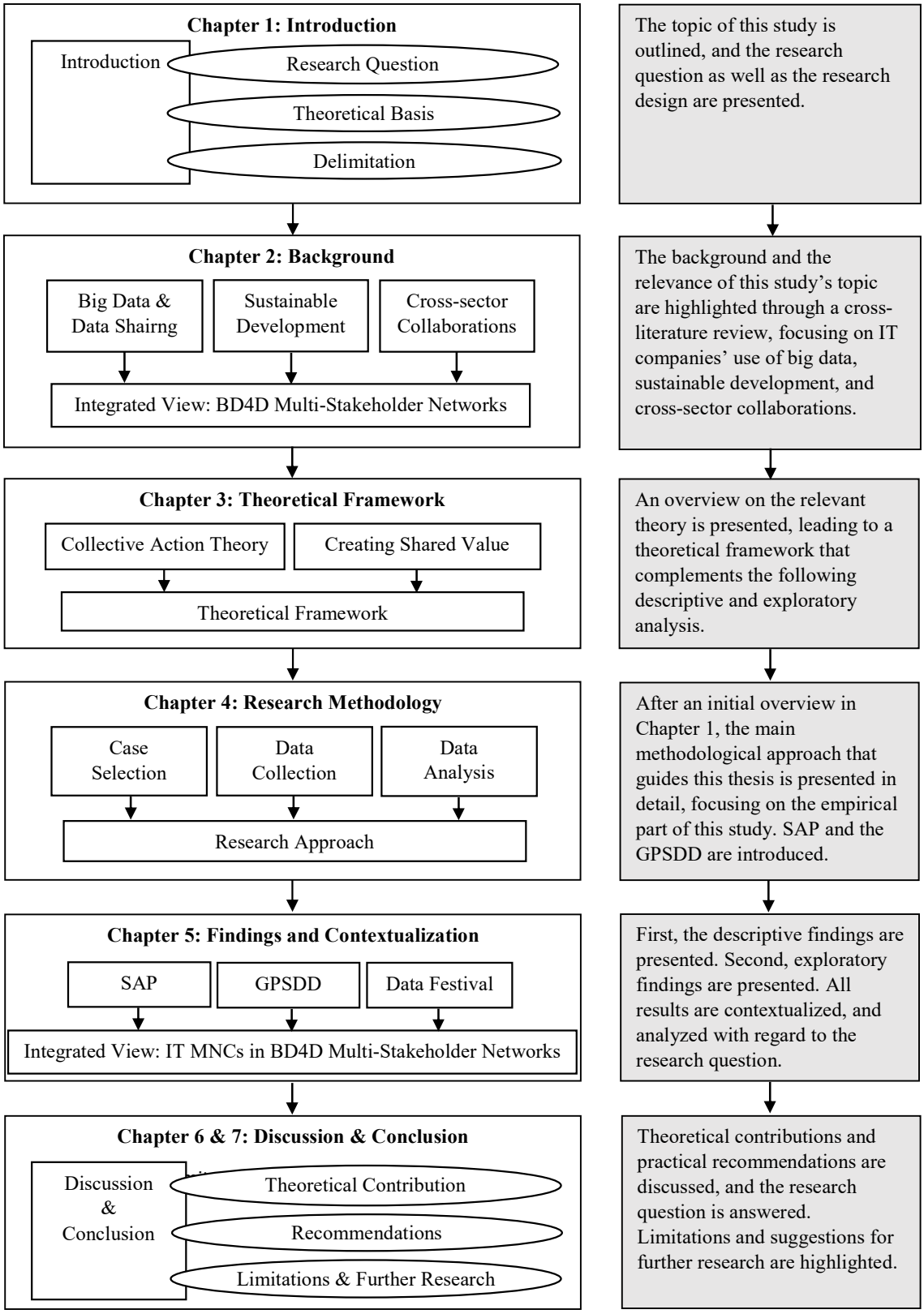

Figure 1: Thesis Outline

2. BIG DATA, SUSTAINABLE DEVELOPMENT AND COLLABORATIONS

The phenomenon investigated in this thesis lies at the intersect of several research fields. This is particularly attractive as it is embedded in all these fields and has the potential to close current research gaps and address practical challenges. The following chapter serves as a review of literature on these related, interdisciplinary fields. The research phenomenon is thereby put into its scientific and practical context, before the theoretical frame is introduced in chapter 3.

2.1 The Big Data Buzz

First, the term "Big Data" is defined. The trend of sharing data across organizational borders through "inter-organizational information sharing" in the private sector is then introduced. Subsequently, chances and challenges of big data analytics for sustainable development are discussed.

2. 1. 1. Emergence of Big Data

Over the last decades the use of data gained immense importance for the business sector, as well as for scientific contexts and public institutions (Jin et al. 2015). McKinsey finds that "data have swept into every industry and business function" (McKinsey Global Institute 2011, p. 3) and the impact that big data has on economy has repeatedly been referred to as "the new oil" (Hilbert 2016; Haupt 2016).

Driscoll (2012, p. 9) traces the early emergence of data analytics back to the late 19th century where punched cards of a U.S. census were used to analyze "12.5 to 15 Million records […] in fewer than two years". Since then, technology has evolved in terms of bandwidths for connecting networks, data storage systems and digital computational capabilities, allowing for an ever-increasing amount of analyzed data in less time (Hilbert 2016).

What we today refer to as "big data" has emerged from these technological innovations. In literature it is often defined and distinguished from former data collection in terms of four to five main characteristics (e.g. Jin et al. 2015; Tekiner & Keane 2013):

- *high volume*: large amount of collected data

- *high velocity*: high frequency or speed by which data is generated and delivered; real-time data
- *high variety*: different sources by which data is generated, either in a structured or unstructured format; data can be classified into data from the physical world (obtained through sensors, scientific experiments and observations), and data from human society (domains such as social networks, internet, health, finance, economics, and transportation)
- *low veracity:* quality of data and trust in data sources is not always given

(adapted from Dubey et al. 2016; Jin et al. 2015)

As the large amount of data requires specific methods for analysis, scholars frequently refer to these *data analytics methods* when characterizing big data (e.g. Dubey et al. 2016). These analytics are grounded mostly in data mining, statistical analysis and machine learning (Chen et al. 2012), meaning that they mainly detect patterns and correlations, and are not theory-driven (Hilbert 2016).

2. 1. 2. Inter-Organizational Information Sharing

Inter-organizational information sharing (IOIS) is an increasing trend in the private sector. It is promoted by the notion that *more data,* shared by several organizations, can enhance the benefits generated through big data analytics (van den Broek & van Veenstra 2015) and by a general increase in inter-organizational collaboration due to higher competition and customer expectations (Trang et al. 2013). Two definitions can support an understanding of the topic:

> *Information* can here be understood as "based on data which, in turn, is a formalized representation of the world. Data becomes information when it is interpreted by humans" (Henningsson 2008, p. 30).

> *Inter-Organizational Information Sharing* then "involves sharing across firm boundaries, and is needed since organizations are unable to generate all of their required resources internally. Firms must therefore interact with other organizations that control these critical resources" (Samaddar et al. 2006, p.745). The information resources shared in these systems "include hardware, software, transmission facilities, rules and procedures, data/databases, and expertise" (Barrett & Konsynski 1982, p. 94).

IOIS can take place through different set-ups, for example electronic data interchange (EDI), shared enterprise resource planning (ERP), supply-chain applications, e-marketplaces (Li et al. 2006), integration with partners' systems, definition of data-sharing standards (Fedorowicz

et al. 2004) and digital platforms (Reuver et al. 2015). The research around IOIS is rather fragmented, caused potentially by the variety of formats, governance structures, participating organizations and agencies, relations between participants and collaboration goals. It is thus difficult to precisely define the boundaries of the phenomenon (Romano et al. 2017).

The largest research stream has evolved around the usage of shared information systems and data collaboration along the supply chain, linking organizations to their suppliers, distributors and customers (Johnston & Vitale 1988). One famous example is the sharing of retail sales data between Wal-Mart and P&G, realizing direct business benefits for both companies by enabling P&G to do improve the management of its production and providing Wal-Mart with greater in-store availabilities (Li et al. 2006). Another example is General Motors linking computers with its primary suppliers for improved supply chain management (Johnston & Vitale 1988). In addition to these vertical networks, horizontal networks in form of partnerships and strategic alliances between companies within an industry exist. An example is "AutoNetwork", a virtual warehouse which connects used car part suppliers with the aim to exchange business-relevant information of part availability and to effectively locate parts (Hong 2002).

IOIS is formed with a wide range of different goals and participant motivations. Goals for example can be supply chain optimization or knowledge management (Madlberger & Roztocki 2008). Advantages of IOIS studied in the private sector include reduced transaction and inventory costs, as well as reduced costs through mutual usage of IT resources; a tighter link to customers, improved customer service and the potential for reaching new customers; reduction of supply chain uncertainties; risk sharing; increased product differentiation and a competence increase in suppliers and clients (Li et al. 2006; Romano et al. 2017; Johnston & Vitale 1988; Samaddar et al. 2006). Furthermore, research and innovation were often found as reasons for sharing data in inter-organizational collaborations (van den Broek & van Veenstra 2015).

Perceived disadvantages when participating in IOIS arise due to the potential vulnerability that electronic access to information introduces (Hart & Saunders 1997). This includes privacy concerns or difficulties to retain a competitive advantage. Therefore, careful design and implementation of governance structures is critical to mitigate risks (van den Broek & van Veenstra 2015). A further challenge is the perceived high cost of implementation (ibid.).

The phenomenon of IOIS has been a subject of scientific interest for decades (e.g. Johnston & Vitale 1988; Cho et al. 2017), and scholars have looked at it from many perspectives to gain comprehensive understanding. Still, researchers today emphasize that "the practical importance of electronic collaboration creates enormous research opportunity for many academic scholars" (Romano et al. 2017, p. 117). For example, Trang et al. (2013, p. 1) identify in their literature review a research gap between the "current and growing relevance of inter-organizational governance of IT resources" and limited scientific theory on it. Van den Broek and van Veenstra (2015) and Samaddar et al. (2006) add more precisely that research is needed on how coordination can be organized in IOIS to allow for data sharing, and on goals of participating companies as well as ways to align them.

Due to the complexity of building such a collaboration and then participating in it, scholars have applied a wide range of theories – such as resource based theory, transaction cost theory and network effect theory – to better understand the phenomenon (Madlberger & Roztocki 2008). One approach well suited for investigating the complex interactions of participants in IOIS collaboration is collective action theory (e.g. Monge et al. 1998). It originates in social sciences and is applicable for groups which collaborate to provide mostly non-exclusive, public goods (Madlberger & Roztocki 2008). For example, it has been used to investigate cases of collaborations aimed at developing shared mobile payment platforms (Reuver et al. 2015), e-business standards (Zhao et al. 2011), and vertical information systems standards (Markus et al. 2006). A more thorough view on collective action theory and its application in information systems research will be provided in chapter 3.

Research shows that IOIS in the private sector can bring great advantages for participating companies and frequently also for non-group members (Li et al. 2006; Zhao et al. 2011). Those advantages could not have been achieved – or at least not with comparable resource investments – in individual efforts (e.g. Reuver et al. 2015). However, diversity in participant objectives, resources and internal working procedures, as well as the need to set up governance structures, define common goals, and distribute power can lead to challenges which have partly been investigated in literature using a variety of theories (e.g. Samaddar et al. 2006). Especially the challenge of incentives is aggravated when the desired outcome of the IOIS is non-exclusive and accessible by companies outside the collaboration (e.g. Zhao et al. 2011). Building on the research already conducted in the field of collective action theory is a promising starting point to analyze such constellations.

It is noteworthy that inter-organizational information sharing is not limited to the private sector, but is formed within the public and social sector as well, and is sometimes crossing these sector borders (Otjacques et al. 2007). This trend has led to new multi-stakeholder networks that use inter-organizational information sharing between public and private entities as a way to create a public good. Before proceeding to these constellations and describing the phenomenon relevant to this study, the subsequent chapter discusses if and how big data analytics and data sharing networks, can be beneficial to achieve sustainable public goods in general.

2. 1. 3. Relevance for Sustainable Development

> "Good data and statistics are indispensable for informed decision-making by all actors in society."
>
> Ban Ki-moon, former United Nations Secretary-General, at World Statistics Day 2015

In his speech at the World Statistics Day 2015, Ban Ki-moon referred not only to the statistical offices that country governments, the United Nations (in the following: UN), and other agencies traditionally relied upon when making relevant decisions. Increasingly, agencies and statistics offices call for the inclusion of new data technologies and explore ways of collaboration (Data Revolution Group 2014; Vale 2015). Big data and networks which assemble large amount of data can – as Ban Ki-moon mentions – be used to benefit a sustainable international development.

Positive outcomes of big data for sustainable development emerge especially through its ability to on the one hand support informed decision-making, for example when detecting and mitigating risks of human rights violations (Sarfaty 2017), and on the other hand provide tools to successfully monitor development indicators (e.g. Gabay & Ilcan 2017) – a challenge that has proven difficult for example in measuring success of the UN "Millennium Development Goals" (in the following: MDGs) from 2000 to 2015 (Attaran 2005).

In recent years, a research stream has emerged around the topic, even inventing an own acronym called "BD4D" (Big Data for Development) (e.g. Flyverbom et al. 2017). Scholars and aid agencies are discussing diverse benefits as well as risks that big data analytics bare for a sustainable development. Mostly, research remains hesitantly positive toward the practice, pointing out great potential of BD4D but also considerable challenges that need to be overcome in order to exploit its full potential and mitigate negative effects (e.g. Hilbert 2016).

To provide valuable insight to the topic, first the term "Sustainable Development" is defined. Exemplary applications of big data promoting sustainable development are then given. Finally, chances and challenges that have been found in the research around big data for sustainable development are presented.

Defining Sustainable Development

One of the most comprehensive definitions for "Sustainable Development" was given by the World Commission on Environment and Development 1987, characterizing it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations 2010). More specifically, three core dimensions are commonly understood as composing a sustainable development. These are economic growth, social inclusion and environmental protection (e.g. United Nations 2018).

To give a clearer picture of the term and add relevance for current issues that should be addressed, a topical sustainable development agenda was determined at the UN Sustainable Development Summit 2015, after three years of inter-governmental and civil society consultation (Gabay & Ilcan 2017). These 17 "Sustainable Development Goals" (in the following: SDGs) follow the eight Millennium Development Goals from 2000. They define 17 global primary goals with 169 sub-targets that should be achieved in a joint effort by all nations and sectors. The goals feature topics ranging from eradicating poverty over ensuring health to combating climate change. An overarching goal is SDG 17: "Partnership for the Goals" (see appendix 1).

Explicitly stated as features that improve the former MDG-agenda are the emphasis on partnerships involving the private sector, and the increased use of technology and data (United Nations 2018).

Examples of BD4D

Big data analytics can be used to support many aspects of sustainable development, and potentially every goal and sub-goal of the United Nations agenda. In this section, exemplary use cases of BD4D are given.

SDG2: Zero Hunger

The UN initiative UN Global Pulse[1] investigated the possibilities of understanding people's perceptions of different crisis, such as volatility in food prices in Indonesia and housing issues in the United States, through analysis of Twitter data. Analyzing trends in conversations about the price of rice in Indonesia, it was found that the statistics retrieved were similar to the official food price inflation statistics:

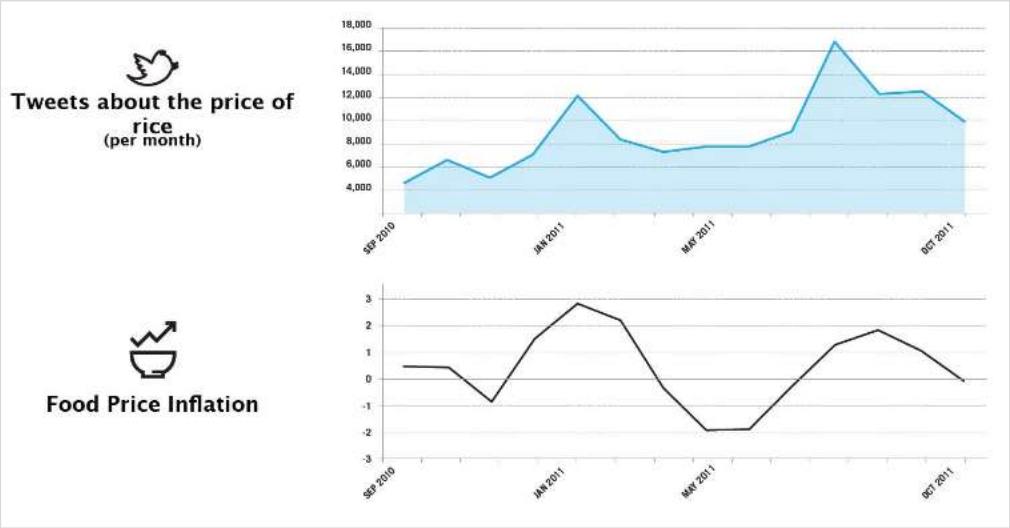

Figure 2: Tweets and Food Prices in Indonesia (United Nations Global Pulse & Crimson Hexagon 2011)

The research team concluded that "Twitter data can be useful for understanding the immediate worries, fears and concerns of populations, but at the same time, the research suggested that it is a poor source of data for gauging people's long-term aspirations." Furthermore, the specific demographics of Twitter should be considered (United Nations Global Pulse & Crimson Hexagon 2011).

SDG3: Health and Well-Being

Google suggested an analytics method in 2009 that uses search engine entries related to influenza symptoms to detect influenza epidemics (Ginsberg et al. 2009). The UN Global Pulse initiative acknowledged that through the project called "Flu trends" it was possible to "detect the onset of seasonal influenza weeks earlier than is possible using traditional methods of outbreak surveillance" (Kirkpatrick 2011). It was, however, found that Google Flu trends did in the end not match the confirmed flu infection data published by the U.S. Centers for

[1] United Nations Global Pulse is an innovation network on big data.

Disease Control and Prevention, but was comparable to its influenza-like-illness data. Google representatives stated that this result did not surprise them, as search engine entries rely on self-perception (Wenner 2010). Even if the algorithm cannot solve the dilemma of timely detection of flu epidemics entirely, it has several advantages if limitations of the application are known: for example, it can track public fears of epidemics and it can help health officials to monitor other respiratory illnesses (ibid.).

SDG 11: Sustainable Cities and Communities

IT corporations work on consolidating different data sources available in cities to enable comprehensive smart city solutions. Use cases include IBM's efforts to integrate and interconnect information from multiple government departments and public agencies in Rio de Janeiro. This includes data from the river basin, topographic surveys, the municipality's historical rainfall logs, and radar feeds. Aims of the project are for example improvements in city safety, responsiveness to various types of incidents, such as flash floods, and the evaluation of effects on traffic systems (IBM 2010).

Chances and Challenges

Hilbert (2016, p. 156) states that "no technology – including Big Data – is inherently good or bad for development". All depends on how it is used by society. Scholars as well as international development agencies are optimistic that big data can be used in a way to positively impact sustainable development. They base this opinion mostly on the idea that big data improves leaders' decision- and policy-making (United Nations Global Pulse 2012; Gabay, &Ilcan 2017; Ford et al. 2016).

In research, additional chances as well as considerable challenges that big data analytics can have for international development are investigated.

Chances

One advantage of big data is that it is often accessible in real-time. This is crucial for some aspects of sustainable development such as disaster relief and vaccination (Flyverbom et al. 2017). Furthermore, big data is often already available from multiple sources. It thus does not have to be collected, e.g. in extensive surveys and is relatively cost-effective (Hilbert 2016; United Nations Global Pulse 2012). This is advantageous especially for development

agencies and NGOs that often have to have a close look on costs due to constrained resources (e.g. Brown & Kalegaonkar 2002).

An additional positive aspect of applying BD4D is its ability to "democratize" development. Scholars argue that the data can be used directly by local communities, and therefore empower regions, cities and individuals to innovation (Gabay & Ilcan 2017; Kharrazi et al. 2016).

A further advantage of big data analytics is that it allows for disaggregating and contextualizing development data, and "zooming in" on details in larger data sets. It therefore allows for relevant insights that can in this way not be achieved with traditional data sources (Flyverbom et al. 2017; United Nations Global Pulse 2012).

Challenges

On the other hand, international development challenges are often very complex, and need innovative future solutions. Big data analytics are based on pattern recognition rather than theory-driven hypothesis testing. Scholars are doubtful about data analytics algorithms' capability to detect and judge relevant abnormalities and suspect a failure to incorporate the necessary contextual interpretation (Adams 2015; Flyverbom et al. 2017; Sarfaty 2017; Hilbert 2016; United Nations Global Pulse 2012).

Another substantial concern of BD4D is that through the collection of big data, the right to privacy might be mitigated and data collection ethics are not always in place (Sarfaty 2017). This is especially true for low and middle income countries (in the following: LMICs), leading to an even stronger divide in respect for human rights between countries (Taylor & Broeders 2015; Heeks & Renken 2017).

A related problem is the so-called "digital divide". It refers to the issue that the population in LMICs often does not have comprehensive access to the internet or mobile phone networks (Williams & Hunt 2017)**.** It is therefore underrepresented in big data which is often retrieved from these sources. Also, the necessary hardware infrastructure, software services, and human capacities and skills to conduct big data analytics and retrieve useful information are underdeveloped in many LMICs. This leads to a twofold disadvantage and further deepening of inequalities between countries (Hilbert 2016).

A third problem is that big data is often collected and processed by private corporations. This leads to concerns about a power shift towards the private sector in international development caused by BD4D (Hilbert 2016; Helbing 2015; Sarfaty 2017). As companies hold the highest amount of data and therefore also development-related information, they theoretically hold the power to be the "primary actors" (Taylor, Broeders 2015, p. 236) for development. They are not necessarily equipped with the knowledge to address far-reaching development issues though but might use inadequate "engineering" solutions. Some scholars even worry that corporations could mis-use their power (ibid.) as their motivation patterns differ from traditional actors (e.g. Laczko 2015).

Scholars still do not regard it as solely negative that corporations hold large amounts of data. Frequently, also the advantages of the high amount of privately collected data and the need to further include corporations in the development context is mentioned, and questions about possibilities to increase the participation of companies are raised (e.g. Sarfaty 2017).

Recommendations

Promising chances and serious threats are still apparent in the field of BD4D. To realize the full potential of the chances and overcome challenges, further action is necessary. Even though the issues are very different in nature, some measures are proposed by multiple scholars to address them separately or altogether.

When looking at the recommendations, most scholars lay strong emphasis on increased collaboration between diverse players (Belaud et al. 2014; Helbing 2015), and research about how these collaborations can work (Flyverbom et al. 2017). Sarfaty (2017) especially emphasizes the need to incentivize companies to engage in "data philanthropy" by voluntarily sharing data for the public good, e.g. to prevent human rights abuses. Organizations working in the field of development are furthermore advised to increase collaboration with data analysts, and/ or acquire capabilities in the field of data analytics themselves (Ford et al. 2016; Laczko 2015).

These collaborations can also function as a means to find ways to effectively adopt big data to sustainable development challenges. This can happen through exploring suitable projects and use cases and through bringing together relevant context and technical skills to develop data analytics methods that are more suitable for the application to complex international development challenges. For this purpose, it has been suggested to broaden the scope of

collaborations to social, natural and engineering sciences to include a wide spectrum of perspectives (Helbing et al. 2012; Sarfaty 2017).

According to scholars, collaboration should furthermore be encouraged between traditional statistical institutes and organizations collecting and analyzing big data. In this way, the flaws that both techniques bear can be solved in a joint effort, and the different approaches can complement each other (Flyverbom et al. 2017; Song et al. 2015; Vale 2015).

A second stream of frequently mentioned improvements is concerned with policies and regulating bodies regarding privacy, ethical use of data, and the prevention of (corporate and governmental) mis-use of data (Hilbert 2016). These could be evolved in an international setting, and should especially improve the current situation in LMICs where those regulations are comparably underdeveloped (Taylor & Broeders 2015; Sarfaty 2017).

2.2 Information Sharing in Public-Private Partnerships

As shown above, big data has the potential to support sustainable development in many aspects of the term. In specific, those advantages can be achieved by forming networks to collect and analyze data, and to build the respective infrastructures.

Not only in the private sector, but also in social and public fields – and crossing these sectors borders – working together in collaborations with other organization to achieve mutual goals has become a major trend since the 1980's (e.g. Selsky & Parker 2005). Considering the evolving complexity of societal issues, scholars emphasize that "collaboration across organizational and sectoral lines is both necessary and desirable to address difficult public challenges" (Page et al. 2015, p. 715). For some decades, one common approach to tackle these new challenges have been public-private partnerships (in the following: PPPs) (Klijn 2008 & Zhang 2005). Simply put, they are established to "ideally bring the best of government (e.g., public values) and private (e.g., efficiency) organizations" (Klievink & Janssen 2014, p. 242). Public agencies can furthermore benefit through innovations which are brought by the private sector in an "outside-in" approach, meaning that "external developments are capitalized by government agencies to transform their operations, in collaboration with others" (Klievink et al. 2016, p. 68). Digitalization – which holds both opportunities to enhance the value to citizens as well as a societal pressure to adapt to current trends (Sundberg & Sandberg 2006) – is one field where these innovations come to play (e.g. Medaglia et al. 2017a). E-Government initiatives and health provision are among the topics highest covered in the literature of inter-

organizational information and IT infrastructure sharing in PPPs (e.g. Medaglia et al. 2017a; Vassilakopoulou et al. 2017), but other goals are also pursued by those partnerships (e.g. Klievink et al. 2012).

Considering the complexity of diverse stakeholders with different values, motivations and processes (Fedorowicz et al. 2009), scholars emphasize that PPPs are not a panacea, and far from being simple (Bryson et al. 2006). Increasingly, the concept of PPPs is challenged for its effectiveness and efficiency in achieving public values, especially when considering diverging goals and complicated interactions of partners (ibid.). Joint information systems planning – which is a complex topic already in itself – does not add to simplifying these partnerships. Current literature on both PPPs in general as well as in the context of digital collaborations is therefore often focused on governance topics and motivations (e.g. Fedorowicz et al. 2009; Klievink et al. 2016), and research gaps in both areas are still determined (e.g. Medaglia et al. 2017b).

To gain an understanding of the complex interactions and evolving governance structures in PPPs, scholars have applied different theories, from new public management and network governance, to stakeholder analysis, power dependence and most recently collective action (Klievink et al. 2012; Fedorowicz et al. 2009; Medaglia et al. 2017b). They found that often both the interests of stakeholders and the governance structures – in terms of communication, responsibilities and decision-making – change over time in response to (in)action of others (Klievink et al. 2012; Medaglia et al. 2017b). In terms of power distribution, it is crucial that public agencies find the right balance between maintaining the control needed to secure public value and enabling autonomy that can encourage innovation (Medaglia et al. 2017a; Vassilakopoulou et al. 2017). Medaglia et al. (2017a) and Klievink and Janssen (2014) furthermore emphasize the importance of overcoming legacy thinking – which will found in both private and public partners – by developing a shared thinking and a different mindset suitable to achieving the mutual benefit and reaping the full potential of the resulting information infrastructure.

To arrive at the point where a shared mission is pursued, multiple scholars emphasize the need to understand and align all partners' objectives. For example, according to Fedorowicz et al. (2009, p. 51), "collaboration outcomes will depend upon the extent to which the project fulfills the disparate goals of each partner organization", and all partners will try to achieve strategic alignment of their own objectives with the collaboration's overall goal and pursued

information system. In public-private inter-organizational information systems, these goals can include political, technical, operational and economic motivations (ibid.). The goals do not have to be equal in all aspects, but should not contradict each other and should enable partners to agree on the shared purpose (Klievink et al. 2016). If they fail to achieve this shared goal, they may not be able to agree on consequent steps (Bryson et al. 2006). Fedorowicz et al. (2009) therefore identify the challenge of aligning participant and collaboration goals as a critical issue for cross-sector project leaders.

Bryson et al. (2006, p. 51) find that cross-sector collaborations are "most likely to create public value when they build on individuals' and organizations' self-interests". While the public sector is usually motivated by the public value creation itself, "businesses are [more] reluctant to join and require incentives" (Klievink et al. 2016, p. 77). Those incentives differ between PPP set-ups, but often direct business benefits can be realized. In the example of the Danish NemID – an information infrastructure developed in collaboration between the Danish government and Danish banks which provides access to online banking and governmental services for citizens – economic interests of banks could be realized through shared resources in the partnership, while at the same time enabling governments to establish universal access to online government services despite financial and bureaucratic limitations (Medaglia et al. 2017b). Further incentives for the private sector identified in research include returns on investments for developing and maintaining of interfaces to multiple government systems, the option to leverage developed systems not only for sharing information with the public sector but for usage in their supply chain (Klievink et al. 2016) and the possibility to add additional services through the collaborations which increase revenues (Klievink et al. 2012).

The incentives identified in conducted case study research on shared public private information systems are far from being comprehensive. Scientific understanding of stakeholders' incentives does therefore not match the relevance raised by multiple scholars in the field of PPPs. E.g. Fedorowicz et al. (2009, p. 57) state that "goal clarity reportedly increases the likelihood of successful collaboration and also has a positive impact on motivation", or Klievink et al. (2016, p. 78) identify "providing the right incentives for businesses to co-develop and use a platform" as one of the main challenges in setting up successful IOIS between public and private partners.

2.3 Multi-Stakeholder Networks

Collaboration in PPPs is already difficult to manage, due to unclear governance structures and diverse partner. Often though, public private partnerships are somehow formalized in contracts, and bring direct business benefits for the private sector, mostly in forms of risks-, costs-, and resource sharing when jointly developing services and products (Hodge & Greve 2007; Weimer & Vining 2016).

The complications of setting up collaborations are getting even more intense when partners from all three sectors come together in often less formalized structures – a phenomenon which is increasingly arising across contexts and fields of intervention, and another approach to offering innovative solutions to complex and persistent social problems (Vurro et al. 2010; van Tulder et al. 2016).

The phenomenon often referred to as cross-sector social partnerships (CSSPs) – even though other terms exist in the fragmented research – can broadly be defined as "cross-sector projects formed explicitly to address social issues and causes that actively engage the partners on an ongoing basis" (Selsky, Parker 2005, p. 850). When partners from all three sectors (social, public, private) come together, this is referred to as "trisector partnerships". Those tend to emerge on a large-scale national or international level (ibid.). Another frequent term used to describe the phenomenon in research and practice is "multi-stakeholder network". The term multi-stakeholder network will be used in the present thesis.

In many of these networks, direct business benefits for engaged companies are not easily found. Yet, the commitment from large multinational companies is often considered crucial due to their expertise and resources (Babiak & Thibault 2007; Arya & Lin 2016). Scholars mostly name the aim to engage in corporate philanthropy and CSR activities as the main motivation for those businesses to participate in such networks (e.g. Vurro et al. 2010; Selsky & Parker 2005). Vurro et al. (2010) see multi-stakeholder networks as a way to engage with communities that is both more effectively in pursuing social impact and more tightly connected to the company's core value proposition than traditional CSR. Also, Porter and Kramer (2011, p. 15) refer to these partnerships as a valuable part of their much cited concept of „Creating Shared Value", a refined concept of corporate responsibility which particularly emphasizes the link of core business and societal engagement:

> "Companies should try to enlist partners to share the cost, win support, and assemble the right skills. The most successful cluster development programs are ones that involve collaboration within the private sector, as well as trade associations, government, agencies, and NGOs."

The concept of creating shared value, though not uncriticized, provides a good basis for exploring sophisticated sustainability approaches in the private sector and will be presented more comprehensively in chapter 3.2 of this thesis.

Additional private sector incentives identified in research include learning opportunities (Vurro et al. 2010); enhanced corporate image; access to existing networks; product selling; employee branding and motivation (Selsky & Parker 2005); management of relevant stakeholders; knowledge of markets; reclaiming moral legitimacy (Koschmann et al. 2012) and the "social license to operate" (Warner & Sullivan 2017). Motivations are generally perceived to be an important precondition to collaboration (Selsky & Parker 2005).

Generally, scholars have investigated the phenomenon of multi-stakeholder networks not only by focusing on the unclear motivations of the private sector but from different other angles, such as formation and incentives, governance, management and conceptualization, and outcome efficiency and effectiveness. Furthermore, research on multi-stakeholder networks has found its way into a wide range of disciplines including public policy and administration, economics, health care, and natural environment (Selsky & Parker 2005; Vurro et al. 2010). Though studies have been conducted to gain insight into specific contents of partnerships (e.g. Environment (Rondinelli & London 2003), Biodiversity (Westley & Vredenburg 1997) and Poverty Reduction (Idemudia 2009)), the emergence of multi-stakeholder networks which explore ways to leverage IT and data sharing for public value creation has not been a focus topic of research yet.

2.4 Big Data for Development Multi-Stakeholder Networks

Since new, data-driven multi-stakeholder networks for sustainable development (in the following: BD4D multi-stakeholder networks[2]) have only just appeared in the past years, this research gap is expected to be caused by the novelty of the phenomenon. Given the high relevance of big data analytics for sustainable development (as seen in chapter 2.1 and 2.3),

[2] This term is equal to the term "big data for development multi-stakeholder networks" used in the research question.

and the opportunities and risks of collective action (as seen in chapter 2.2 and 2.4) in this field, it is of high interest to investigate, describe and analyze these networks.

In the past years, BD4D multi-stakeholder networks have emerged in a variety of initiatives. They occur within sectors (e.g. "Big Data for Social Good", an initiative founded by private mobile operators with the aim to collect and analyze data for social purposes (GSMA 2018)), and cross sector borders. Some trisector initiatives were started by governments and then involved businesses, NGOs and scientific organizations. One of them is the "Big Data Research and Development Initiative" (Kalil 2012), initiated 2012 by the United States with an investment of over US$ 200 million (Jin et al. 2015). Other examples are the independent "Predictive Network" (Predictive Network 2018) and the two UN backed initiatives "UN Global Pulse" (United Nations Global Pulse 2018) and "Global Partnership for Sustainable Development Data" (GPSDD 2018a). Beside those large and comprehensive networks partnering to address a variety of social challenges, smaller data networks emerge with a local focus: e.g. the "London Datastore" is aimed at providing a free and open data-sharing portal to tackle city-wide problems in a network with citizens, businesses, researchers and developers (London Datastore 2018).

Especially the large international big data networks are characterized by diverse partners and unconventional set-ups which make a deeper investigation worthwhile to first better understand the circumstances of a new phenomenon and second contribute to the research on multi-stakeholder networks.

Many theories have been applied to investigate multi-stakeholder networks, with an emphasis on resource dependence and transaction cost theories (Koschmann et al. 2012). Collective action theory is another popular theory for describing the phenomenon and has to the knowledge of the authors not yet explicitly been applied to data trisector partnerships. Considering additionally the maturity of collective action theory with regard to IS networks (Monge et al. 1998), it forms a promising foundation for investigating BD4D multi-stakeholder networks.

Furthermore, understanding the phenomenon does not only enhance the research body on collective action in information systems, it may also help to address practical problems encountered within collective action in practice: The "Global Partnership for Sustainable Development Data" (in the following: GPSDD), a newly established multi-stakeholder network in the data and sustainability space, has already encountered typical collective action

problems: The GPSDD is a network with partners from all three sectors, including organizations from government, civil society, private sector and foundations. In a quest for external consultancy from July 2017, the partnership describes that while some private sector organizations do engage in the partnership, it has proven difficult to attract additional businesses and to keep whole companies engaged instead of committed individuals from firms. The GPSDD itself identified the lack of a compelling value proposition for private sector organizations as a potential explanation for the challenge (United Nations Foundation 2017). This indicates two things: First, the motivations of the private sector form a greater challenge, at least for the GPSDD, than the engagement of other sectors, as the external consultancy quest was explicitly aimed at a value proposition for the private sector. Second, an investigation into reasons and processes of private sector engagement is crucial to form the basis for a compelling value proposition.

It is therefore of high relevance for both theory and practice to investigate BD4D multi-stakeholder networks, and especially the highly relevant yet poorly understood phenomenon of private sector IT MNCs engagement in these networks. With this study, the authors thus aim to answer the following two-fold research question already presented in the introduction:

> *Through the lens of collective action theory, how can the role of multi-national IT corporations in big data for development multi-stakeholder networks be described,*
>
> *and why do these companies take part?*

The research phenomenon investigated is the private sector engagement, and it cannot easily be distinguished from the context of these emerging networks. The networks shall therefore be investigated first to subsequently allow for detailed exploration of IT MNC engagement. Theories which were considered supportive for the investigation are presented in the following chapter.

3. THEORETICAL BACKGROUND

As presented in the previous chapter, the emergence of complex multi-stakeholder networks for sustainable development data is both a promising trend and a novelty in information systems research. In general, collaborations between a variety of stakeholders are not a new phenomenon though. The existing literature on such collaborations presents a valuable intellectual resource, both for understanding collective action in general and in information

systems. The theory of collective action (Olson 1965), and the theory of creating shared value (Porter & Kramer 2011), are found to be crucial complementary intellectual resources for investigating the research problem and are therefore described below.

3.1 Collective Action Theory

Since its introduction in 1965, Mancur Olson's publication "The Logic of Collective Action" has become one of the most influential books in the study of public choice and – among others – influenced a variety of scholars in economics (Udehn 1993; Sandler 2015). As of today, collective action is still used as a predominant theory to explain and analyze collaborations of various actors and has more recently found its way into information systems research (e.g. Vassilakopoulou et al. 2017; Eaton et al. 2017; Constantinides & Barrett 2014). Therefore, collective action theory offers a good starting point to understand and explain the BD4D multi-stakeholder networks investigated in this study.

In the following subchapters, the basics and evolution of collective action theory will first be presented and discussed on a general level. Focus is put on member motivations and incentives that can foster collective action. After establishing a common understanding of the theory and its roots, it will be investigated how the theory is applied within information systems research. An integrated framework for describing the key factors influencing collective action in alliance-based interorganizational systems (Monge et al. 1998) will be presented. It allows for an application to the investigated phenomenon in this thesis, as it enables the authors of this thesis to accurately describe the context of the phenomenon in a structured way. In addition, the existing research on collective action will be evaluated with regard to the research question of the thesis, and research gaps will be pointed out.

3. 1. 1. General Theory

The main point of Olson's collective action theory is to challenge conventional wisdom about group behavior by stating that:

> "unless the number of individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not act to achieve their common or group interest"* (Olson 1971, p. 2)

The idea that individual rationality may not lead to achieving collective rationality is considered a "stark contrast" (Sandler 2015, p. 196) to Adam Smith's invisible hand. In particular, Olson refers to interest groups that form among specific topics and argues that the rational

egoists involved in the group will not act in their common interest if these groups trade in public goods, which are non-excludable (Olson 1965, 1971).

Public goods are an integral part of collective action theory and can be characterized through the "jointness of demand" (Samuelson 1954, p. 389) and the fact that "each individual's consumption of such a good leads to no subtraction from any other individual's consumption of that good" (ibid., p. 387). This means that when provided, public goods are supplied to all members of a group. Even if they do not contribute to it, members of the group cannot be excluded from using the good (Barry & Hardin 1982). According to Olson, a group member's most rational course of action then is to act in the own self-interest and take a "free ride" by benefitting from the good without contributing to the costs of the goods establishment and / or its maintenance (Sweeney 1973). Public goods can be created in public and private sectors as well as in alliances of both (Monge et al. 1998).

Olson's Rules of Thumb

Sandler (2015) has drawn the main nine propositions from Olson's original collective action theory to create general rules of thumb for collective action. They provide a good overview of the main propositions in collective action theory. The propositions are grouped into: size of group, group composition, and institutional recommendations. The table below lists all propositions which are described and evaluated afterwards.

Table 1 Collective action: general rules of thumb

Size of group
Large groups may not form to provide themselves with the collective good (strong version)
The larger the group, the smaller the collective provision level (strong version)
The larger the group, the greater the inefficiency associated with individual uncoordinated/Nash behavior (weak version)
Group composition
Larger members with greater endowments bear a disproportionate burden of collective provision (action) (exploitation hypothesis)
Heterogeneous groups are more apt to achieve some collective action
Homogeneous groups are more apt to form
Institutional recommendations
Collective action is promoted by selective incentives that bolster individual gains
Collective action may be fostered by institutional design—for example, refunds or federated structure

Table 1: Olson's Collective Action: General Rules of Thumb (Sandler 2015, p. 199)

Size of group

Olson states that large groups suffer from the inability to form a sustainable collaboration to provide a collective good. Also, he believes in a negative correlation between the group size and the level of collective provision level: the larger the group, the smaller the collective provision level. These two propositions are characterized by Pecorino (2015) as the strong versions of group size influence on collective action. In addition, Olson states that when a group gets larger, the inefficiency associated with individual uncoordinated behavior rises. This proposition is considered a weak form of group size influence on collective action (ibid.).

Olson's universal propositions have been proven wrong in a variety of studies (e.g. Hardin 1982; Sandler 1992). For example, Hardin (1982) argues that Olson falsely assumes that small groups are always privileged, hence manifest, and that large groups are always latent. Such a relation between the two types of groups is not evident. Calling it the "most dubious assumption", Udehn (1992, p. 241) argues that Olson's statement that individuals' net benefit necessarily declines as the group becomes larger is proven wrong as well, since a larger group does not always result in individual benefits decrease and / or individual costs increase. In fact, there are practical examples of increasing returns through scale. Udehn (1993) holds this especially true for cases where the public good depends on protest and / or revolt: Activities such as demonstrations or revolutions often depend on the group size, meaning that the power of the group and thus the individual benefit increases with group size. Also, Olson neglects the possibility of decreasing marginal costs and cost-sharing in his assumption that group size and the degree of inefficiency are positively correlated. Yet, researchers confirm that there is an "increased difficulty of conditional cooperation in larger groups" (Taylor 1987, p. 12).

Group composition

In the original collective action theory, it is assumed that larger members with greater endowments bear a disproportionate burden of collective provision. This proposition is also called "exploitation hypothesis" (Olson 1965). Further assumptions are that heterogeneous groups are more apt to achieve some collective action whereas homogenous groups are more apt to form.

Again, research shows exemptions to Olson's universal claims. On the one hand, studies prove that the richest group members may contribute more when their interest is as high as the interest of poorer group members (Bergstrom et al. 1986; Andreoni & McGuire 1993).

On the other hand, Sandler (2015, p. 207) shows that this does not necessarily hold true when poorer group members have the most interest in the public good:

> "Consider the Israeli-United States military alliance. Israel has a much greater preference for its own defense in the Middle East where it has many enemies. As a consequence, Israel typically spends a larger percentage of its gross domestic product (GDP) on defense than its richer and larger ally, the United States."

According to Heckathorn (1992), heterogeneity of groups is not always a success factor for collective action since the heterogeneity can impede collective action by polarizing a group into different opposing camps. In highly complex scenarios with interdependent problems faced by many actors, heterogeneous groups may also still be more likely to form than homogenous groups.

Institutional recommendations

To address the observed collective action problems, Olson (1965, 1971) offers institutional recommendations. Over the years, these recommendations have been investigated and strategies have emerged to overcome collective action issues. The most relevant strategies to influence an actor's willingness to contribute to collective efforts are described below.

1. Individual Motivations and Selective Incentives

According to Olson (1965), selective incentives are the only way to influence the individual actor's interest and motivation to contribute to collective efforts. The incentives are considered "selective" because they are only contributed to actors who take part in the collective action for a public good. These selective incentives can be tangible or intangible benefits for the actors who contribute, or tangible or intangible losses for actors who do not contribute. Selective incentives that bolster individual gains may promote various actors to engage in collective action.

Cornes and Sandler (1996) have found selective incentives to be most effective when produced jointly with the public good while being complementary to it, meaning that the benefits of the private good increase with the level of public good provision. Sandler (2015, p. 211) points out an example: "concert tickets, given to large contributors to the symphony, increase in value as the orchestra's quality improves, because of the enhanced support."

Interests in selective incentives are not limited to rational choice, meaning cost-benefit calculi that maximize the individual's expected utility. Interests can of course be economic, such as

gaining commercial profit, but also non-economic, for example gaining knowledge (Knoke 1988).

A prerequisite for the provision of the right selective incentives is the identification of the individual's motivations. Knoke and Wright-Isak (1982) suggest a categorization for motivations that influence the participation in collective action which has gained praise from fellow scholars (Puffer & Meindl 1992). They conceptualize member motivations into three categories:

> "Rational Choice: cost-benefit calculi that maximize the individual's expected utility
>
> Affective Bonding: emotional attachments to other persons and groups
>
> Normative Conformity: adherence to standards of conduct grounded in socially instilled values about principled behavior"

(Knoke 1988, p. 315)

All three motivations are jointly affecting basic decisions about an individual actor's involvement in collective action. These decisions can be

> "whether to join an association, whether to remain a member, how much to participate in collective actions, and what amount of personal resources to contribute to the collectivity" (ibid., p. 315).

In line with Knoke's reasoning, Clark and Wilson (1961) identify three types of incentives for collective action: material incentives such as financial aids, solidarity incentives such as reputation, and purposive incentives that are based on a group ideology. While material incentives are tangible, solidarity incentives and purposive incentives are intangible. The intangible incentives have often been discussed on an individual level in sociological research, whereas material incentives are considered more central in the context of inter-organizational collaboration (Von Hippel & Von Krogh 2003).

Selective incentives have been identified as a solution to the free-rider problem (Hardin 1982) and a way to encourage actors to take part in collective efforts despite an initial lack of interest (Olsson 2009). They are understood as a strategy to encourage actors – both individuals and organizations – to take part in collective action (Udehn 1993). Some scholars suggest that a central authority is required that provides the selective incentives to stimulate the actor's motivation to take part in collective action (Sandholtz 1993). The role of institutional design and leadership is discussed next.

2. Institutional Design

Olson (1965) suggests institutional design as a possibility to foster collective action. For example, by employing institutional designs through federated structures or clubs, incentives can be established that make everyone achieve collective action. Again, Sandler (2015, p. 211) gives an example: "Homeowner associations in gates communities and condominiums share costs for common grounds, infrastructure, and collectively consumed facilities." Thus, it is in the interest of all actors within these associations to maintain the common good.

For Olson's institutional design proposition to work, transaction costs and exclusion mechanism costs need to be low in order to not wipe out efficiency gains of the collective action. But institutions may require multiple stages of interaction and thereby cumulate costs and reduce efficiency (Dixit & Olson 2000). As a result, the institutional design cannot always solve collective action problems.

Yet, many scholars have highlighted the necessity of a leader to provide selective incentives and organize group activities for collective action, and thereby identified leadership as an essential condition to mobilize collective action (e.g. Frohlich et al. 1972). Bianco and Bates (1990) consider leadership to be more critical in initiating collective action compared to sustaining it. According to them, a leader's capabilities and the reward structures, such as selective incentives, are the two main indicators for a good leader in a collective action scenario. Monge et al. (1998) point out that leaders in collective action are often the actors that are most dependent on the resources of others. Therefore, it is important for a leader to understand and draw on resource interdependencies between other actors, and to offer the right incentives to these actors.

Collective Action on a Global Scale

Besides the discussion around collective action on a small scale, it has recently been investigated how collective action can lead to impact on a global level. Looking at the global collective action problem of environmental change, Ostrom (2010) argues that conventional collective action theory fails when there is no global treaty. In the conventional way, actors would have to accept an existing treaty or agree on a new treaty to determine collaborative actions, monitor mechanisms and eventually put sanctions into place. Yet, when looking at issues like global climate change such a convincing treaty does not exist and still a variety of collective action efforts can be observed. Ostrom (ibid., p. 551) states that "many activities

can be undertaken by multiple units at diverse scales that cumulatively make a difference". While she acknowledges that focusing on global efforts is a necessary part of a long-term solution, she also argues that focusing only on global efforts would not be beneficial. Instead, she encourages polycentric approaches for achieving benefits at multiple scales and allowing for experimentation and learning.

Given the rise of complex interdependent problems at a global scale, Ostrom (2010, p. 556) argues that polycentric systems, with bottom-up processes, are often a necessary groundwork to tackle global collective action problems at scale:

> "Building […] commitment, and trusting that others are also taking responsibility, can be more effectively undertaken in small- to medium-scale units that are linked together through diverse information networks"

Due to enhanced global connectivity, for example through digital infrastructures, she expects polycentric systems to expand in the future.

Conclusion

As presented, Olson's original theory of collective action offers a good starting point to understand the characteristics and challenges of collective efforts and has already served as a valuable intellectual resource for further theoretical adjustments. Yet, the theory fails to establish a universal set of maxims. Sandler (2015, p. 214) points out that developing a new unified version of the theory is an "impossible task" given the complexity and variety of collective action phenomena. Oliver and Marwell (2001, p. 308) conclude:

> "It is clear that most social scientists have finally moved away from trying to develop 'the theory of collective action' to recognizing that there are many different issues and many different kinds of collective action and that one can shade into the other depending upon the structural characteristics of the situation."

3. 1. 2. Collective Action in Information Systems

The shift from investigating collective action on a universal level towards focusing on the phenomenon in specific scientific disciplines has led to a huge variety of collective action studies across a broad spectrum, targeting specific situations and issues within particular disciplines, and thereby adapting the theory towards the unique structural characteristics of the situation (Sandler 2015). Lately, research on collective action has become more common in the area of information systems. For example, the theory has been applied to the study of

digital initiatives and information networks (e.g. Vassilakopoulou et al. 2017; Eaton et al 2017; Constantinides & Barrett 2014).

Framework of Key Factors Affecting Collective Action in ICI Systems

In one of the earlier and extensive works about collective action in information systems, Monge et al. (1998) developed a model of key factors affecting collective action in alliance-based interorganizational communication and information (ICI) systems. ICI systems are information systems that link members through commonly held information and, in addition, offer point-to-point communication (Fulk et al. 1996). The model captures the main processes with which ICI systems produce public goods based on a refined collective action theory by Marwell and Oliver (1993), focusing on the benefits on both the collective and the individual level. Monge et al. (1998) propose the integration of an evolving set of relationships and illustrate the processes as a graphic representation of the gain function with the production function. The graphic is shown in figure 3.

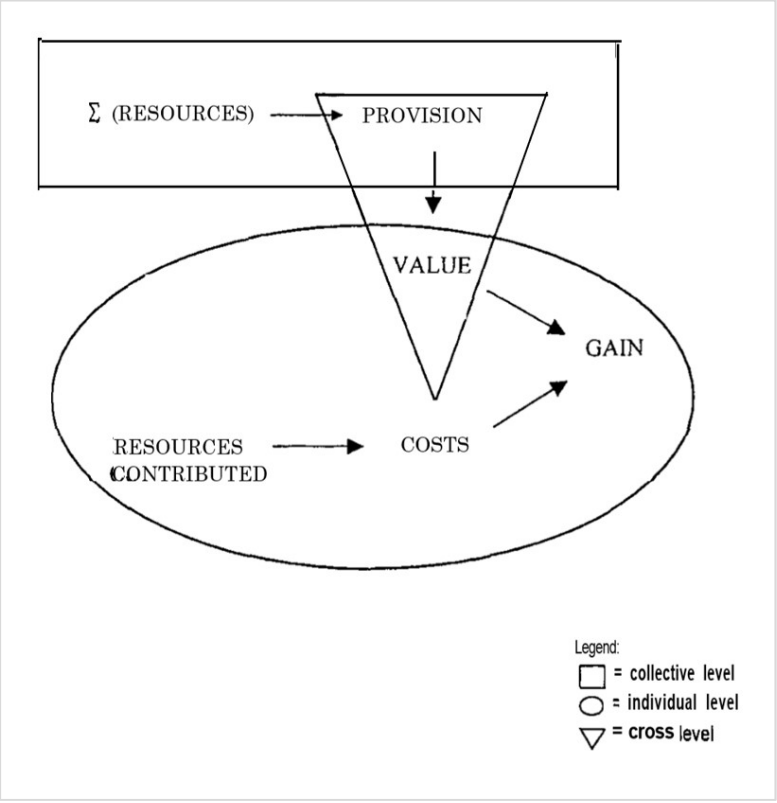

Figure 3: Gain and Production Function in Collective Action (Monge et al. 1998, p. 415; based on Marwell & Oliver 1993)

The figure illustrates how a diverse group of collective action participants can contribute to a sum of resources on the collective level, thereby enabling the provision of public goods on the collective level. These goods are of different value on the individual level. On the individual level, the individual gain is perceived as a function of the individual value and the individual costs. The individual costs depend on the individual resources contributed. Four key factors are identified that affect collective action: the characteristics of the public good, the participants who compromise the group, the collective group of participants, and the action processes that produce the good (Marwell & Oliver 1993). In the following, the key factors and the respective subdimensions in the information systems context are explained based on Olson's original theory (1965), complemented by Marwell and Oliver's adjustments (1993), and adapted to the IS context by Monge et al. (1998).

Goods: The first factor are the characteristics of the good. Some goods can be produced through an accumulation of parts, whereas other goods are only valuable when produced as a whole. Also, goods can be heterogeneous, meaning that they have various dimensions that differ in their value to different individuals. For ICI systems, two kinds of goods are proposed:

- Connectivity: ability to reach other members of the interorganizational collective through the ICI system
- Communality: created through collectively storing and sharing information-through shared databases. Pooled data can lead to new and additional information that is more valuable than information solely derived from data silos.

In other scenarios, different kinds of goods may arise.

Participants: As a second factor, participants can have distinct characteristics. Since they form the group that carries out the collective action, they are of special interest. In alliances, participants can be actual and potential partner organizations as well as individual persons representing these organizations. The characteristics of participants include the individual interests in the public good, the individual resources relevant for that good, the individual costs associated to contributing to that good, and the individual gain from the provision of the good. The following characteristics of participants are considered:

- Interests: Possibilities to benefit from taking part in the collective action. The level of interest is considered to be positively related to the likelihood of contributing.
- Costs: Costs for physical and social contributions. Costs are an issue in the development of public goods. Excessive costs can inhibit contributing. For ICI systems, costs consist of
    - Start-up costs: expenditure required by participants for resources required for initial system use
    - Recurring costs: expenditure of resources required to continuously use the system
- Resources: Abilities to contribute to the collective action. The success of a collective action depends on the continued contributions from participants. For data and information sharing, quantity dimensions, meaning the amount of information contributed, and quality dimensions, such as timeliness, accuracy, and relevancy, are identified. The individual level of resource contribution is not only affected by interests and costs, but also by specific factors regarding data and information sharing. The following factors have found to be critical:
    - External Confidence: perception that the system through which information is shared is secure from outside tapping. Participants are more likely to contribute when the system is perceived as secure.
    - Trust: expectation that alliance partners will not themselves compromise sensitive information and instead recognize and protect the rights and interests of contributors. A high degree of trust encourages collective action.
    - Key Collaborators: partners with information resources that are most critical to that participant, for example due to complementary resources. A participant in a collective action is considered to be more likely to collaborate when key collaborators contribute to the public good as well.

The individual gain from a public good provided through collective action depends on the individual interests and the individual costs associated with the good. As discussed in chapter 3.1, interests are thereby not limited to rational choice, but also include non-economic

interests, for example interests in gaining knowledge. Selective incentives can serve as a way to stimulate these interests.

Group: The collective group of participants is the third factor. The collective level of resource contribution is affected by:

- Resource and Interest Heterogeneity: Degree to which the individual members within a group have different resources and different interests. Resource heterogeneity can facilitate collective action when the mean level of resources in the collective is not sufficient. Interest Heterogeneity is also affected by:
    - Task Interdependence: Degree of members' belief that they belong to an existing or latent collective whose members rely upon each other's actions, resulting in an increased participation in the collective effort.
    - Geographic Dispersion: Degree to which group members are dispersed / isolated. It is assumed that geographic dispersion implies that distant sources will be more interested in sharing data through technology.
- Noticeability: Degree to which the contributions of an actor's resources towards the good are visible and noticeable. A high degree of noticeability can foster collective action when it is in line with the participants' interests.
- Group Size: Size of the collective. Large collectives are considered to be more useful when substantial infrastructure is required or when the benefits increase with the number of involved members.

Action Processes: Characteristics of action processes that produce the good are the fourth factor. They refer to the degree of interdependence among the participants when producing the good. One form of independence can be the degree and type of information that participants possess about other participants' decisions regarding the collective good contribution. Interdependence can be fostered by organizers who try to mobilize action by communicating with the different participants. For ICI systems, two characteristics are identified as relevant:

- Density: Proportion of organizations in the network to which an organization is directly connected. A high density is considered to foster collective action.

- Centrality: Sum of the lengths of the shortest paths by which an individual or organization typically "reaches" or connects to every other individual or organization. Centralized communities allow for an easier coordination of collective action than decentralized communities.

As Monge et al. (1998) point out, this simplified model cannot capture the whole phenomenon of collective action in general, and in alliance-based ICI systems in specific. It allows for a deeper understanding of collective action characteristics in information systems though and gives guidance to scholars who try to describe distinctive collective action phenomena in the area of IOIS. It is therefore considered a reliable framework for describing key factors influencing the collective action phenomenon investigated in this study.

Further Examples of Collective Action in Information Systems

The existing research body is not limited to alliance-based ICI systems. Consistent with collective action theory, it has been found that a firm's interests, resources, and the effectiveness of the alliance management determine collective action efforts in standardization initiatives, such as in vertical information systems standardization (Markus et al. 2006) and within e-business standardization consortiums (Zhao et al. 2011). Those standards are regarded as public goods because once developed they are freely available also to firms that have not contributed in the process. Both articles find that this leads to the free-rider problem, as all firms are theoretically incentivized to not contributing but simply enjoying the final benefits of the standards.

Findings which could solve the dilemma include that firms can in the end be convinced if the perceived individual benefit of the standards is high enough (Markus et al. 2006; Zhao et al. 2011), and that firms see the chance to build private, non-public solutions on top of the publicly available standards (Zhao et al. 2011).

Another example is collective action for large-scale national e-government infrastructures (Medaglia et al. 2017). In this study, it was investigated how interests, resources, and governance may change over time due to the interplay between the actors that results in the common good. The scholars call for refining the theoretical lens of collective action by looking at it from a process view instead of a still representation of the role of interests, resources, and governance.

One more interesting insight could be achieved by looking through the lens of collective action at the failure to implement a shared mobile payment platform – a common goal which could not be achieved by individual firms alone (Reuver et al. 2015). The collaborating firms come from different industries – banking and telecommunication – and are characterized by different strategic interests in the platform and different ways of doing business. The scholars find that participants failed to solve several challenges identified in collective action research – among them the failure to align both parties' interests in the platform, and even a divergence of interests throughout the process; the inability to solve conflicts within the collaboration which made it difficult to stand as a strong unity against platform competitors; and the absence of clear authorities and leadership in the governance structure.

As presented in these examples, the actors' different interests have been specifically emphasized in collective action research within the information systems discipline. They are considered one of the most important aspects in the creation of public goods (Monge et al. 1998). Partly due to the heterogeneity of actors in IS alliances, their subjective interests tend do vary substantially: Browning et al. (1995) point out that due to the complexity of IS products it is often not possible for actors to understand the benefits from a collective effort at first. Instead, interests grow and vary over time when substantial contributions are made, technological change happens at accelerated speed, and actors increasingly understand the potential of the collective effort. Zhao et al. (2011) state that nevertheless it is important to understand the initial motivation and factors driving an IT company's contribution towards collective efforts since often collaboration will only be successful if specialized companies start to contribute critical resources. The cases in which private sector engagement in collective IS action has been investigated so far thereby provide rather specific and individual benefits for actors from the private sector.

Conclusion

As of today, the research on collective action in the IS context is of high relevance but neglects a part of reality by mostly ignoring new forms of complex multi-stakeholder networks where no clear business benefits exist for the private sector actors involved. As a consequence, the existing research cannot fully explain the emergence of larger networks in the information systems space to achieve social impact on a global scale. When investigated on a general level, scholars mostly name the aim to engage in corporate philanthropy and CSR activities as the main motivation for companies to participate in multi-stakeholder networks

without direct business benefits (Vurro et al. 2010; Selsky & Parker 2005). But that view neglects major dimensions of motivations and interests discussed in collective action theory in general as well as new findings in the information systems discipline. Therefore, it can be concluded that it is still unclear what interests and motivates a subgroup of actors in these emerging BD4D multi-stakeholder networks, in particular the private sector. And even though the general theory on collective action gives a few indications, and its adaptations in information systems offer a framework for describing the phenomenon itself, it becomes clear that collective action theory does not offer enough substance to solely answer the research question.

3.2 From Philanthropy to Shared Value

A new and related concept is introduced to complement the collective action theory: The concept of creating shared value (in the following: CSV) by Michael E. Porter and Mark. R. Kramer (2011) explains why companies may be interested in and motivated by addressing social causes for more reasons than just an interest in corporate social responsibility (in the following: CSR) and philanthropy. The CSV concept highlights potential business benefits for companies that address social causes, and thereby refers to the individual value, meaning the company value, derived in the provision of a public good as shown in figure 3.

Given the identified research gaps in chapter 3.1 and the limitations of collective action theory in answering the research question entirely, the CSV concept is found to be an integral intellectual resource to partially guide the research process of the authors of this thesis. In the following subchapters the concept will be presented, including a distinction between CSV, CSR, and philanthropy. Its connection to and relevance for the collective action theory will be assessed.

3. 2. 1. General Theory

Since its introduction, the concept of creating shared value (Porter & Kramer 2011) has gained both praise and criticism from fellow researchers for its assumed potential to guide companies in serving the public good and creating a competitive advantage at the same time (Dembek et al. 2016). While Bosch-Badia et al. (2013) say that the connection between societal and economic progress is revolutionary, Crane et al. (2014) argue that the concept is

unoriginal. To allow for a better distinction between CSV and its related approaches from the sustainable development literature, all approaches are defined first.

Philanthropy

Philanthropy is generally described as an "active effort to promote human welfare" (Merriam-Webster 2018). In a company context, it is more precisely defined as

> "corporate actions that are in response to society's expectation that businesses be good corporate citizens. This includes actively engaging in acts or programs to promote human welfare or good-will" (Carroll 1991, p. 42).

Corporate Social Responsibility (CSR)

There exist many definitions of CSR. Often, different concepts are used synonymously, and boundaries are not clear (McWilliams et al., 2006). In this study, CSR shall be defined as

> "a view of the corporation and its role in society that assumes a responsibility among firms to pursue goals in addition to profit maximization and a responsibility among a firm's stakeholders to hold the firm accountable for its actions" (Werther & Chandler 2011, p. 5).

During the last decade, CSR has become a buzzword and many companies have engaged in CSR activities. The question for these companies is not whether to involve in CSR activities anymore, but how to get involved (Du et al. 2007).

Porter and Kramer (2011) challenge this broad concept of CSR. According to them, CSR puts business against society because generic CSR programs have limited connection to the business. They argue that CSR programs create societal benefits, but they are an obstacle for profit maximization and therefore the inclusion of such programs is considered an unsuitable business strategy in the long run.

Creating Shared Value (CSV)

CSV is a business concept developed by Porter and Kramer (2006, 2011). It was introduced as an alternative to CSR. The concept is defined as

> "policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates. Shared value creation focuses on identifying and expanding the connections between societal and economic progress" (ibid. 2011, p. 6).

Value can be defined as benefits relative to costs. According to the concept, there are three possible ways for companies to create shared value (ibid.):

- Reconceiving products and markets: Meeting needs in underserved markets often requires redesigned products or different distribution methods. These requirements can trigger fundamental innovations and both economic and societal benefits.
- Redefining productivity in the value chain: A company's value chain is affected by and affects societal issues, for example natural resources or working conditions. Avoiding these issues by improving conditions can save economic costs and create shared value.
- Enabling local cluster development: Supporting communities and the infrastructure around the company affect its success. Building local clusters can increase both the company's productivity and innovation potential and help to develop sustainable regional economies.

Companies may choose one, two, or all three ways to create shared value. The central premise behind CSV is that the competitiveness of a company and the health of the communities around it are mutually dependent. Social responsibility, philanthropy, and sustainability are not considered shared value per se, creating economic value must be involved as well. According to Porter and Kramer (2011, p. 3), CSV has the potential to "reinvent capitalism and unleash a wave of innovation and growth".

Even though there is a strong link between CSR and CSV, there are key differences in the concepts as presented below.

CSR:	**CSV:**
• **Value:** doing good • Citizenship, philanthropy, sustainability • Discretionary in response to external pressure • Separate from profit maximization • **Agenda** is determined by external reporting and personal preferences • Impact limited by corporate footprint and CSR budget • **Example:** Fair trade purchasing	• **Value:** economic and societal benefits relative to cost • Joint company and community value creation • Integral to competing • Integral to profit maximization • **Agenda** is company specific and internally generated • Realigns the entire company budget • **Example:** Transforming procurement to increase quality and yield.

Table 2: Differences between CSR and CSV (based on Porter & Kramer 2011, p. 16)

Next to the theoretical discussion, more case study based research is being conducted to better understand the existence of CSV across industries in practice. In general, the interpretation of CSV in practice differs (Crane et al. 2014). Given the initial vague definition of CSV in theory and the ongoing research in this field, the detailed dimensions of CSV in specific industries need to be derived by the researchers in the respective fields (Porter & Kramer 2011). Other studies show that this personal interpretation adds subjectivity to the scholar's individual research process (Schmitt & Renken 2012). Also, the concept's interdependency with other business research areas can be observed in some studies (Ligonie 2017; Moon et al. 2014; Michelini & Florentino 2012).

Evidence for the CSV concept can be found in most studies investigating CSV in practice. Compared to generic CSR activities, companies that explicitly engage in CSV activities appear to be able to improve more than only their image: In practice, these projects show that gaining both a competitive advantage and societal benefits can go hand in hand. Companies created shared value by reconceiving products and markets (Bergquist & Eriksson 2017), by redefining productivity in the value chain (Lee et al. 2014), and by enabling local cluster development (Matinheikki et al. 2017). Panapanaan et al. (2016) point out the example of companies serving bottom of the pyramid markets with innovative products that meet societal needs: The concept of CSV is considered to be integral to these companies' overall business model and indeed a source of long-term and sustainable success.

A correlation between shared value and economic performance was assumed in qualitative studies but could not be confirmed as sophisticated quantitative longitudinal studies are still missing. However, scholars conclude that the CSV concept is helpful to understand the intrinsic motivation behind a company's strategic investment into social projects (Panapanaan et al. 2016). Furthermore, studies show that the CSV concept cannot easily be applied in every region, industry, organization, or project (Serra et al. 2017; Font et al. 2016). Given the novelty of the phenomenon investigated in this thesis, the CSV concept can therefore serve as a guiding intellectual resource for the theoretical contextualization of this study's findings, but it cannot replace an exploratory analysis.

3. 2. 2. Relevance of CSV for Collective Action

Porter and Kramer (2011) partly base their theory on and refer to collective action theory when talking about the relevance and importance of CSV. After acknowledging that many

CSV projects require collective action, they state that "what matters is that benefits are delivered by those organizations – or combinations of organizations – that are best positioned to achieve the most impact for the least cost" (p. 12) and that the principle of shared value creation "cuts across the traditional divide between the responsibilities of business and those of government or civil society" (ibid.). All three ways to create shared value – by reconceiving products and markets, redefining productivity in the value chain, and strengthening the local clusters – can only be achieved if a sufficiently robust market ecosystem is in place. Friendly business ecosystems and platforms are a source for advancing competitiveness and a main requirement to discover competitive advantages in accordance with the CSV concept (ibid.). Therefore, the CSV concept offers a new angle to look at a company's interest and motivation in taking part in complex collective action with diverse actors.

Since for complex problems the required conditions for shared value creation cannot be controlled by a single company only, businesses must interact with multiple stakeholders such as governments, NGOs, companies, and community members who often rather work in opposition than in alignment. Kramer and Pfitzer (2016, p. 11) point out a fundamental reason for companies being reluctant towards this approach despite the discussed advantages:

> "The further a company looks beyond its own value chain to the causes of market failure – situations in which socioeconomic conditions prevent conventional business models from succeeding – the less control and perceived legitimacy it has, and the greater the cost, complexity and time frame to change. These factors keep many companies from even contemplating an effort to alter the external context."

By building on the CSV concept, Kramer and Pfitzer (2016) identify three obstacles that keep companies from supporting large-scale social change despite the discovered incentives and unique resources. These obstacles are in line with collective action theory and complement the existing knowledge body with a business-oriented perspective: First, companies may not be viewed as having the legitimacy to initiate social progress since ultimately, they are in the self-interest pursuit of profit. Second, many companies do not want to bear the costs when rivals will share the benefits. Third, most companies look at social issues via their philanthropy or CSR departments instead of through the business lens and thus fail to assess the business case for such projects. As a result, they may miss the justification for investing the required funding and management attention.

Kramer and Pfitzer (2016) state that "the ability to understand and catalyze collective impact is essential" (p. 11), and that "the greatest impediments to this promise of social and economic progress are the internal barriers that prevent companies from taking action" (ibid.). But since

businesses are considered “essential players, able to unlock possibilities for change on issues that have long been impervious to intervention” (ibid.), it is crucial to further analyze and understand the interests and motivation behind companies engaging in complex collective action over time.

3.3 Integrated Theoretical Framework

The authors conclude that the theory of collective action (Olson 1965), and the theory of creating shared value (Porter & Kramer 2011), are interrelated intellectual resources suitable to support the investigation of the two-fold research question of this thesis. Both theories therefore serve as a guiding principle in this thesis. The relationship is shown in figure 4.

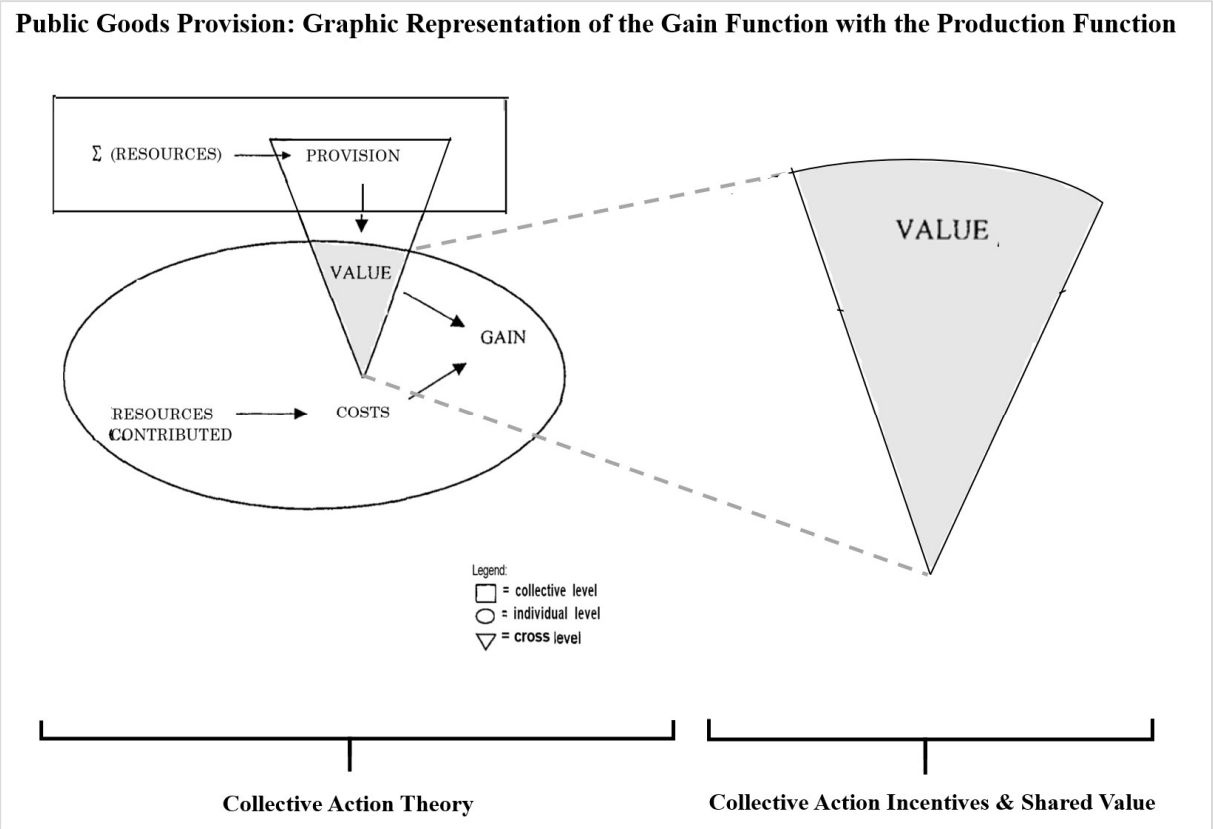

Figure 4: Relatedness of Theories (based on Monge et al. 1998; Marwell & Oliver 1993)

Throughout the empirical part of this thesis, the authors will contextualize the results, connect findings to the theoretical framework where possible and point out discrepancies. The theories serve as a guiding principle, but do not replace an exploratory analysis into the reasons for the participation of IT MNCs in collective action. In the following, the research

methodology will be presented before proceeding to the results and the contextualization considering this theoretical framework.

4. RESEARCH METHODOLOGY

The research methodology and design will be described in detail in chapter 4.1 to 4.5, so readers can follow through the whole research process from problem formulation over data collection to data analysis and result presentation. The case organizations GPSDD and SAP will be introduced in chapter 4.6.

4.1 Research Design

The present thesis aims to understand the contemporary phenomenon of IT MNC's engagement in BD4D multi-stakeholder networks. It is difficult to distinguish this phenomenon from its complex context of the emerging networks around the use of IT and big data for sustainable development, and the larger context of discussions about chances and threats of big data analytics when applied to sustainable development. While a relatively new research stream can be identified for the last topic – which emphasizes the need to investigate modes of collaboration between multiple stakeholders and the incentives of private sector involvement – a gap exists between little research and high relevance of the former topics as described in chapter 2.

When having a comparably small body of literature available on the research topic, an exploratory, qualitative research mode is typically advised (Eriksson & Kovalainen 2008) and was adopted for this investigation. The exploratory research into the underlying reasons for IT MNCs to engage in BD4D multi-stakeholder networks (part 2 of the research question) is accompanied by the descriptive investigation of the role of IT MNCs within such networks (part 1 of the research question).

Within qualitative research methods, according to Benbasat et al. (1987), the case study methodology is particularly suitable when the focus lays on contemporary events, and the phenomenon cannot be studied outside its context but rather provides a rich natural setting that supports theory generation. Baxter and Jack (2008) add that a case study approach should be considered when the aim is to answer "how" or "why" questions. As the phenomenon studied in this thesis furthermore does not enjoy an established theoretical base and manipulation – which would require an experimental design – is not regarded as a useful approach to studying

the topic (Benbasat et al. 1987), a case study design was chosen as the best research method for a fruitful investigation.

Yin (2009) emphasizes the need of investigators to be flexible and able to adapt the research when new situations – potential opportunities – are encountered. This flexibility was kept in mind throughout the whole process from conducting literature reviews over exploring initial data sources to collecting the final data. The purpose of the research – exploring and understanding the engagement of IT MNCs in BD4D multi-stakeholder networks in terms of motivation and process – has remained the same, whereas the exact research question and unit of analysis have changed during the process.

This iterative process in shaping the qualitative research question can, according to Agee (2009, p. 431), "give shape and direction to a study in ways that are often underestimated", and enables research participants to contribute their perspectives for relevant research questions (ibid.).

4.2 Case Selection

After choosing the research topic of private sector engagement in BD4D multi-stakeholder networks, the authors selected the engagement of large IT corporations as most appropriate for investigation for two reasons: First, the resource situation in terms of financial resources and IT capabilities make them specifically important partners for these networks; second, IT corporations are presumed to have a more strategic approach towards social engagements, compared e.g. to small start-ups, which make them interesting from a scientific perspective. Benbasat et al. (1987, p. 370) describe the case study strategy among others as a means "to capturing the knowledge of practitioners and developing theories from it". A corporation which has already developed a strategy towards engagements for social purposes, and presumably applied this strategy at least partially to the new engagement in social IT and data partnerships, was regarded as a rich source for already present knowledge about the topic and reflected insights on the engagement.

It was furthermore desirable to choose a company with a high degree of engagement in a partnership, as insights would both be broader with regard to different aspects of the engagement and deeper due to enhanced reflection of the engagement.

Considering the unclear and not yet conceptualized structures of BD4D multi-stakeholder networks - which makes it difficult to apply set criteria for quality - the authors aimed at choosing a network with presumed legitimacy due to support of prominent agencies and companies in the field. Visible activity, e.g. through an active newsfeed, was important to ensure that the network was still operating.

One author was, through prior working experience, in contact with the sustainability department of SAP, an IT MNC which is engaged in the UN backed *Global Partnership for Sustainable Development Data (GPSDD).*

SAP suited criteria 1 (large multinational IT corporation) and criteria 2 (mature sustainability strategy, for details see the case description in chapter 4.6.2). A high degree of engagement was presumed, as SAP is a founding member of the GPSDD (SAP News 2015), and SAP's current Senior Vice President of Analytics is a member of the GPSDD Board (GPSDD 2018d).

The GPSDD is a multi-stakeholder network which was initiated through and is still backed by the United Nations (GPSDD 2018c). Members of important social organizations such as the World Bank and Plan International are part of the board (GPSDD 2018d), and large corporations from the IT sector, e.g. IBM and Tableau, are partners of the network (GPSDD 2018g). The GPSDD frequently publishes news on their website and maintains active Facebook (GPSDD on Facebook 2018), LinkedIn (GPSDD on LinkedIn 2018) and Twitter channels (GPSDD on Twitter 2018), and it is subject to external articles (e.g. Center for Data Innovation 2018). A website make-over was published in the beginning of 2018. The GPSDD is organizing events such as the Data for Development Festival in March 2018 in Bristol (GPSDD 2018n). These aspects indicate active work of the GPSDD towards achieving their goals, and a high quality and legitimacy of the network.

Through the contact at SAP, discussions via e-mail and phone were held about relevant research questions within the topic. In these discussions, the research question could be shaped toward relevant topics for theory and practice. At the same time, through further research into the GPSDD via publicly available content, a tender for external consulting on private sector engagement in the partnership was found on the partnership's website. This indicated a present challenge in the field and practical relevance of an investigation. The tender is not online anymore, but results of the consulting project were to the knowledge of the authors not

obtained yet, and in any case not made available to the authors. The tender is part of the research data base (United Nations Foundation 2017).

After the initial phase, further private sector partners of the initiative were contacted for potential case study investigation. While initiating the data collection at SAP, it became clear that this single case provided both a good data basis to analyze motivation, processes and strategy from an internal company perspective, and the additional option to include relevant perspectives from the GPSDD administrative staff through interviews and a field trip. The authors evaluated this opportunity as more revealing than including the perspective of another, similar IT corporation, and decided to shift resources from conducting multiple case studies to broadening the unit of analysis to the contextual network in the single case of SAP's engagement in the GPSDD. Further direct case investigations into other engaged companies were thus not initiated, but snapshots of other IT companies' commitments and motivations were collected during a field trip to the Data for Development Festival (March 2018, Bristol) organized by the GPSDD.

4.3 Data Collection

According to Benbasat et al. (1987, p. 374), "the goal [of data collection in case studies] is to obtain a rich set of data surrounding the specific research issue, as well as capturing the contextual complexity". Furthermore, the use of multiple data sources enhances credibility of the case study (Baxter & Jack 2008) and strengthens its validity through the possibility for data source triangulation (Yin 2013). The authors thus included a wide range of data sources on both the phenomenon and the related context, namely:

- Primary data
    - Correspondence via e-mail and phone with one employee at the case company SAP to discuss the research topic
    - Five semi-structured phone interviews with four SAP employees who are part of SAP's engagement in the GPSDD
    - Two semi-structured phone interviews with two employees of the GPSSD
    - One three-day field trip to a conference ("Data for Development Festival") organized by the GPSDD, from March 21-23, 2018 in Bristol (UK)

    - Additional correspondence via e-mail with all six interviewees (SAP and GPSDD) for further clarifications and additional questions

- Secondary data:
    - General websites of both organizations (SAP and GPSDD)
    - Sustainability-related websites of SAP
    - Press releases and social media accounts of both organizations
    - External press releases and blog posts about both organizations

The mix of different sources of evidence, primary and secondary, is recommended for case study research (e.g. Yin 2003). First, because the sources of evidence complement each other to allow a multi-perspective view on the case – Baxter and Jack (2008) use the metaphor of single "puzzle" pieces with each piece contributing to an understanding of the whole picture – and second, because they allow for data triangulation which enhances the construct validity of the study (Yin 2003).

Primary data refers to data which is collected explicitly for the purpose of the research. An advantage is that it is best-suited to investigate the respective research questions, and includes procedures most appropriate to the research problem (Adams 2010). Secondary data on the other hand is data which is already available elsewhere, collected previously by researchers or others (e.g. official statistics or newspaper clippings). An advantage is that this data is easier to collect and therefore relatively simply leads to high amount of data, and it can be regarded as less biased and therefore more reliable and valid (Adams 2010; Hox & Boeije 2005). For investigation of the research problem, mostly primary data in form of semi-structures phone interviews and a three-day field trip was used, while secondary data served as means to evaluate the suitability of both SAP and GPSDD for this case study and look for further companies and networks, to retrieve general data complementing topics discussed in the interviews (e.g. more detailed information on SAP's sustainability strategy) and to triangulate the data obtained in interviews and during the field trip.

Semi-Structured Phone Interviews with SAP/ GPSDD

Seven semi-structured interviews were conducted with SAP and the GPSDD. Two interview partners are part of SAP's engagement in the GPSDD through their role at SAP's

sustainability department. They were reached through the already existing contact with one author of this thesis caused by her prior work in the department. These respondents arranged interviews with two additional colleagues within SAP. One of these interview partners then introduced the authors to two employees at the GPSDD Secretariat.

The first round of interviews at SAP was carried out between 12 December, 2017 and 1 February, 2018, and one follow-up interview was conducted on 26 April, 2018. Interviews partners included members of SAP's sustainability department, who are responsible for supporting the engagement from the strategic sustainability side. These are the Manager for Transformation and Change Management, and the Director for Sustainability (referred to as S1 and S2 in the following). Furthermore, they included managers from the SAP analytics product side (referred to as A1 and A2 in the following). A1 is the Vice President of Thought Leadership Markets at SAP and formerly had a role in leading and incubating new big data initiatives. He actively engages in multiple projects of the GPSDD. A3 is Senior Vice President of Analytics at SAP, and a member of the GPSDD Board of Directors. The table provides an overview of all conducted interviews:

Reference	**Interview Partner**	**Institution/ department**	**Interview date**	**Interview length**
Interview 1	S1	SAP/ Sustainability	13.12.2017	58 min.
Interview 2	A1	SAP/ Analytics	14.12.2017	40 min.
Interview 3	S2	SAP/ Sustainability	09.01.2018	60 min.
Interview 4	GPSDD1	GPSDD	01.02.2018	29 min.
Interview 5	A3	SAP/ Analytics	01.02.2018	23 min.
Interview 6	GPSDD2	GPSDD	23.02.2018	50 min.
Interview 7	S1	SAP/ Sustainability	26.04.2018	25 min.

Table 3: List of Semi-Structured Interviews with SAP and GPSDD (sources: recordings 1-7)

In addition to the phone interviews, the authors engaged in the correspondence via e-mail and informal phone calls with all six interviewees before and after the conduction of the interviews.

By including several interview partners from similar and different backgrounds, a variety of perspectives for comprehensive understanding of the phenomenon and validation of the described events are achieved (Eisenhardt & Graebner 2007).

In the end of each interview, the authors asked the respondents if they could recommend and make contact with other relevant persons who were involved in the engagement. As the respondents were open to support the research but did not suggest further relevant interview

partners within SAP, the researchers believe that they obtained insights from all involved employees at SAP. One respondent at SAP (A1) suggested and made contact with relevant members of the GPSDD Secretariat.

Consequently, two interviews were conducted with the Chief Executive Officer (GPSDD 1) and the Community Engagement Manager (GPSDD 2) of the GPSDD from 1 February, 2018 to 24 February, 2018.

All interviews were held via phone due to geographical distance. A limitation of phone interviews can be a perceived impersonality compared to direct interviews (Adams 2010). To accommodate the interview partners, all interviews were conducted in the respective first languages when possible, resulting in two interviews in German language and four interviews in English language. One researcher knew two of the interview partners personally and consequently guided the respective interviews which presumably additionally comforted the respondents. Cited passages from the German interviews were translated to English. One respondent at SAP (S1) provided additional help and guidance throughout the research and can be regarded as a key informant (Yin 2003).

The researchers chose interviews as the primary source of data as they can give insights first on what happened during the time of engagement in the GPSDD (positivist interview), and second on how the engagement was perceived and what were the underlying motivations for all respondents (emotionalist interview) (Eriksson & Kovalainen 2008).

The interviews were guided and semi-structured with open-ended questions to allow for systematic and comprehensive insight into prepared topics but keep a conversational setting which encourages respondents to set their own focuses and add unexpected aspects (ibid.). The conversations started with an introduction of the researchers and the research project. The interview itself was then organized in topical fields, starting with an introduction and easy questions of the respondents' role and organization or department, followed by the main block about the engagement and a last part asking for topics that the respondent would like to add and for further interview partners that the respondent could think of. All interview guides can be found in the digital data base of this thesis.

Both researchers were present in all interviews, with one of them respectively guiding the interviews. This is beneficial for two reasons. First, researchers often have complementary insights, and the different perspectives increase the likelihood of capturing relevant and novel

insights. Second, the convergence of observations from two investigators increases confidence in those findings (Eisenhardt 1989). The researchers discussed all interviews immediately after conduction to capture direct impressions and evaluate which topics to emphasize in further data collection. Through these discussions and in consideration of the different roles of respondents, the interview questions slightly vary between respondents.

All interviews were – after asking for permission from the respondents – recorded and transcribed verbatim. Though one of the most time-consuming ways to capture data, this method is advantageous as the interview content does not solely rely on the researchers memories and notes – which makes it also easier for others to follow the path of the study – and as the researchers can familiarize with the content during the transcription process (Eriksson, Kovalainen 2008). The recordings and the transcripts can be found in the digital data base.

Field Trip: Data for Development Festival

To complement the data retrieved in interviews and address the method's biases, a three-day field trip to an event organized by the GPSDD (Data for Development Festival, March 2018, Bristol) provided direct insight into the operations of the network. The attendance of the event was recommended and facilitated by one interviewee from the GPSDD (GPSDD 2).

Observations are beneficial as the events are captured "live" while taking place, so they are not blurred through memory or presentation biases; and as they can be used to triangulate the information given in other data sources. On the other hand, observation is not suited to reveal people's thoughts (Eriksson & Kovalainen 2008).

One of the researchers attended the festival in Bristol, UK as a direct observer. Though not all participants were aware of the observations, the scientific purpose was both suggested by the GPSDD Community Engagement Manager and communicated during registration for the event.

An advantage of direct observation instead of participant observation is that the researcher can already focus the observation on themes relevant for the respective research problem (Eriksson, Kovalainen 2008). The researcher therefore attended discussions most likely to yield valuable insights on private sector engagement in the initiative, and on the general set-up of the network. He furthermore observed the general atmosphere and dynamics of the participants both during discussions and in the breaks.

As the aim of the observation was among others to obtain momentary insights and statements on engagements of other companies, those statements were transcribed for comparing them with insights from the present case of SAP's engagement.

For documentation, the researcher took screenshots of the event app, and recorded relevant discussions. To capture impressions, the two researchers directly discussed the impressions via phone during the three days, and the researcher took comprehensive field notes at the end of the event.

All workshops attended during the event were recorded and are available in the digital data base. Relevant statements during the festival that are directly quoted in this thesis are additionally available as transcripts in the data base. The researcher chose to attend the workshops that were concerned with the overall GPSDD strategy, private sector engagement, and / or included IT MNCs. The table provides an overview of all attended workshops:

Reference	Title	Involved Organizations	Length
Workshop 1	Opening Plenary Session	GPSDD Secretariat, UN Foundation, UK Government, GSMA, TECHO, Open Institute, UN Statistics Division, National Institute of Statistics and Census of Costa Rica, Government of Ghana, City of Bristol	90 min.
Workshop 2	Planetary Data for Development	Group of Earth Observations, NASA, Gates Foundation, Amazon Web Services, Strathmore Business School, Government of Kenya, Government of Colombia	90 min.
Workshop 3	Engaging Youth and Data. MYDATA Initiative Launch	Data Zetu Project, US Department of State, PEPFAR, Ushahidi, IREX, Youth Advocates Ghana, Youth Advocates Zimbabwe, UN Sustainable Development Solution Network Youth, dLab, GPSDD Secretariat	60 min.
Workshop 4	Building Data Ecosystems for Decision-Making	US Department of State, PEPFAR, Development Gateway, MCC Tanzania, GPSDD Secretariat, dLab	60 min.
Workshop 5	Data for Advocacy and Social Change	Cepei, Video Volunteers, Lancet, Group on Earth Observations, Multimedia Group Limited	60 min.
Workshop 6	Harnessing Open and Proprietary Intellectual Property Conditions to Increase Data Impact	Tableau, Fraym.io, World Bank, Vizzuality, dLab	90 min.
Workshop 7	Making the Case: More and Better Financing for Data	OECD, PARIS21, Open Data Watch, World Bank, Development Gateway, Philippine Statistics Authority, Twaweza	90 min.
Workshop 8	Using Data to Increase Accountability and Strengthen Partnerships for more Development Impact	Government of Malawi, Global Affairs Canada, UN Development Programme, Vizonomy	60 min.
Workshop 9	From Paper to Practices: Shaping a Common Vision for the Data Revolution	GPSDD Secretariat, PARIS21, Open Data Watch, World Bank, Web Foundation, UN Sustainable Development Solutions Network, Southern Voice, UN Statistics Division	90 min.

Table 4: List of Workshops attended at the Data for Development Festival (March 2018, Bristol) (sources: recordings 8 – 17)

Case Study Data Base

When multiple sources of evidence are employed, the use of a systematic data base is recommended both for the researchers to not get "lost in the data" (Baxter & Jack 2008, p. 554) and retain an organized overview of the available data, as well as to theoretically allow for other investigators to review the evidence directly and not only the final reports. A data base thus enhances the reliability of the study (Yin 2003). The data base for this study was built using a virtual folder structure. The data base is made available in the digital appendix and on a DVD in the printed version.

4.4 Data Analysis

Two different methods were used to analyze the data in the present case, suitable to address the first part of the research question ("through the lens of collective action theory, how can the role of multi-national IT corporations in big data for development multi-stakeholder networks be described?") descriptively, and the second part of the research question ("why do these companies take part?") exploratorily.

For the first part of the research question, collective action theory was found to be a helpful resource to enable a deeper understanding of the new BD4D multi-stakeholder networks. The literature review revealed a framework which had been applied to the field of information systems already and could, with minor adaptions, be used to describe the new form of collective action in the present case systematically. Considering this promising theoretical base, a deductive approach to analyzing the data was regarded most beneficial to responding to the first part of the research question. As according to Zainal (2007, p. 3) "descriptive theory to support the description of the phenomenon or story" is a crucial pre-requisite for descriptive case study research, this basis was an important aspect in choosing the descriptive design and deductive data analysis approach.

For addressing the second part of the research question, the theoretical basis available was not regarded sufficient to investigate the question in its entirety, considering both the processes and the motivations for the engagement. As the theories presented in chapter 3 can still contribute to contextualizing the results, a mix of inductive and deductive methods was used for data analysis. The data analysis is inspired by Eisenhardt's method of "Building Theory from Case Study Research", which builds on Glaser and Strauss's (2009, first published 1967) grounded theory. An important aspect of this method is to use a process of "recursive cycling

among the case data, emerging theory, and later, extant literature". Eisenhardt's notion of a recursive progress between data collection and data analysis was used to allow for inclusion of emerging themes in further investigation, e.g. via an adaption of data collection instruments such as additional interview questions, or the integration of additional data sources (ibid.).

Paré and Elam (1997) refined Eisenhardt's approach and applied it to research on IS implementation. Samaddar et al. (2006) note that the resulting methodology is especially well suited for multidisciplinary studies as present in this case.

Paré and Elam (1997) find that the inclusion of a meta-theory can be necessary and beneficiary for data analysis in IT related research. In the present case, the meta-theories of collective action and CSV were included in the research after the initial informal data analysis revealed that the constructs can contribute to building new propositions which "become more meaningful when situated within a broader or higher level of […] theory" (ibid., p. 553). When including existent theory in theory-building approaches it is however important to note that the identification of constructs is tentative, and subject to change if the data points in another direction (Eisenhardt 1989).

The researchers analyzed the data in approximately three cycles. The first analysis was the least systematic and occurred in discussions during the period of the first data collection. It was used to refine further data collection and identify theoretical frameworks to support emergent theories.

The next cycles occurred after the first data collection phase. In the second cycle, the researchers coded the interviews using three different techniques.

For the descriptive first part of the research question, the researchers used pattern matching aimed at relating the data retrieved from different primary and secondary sources with the theoretical basis (compare Yin 2003) to arrive at a rich description of the phenomenon and allow for derivations about the theory itself.

For the exploratory second part of the research question, two techniques were used. First, a time-series analysis was applied to reveal the temporal sequence of the engagement, both within SAP during the engagement and in the GPSDD (Yin 2003). Second, pattern coding (Paré & Elam 1997, p. 554) was applied with the aim to capture emergent themes and topics related to SAP's engagement in the GPSDD. The researchers assigned patterns (e.g. for motivations or challenges) which were solely grounded in the data. According to Paré and Elam

(1997, p. 554), “pattern codes are ones that identify an emergent theme, pattern, or explanation that the site suggests to the researcher”. This was a suitable strategy, as the researchers at this point tried to leave out theoretical grounding to allow for a “fresh view” on the retrieved information. Pattern coding can then reduce large amounts of data into a smaller number of analytic units and help to build an evolving scheme for understanding what is happening in the case (ibid.). The techniques were applied to the interviews with SAP employees. Missing data was added from secondary sources, e.g. if projects were shortly described by interviewees and turned out to be relevant for the research, they were complemented by sources such as company websites or external articles.

In a third cycle, only applicable to the second part of the research question, the researchers decided on reasonable categories to organize the data and prepare visualizations for its comprehensible presentation. They then turned back to theory to make sense of the data and to evaluate the theory’s suitability in light of the second part of the research question and the collected data. In an iterative cycling between data and theory, the research question was then answered and contributions to theory and practice were identified.

Throughout all cycles of the data analysis, interview data was compared and partly extended through observations and secondary data. The CAQDAS software NVivo was used to support the process of coding and categorizing transcripts, as suggested for large amounts of texts (Yin 2003).

4.5 Reliability, Validity and Generalizability

Validity and reliability continue to be challenges in case study research, and case study research is still by some scholars regarded as subjective (Yin 2013; Eisenhardt & Graebner 2007). To address these challenges, it is crucial to create transparency on the steps taken to arrive at conclusions, and link abstractions to respective data sources, to allow for others to follow the chain of evidence pursued through the process (Yin 2003). The research approach was therefore outlined in detail in this chapter, results are presented using precise references to their origin in the raw data, and all used data is made available to the readers and future researchers in the data base in the digital appendix. A preliminary version of the case study report was furthermore sent to the key informant at SAP (S1) for validation.

Generalizability, or external validity, is a further challenge in case study research. "Classical" generalizability in terms of transferring findings from a single case to a larger popularity is not the approach and not the goal here. Cases in case study research are selected by theoretical sampling instead of random sampling common to other research methods. While in other methods, a sample-to-population logic can therefore be assumed, generalization should here be understood as analytical or conceptual generalization, meaning an "extraction of a more abstract level of ideas from a set of case study findings − ideas that nevertheless can pertain to newer situations other than the case(s) in the original case study" (Yin 2013, p. 325). Researchers need to connect the theory to existent literature and thereby lead to a desired cumulative knowledge (ibid.).

In the present case, the authors are aware of these limits to external validity and they are outlined in the limitation section. In chapter 5, the results are contextualized in meta-theories, and contributions to these theories and related research fields are stated in chapter 6 to add to cumulative knowledge. Yin also emphasizes that replication studies strengthen the generalizability. They are proposed for further research.

4.6 Case Introduction

The Global Partnership for Sustainable Development Data forms the context of the research phenomenon, as it is the BD4D multi-stakeholder network that the case company SAP is engaged in. It will be introduced first, followed by the introduction of the case company SAP.

4. 6. 1. Global Partnership for Sustainable Development Data

The Global Partnership for Sustainable Development Data (GPSDD) is a global multi-stakeholder network that brings together a variety of actors dedicated to using the emergence of big data analytics to achieve the Sustainable Development Goals. As of today, the GPSDD is a growing network of 300 members, including governments, the private sector, civil society, international organizations, academic institutions, foundations, statistics agencies, and other data communities (GPSDD 2018a).

The GPSDD envisions a world in which timely, accurate, and high-quality data is used to contribute to achieving and measuring sustainable development:

> "It is a world in which data is produced, organized, shared, and used in an environment of trust, inclusion, creativity, efficacy, and efficiency. It is a world in which the right data is available to

> the right people at the right time to make the right decisions for the right outcomes." (Egon Zehnder n.d.)

The GPSDD refers to three main actors: It wants to help governments to improve policy-making and service delivery, citizens and civil society groups to make better decisions and hold leaders accountable for their actions, and companies to build capacity and drive entrepreneurship and innovation. It mentions the following ways to do this:

- Strengthening inclusive data ecosystems by working with governments to develop national partnerships and driving data collaborations to achieve national priorities for change.
- Forging collective action by driving global collaboration to improve the production and use of data in critical areas.
- Communicating the value of investing in data and of multi-stakeholder collaborations on data.
- Mobilizing stakeholders to develop global data principles and protocols for sharing and leveraging privately held data.
- Bringing together multiple data communities at global and national level to spur innovation and collaboration.
- Harmonizing data specifications and architectures, and helping to ensure the interoperability of technology platforms for assembling, accessing, and using data

(GPSDD 2018b)

History

The GPSDD was launched in September 2015 by more than 70 governments, civil society groups, companies, international organizations, and expert networks worldwide. It was introduced in Addis Ababa and New York, alongside the new SDG-framework, adopted by world leaders during the 70th session of the United Nations General Assembly (GPSDD 2018c). An UN Secretary-General's Independent Expert Advisory Group had previously identified the exponential increase in volume, quality, and sources of data as a major potential driver of sustainable development, and called for the creation of the Global Partnership for Sustainable Development Data (Egon Zehnder n.d.).

Since then, more and more actors have joined the partnership. In October 2016 the GPSDD selected its first-ever Executive Director (GPSDD 2018d). In April 2018 the GPSDD reported that it had more than 300 members (GPSDD 2018a).

Working Model

The United Nations Foundation hosts the Global Partnership. A Board of Directors and a Technical Advisory Group govern the Global Partnership (GPSDD 2018d). Day-to-day operations are managed by the GPSDD Secretariat, which is directed by the GPSDD Executive Director. The GPSDD Secretariat is comprised of a small team (14 employees in May 2018) spread across the globe (GPSDD 2018e).

The Board of Director's work includes approving the direction of the GPSDD's overall strategy, its annual workplan, and budget. Additional governance responsibilities include making major policy decisions, choosing new board members or a replacement for the GPSDD Executive Director if there is a need, and contributing individually to advocacy and resource mobilization to advance the Global Partnership's mission (GPSDD 2018d). The Board of Directors is supported by a Technical Advisory Group. It provides sectoral and working-level expertise on areas including open data, statistics, citizen voices, earth observation technologies, and remote sensing (GPSDD 2018f).

Members of the GPSDD engage through a series of working groups, project-specific collaborations, and country-led data roadmaps, as well as national, regional, and global events (GPSDD 2018b).

The GPSDD receives monetary and in-kind contributions from some of its members. This includes staff time, technology, advice, and other assets. Major funding has been provided by the William and Flora Hewlett Foundation, Ford Foundation, International Development Research Centre, and World Bank, as well as the Children's Investment Fund Foundation and U.S. government, through the President's Emergency Plan for AIDS Relief and the Millennium Challenge Corporation (GPSDD 2018c).

The Global Partnership is open to all governments, international institutions, companies, and civil society groups. According to the GPSDD, it supports its members in the following way:

> "We see ourselves as conveners, connectors, and catalyzers. We facilitate our members' access to other key stakeholders to exchange best practices, learn from one another, and drive impact

> together in ways one actor would not be able to do working alone."
> (GPSDD 2018c)

Members

More than 300 members are part of the initiative. Among others, GPSDD clusters its members in the following main categories:

- academic / research institution, such as Columbia University and Strathmore Business School
- multilateral organization, such as the United Nations Development Programme
- non-governmental organization, such as the Bill & Melinda Gates Foundation
- private sector companies, such as Microsoft, SAP, and Tableau

Most members organize themselves in working groups and work on specific projects (GPSDD 2018g). Some of the members are also active in the GPSDD Board of Directors (GPSDD 2018d).

Achievements

The GPSDD points out that it has catalyzed a number of cross-sector collaborations for data-driven sustainable development and that it has elevated data issues at important national and international events (GPSDD 2018h). In July 2016 and 2017, the GPSDD launched multi-million dollar initiatives for collaborative data innovations in partnership with the World Bank (The World Bank Group 2017).

So far, the most tangible results of the GPSDD are country-led "Data Roadmaps" for sustainable development in Colombia, Ghana, Kenya, the Philippines, Senegal, Sierra Leone, Tanzania, and elsewhere (GPSDD 2018i). The roadmaps support countries at the national and sub-national levels to develop and implement multi-stakeholder data ecosystems for sustainable development. In specific, the roadmaps shall help to align existing national plans, activities, and priorities to further strengthen these data ecosystems and enable the use of real-time, dynamic, disaggregated data to achieve and monitor the Sustainable Development Goals. Next to a process for developing these roadmaps, the GPSDD has created a publicly available set of tools, methods, and resources to help countries to create and implement these roadmaps (GPSDD 2018j).

Challenges

From the beginning, the GPSDD has had a number of very active and engaged private sector partners. However, it has proven difficult to expand the range or number of private sector partners, and according to the GPSDD the relationships are in some cases dependent on the interest and engagement of a few individuals rather than commitment by the company as such (United Nations Foundation 2017). The GPSDD claims:

> "Our hypothesis is that this is at least in part because we have not succeeded in developing a compelling value proposition for the private sector, and have not yet developed the business model or models that will enable deeper engagement" (GPSDD 2017a).

The problems that the GPSDD has encountered with private sector engagement are different to those issues encountered with other types of members, which the GPSDD feels to be able to better understand (ibid.). The GPSDD Secretariat now wants to address the problem and ensure that a proven value proposition and the modes of engagement are appropriate to different types of companies, "in order to expand both the breadth and depth of private sector engagement within the Partnership" (United Nations Foundation 2017).

4. 6. 2. SAP

SAP is an international software company focusing on enterprise software which was founded and is headquartered in Baden Württemberg, Germany. It serves over 378,000 customers globally and has 88.543 employees from approximately 130 nationalities. SAP is global market leader for ERP software with a market share of 19% (Panorama Consulting Solutions 2017). SAP's operating profit in 2017 was €6.92 billion, and it had total revenues of €23.77 billion. The company's vision is to "help the world run better and improve people's lives" (SAP 2018c, SAP 2018d).

Besides ERP software, SAP provides further solutions for enterprises. Those include among others IoT and digital supply chain solutions, function specific solutions (e.g. for HR), cloud and data platforms, and solutions for business intelligence and predictive analytics (SAP 2018e).

SAP offers solutions for different industries and claims to "offer proven solutions for all […] industry-specific needs and goals" (SAP 2018f). Those industries come from the private, but also the public and social sector. They include among others service industries, financial industries and consumer industries but also health care, higher education and the public sector.

SAP Analytics

SAP Analytics is the product portfolio which allows insights into big data. In 2016, SAP held a market share of 11% in the business intelligence and analytics tools software market (Stevkovska 2017). SAP claims to support "every phase of the analytics lifecycle – from data to discovery to deployment" with its business analytics portfolio (SAP 2018g). The solutions range from business intelligence with tools for analyzing and visualizing data, dashboards and reporting to predictive analytics with predictive data modeling and management, and predictive network and link analysis. Products are available on premise and in the cloud (SAP 2018g, SAP 2018h).

SAP's Sustainability Strategy

SAP aims at pursuing sustainability through enhancement of internal operations and CSR initiatives, and through incorporating sustainability into the core business in a "sustainable strategy" (SAP 2017a). Since 2013, SAP has a routine to publish annual company results in an integrated report including measures on financial, social and environmental performance and connecting financial and non-financial indicators in a connectivity analysis, instead of partitioning the report into financial results and an additional sustainability report (SAP 2018d).

On the company website, SAP describes the aim of the sustainable strategy like this:

> "Instead of treating sustainability as a single project or department, we integrate sustainability into our core business by embedding sustainability throughout our organization. One of our goals is to show how sustainability both aligns with our business objectives and benefits our bottom line" (SAP 2018i).

While a dedicated CSR department is responsible for topics like corporate volunteering and donations, and departments like "health" and "diversity" implement topic specific programs, the sustainability department at SAP is in charge of embedding sustainability into the corporate strategy and promoting new sustainability initiatives across the organization (SAP 2018d).

Sustainability projects within SAP are sometimes, but not necessarily, initiated by the sustainability department. Projects can be initiated by others through their primary roles, or in

collaboration with the sustainability department (I1[34]). The sustainability department often sees itself as adopting an "umbrella function" by consolidating sustainability efforts under a common roof and connecting the dots in two ways: between single initiatives and SAP's overall strategy, and between employees who work on similar topics or projects, or could otherwise benefit from collaborating (ibid.).

Adopting a holistic view on sustainability in the three dimensions "ecological", "economical", and "social", the sustainability department aims to drive initiatives which make SAP an enabler and an exemplar of sustainability (Mueller 2017). The exemplar role is directed towards internal operations and includes for example the goal to achieve carbon neutrality by 2025, or the achievement of raising the amount of recycled e-waste by 25% in 2017 (SAP 2018j).

In the role of an "enabler", SAP enables its customers through software solutions to run more sustainable companies, by for example supporting them in "saving energy and resources, keeping toxic chemicals out of a child's toy or reducing factory accidents" (SAP 2018k). The potential impact that the enabler role can have is described by one interview partner: "My favorite example is that if we help BASF to reduce their four megatons of transport-related emissions by 5%, I do not care if the developer comes to work walking, by bike or by car" (I3).

Since 2015, SAP is orienting its sustainable strategy towards the United Nations agenda of the SDGs. With a blog series published in 2015 and a resultant webbook, SAP evaluated the opportunities that new technologies in general and SAP's software in specific can have for each of the Sustainable Development Goals (SAP 2018a). One interview partner states that the SDGs are increasingly adopted as a guideline for sustainability strategies by SAP's customers, the orientation toward the SDGs can also be regarded as one way of combining sustainability with SAP's core business (I3).

[3] This subchapter was based on publicly available sources to the highest extent possible. Where relevant details, e.g. about the internal structure of sustainability operations at SAP, were described by interviewees and could not be found in external sources, interview content was already cited in this part. This information is purely descriptive and should be regarded as the general basis for the research. It does not anticipate neither forms a part of the results of this research.

[4] When citing from interviews, the sources will in the following be referred to as I1-I7 for interviews 1 to 7. Respective interview details can be found in table 3. The interview transcripts can be found in the digital data base in the folder for primary data.

5. FINDINGS AND ANALYSIS

With reference to the two-fold research question and the respective theoretical framing, the results are divided up into two interrelated parts as shown in figure 5.

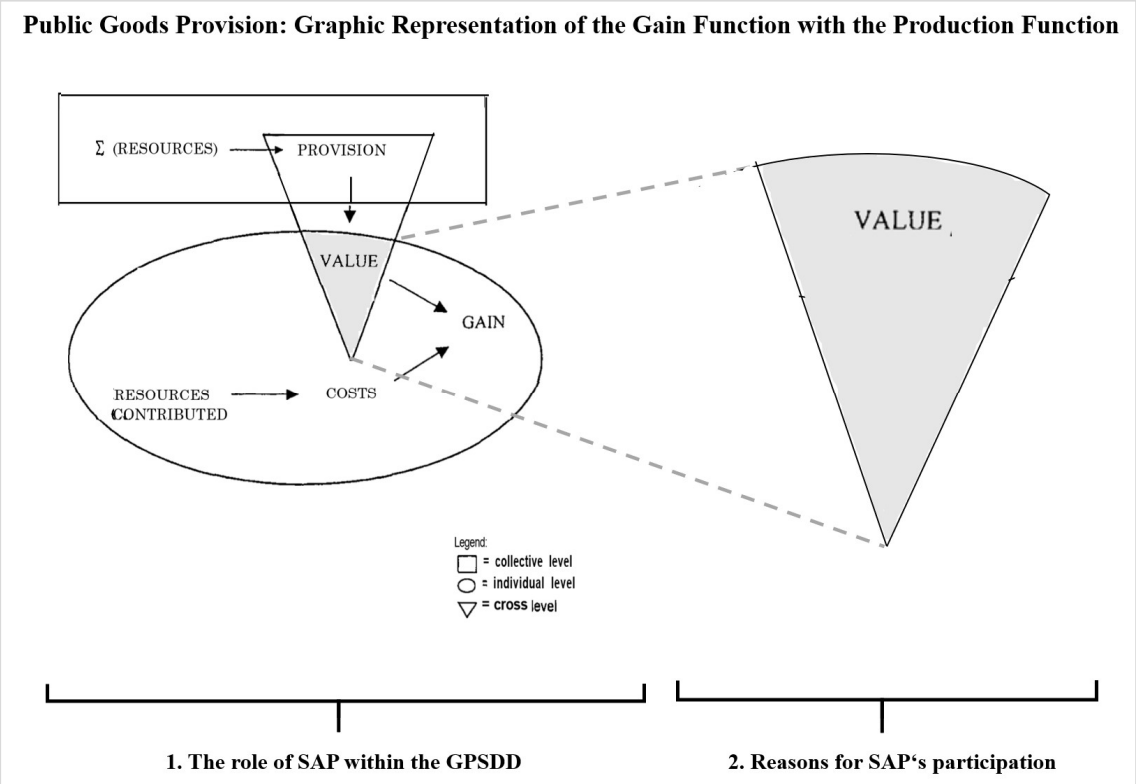

Figure 5: Relatedness of Theories and Results (based on Monge et al. 1998; Marwell & Oliver 1993)

The first part of this chapter focuses on collective action within the GPSDD. Directed at addressing the first part of this thesis' research question "through the lens of collective action theory, how can the role of multinational IT corporations in big data for development multi-stakeholder networks be described?", the characteristics of the four key factors affecting collective action are described, and the role of IT MNCs in the GPSDD is investigated through a descriptive analysis at the macro-level. Through a deductive analysis of interviews with the GPSDD Secretariat, secondary material on the GPSDD, and a field-trip to the Data for Development Festival, first conclusions are drawn on the general role of IT MNCs for the GPSDD.

The next subchapter addresses both parts of this thesis' research question by exploratorily analyzing SAP's engagement in the GPSDD on a company level. Through this process, the analysis of SAP's role within the partnership is complemented by a micro-level perspective. Including interviews with SAP employees engaged in the GPSDD as well as secondary material on SAP's strategy and GPSDD engagement, further conclusions on SAP's role within the GPSDD are drawn and contextualized with existing theory. Special emphasis is put on the individual value for SAP derived from the participation in the collective action, and the respective motivations to take part in it. The descriptive results from the first part are then complemented by the exploratory findings and further general conclusions are drawn.

5.1 Collective Action within the GPSDD

The key factors affecting the collective action in the GPSDD are described according to Monge et al.'s framework (1998). Special emphasis is put on the role of IT MNCs. The description is based on interviews with the Executive Director of the GPSDD and the Community Engagement Manager, a three-day field trip to an international data festival held by the initiative, secondary material on the GPSDD website, and other press releases referring to the GPSDD. The results are then contextualized.

5. 1. 1. Description

Goods

Monge et al. (1998) define connectivity and communality as public goods of alliance-based ICI systems. In the case of the GPSDD, a different definition is necessary.

Similarities are apparent between the integrated model for alliance-based ICI systems and the collective action phenomenon observed in this thesis. In both scenarios, the public good is achieved through digital infrastructure and the sharing of data and information. Also, the quality of the product is affected by the accessible pool of information. And among the public goods considered by members of the GPSDD are indeed alliance-based ICI systems (GPSDD 2017a) like the systems discussed by Monge et al. (1998). Monge et al.'s proposed integrated model is therefore a valuable resource for describing the phenomenon of this thesis.

It is important to point out though that the public goods that shall be achieved through the GPSDD are framed as more holistic goals and are not limited to alliance-based ICI systems. In general, the collective efforts of the GPSDD are rather aimed at building the groundwork

for a more reliable and sophisticated data ecosystem (GPSDD 2018h). The main collective efforts can be clustered into three pillars. The associated public good is discussed after the explanation of the collective efforts.

1. Global Community for Data Ecosystems

The GPSDD Executive Director states

> "The first objective is building up the data ecosystem. And by that we mean the sense of community and around the joint endeavor that we are all involved in. Getting some of the very different players [together], building a community of people who need to work together now if we bring together all the different data resources [...] in a coherent way to achieve the SDGs. […] And what we're trying to do, building up not just a place as a functional place, but as a place for people from different organizations to connect, but also helping to build a community of trust, with shared goals and understanding what we are trying to do" (W9[5]).

One of the main collective efforts of the GPSDD is the creation of so called "data roadmaps" to support countries at national and sub-national levels to develop multi-stakeholder data ecosystems for sustainable development (GPSDD 2018i). The data roadmap is not clearly defined by the GPSDD but can best be understood as an action plan with short and long-term goals for addressing specific data needs and priorities with regard to the implementation of SDGs. It is part of an iterative and adaptive planning process based on experiences and implementation models from partner countries (GPSDD 2017a). The partnership has jointly developed frameworks for data roadmap processes that help to align existing national plans, activities, and priorities to strengthen data ecosystems (ibid.). The goal of these data roadmaps is to support governments to enable the use of real-time, dynamic, disaggregated data to achieve and monitor the SDGs, bridge data gaps, and improve capacities to generate, share, and use data (ibid.). A long-term goal can include the set-up of alliance-based ICI systems. An example of a data roadmap is provided in the data base.

To help countries not only on a strategic, but also on an operational level, a variety of cross-sector GPSDD members have developed a toolbox with different modules that provide information on tools, methods, and good practices on how to implement the data roadmaps, including hands-on help with statistics for planning and monitoring as well as institutional, policy, regulatory, and capacity-building aspects. The GPSDD itself refers to the toolbox as

[5] When citing from workshops at the Data for Development Festival, the sources will in the following be referred to as W1-W9 for workshops 1 to 9. Respective workshop details can be found in table 4. The audio files can be found in the digital database.

a “public good” (GPSDD 2018k). Examples of modules included in the toolbox are provided in the data base.

Since the introduction, data roadmaps have been created with Colombia, Ghana, Kenya, the Philippines, Senegal, Sierra Leone and Tanzania. The implementation is ongoing. In a report on the progress, the overall evaluation of the data roadmap project is positive. Based on cumulative country feedback, the GPSDD makes recommendations for some refinement. Among other things, it states that more support from the GPSDD Secretariat is needed and that it is necessary to work more closely with each country and identify priority areas for further support before scaling the project towards other countries (GPSDD 2017a).

To support the implementation of data roadmaps, the GPSDD offers practical support for developers. The GPSDD has realized that its diverse members have many valuable data sets that could support the implementation and measurement of the SDGs, but that for a single actor it is often difficult to find the right data sets in a developer-friendly format. The GPSDD therefore considers itself to be in the role of a neutral data broker across sectors, supporting interoperability (GPSDD 2017b). In 2017, a beta version of the new project “API Highways” was launched to provide easy access to SDG-relevant data and further empower the developer community to use the data. The API highways project consolidates data through a standard API and lets others build on top of the infrastructure (ibid.). Since the introduction of the API Highways project, the GPSDD was able to gather valuable data from NGOs and multilateral organizations but has encountered problems when trying to enrich existing open data with data from the private sector. The Executive Director states commercial and regulatory barriers:

> “There is a commercial barrier in that we have to understand the commercial side of a company […] even if companies did want to share some of their data under specific circumstances in front of the legal framework in any particular country [...] so I think that, you know, the one thing that has come out of the partnership is we find out in the conversation about data sharing that it is a very very difficult conversation to have” (I4).

2. Entrepreneurship and Innovation

The GPSDD supports innovative collaborations for data production, dissemination, and use. Next to the general discussion around strategies for national data ecosystems and practical help for developers, different working groups work on relevant subtopics (GPSDD 2018h): For example, one working group aims to increase confidence in citizen-generated data for sustainable development and to enhance the ability of governments to use this data. Another

working group focuses on solutions to access and use data drawn from earth observation technologies and remote sensing technologies to protect the environment. In addition to that, the GPSDD has set up a multi-million dollar fund in partnership with the World Bank to support small-scale innovative collaborations that take place in or benefit low-income and lower middle-income countries (The World Bank Group 2017).

Next to the collaborations in working groups, many specific projects have been initiated by GPSDD members that usually only include a few members, and address specific challenges and opportunities encountered in the work with data roadmaps. These projects are undertaken in small- to medium-scale units (I4). The GPSDD is eager to represent the activities of its members in the area of entrepreneurship and innovation as well as to show best practices and connect them with other actors for whom new and innovative solutions might be useful.

The GPSDD Executive Director states:

> "The second thing is to create the pipe work, I sometimes describe it, that can help to connect up demand and supply within that data ecosystem in a much more efficient way. [...] Connecting up the very different worlds not just for relationship building but for achieving very specific practical outcomes together. So where a government has a particular need for a specific kind of data to improve its agricultural productivity, for example, we are able to help as you have seen today with the launch of the African Regional Data Cube. We help to broker these relationships that can actually give those governments what they told us they need" (W9).

The African Regional Data Cube, which the Executive Director refers to as an example for entrepreneurship and innovation within the partnership, is a free and publicly available tool that uses earth observation and satellite technology to help Kenya, Senegal, Sierra Leone, Ghana, and Tanzania address food security and issues related to agriculture, deforestation, and water access (Magan 2018). It was developed by The Committee on Earth Observation Satellite (CEOS) in partnership with the Group on Earth Observations, Amazon Web Services, and Strathmore University in Kenya. It was launched at the GPSDD Data for Development Festival 2018 (W2). There are many other examples of specific projects that have been brokered through the GPSDD (W1; W3; W5; W6). Projects that included SAP are discussed in detail in chapter 5.2.

3. Political Advocacy for Data

Addressing the members of the partnership, the GPSDD Executive Director states:

> "We see ourselves as the voice for data. And there are many others here in this room and at this festival who are deeply concerned with data and advocate for it. But that's the only thing we do. That's the sole function of the partnership, to focus on data. […] I hope we are able to advocate

> and amplify messages that are coming from all of you because you focus on the need to increase funding for data, or the need to improve the institutional or regulatory framework for data in your various areas and in your various sectors and I hope that we are able to advocate that and make a case for the importance of investing in data and setting up the right frameworks and systems for data as part of a critical infrastructure to achieve the Sustainable Development Goals" (W9).

Practical examples of data advocacy include workshops with the governments of Colombia, Ghana, Kenya, the Philippines, Senegal, Sierra Leone and Tanzania to identify the potential of better data ecosystems through the setup of data roadmaps (GPSDD 2018i). Also, the GPSDD tries to build up data literacy by encouraging and empowering local NGOs to use and teach technology (W3; W7). The political advocacy for data is understood as a prerequisite to get a variety of actors engaged in the GPSDD projects (ibid.).

Public Good and Collective Benefits

From the collective efforts described above, one major public good arises: more and better data (analytics) for sustainable development.

All three collective efforts aim to achieve this overall goal, which is understood as a means for better informed decision making, and a prerequisite for more efficient and successful sustainable development (I4). The output can be characterized as a public good because the actors who have not contributed to this emerging data cannot be excluded from it, and because an actor's consumption of the good does not lead to subtraction from any other actor's consumption of the good: The data that emerges from the data roadmaps is made available to everyone within and outside of the GPSDD. Also, the developed knowledge in the analysis, planning and implementation of strategies for more robust data ecosystems are made available to everyone inside the GPSDD and outside (GPSDD 2018k, 2018l) via reports and frameworks. It is therefore not necessary for an actor to contribute to the GPSDD in order to profit from its major outputs.

Next to the overall public good, collective benefits arise exclusively for members of the partnership. These benefits include the belonging to a community based on trust and shared goals, relationship building as well as knowledge of and potential participation in innovative GPSDD projects, and the chance to shape the discourse around political advocacy for data (I4; I6).

Participants

The GPSDD consists of more than 300 members as well as potential partners with very different interests, costs and resources attributed to the collective action. The actors include governments, the private sector, civil society, international organizations, academic institutions, foundations, statistics agencies, and other data communities (GPSDD 2018a).

According to the GPSDD Executive Director, the variety of stakeholders involved in the partnership is unique:

> "The thing that differentiates us from other partners in the data, other partnerships in the data sector, is that we, again, really try to be an umbrella organization for a very wide range of stakeholders" (I4).

Interests

As a result of the variety of actors involved in the GPSDD, the interest heterogeneity within the group is very high, both on an organizational and on an individual level (I4). Due to the complexity of the member group, it is impossible to identify all relevant interests of all the involved actors in this study. Instead, a basic overview on major interests will be given based on information and perception provided by the GPSDD Secretariat. In addition, the most pressing challenges in understanding and managing interests that have been pointed out by the GPSDD Secretariat will be presented.

One major pillar of interest is more efficient work towards sustainable development through better informed decision-making: Given their mission and purpose, multilateral and non-governmental organizations such as Unicef, Plan International, and a variety of UN agencies are especially interested in achieving the public good of sustainable development itself, as well as respective academic institutes (W1; W2; W7; W9).

According to the GPSDD, participating governments, and especially the national statistical offices, also express their interest in understanding the opportunities of data and creating data ecosystems to increase knowledge and make better informed decisions, because they often do not have the necessary resources on their own (I6). In addition, the GPSDD engages in political advocacy for data to strengthen the collaboration with governments and build up capacities on a national level (I4). The interest within governments varies a lot and cannot easily be generalized (W1; W2; W4; W8).

The GPSDD points out that new advances in big data analytics allow for more voices within the civil society to be heard. The GPSDD Executive Director explains that it is for example in the major interest of people living in poverty to be heard, since they can only be helped when they are counted in national statistics in the first place (I4). As of today, this is often not the case: In the planning of data roadmaps, data gaps are frequently identified that result in subgroups of civil society not being included in the census of development countries (W1; GPSDD 2017a).

For the private sector, it is necessary to distinguish between different types of actors: For some smaller companies whose core business model is around big data and sustainable development, the GPSDD Executive Director acknowledges that taking part in the initiative can be directly associated with sales opportunities (I4). For example, there are companies that make money by collecting and selling citizen generated data from areas with high poverty and crime rates. By doing so, they enrich the data sets of national statistical offices with data that would otherwise not be collected (W1).

For multinational IT companies the interests are less clear and not understood as well by the initiative. The Executive Director of the GPSDD states this situation as a main challenge:

> "I am not sure that we are yet managing to really quite get it right in terms of finding where we can be most useful to the private sector and where private sector engagement can be made most useful to other stakeholders within the partnership […] I think we need to think about what it is that we can offer companies […] And I think, what we need to do, I think, is to sit down with our most active members and really work out with them in a much more [...] grained way what is it that they want to get out of the relationship with us. And how can we help them to do that. And I imagine this will be quite different to this companies so we really need to sit down and put the time in to do that and understand their needs a bit better" (I4).

As this problem statement is directly associated with the research question of this thesis, a thorough analysis will be provided after the initial overview on the collective action phenomenon.

Costs

There are no initial set-up costs or membership fees for an organization that wants to join the initiative. The Executive Director explains:

> "we deliberately make it a strategy to have very low barriers to entry, so it's quite easy to join the partnership. And our approach is being more to get people in as easily and quickly as possible and then for that begin the conversation about what they are going to do" (I4).

It is up to every member of the partnership whether to get involved in a collective effort, and to which degree (ibid.). As a result, there are no fixed costs for the members involved in the partnership, but there is a high variation in variable costs that these members must bear when they participate in collective efforts.

Depending on the individual time and resources spent, the collective action can become very costly for each actor. An example is the GPSDD data roadmaps project for more robust data ecosystems: The production and implementation of these data roadmaps can require high start-up costs, such as agreeing on a plan, setting up systems and learning how to use them. Depending on the background and the degree of involvement, costs may vary between actors. Also, recurring costs will occur since the data roadmaps are considered a dynamic process that requires continuous contributions, for example in the optimization of digital infrastructure, more reliable data production, and better data analytics. Given the different nature of the actors and the varying degree of involvement, costs are different for each participant in these projects (GPSDD 2017a).

Some projects that have been initiated through the GPSDD highly rely on public funding, such as the data roadmaps (GPSDD 2017a), whereas the costs of other projects are mainly borne by partners from the private sector (I2). Hybrid financing models are the usual operating model for projects within the GPSDD and it is the partnership's goal to increase this approach (I4). Examples will be provided in the next subchapter.

An exception to the focus on variable costs are the fixed costs that arise for the GPSDD Secretariat due to operating costs for the daily business, including for example its employees and the execution of international events. The core funding to cover these costs has been presented in chapter 4.6.1. For major events such as the GPSDD Data for Development Festival the partnership relies on further sponsorship from its members. One of the major contributors for the conference in 2018 was the IT MNC Tableau (W1).

Another exception where both fix costs and variable costs are not borne by the members that take part in the specific project, is an innovation fund within the GPSDD (The World Bank Group 2017). A minority of projects within the GPSDD are financially supported through this fund. The fund particularly addresses the needs of local NGO collectives for financial resources. The collaborations must take place in or benefit low-income and lower middle-income countries and are directed towards sustainable development generally and linked to the SDGs in particular.

Resources

There is a high resource heterogeneity across the partners. In the GPSDD, the most interdisciplinary projects covering all topics of sustainable development are jointly delivered by multilateral organizations, non-governmental organizations, and research institutions, both on a local and on an international lens (GPSDD 2018h). The resources contributed thereby range from sharing of relevant data, over financial funding for new innovations, to the implementation of projects executed by local NGOs (ibid.). In these cases, civil society is a crucial resource to both empower homegrown expertise in technology and fill current data gaps through citizen generated data (W1; W9).

Governments can as well provide resources such as financial funding and intellectual resources in form of their statistical offices. But the GPSDD Community Engagement Manager explains:

> "[National statistical offices] are understaffed, don't have the necessary capacities and sometimes they get access to knowledge, they process millions of data points, they are the ones that are in charge of census. They are the ones that are contributing to measuring the SDGs and to use the data to put these policies in place. And they are overworked, right, and it's complicated" (I6).

As the private sector is producing an increasingly high amount of data, private sector data is considered a valuable resource as well. In addition, the Executive Director points out the unique capabilities and complementary data expertise of some companies within the partnership:

> "So I think there is this whole area there, sort of the private sector providing the tools that will allow them [other actors in the GPSDD] to make much more use of their data, that's really important" (I4).

> "there are lots of things going on inside the private sector around their usage of data for their own management systems, information systems, and for their own performance management and effectiveness and I think there are many ways [...] [we] could learn about how the private sector is using data and how they integrate [...] [that] into that systems [...] and I think that will give many people in the public sector a wakeup call to start to see that and understand the benefits" (ibid.).

Since the creation of public goods such as the data roadmaps requires an extensive amount of data sharing and commitments from various cross-sector partners, the GPSDD realizes that the decision to contribute resources depends not only on intrinsic motives but also on dimensions such as external confidence and trust, which was pointed out by the GPSDD Executive

Director (I4) as one of the main success factors for establishing a functioning BD4D multi-stakeholder network. To create a perception that new ways of producing and analyzing data are secure, to establish trust among the partners, and to identify potential key collaborators inside and outside the partnership, the GPSDD is using its Board of Directors and Technology Advisory Group as another resource that oversees the actions within the partnership and represents it to the outside (GPSDD 2018d, 2018f).

Group

The GPSDD Executive Director names the GPSDD's mission and concept as a reason why the collective group of participants is characterized by a very high degree of resource and interest heterogeneity:

> "The thing that differentiates us from other partners in the data, other partnerships in the data sector, is that we really try to be an umbrella organization for a very wide range of stakeholders" (I4).

> "We straddle all the SDGs because of course if the government puts in place a data infrastructure as part of the strengthening of the national statistical system, that's going to have benefits across all areas of government policy" (ibid.).

Because of the variety of projects and the voluntariness that characterizes potential participation in these projects, not all members of the GPSDD have interdependent tasks. The GPSDD Community Engagement Manager states his impression that nevertheless members of the GPSDD develop a belief that they belong to a collective whose members rely on each other's action:

> "I think that when civil society, governments, and all these different stakeholders sit on the table and collaborate […] I think it changes how they act when everyone is sitting at the table and has the same kind of importance. Which is one of the things we try to do in the partnership" (I6).

Getting all the members on the table is a challenge since the members of the GPSDD are geographically dispersed: Many actors act on different national, regional, or local levels, and only a few actors have an international footprint (GPSDD 2018g). Examples are multilateral organizations and multinational companies. The GPSDD Executive Director (I4) considers international conferences such as the GPSDD Data for Development Festival an important opportunity to overcome the challenges of geographic dispersion and develop the feeling of each GPSDD member that they belong to a collective.

The geographical dispersion and the varying degree of task interdependence lead to the result that the contributions of an actor's resources towards the good are not always visible and noticeable. The GPSDD admits: "Like many networks, the majority of these interactions have sometimes taken place behind closed doors, physical and virtual" (GPSDD 2018h).

To counteract, the GPSDD offers a new platform on its website to represent the activities of its members to attract input, resources, and partners, while offering regular updates about progress (GPSDD 2018h). It is up to every actor if and when contributions are made (I4).

Action Processes

Within the GPSDD, collective action contributions do not take place independently. The Secretariat is responsible for the coordination across the potentially contributing actors and makes actors within and outside of the partnership aware of the actions of its active members (I6). The quality and character of that communication differs depending on the three pillars of public good provision. For the broader GPSDD projects, the data roadmaps and the API highways, there are clearly structured processes in place and there is much information available (GPSDD 2018h, 2018l). Smaller projects, on the other hand, are often initiated by members of the GPSDD, but not through the GPSDD Secretariat. The Executive Director states that the GPSDD embraces these projects but does not act as an initiator:

> "that has really taken place through the initiative of individual partners within that group and we relied on them to express an interest" (I4).

To foster the dialogue among its members, the GPSDD holds national as well as international conferences (I4). Also, a platform is put in place on the website which serves as a digital marketplace in which initiatives that look for additional partners can be posted (GPSDD 2018h). In addition, the GPSDD has developed a community manager position to support the partners' needs, challenges, and engagement (I6).

As a result, the centrality within the network is rather high while the density is rather low. The proportion of organizations in the network to which an organization is directly connected relies on the digital marketplace and how the GPSDD Secretariat, as the central organ, is brokering potential partnerships that may lead to meaningful collaborations. The GPSDD Secretariat, and its Board of Directors and Technical Advisory Group, thereby identify themselves as the leaders of the collective action that mobilize and catalyze change (I4; W9). While the GPSDD in its leadership function especially embraces its large-scale projects,

smaller scale projects mainly arise within the partnership through bottom-up processes. This is in line with Ostrom's (2010) suggestion that polycentric approaches are an encouraging way to achieve benefits at multiple scales and allow for experimentation and learning.

5. 1. 2. Contextualization and Implications

The GPSDD is a collective action phenomenon that is in line with a number of Olson's (1965) basic propositions described in chapter 3.1.1, but neglects others. In addition, the existing theory on collective action in information systems serves as guidance for understanding the key factors affecting BD4D multi-stakeholder networks and assessing the role of multinational IT corporations within this context.

In line with Olson's rules of thumb, the late emergence of the GPSDD and other BD4D multi-stakeholder networks supports the claim that heterogeneous groups are less apt to form than homogeneous groups, and that a large group size is considered to be an obstacle for the formation of the group. Whereas the GPSDD was only launched in 2015, examples of collective action in complex homogeneous IOIS collaborations with multiple companies (e.g. Johnston & Vitale 1988) as well as small-scale heterogeneous collaborations between IT companies and actors in the sustainable development space (e.g. Selsky & Parker 2005) were present long before.

Olson's institutional recommendations which were presented more than 50 years ago are still discussed and relevant for the GPSDD. The GPSDD continuously tries to foster collection action by the institutional design through its Secretariat, as presented in chapter 5.1.1. This central leadership role within the partnership helps to achieve collective efforts. In addition, the GPSDD has realized that it needs to better understand the varying needs of its individual members, especially from the private sector. It investigates how companies can be better incentivized to take part in the initiative (United Nations Foundation 2017).

Not all propositions are in line with the findings. Neither a negative correlation between the group size and the collective provision level, nor a negative correlation between the group size and the efficiency associated with individual uncoordinated behavior could be observed from the GPSDD Secretariat (W1; W9). Also, the richest group members are not always the ones who contribute the most (United Nations Foundation 2017).

The case of the GPSDD supports Reuver at al.'s (2015) and Medaglia et al.'s (2017) point that the interplay of different actors in a collective action scenario changes over time,

especially since technology is changing the world faster than ever before. The GPSDD leadership recognizes the trend of declining resources spent by the private sector and tries to adjust towards it by better understanding the interests of companies involved in the initiative, and as a result considers making changes towards its value proposition and governance model.

Macro-Level: The Role of IT MNCs within the GPSDD

The presented key factors affecting collective action within the GPSDD allow to draw conclusions on the role of multinational IT companies on the collective level of the partnership. It becomes clear that IT MNCs are an essential group of actors, and that their participation within the collective is necessary for the public good provision that the GPSDD is thriving for.

The GPSDD Secretariat mainly names the relevant resources of IT MNCs as a reason why they consider the participation of IT MNCs a crucial success factor. According to GPSDD interviewees, IT MNCs have unique intangible resources that include privately collected relevant data on the SDGs, very high data expertise, and operational expertise. Unique tangible resources are financial resources and unrivaled proprietary software (I4; I6). Both the unique tangible and intangible resources are considered by the GPSDD as complementary to the resources of other members within the partnership (I4). The analysis above has shown that the private sector's resources alone are not enough for achieving the intended public goods, but they are a necessary part.

Because of their resources and expertise, the GPSDD states that IT MNCs have been identified as key collaborators in several projects (I4; W2; W6; W7). An example is the African Regional Data Cube that was voluntarily co-developed by Amazon. In the project, Amazon offered its Amazon Web Services solutions as a critical complementary resource for hosting and visualizing the information that was gathered and analyzed by other actors involved in the projects (W2). More project examples are presented in more detail in the next chapter. Having key collaborators in a collective action setting is of high importance according to Monge et al. (1998), who state that other members are more likely to participate in collective efforts when key collaborators contribute as well.

In addition, the unique resources of IT MNCs raise the degree of resource heterogeneity within the collective action group. Since the GPSDD considers the mean level of resources

in the collective rather low (W7; W9), the heterogeneity is expected to facilitate collective action (Oliver 1993).

While the value of the resources of IT MNCs and their critical role for the provision of the public goods are clearly stated by the GPSDD Secretariat, the interests of IT MNCs in the participation in the GPSDD are not understood (I4). And despite their relevance for collective action in the GPSDD, the GPSDD Secretariat finds it difficult to expand the number of private sector partners, and states that the relationships are in some cases dependent on the interest and engagement of a few individual employees rather than a commitment by the company as a whole (United Nations Foundation 2017). Given the unique role and the overall relevance of IT MNCs for the GPSDD on the collective level, understanding the interests and motivations of participating IT MNCs is critical to fully understand the role of IT MNCs in the partnership. Therefore, in the following subchapter the results of the authors' explorative investigation into the interests and motivations of multinational IT companies are presented.

5.2 SAP's Engagement in the GPSDD

The following chapter explores SAP's engagement in the Global Partnership for Sustainable Development Data. The chronological sequence of internal events and events of SAP's engagement within the partnership is considered and the responsibilities taken by different teams inside SAP are outlined. SAP's engagement within the GPSDD is investigated in general and in specific individual projects.

Motivations for SAP to take part in the GPSDD stated by different engaged employees are subsequently explored and challenges that arose during the engagement are outlined.

The data was first explored inductively with the intent to leave aside theoretical considerations. In chapter 5.2.3, the theories of collective action and shared value are additionally applied where considered useful, to contextualize the insights gained through the results of the inductive analysis and contribute to theory.

For this chapter, mostly interviews with SAP employees complemented by interviews with GPSDD employees were used. Information retrieved from SAP's website, the GPSDD's website and external articles were in some cases added, both to include new knowledge and to triangulate existing information.

5. 2. 1. Processes: Timeline of the Engagement and Involvement in the GPSDD

SAP's engagement in the Global Partnership for Sustainable Development Data was initialized by one employee from the SAP analytics department. The sustainability department and further employees from the SAP analytics side were involved later. These two teams, employees from SAP analytics and employees from the sustainability department, are the most important players within SAP for the engagement in the GPSDD. They are in the following referred to as A1, A2 and A3 (SAP analytics) and S1 and S2 (SAP sustainability).

First, the chronological sequence of events during the engagement is outlined. A timeline with the milestones of SAP's engagement in the GPSDD, featuring important events that happened within SAP, and in the collaboration of SAP and the GPSDD, gives a first overview. The process will then be examined in detail and the respective responsibilities of each team will be explained.

In the second part, the involvement of SAP in the partnership with regard to the three pillars of public goods will be explored in more detail. SAP's participation in various projects with other members of the GPSDD is thereby specifically emphasized.

Timeline of the Engagement

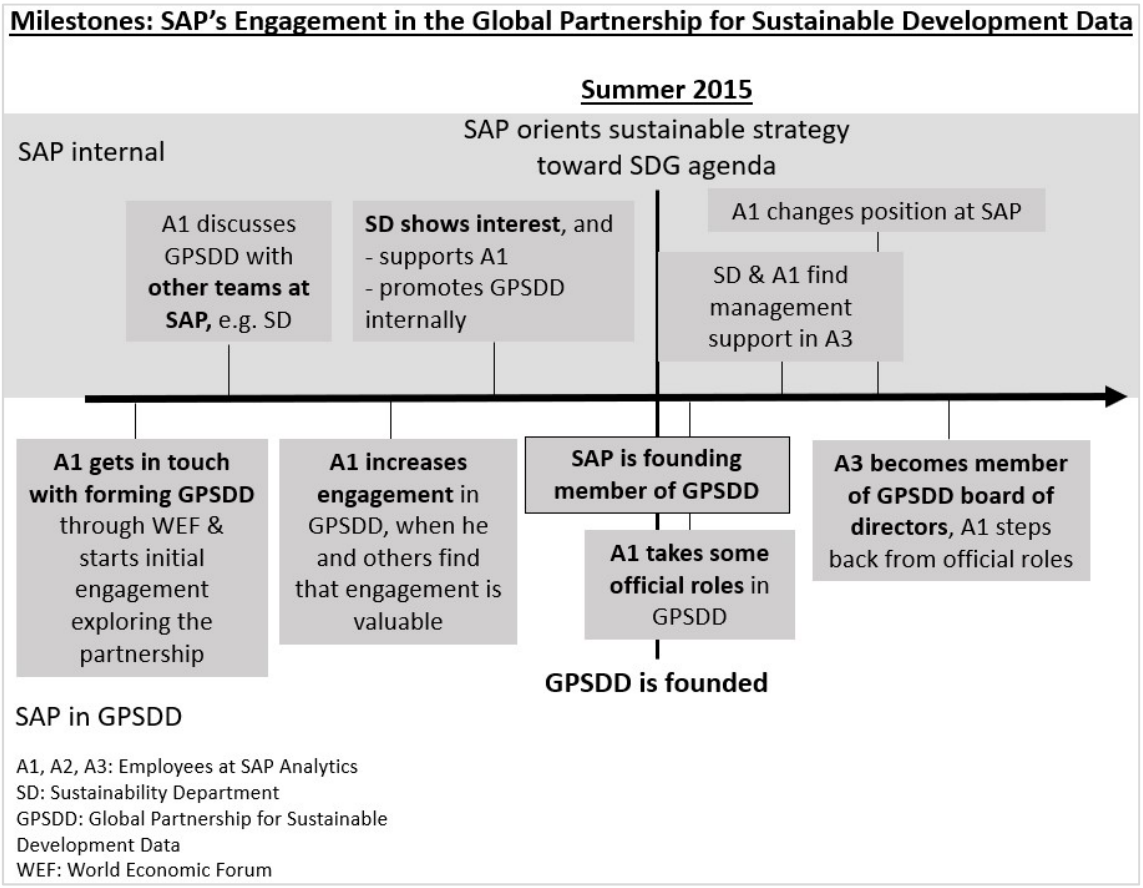

Figure 6: Milestones of SAP's Engagement in the GPSDD (internal and external), (sources: I1, I2, I3, I5; GPSDD 2018c, GPSDD 2018d, SAP News 2015)

One employee at SAP analytics (A1) first got in touch with the still forming Global Partnership for Sustainable Development Data at the World Economic Forum (WEF). He had joined the WEF as part of his engagement in a project called "Barcode of Life", which leverages big data and societal support for protection of biodiversity. At that time, his role at SAP was connected to innovations in big data, so the partnership seemed like an interesting opportunity:

> "I was involved in big data initiatives specifically, leading and incubating new big data initiatives and ideas and so the Global Partnership was an interesting sort of opportunity for SAP" (I2).

A1 states a two-fold motivation for his interest in the partnership:

> "So, when I was looking at the Global Partnership I thought that this was a great opportunity for us to one, find some big data project that might have some business value to SAP but at the same time make a positive difference for the world" (I2).

A1 is described as being interested in sustainability in general by colleagues (I3). As it was still unclear what the partnership would be about in the end, A1 joined some initial meetings held by the GPSDD – on what the partnership should do, how it should be formed and who the players should be – to get a clearer picture of the initiative (I2; I4). He did hold back his effort a bit in the beginning though, as he "was looking to make sure that there were other groups within SAP that saw some value in this effort, you know before we put a lot of effort into it" (I2). After having a broad idea about what the partnership would look like, A1 found that it did indeed hold some potential and therefore started conversations with other teams within SAP, namely the sustainability team, the public sector industries team, and the data analytics and big data organization (I2). All teams saw potential in the initiative for different reasons, and A1 was encouraged to strengthen his engagement in the partnership. Among others, A1 could in these internal conversations convince A2 to support the engagement from a higher management side. A2 could, due to a change of his job position, not maintain this role in the engagement for very long though (I1).

Furthermore, especially the sustainability department saw the partnership as a good way to combine societal value with SAP's core business and started a close collaboration with A1 on the engagement in the GPSDD (I1, I2, I3). While employees from SAP analytics continued to engage directly with the partnership – also due to the fact that employees from the analytics side hold the necessary technical knowledge (I1) – the sustainability department adopted a supportive and strategic role inside SAP, e.g. by connecting the right people and further promoting the partnership internally and partly externally.

An overview of the tasks that are assumed by both teams can be found in the next table.

Members of SAP analytics Area (directly involved with GPSDD)	Members of SAP Sustainability Department (not directly involved with GPSDD)
Directly involved with the GPSDD through official roles	Contextualizing the GPSDD engagement in the overall SAP sustainable strategy, especially with the orientation toward the SDG framework
Directly involved in the GPSDD through innovating and executing projects	Connecting people inside SAP who could benefit from collaboration in or conversation about the GPSDD
Involving other people and teams within SAP in the GPSDD engagement	Managing internal SDG network, and organizing regular calls for employees involved in SDG related projects/ interested in SDGs to - report on current project status - discuss SDG focus topics - connect people and projects
Participating in SDG network calls	Looking for local SAP employees who could join GPSDD meetings in different locations
Promoting the GPSDD internally (and partly externally)	
Searched for management support, and suitable person to represent SAP in the GPSDD Board of Directors	
Stay in regular exchange with each other	

Table 5: Responsibilities of SAP Teams in the GPSDD Engagement (sources: I1; I2; I3; I4; I5; SAP 2018a)

The GPSDD was officially launched in September 28, 2015, with SAP being a founding member of the partnership (I2; Eventbrite 2015; SAP News 2015). The launch happened alongside the adoption of the new United Nations SDG framework during the 70th session of the United Nations General Assembly (GPSDD 2018c). At the same time, SAP started orienting its sustainable strategy toward the SDG framework, beginning with a blog series on technology's and SAP's contribution to each of the 17 SDGs (I1; e.g. Digitalist Magazine SAP 2016), which also mentioned the engagement in the GPSDD as one example of the contributions.

After the launch, A1 adopted some official roles within the partnership. He was SAP's representative in the steering committee of the GPSDD which was set up to "to make decisions on how it [the GPSDD] would be shaped" (I2). A1 had this role for 1,5 years. He also co-chaired the data collaboratives working group for the first year. As the reasoning behind it, A1 states that he "jumped into a number of roles, just to really understand what's going on and make sure SAP is present, aware of opportunities that come along" (I2).

As time progressed, and approximately at the same time of a change of job position within SAP to the higher management role in thought leadership markets, A1 stepped back from his official roles in the partnership. Instead, he worked together with the sustainability

department on getting A3, who has a higher management position in SAP analytics, into the Board of Directors at the GPSDD. As of now, A1 is still engaged in the GPSDD but left all official roles. He still has conversations with different people in the partnership to understand project opportunities and participates in discussions of the GPSDD assessing the opportunities for enhancing private sector engagement. So, at this point "[his] role is a little bit more hands on" (I2). A1 is also still in close communication with the sustainability department about the topic, and participates in regular, SAP internal SDG calls which are initiated by the sustainability department and present SDG related projects which happen inside SAP, discuss SDG focus topics, and connect employees who are engaged with or interested in SDG topics (I1).

A3 is member of the GPSDD Board of Directors, responsible for "help[ing] with the overall vision and mission and strategy" (I5). The Board of Directors held its first meeting in September 2017 (I2; GPSDD 2018d).

A comprehensive timeline featuring all important events, for clarification and easy look-up during the analysis part can be found in appendix 2.

When looking at the chronological sequence of events with regard to the second part of the research question "why do IT MNCs take part in BD4D multi-stakeholder networks?", it seems that the answer will be at least two-fold:

One individual (A1) was responsible for initializing the engagement at SAP. He works on the product side for SAP analytics and is generally interested in sustainability topics.

When continuing the engagement and increasing his efforts, A1 included further teams at SAP. These teams look at how the engagement can create business value for their area, or, as in the case of the sustainability team which fulfills a strategic cross-area function, evaluate the GPSDD's potential to fulfill the company's vision and at the same time create overall business value.

Different processes are thus in place for initializing the engagement than for continuing and enhancing it. These processes seem to be accompanied by different motivations which will be investigated in more detail in subchapter 5.2.2.

Projects within the GPSDD

SAP has been involved in the creation of all three major public goods that the GPSDD provides as presented in chapter 5.1.1.

1. Global Community for Data Ecosystems

After the launch, SAP took a consultative role in shaping the partnership's agenda and creating public goods in the form of data roadmaps. A1 states the involvement in the strategy for building data ecosystems:

> "And so the intent, I was engaged for the partnership, was how do we tap into all this data that in many cases is held by private sector organizations, to help us monitor much more regularly, in a much more granular way, progress against the SDGs. That was the original sort of concept around that. Could they tap, for example, companies like Google and Facebook, major global presences, collecting data all the time, could they tap into the mobile phone companies - we have got all kinds of data from mobile phones - could they tap into data from companies like SAP. We have got data on a global footprint. Could they tap into satellite data and mine all of that information to understand how things are progressing, not only in an environmental point of view but also from an economic and social point of view, you know, what could you collect from satellite information. So that was kind of the thinking, to harness all these non-traditional data sources that a statistics office rarely uses" (I2).

Through its membership in the GPSDD Board of Directors, SAP engages in knowledge sharing and brings in expertise for strategic and technical questions regarding data ecosystems. At this point in time, SAP is exploring opportunities for a project which uses the HR data of 40 million people around the world which is available to SAP to look at gender equality issues, e.g. between industries or countries. According to A1, this project might happen, but “has been very slow to take off” (I2). Reasons include regulatory and commercial barriers.

2. Political Advocacy for Data

Through its membership in the GPSDD Board of Directors and GPSDD projects with UN organs, SAP engages in external political advocacy for data. A1 lists an example where SAP was engaged in shaping a political discussion:

> "So, the UN Industrial Development Organization, they help developing countries, they invest in developing countries to build up their economic capacity. And build the right economic policies to drive growth. And so, we did some early prototype work with them to figure out how they can change the nature of the conversation, because the conversation was often very sort of a political nature, and they wanted to make it more data-driven" (I2).

Next to external political advocacy for data, an internal political discourse within the GPSDD takes place. S1 states that in the GPSDD

> "some are more involved in rather political processes which are maybe more consensus-oriented, bringing more inclusion, so more participation from all kinds of perspectives, which have more like a – I wouldn't say dogmatic but policy-giving character in the end, that can be lengthy, and I think for companies that is always a little unfamiliar and difficult, as they would actually rather push things quicker, more focusing on implementation then" (I1).

While these differences certainly can complicate things, S1 also states that they can benefit the whole discourse: "the corrective to have other organizations involved to make sure that everything is going in the right direction, that is certainly also important and helpful" (I1).

A1 confirms this assessment and points out the downside for companies like SAP who are not familiar to these processes: "It is much more sort of politically oriented. […] The challenge along the private sector companies are facing is how to engage through the Global Partnership."

3. Innovation and Entrepreneurship

Throughout the engagement, A1 as representative of SAP has participated in various projects with other members of the GPSDD and the GPSDD Secretariat. A short overview on these projects and general approaches towards project conduction will first be provided. One project – the development of an SAP Digital Boardroom for the United Nations Industrial Development Organization (UNIDO) – was particularly emphasized by SAP employees (I1; I2; I3). It will be described in more detail after the initial overview to provide deeper insights.

One project was conducted with The United States President's Emergency Plan for AIDS Relief (PEPFAR). PEPFAR is working in over 50 countries and has transformed the global HIV/AIDS response (PEPFAR 2018). The aim of the project was to improve reporting and visualization of relevant KPIs. During the project, SAP took available data from external and internal datasets on AIDS relief and spending on projects and integrated them in visualized storyboards using its SAP Lumira solutions. The results were presented at an event in Washington DC which was among others attended by the White House Chief Technology Officer and UN Senior Program Officers (I2; SAP 2015).

Another project was implemented directly with the GPSDD Secretariat and the World Bank:

> "We did spend a bit of time with the members of the GPSDD, or the Secretary I should say, you know the people that actually work for the Global Partnership, their employees, along with the World Bank, to do some initial visualizations for each of the 17 UN global goals" (I2).

Project exploration was done with the UN Sustainable Development Solutions Network, on ways for cities to themselves track and visualize data of their own progress around the 17 SDGs. While A1 started conversations and even visited one city, he states that "those projects never really took off" (I2).

In general, when conducting projects through the GPSDD, A1 works together with different people within SAP. These are for example other teams at SAP, other networks at SAP, or student assistants who acquire skills in respective SAP tools for the purpose of the project (I1; I2). When deciding which project to participate in, A1 and A3 take into consideration on the one hand where SAP can add value and the GPSDD Secretariat sees a good fit for SAP, and on the other hand where projects fit to SAP's business, all balanced with the constrained resources available within SAP. A1 states:

> "it is a sort of a mix of things that we would look for in a project. One is: are there SAP partners participating in the project? The second would be: Does the project have some applicability to our customer base? Or are there things that we can take away from that project to help, you know, apply in a specific industry. Where we are helping with sustainability issues, but maybe even turning it into a business opportunity long term" (I2).

A3 adds:

> "it is a matrix decision between the projects where the partnerships and the Secretary feel where we could add value, where we can add value, and of course sometimes there are things where there are resource availability constraints" (I5).

Generally, A1 evaluates SAP's engagement in projects of and through the GPSDD as having been involved in "a number of minor events where [they] were using [their] analytics tools to analyze data sets and visualize data sets" (I2).

Exemplary Project Description: Digital Boardroom for UNIDO

A1 initialized the voluntary project within the GPSDD, and describes the common goals and the process of the project as follows:

> "I did some work for the UN Industrial Development Organization (UNIDO), where they were looking to use data visualizations to change the way that they would have conversations with developing countries. […] So we built some visualization using SAP Analytics Cloud, you know sort of a demo of that, they showcased that at their 50th anniversary. And then, just recently, we started a contract with them to further build out that platform and capacity around that" (I2).

A video of the prototype which was shown at the anniversary can be viewed also in a publicly available video (SAP Analytics 2016), and a picture showing the prototype design can be found in the digital database. On 17 October 2017, SAP and UNIDO announced the

continuous collaboration on the project following the prototype (UNIDO 2017). UNIDO has become a paying customer of SAP (I1).

The SAP solution that was used to consolidate and visualize the data is called SAP Digital Boardroom. It consists of triple-interlinked touch screens which shall serve as a "single point of truth" for real-time data insights by showing visualized data and allowing for deep-diving into data points. It is powered by SAP HANA, uses SAP analytics solutions, and combines data from different sources (SAP 2018b). At the time of the prototype development, the Digital Boardroom had just been announced by SAP, and so according to an external designer who took part in the project, "the market may not fully [have had] understood its potential yet" (Selene n.d.).

For the project, the SAP public services team joined the engagement, and an external UI/UX designer was involved (UNIDO 2017; Selene n.d.). The data that was used was collected and provided by the World Bank and the United Nations. The external designer describes that the team used design thinking methods to develop the optimal solution suitable to the UNIDO's needs (Selene n.d.).

The Global General Manager for Public Services at SAP publicly commented on the collaboration stating:

> "SAP Digital Boardroom allows UNIDO groups to gain visibility across their entire organization, consolidate achievements on the SDGs and document their impact on people's lives. Through data integration, the solution provides a single source of truth for strategic decisions, and that is critical for success in the fast-paced digital economy" (UNIDO 2017)

The UNIDO announced the signing of the joint declaration to continued work on the Digital Boardroom for monitoring SDGs and their industry-related targets following the prototype on their website, with the Deputy to the Director General of UNIDO commenting:

> "With SAP as a partner, we are making progress under the 2030 Agenda by harnessing the power of new technologies to overcome the digital divide and achieve prosperity for all" (UNIDO 2017).

The project is an example of how project engagement in the GPSDD can help SAP to build showcases and thus make the business and sustainability value of their technologies more tangible (I3), to develop industry-specific solutions – in this case solutions which can be used by public sector institutions and other organizations striving toward achieving Sustainable Development Goals – and to establish sustaining customer relationships. S2 states:

> "in the end, it's about that we would like to do something like the head of the UN getting what our board gets for their companies… it would be a cool thing if the UN had such a reporting tool. And for us that wouldn't be just a brand thing, a value thing, but in the end you also have to… they would buy the software if they want to see such things. […] And basically, you can then sell this to 192 countries. Because the countries also have the respective development plans and development goals" (I3).

It furthermore suits SAP's sustainability strategy by enabling other organizations to achieve sustainable value through their technologies (I1).

5. 2. 2. Motivations and Challenges

Motivations are at the core of understanding what drives SAP as an IT corporation to engage in the Global Partnership for Sustainable Development Data. To get a comprehensive understanding of the motivations, the perspectives of the four employees who were part of the engagement are considered, two of them being employed in the SAP analytics area (A1; A3) and two in the sustainability department (S1; S2). The interviews conducted with those employees are the data basis for the following part. A tabular overview of stated and categorized motivations is given, which will be explained and analyzed below.

In addition to motivations, internal and external challenges of the engagement are outlined under additional consideration of the interviews with two employees at the GPSDD.

Categories of Motivation

13 different motivations for the engagement were identified, stated by at least one up to all interviewed employees. They can be categorized into "'The Classics' - CSR Benefits", "Creating Shared Social and Business Value", and "Doing Good", with one motivation not fitting into any category precisely but touching all of them.

The interviewees mostly answered the interview questions around motivations by taking a company or department point of view. Only in some cases, they were explicitly asked for, or stated without being asked, their personal motivation. As this forms an important difference, these cases are indicated in the tables below.

A codebook which contains the original codes with respective exemplary quotes and descriptions can be found in appendix 3.

"The Classics" - CSR Benefits

Motivation	Stated by	Perspective	Total	Comments
Employee Satisfaction	S1, A3	Sustainability Analytics	**2**	
Brand Reputation	S1, S2, A3	Sustainability, Analytics	**3**	Partly relativized
Investor Relations	S1, S2	Sustainability	**2**	
Employer Branding	S1	Sustainability	**1**	Partly relativized
Sustainability as Trend Topic	S1	Sustainability	**1**	

Table 6: Motivations: "The Classics" – CSR Benefits (sources: I1, I2, I3, I5)

The engagement in the GPSDD brings classic advantages that are obtained through most CSR activities. The most important aspect here, especially emphasized by A3 who is engaged directly in the GPSDD, is employee engagement. He states that in his view "people like working for a company where there is a greater purpose than just making money" (I5). Especially job satisfaction for employees who get the chance to involve in GPSDD projects is therefore strengthened, but also employees who hear that their company engages in and their technologies are used to achieve global goals can be positively affected. Further classical CSR benefits are enhanced brand value, employer branding making SAP more attractive for new employees, and enhanced investor relations, especially for socially responsible investors (I1; I3). Furthermore, CSR and purpose driven business can be regarded as a real "trend" topic among companies (I1) which can explain increased social engagement of the private sector in general. The classical CSR advantages are mostly mentioned by members of the sustainability team. Both S1 and S2 place low emphasis on these benefits, and seem to list them mostly for completeness:

> "It has all the advantages of – also the classics, right: of brand and reputation, certainly also employer branding, that it is important for employees. It is also received as interesting by investors that we engage somehow stronger in this field" (I1).

S1 also relativizes those classical benefits later by presuming that external stakeholders are mostly unaware of the initiative or SAP's engagement in it, and have not yet asked for it specifically: „I personally have not yet experienced that someone would have asked specifically 'ahh, why or why not are you actually engaged in the GPSDD?'" (I1)

S1 assumes that a potential reason for this could be that people interested in sustainability are often not active in IT related environments, and vice versa, and initiatives combining both are therefore not known by a wide public (I1).

Creating Shared Social and Business Value

Motivation	Stated by	Perspective	Total	Comments
Enhance Customer Relationship	S1, S2, A1, A3	Sustainability, Analytics	**4**	
Showcase Building & Story Telling	S2, A1	Sustainability, Analytics	**2**	Highly emphasized both by S2 and A1
Business Opportunity: Sell solution later	S1, S2, A1	Sustainability, Analytics	**3**	Highly emphasized by S2
Developing Suitable Solutions for Specific Areas	S2	Sustainability	**1**	
Opportunity: new Business Models	S2	Sustainability	**1**	

Table 7: Motivations: Creating Shared Social and Business Value (sources: I1, I2, I3, I5)

Interviewees furthermore name business benefits which are generated specifically through the engagement in the GPSDD. Through the close connection to SAP's core business, shared social and business value can be created (I3).

The GPSDD is regarded as a good way to strengthen customer relationships. All interviewees mention that some existent and potential customers are also members of the GPSDD. The partnership can enhance those existing relations through "joint solidarity and joint effort to achieve a common goal" (I1), and the opportunity to "show that SAP is a trustworthy partner" (I3). The projects also hold possibilities to build new customer relationships when SAP and potential customers collaborate on a specific challenge:

> "Where they connect us to organizations like the UN Industrial Development Organization or the US State Department, where they have specific projects that they are wanting to take on and where SAP can […] and want to participate because it has certain business value if you like." (I2)

Applicability to customer base and involvement of SAP customers are explicitly mentioned as reasons for deciding for a project (I2).

Benefits highly emphasized by employees from the analytics as well as from the sustainability field relate to showcase building and story telling, and business opportunities which result from selling suitable solutions for a project later. S2 shortly addresses the importance of story-telling and showcases of SAP's business in general:

> "That is actually our point, or my point, that I try to tell stories and to bring sales representatives, or developers, on the track that they do not sell technologies, but we sell… we help our customers to solve business problems. And those business problems have in many areas a sustainability aspect" (I3).

Stories and show cases then build the bridge between SAP technology and tangible outcomes for businesses and agencies. A1 states that the analytics organization also saw this opportunity when hearing about the GPSDD: "And the analytics organization said, look there is an opportunity here for us to maybe build some showcases, show what's possible with SAP technology" (I2). The chance to build showcases is also one aspect considered when deciding for a project participation within the GPSDD (I2).

Through engaging with different partners in projects which leverage SAP technology, it is furthermore possible to not only give away software for free, but build trust and show how solutions are applicable to an organization. This can in the long run lead to organizations then buying SAP software for future projects. S2 states that

> "and my idea at that time was […] that we should use that also as a sales platform, that we should also position ourselves as solutions provider there and say: so, we can not only help you to analyze data, but we also have products that you can buy to do something like that" (I3).

Additional benefits related to SAP's products and solutions arise from the option to build solutions in projects which are applicable for specific fields – e.g. a tool for national SDG tracking and reporting (I3) – and can then be sold to similar organizations. The engagement in the GPSDD can furthermore support new business models. S2 brings the example of data-as-a-service when looking at the impact SAP's data could have on tracking some of the SDG indicators, e.g. on education through SAP's student systems. SAP providing or selling its data could have high social impact through improvement in measuring the SDGs and support an emerging business model at SAP (I3).

Doing Good

Motivation	Stated by	Perspective	Total	Comments
Doing good as a company (in addition to business benefit)	S1, S2, A1, A3	Sustainability, Analytics	**4**	
Doing good through technology as personal motivation	A1, A3	Analytics	**2**	Employees from the sustainability department were not asked for their personal motivation explicitly, which could be the reason why they did not state "Doing good".[6]

Table 8: Motivations: Doing Good (sources: I1, I2, I3, I5)

The last category "Doing Good" – in addition to business value – as a motivation is mentioned by all interviewees in one way or the other, taking a company or personal perspective. Especially the notion that SAP has unique resources and skills which have the potential to make a positive change are mentioned as reasons for SAP to contribute: "It is a little bit the core, the heart of SAP, where we think that we can use that to, well, make a contribution then" (I1). A1 adds as a reason to initialize the engagement:

> "The thinking at the time was would there be opportunities for us to leverage our technology, to help them figure out ways to address some of these SDGs. That was where it originally started. Using some of our big data solutions" (I2).

As the engagement was first driven by individuals outside the sustainability team – for employees working in sustainability, the motivation for such engagements is more anchored in the classical job description – the employees from the analytics area were additionally asked for their personal motivations to engage with the partnership[7]. Both A1 and A3 state as their main motivation to make a positive difference for the world, and especially having the chance to contribute through leveraging their expertise of suitable technologies. For example, A1 states that

> "You know, for me, personally, what drove me to drive this at SAP really at the end of the day is – I am very interested in saying look, technology for technology's sake or technology for profit's sake is not – There is gotta be more to it. You know what I mean? Let's make a difference in this world" (I2).

[6] It was considered more revealing to ask employees from Analytics about their personal motivations, as the GPSDD engagement does not necessarily fit their daily business and is an unusual engagement. It suits the classical job description of sustainability employees though. The questions "why are you personally interested in the engagement?" could be understood as a wider question on the personal motivation to work in the sustainability department in general, which would lead too far from the research question. A3 answered the question about personal motivation before it was asked by the interviewer.

[7] Or stated explicitly their personal motivation before they were asked, in the case of A3.

SAP Vision & Strategy

Motivation	Stated by	Perspective	Total	Comments
Suits SAP's vision & sustainable strategy	S1, S2, A1, A3	Sustainability, Analytics	**4**	

Table 9: Motivations: SAP Vision & Strategy (sources: I1, I2, I3, I5)

When asked about reasons for SAP to engage in the GPSDD, all interviewees furthermore state that it is strongly in line with SAP's vision and fits with SAP's recent orientation toward the sustainability strategy on the SDGs: "In this way, it suits our vision *help the world run better and improve people's lives*" (I1), and "I think the most important reason that we take part is that we very strongly support the UN's objectives over all. And this is one way which we have some experience and expertise that we can add" (I5). Members of the sustainability department also see SAP's approach to act as an "enabler" for customers that use SAP software to promote sustainability realized through the engagement in the partnership: „It suits wonderfully the realization of our enabler approach where we help with our solutions other organizations [to achieve positive impact]" (I1).

This aspect is difficult to assign into one of the three categories, as a categorization to either one of them could be argued: under the broad vision "*help the world run better and improve people's lives"* any contribution to a social good, be it related or unrelated to business benefits or the core business, can be subsumed. The vision itself though does also realize classic CSR benefits such as enhanced public perception (SAP 2018c) and employee engagement. SAP's "sustainable strategy" and the deeper reasoning behind the vision furthermore suggest an anchoring of social initiatives in the core business.

Motivations on the "Engaged Individual" and "Strategic Company" Level

Especially the interviews with A1 and A3 show that the personal motivations of engaged individuals can differ from the motivations of the company as such to contribute to social impact initiatives. A3 captures this distinction by stating that

> "there is a combination of reasons that people would participate, not just one. One certainly would be that there are good feelings associated with doing good things for the world. And so, I think you can appeal to human nature, and the fact that people like to be helpful. For things that are good for the world. But I think companies probably need a little bit more than that. That is a good individual reason, so for me personally that is a good reason, but for a company, I think there is also, there are also needs to the organization that companies exist for commercial reasons. They exist to transact business and make money and deliver value for their shareholders.

> So there has to be something about the partnership that they believe will help them further that objective" (I5).

Both types of motivations – from the perspective of the engaged individual employee and from a company perspective – are relevant for initial and continued engagement within the GPSDD. The results show that whereas the individual support is an important prerequisite, the organizational support is necessary to continue and enhance the engagement. In the present case the interplay of both levels led to successful SAP projects within the GPSDD: the level of the individual A1 who initiates and actively drives the engagement, and the level of the company which justifies the effort put into the engagement and unlocks critical resources. Considering the biggest challenge for the engagement stated by SAP employees – limited resources, which will be described in more detail below – the second level is a crucial step toward achieving higher contribution in terms of time, personnel and financial resources.

It has to be noted that the distinction of the levels of the engaged individual and company as such cannot be made by simply partitioning the interviews according to respondents. Especially the two respondents who are actively engaged in the partnership (A1, A3) speak for both perspectives. They combine company and individual motivations in their reasoning and are mostly aware which perspective they assume when making a statement, and understand the necessity to distinguish between both. This is visible for example in the statement of A3 cited above.

The two levels and respective motivational patterns are both highly relevant for answering the research question. While this chapter added to an understanding of these levels by inductively exploring the single motivations underlying the engagement, a further analysis and contextualization under consideration of suitable theory will be conducted in subchapter 5.2.3.

Challenges

While the motivations positively influence the engagement in the GPSDD, some interviewees also mention associated challenges, within SAP and related to the partnership, which impede the engagement and reduce the member motivation.

The challenges are outlined in the next table.

Challenge	Internal/ external	Stated by	Comments
Resource scarcity in: - Time - Money - Local representatives	internal	S2, A1, A3	
Difficulty to achieve understanding for the business value internally	internal	S2	
GPSDD and SAP differ in terms of: - interests - processes - project orientation	external	S1, S2 A1	S1 states that those different approaches can also lead to more valuable outcomes, also identified by GPSDD employees (I6, I4), GPSDD employees also mention that it would not be good to change all of these, as they are still a UN organization (I6)
Difficulty for companies to determine how to engage in the GPSDD	external	A1	Also identified by GPSDD employees (I6)
Business value not communicated by GPSDD	external	S2	Also identified by GPSDD employees (I4)

Table 10: Challenges of SAP's Engagement in the GPSDD (sources: I1, I2, I3, I4, I5, I6)

One major challenge that SAP employees faced when engaging in the GPSDD is resource scarcity. A1 states that: "One of the most basic challenges we always have is a lack of resources to actually implement that stuff within SAP" (I2).

With a limited number of employees involved in the partnership, for example time is a major constraint. This is especially true for employees with executive position and a wide range of responsibilities. A3 describes this challenge regarding a request of the GPSDD for him to attend the Data for Development Festival:

> "One of the challenges I'm having is I have some other travel demands at the moment on that week that I have to move. So, you know, that is a very practical example of some times, other things to get in the way" (I5).

Financial resources are another difficult topic. S2 describes the acquisition of financial resources within the company as difficult in general, and sustainability is no exception. The lack of resources also results in an inability to find local representatives who can attend GPSDD meetings (I3).

Acquiring resources from other teams and departments would be very relevant to contribute more time, money, and local representation to the partnership. A1 however mentions that acquiring these resources is often difficult:

> "There is always a lot of work to try and find where there is a team within SAP or the SAP network that can help with this project. That was an issue that sort of plagued us all the time, to be very honest" (I2).

Another challenge related to the GPSDD are multiple differences between the various stakeholders within the partnership, and especially between UN organizations and companies. Disparities are apparent not necessarily in all interests of these actors, but at least in primary goals (I1), and major differences exist in how working processes are set up which complicates collaboration. These disparities are not necessarily regarded as obstacles though but can also offer opportunities. S1 states that there is no "best process" that one stakeholder has found yet but rather that

> "maybe it is exactly this mixture, which can bring the strengths then, which supports this in the end. Because I think that a solely company-directed format also wouldn't help the world in this, that can quickly become one-sided" (I1).

Still, A1 notes that it can be difficult for companies to determine how to actually engage with the partnership:

> "Originally we expected more work and more time spent around initiating data projects specifically. Where we are doing actual projects with our technology through the partnership or at least where the partnership is connecting the right players together around that. That has not really materialized through the partnership. It is much more sort of politically oriented. […] The challenge along the private sector companies are facing is how to engage through the Global Partnership" (I2).

Members of the GPSDD Secretariat are aware of the differing processes in companies and the resulting difficulties for the private sector to engage (I4), and both A1 and employees of the GPSDD Secretariat state that measures are on the way to make it easier for companies to engage (I2, I4, I6). Finally, a member of the sustainability department finds that improvements could be made in the value proposition of the GPSDD. He refers not only to the GPSDD though, but finds that UN organizations in general, "never translate their things in the business value" (S2) which complicates arousing interest among companies. Members of the GPSDD Secretariat identified this challenge, both in the interview and the consulting tender, and state that the GPSDD is seeking to frame the value proposition "in a more specific way" (I4).

5. 2. 3. Contextualization and Implications

The results are contextualized to enrich the analysis of SAP's role in the GPSDD by the micro perspective. A specific emphasis is put on the motivational factors that drive SAP's involvement within the GPSDD.

Relevant theories are applied where considered useful with regard to the inductively derived results to enhance scope and depth of the insights.

Micro-Level: SAP's Role within the GPSDD

As shown above, the GPSDD is a collective action effort providing public goods on two levels: First, it provides "more and better data (analytics) for sustainable development" as a public good that is accessible by everyone, regardless of their membership in the GPSDD. Second, it provides the belonging to the community, relationship building as well as knowledge of / potential participation in innovative GPSDD projects, and the chance to shape the discourse around political advocacy for data as a public good available to all members of the partnership (I4), regardless of their actual contribution and amount and quality of contribution to the partnership's goals.

In specific projects, the involved members can attain selective benefits in addition. An example is the voluntary SAP project with UNIDO, which first led to relationship building between SAP and UN organizations and ultimately ended up in more sales and revenue for SAP, when it was decided to use the digital boardroom for more than prototyping (I2).

The interviews show that SAP is aware of its relevant resources for the GPSDD, and that due to the complementary nature of these resources the company feels to have an obligation to take part in the GPSDD. Referring to SAP's membership in the GPSDD Board of Directors and the involvement in a variety of GPSDD projects, the GPSDD Secretariat considers the degree of SAP's involvement high, but states that the involvement is rather focused on an individual SAP employee level, than the company level (I4). This notion is confirmed by SAP (I2, I3).

For both the GPSDD Secretariat and SAP it is not clear how the company can be most useful to the GPSDD and vice versa. SAP mentions that the contribution of resources is associated with costs that need to be justified within the organization (I2, I3). But as the GPSDD

Secretariat states, it does not offer an economic justification to companies within the initiative when brokering opportunities for participation (I4, I6). This tension inhibits more participation.

As a result, more than two years after the launch of the GPSDD, the role of IT MNCs within the initiative is still evolving. The role is formed through an interplay of the GPSDD Secretariat, the other members within the GPSDD, the IT MNC itself, and the involved individual employees. It is important to understand what motivational factors drive or potentially inhibit the initial and continuous engagement in the partnership.

Motivations

In the preceding empirical result section, it was found that different processes are in place to initiate and to continue the engagement. Furthermore, it was found that motivational patterns differ between the level of the engaged individual employee and the company level. The engaged individual seems to be the most important driver for initializing the engagement, while individual and company level together are necessary to continue and enhance the engagement. As described in chapter 3.1, research on collective action found that actors overcome the free-rider problem through pursuing a variety of motives which are addressed by respective organizational incentives. One influential typology for these motives is developed by Knoke and Wright-Isac (1982). It was presented in chapter 3.1.1. This typology was evaluated as a useful resource to systemize the inductive results on motives at different levels and phases of the engagement and to put them into theoretical context.

Motives in CA typology

Looking at the two levels of motivational patterns (engaged individual employee and strategic company level), the nature of the public good itself seems to have different importance. A1 and A3, who are the employees actively engaged within the partnership, both mention their will to make a positive change as a main motivation. A1 explicitly states that

> "I really believe that we can make a positive difference in the world and at the same time use that to find ways to, whatever, improve our bottom line. You know what I mean? But for me personally it is really about how do we use it [technology] to make a difference in the world" (I2).

The reason for him individually is thus to contribute to social value by using technologies, and therefore strongly aligned with the GPSDD's purpose to create the public good "more and better data (analytics) for sustainable development".

This ambition suits with the motive of normative conformity, where the engagement in the GPSDD serves as a way to live out the personal conviction that big data should be used to promote sustainable development. Normative conformity can thus serve as a motive both for initializing as well as for continuing the engagement. Motives related to affective bonding are not explicitly mentioned by A1 or A3 as personal motivations. As A1 is participating in many projects and conversations both with other members and with the GPSDD Secretary – where he is referred to as having "been a great impulse and a lovely active member within the partnership in the early days" (I4) – it is possible that "emotional attachments to other persons and groups" (Knoke 1988, p. 315, defining affective bonding) within the partnership positively affected his motivation to continue and enhance the engagement in the partnership. Thus, affective bonding might have played a role not for the initial phase but for his continued engagement in the GPSDD. Neither A1 nor A3 mention motives related to rational choice, such as direct economic benefits or career chances, in their interviews, and no other indicators suggest such motives. Generally spoken, the non-economic motives of normative conformity and possibly affective bonding lead to individual contribution both to the public good of big data for sustainable development and the mediate public goods within the network.

On the company level, the nature of the public good "more and better data (analytics) for sustainable development" itself plays a smaller role in the motivational pattern. It is considered important as it supports SAP's vision and contributes to realizing SAP's role as an enabler of sustainability, but it is always regarded in combination with the GPSDD's suitability to support core business value. S1 states that

> "it is a little bit the core, the heart of SAP, where we think that we can use that to make a contribution in the end. In this way, it suits our vision *help the world run better and improve people's lives*, yes. And it suits wonderfully the realization of our enabler approach where we help with our solutions other organizations [to achieve positive impact] – and you have to say that the UNIDO is also a customer, so it is indeed positive impact, but it is not a pure charity activity and can also bring a potential business opportunity. And then there comes into effect again, that good business can absolutely also lead to earning money with it, only then is it actually anchored in the core business, and not only a philanthropic activity which is done on the side. They don't exclude each other" (I1).

While on the individual level, it was found that non-economic motives are of major importance, the focus seems to be on economic rational choice motives on the company level. Even though the engagement does not offer direct business benefits, when taking a company's perspective, all interview partners state that enhanced business value can in different ways be realized through the GPSDD, e.g. in form of business opportunities, show case building and enhanced customer relations.

Concluding, the assumption made in chapter 5.2.2 that the motivational patterns on the level of the engaged individual and on the strategic company level differ profoundly was confirmed through the application of Knoke and Wright-Isac's typology. On the individual level, which is crucial to initiating the engagement and still important in it continuation, the nature of the public good itself plays an important role. Non-economic motives, especially in the form of normative conformity, are found to be relevant. The company level is important when it comes to acquiring additional resources and justifying the engagement. For the company, the nature of the public good itself has a medium effect, and economic motives of rational choice are of high importance.

As the GPSDD according to their consultancy tender struggles not so much with the motivation of individuals but with engaging entire companies (United Nations Foundation 2017), and presumably other BD4D multi-stakeholder networks face similar challenges, the inclusion of a theory suitable for a more detailed investigation into the rational choice motives of companies is considered beneficial to contextualize the inductive results of chapter 5.2.2. Most research on motives typologies, among them the here cited Knoke and Wright-Isac (1982) investigate motives for individuals to contribute to collective action. They do not provide further insights on motives and incentives for organizations. A theory concerned with business benefits produced through and jointly with social public value is the theory of creating shared value, with the related concept of corporate social responsibility. These concepts were assessed for their suitability with the obtained results.

CSR

As described in chapter 3.2, Porter and Kramer (2011) regard activities which are creating shared value as integral to the business, while CSR activities in their view provide value for society but have limited connection to the business. SAP employees, especially from the sustainability department, do mention that "classic" (I1) CSR business benefits such as enhanced public image and employer branding are obtained through the partnership. The engagement is also mentioned in external communication, though to a small extent (SAP News 2015, SAP 2018a). The reputational benefits are relativized by one employee of the sustainability department though by stating that to her knowledge, SAP was never explicitly asked about their engagement in the GPSDD (I1). From a company perspective, no interviewee puts profound emphasis on CSR benefits.

From a personal perspective, employees from the SAP analytics side who are not necessarily involved in sustainability topics in their daily work, do value the opportunity to contribute to a greater good through their profession:

> "This is one way in which our employees, myself included, get the opportunity to do something that leverages our expertise in our area of professional passion, but also makes us feel good about getting up in the morning and being part of a bigger world" (I5).

The notion of working for a company and developing solutions which promote societal values is intensified through the continuous pursuit of a company vision:

> "Our corporate mission is help the world run better, not just to make a bunch of profit, right. So we certainly like to make profit, and we sure like to sell our software. But there is also a greater purpose out there" (I5).

Thus, those "classic" CSR benefits are of interest to engaged individuals.

Shared Value

The company's focus on rational choice motives is in line with Porter and Kramer's (2011) shared value concept introduced in chapter 3.2. Shared value shall be created not through redistributing value to society but through "expanding the total pool of economic and social value" (ibid., p. 5).

This is also the aim of SAP's sustainability department in general. S2 describes an exemplary win-win-win situation generated through SAP's "enabler" approach, where with SAP's production planning solution it is possible for the customer company to

> "reduce water usage, reduce energy usage, reduce waste water usage, reduce material usage. I optimize material usage, and with that on one hand reduce costs and reduce the impact on the environment" (I3).

SAP here wins through selling its software, the enabled company through reducing its cost, and society by lowered environmental impact.

Porter and Kramer further argue that for creating shared value, societal issues have to be addressed at the core of the company, not the periphery. This is in line with the strategy of the sustainability team at SAP – S1 states that

> "I believe that this is a key to success, that it is not somehow a "nice-to-have", and add-on, which is rather philanthropic […] but how much it is actually related to SAP and to their actual core business" (I1).

SAP tries to apply this approach also with the engagement in the GPSDD, but S2 mentions that they are not yet all successful:

> "and unfortunately, unfortunately we are not yet there, that we are as successful that the core organization, that is development and sales, have understood, that they also have to invest a bit there [in the GPSDD engagement]" (I3).

Being able to communicate this shared value that can be achieved through an engagement in the GPSDD could form an essential part of achieving company commitment in addition to individual contributions (ibid.).

Though not having reached all employees at the core organization, the sustainability department at SAP does see the engagement as aligned to the core business in many ways. In specific, two dimensions of the CSV concept are suited to classify the motivations for SAP to voluntarily participate in the GPSDD.

1. Reconceiving products and markets

When referring to this aspect, Porter and Kramer (2011) mostly emphasize that products can be adapted to still underdeveloped markets, for example in developing countries, or underserved regions in developed countries. Through the adaptions, people in these regions benefit from products suiting their needs and companies benefit through new business opportunities. In a similar way, SAP can through the engagement in the GPSDD tap into a new market which is just starting to develop – the market of big data applications for organizations related to sustainable development, from agencies to public organizations as government and city councils, NGOs, statistics offices etc. According to SAP, the partnership serves as a way to 1) explore the needs in this market through discussions and projects (I1); 2) build prototypes, show cases and software solutions around the topic in projects (I2; I3), as for example in the case of the Digital Boardroom prototype development for the UNIDO which could result "in a standard reporting solution for the UN" (I3); 3) foster innovation and identify new business models around the theme (I3), and 4) establish connections to potential customers in the market (I1; I2; I3; I5).

2. Redefining productivity in the value chain

While Porter and Kramer focus in their analysis mostly on the production of goods and upstream activities, an integral part of value creation in service oriented IT companies lies, in addition to software development, in customer consulting and partner relations. Considering

this as a part of SAP's value chain, the engagement in the GPSDD does offer some valuable and unconventional ways to establish new customer and partner relations (I3; I5), strengthen these partnerships through mutual projects and striving towards common goals (I1; I2; I3), and transform potential to actual customers of SAP products when solutions can be sold after a successful project, as for example in the case of the Digital Boardroom for the UNIDO.

Aspects of enabling local cluster development – the third category in the theory of CSV – have not been identified in the present case. It can be hypothesized that the new evangelism for data in developing countries can lead to new data communities, which in the end may create new expertise of and demand for IT solutions, and then be of economic interests for IT MNCs. However, this notion was not stated by any interviewee or any participant at the Data for Development Festival in March 2018, Bristol. Therefore, this category cannot be confirmed as a motivation in the present case.

Conclusion

A high level analysis of general motives on the individual employee level, important for initialization and continuation of the engagement, and the strategic company level, relevant for continued and enhanced engagement, was conducted. It was complemented by an in-depth analysis into the detailed motivational pattern at the company side. The following graphical representation illustrates the contextualized results.

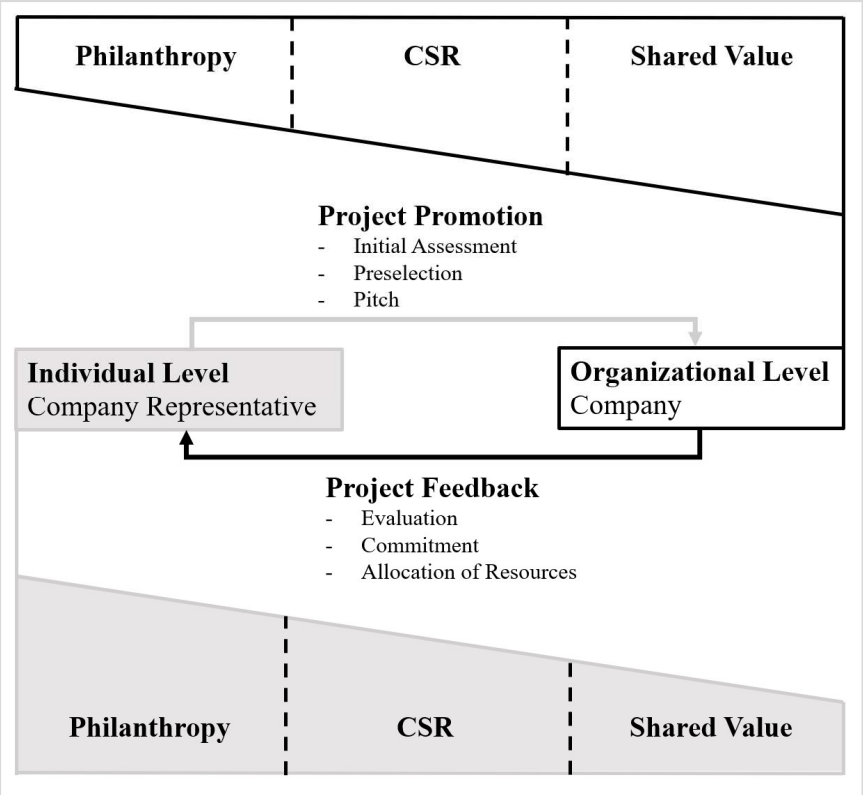

Figure 7: Motivations: Individual and Organizational Level

The graphical representation distinguishes between three different approaches to engage in sustainable development. These approaches refer to the category system that was exploratory developed and then contextualized.

The lines between the three approaches are blurry, as the distinction between the theories in practice (McWilliams et al. 2006; Crane et al. 2014). The major difference between the three is the degree of relatedness of the core business model and business value creation to the actions of a company for sustainable development. For philanthropy, there is no assumed relatedness (Carroll 1991; Merriam-Webster 2018). For generic CSR activities, a small to medium degree of relatedness is usual (Werther & Chandler 2011), e.g. through image campaigns or employer branding. In the shared value approach, the potential of creating economic value is a necessary prerequisite (Porter & Kramer 2011). A detailed theoretical background is provided in chapter 3, empirical evidence is categorized in chapter 5.

The different emphasis on the three approaches in the decision phase for or against participation in collective action projects is illustrated. As shown in tables 6, 7, and 8, the individual employees involved in the collective action point out philanthropic reasons – i.e. the aim to make a positive difference for the world – as their main motivations, list the potential for

corporate social responsibility as another motivational factor, and state that the potential for creating shared value is rather valuable for the company than a motivational factor on the individual level. On the organizational level, it is the other way around. According to the interviewees, the potential for creating shared value is the main motivation for the companies employing the engaged individuals, and CSR effects are welcomed as well. Philanthropy, though one interviewee mentions that a company should seek to create social value in order to "legitimize" its existence (I1), is generally not understood as a reasonable argument on an organizational level.

Building on the case study of SAP's engagement within the GPSDD, company representatives that are involved in a collective action promote the collective action projects within the company. They are the company's face in the collective action community. Their responsibilities include the assessment of new involvement opportunities in the collective action, the preselection of collective efforts that can be a fit for the company, and the project pitch within their organization. On an organizational level, the respective departments evaluate the proposed possibilities of participation, and can make commitments and allocate resources.

The decision for a participation in projects, and the further engagement, is formed through an interplay of company representatives and the organization as a whole. Once the participation in a collective effort is initiated, this interplay may go on and include other members in the collective effort and further employees of the organization that have been allocated towards these projects (Medaglia et al. 2017). Since this illustration is based on this thesis' findings, it depicts the initial decision phase, not the implementation phase.

6. DISCUSSION

The findings of the analysis and the respective contextualization are discussed in this chapter with regard to the general theoretical contributions and practical implications. Based on the outcome, the authors speculate about potential recommendations for the GPSDD to address the issues in IT MNC engagement.

6.1 Theoretical Implications

In chapter 5, the findings of the analysis have been contextualized with respect to the research question. In addition to this detailed contextualization, the findings allow to draw general implications for the supportive theories presented in this thesis.

Contributions to Theory

Olson's Collective Action Propositions

The findings of this case study analysis support some of Olson's collective action propositions (1965) and are contrary to others. Therefore, this study adds to the research body on Olson's propositions and confirms the notion that they are still of value as a guiding principle, but not universally applicable (Sandler 2015). BD4D multi-stakeholder networks are yet another complex collective action scenario that cannot solely be explained by Olson's theory. While the original collective action theory remains an influential intellectual resource, it remains to be seen whether its general propositions will keep influencing scholars as they still do in some cases (ibid.), or whether Oliver and Marwell's (2001) conclusion that it is not possible to develop a universally applicable theory will prevail.

Institutional Design and Motives in Collective Action

In particular, Olson's recommendations on the institutional design of collective action are proven to be relevant in this study: The need for organizational leadership and the relevance of selective incentives are supported by the findings in chapter 5. This is in line with several findings in information systems research. An example is Zhao et al.'s (2011) conclusion that firms may overcome free-rider problems when they see the chance to build private, non-public solutions on top of publicly available standards. Furthermore, the results show that the institutional design is continuously formed through an interplay of actors, supporting Medaglia et al.'s (2017) call for refining the theoretical lens of collective action by looking at it from a process view. Additional research is needed to understand the process how the institutional design in collective action is formed and adjusted, and how the outcome affects the provision of the public good.

The exploratory analysis of the motives of IT MNCs to contribute to collective action for sustainable development led to results that are not limited to, but still in line with Knoke’s (1988) typology of motives in collective action. The findings of the thesis add to the theory of motives by proposing that in the case of commercial organizations participating in a collective action, two levels of motives have to be distinguished – the individual and the company level.

Theory of "Creating Shared Value"

Through the contextualization of the findings from the exploratory analysis, two of the three main propositions of the CSV concept were found to be integral to the case company's motivations on a company level: "Reconceiving products and markets" and "Redefining productivity in the value chain". The findings thus add to the research body on CSV, which has developed essentially through case study research (Kramer & Pfitzer 2016), through an additional case focusing on IT MNCs and BD4D multi-stakeholder networks.

Contrary to Porter and Kramer's claim (2011) that CSV is the only sustainable concept for companies to "do good", the findings implicate that for both the company as a whole and for its employees all three approaches – philanthropy, CSR, and CSV – play a role in decision making.

Contribution to Related Research fields

This study addresses research gaps in related fields. In general, it contributes to the understanding of private sector motivation to engage in multi-stakeholder networks and in inter-organizational information sharing for public good provision. It furthermore gives insights into the internal interaction processes of members in data-sharing collaborations, and highlights challenges in the development of goal alignment between members in a collective action, both on an individual and on an organizational level.

6.2 Recommendations for Practice

Next to the theoretical contributions, the insights derived from this study are of practical relevance for the Global Partnership for Sustainable Development Data and other multi-stakeholder networks with sustainability focus, as well as IT MNCs taking part in these initiatives. Implications are discussed below. A special emphasis is put on the speculation about potential practical recommendations for the GPSDD.

6. 2. 1. Big Data for Development Initiatives

Global Partnership for Sustainable Development Data

As presented in chapter 2, the GPSDD is facing difficulties when trying to expand the range or number of private sector partners, and according to the GPSDD the relationships

are in some cases dependent on the interest and engagement of a few individuals rather than a commitment by the company as a whole (United Nations Foundation 2017). It therefore wants to better understand the needs and motivations of the private sector to develop a compelling value proposition in order to expand the breadth and depth of private sector engagement within the partnership (I4). The results from this study partly allow to speculate about potential solutions for the GPSDD's problem statement and encourage further thoughts and assumptions on how private sector recruitment and engagement can be increased within the partnership.

It is worth to mention that the GPSDD has major strengths that are valued by IT MNCs. First of all, the community based on trust and collaboration offers ways for innovative cross-sector collaborations between actors that usually would not partner up (I2; I6). Second, the support from the United Nations offers additional legitimacy to the initiative (I4; I5). Third, projects that arise within the partnership may not only serve the public good but can have an additional benefit for the companies involved in this project (I1; I3), for example by offering proprietary solutions on top of the public good (W6). The authors conclude that the GPSDD should embrace its strength for recruitment and engagement of IT MNCs by simultaneously addressing the unmet needs uncovered in this study. Drawing on the analysis presented in the previous chapters, the authors come up with five practical recommendations for the partnership that will be discussed in this chapter.

Tell the Story

As seen in chapter 2, the GPSDD presents a new and complex collective action phenomenon. Most of the public goods that are expected to derive from the collective efforts are based on intangible long-term goals (I4). Given the vast amount of possibilities to engage in sustainable development (I7), the GPSDD may therefore not be the first choice of many IT MNCs to engage in: taking part in the GPSDD is associated with collective action uncertainty and may require IT MNCs to spend resources without offering any direct business benefits or other short-term results. Other less complex CSR activities can offer more security when it comes to tangible outcomes and are easier to communicate to a company's stakeholders.

It can therefore be assumed that it is important for the GPSDD to tell the story why its promoted collective action is so important. The authors speculate that the GPSDD needs to make a point why data matters for sustainable development and why collective action at scale, for example through data roadmaps, makes a bigger impact towards sustainable development than other small-scale projects. And it probably needs to point out why IT MNCs take on a crucial role in the collective effort and should therefore join the GPSDD. As seen in the results, IT MNCs in fact have normative motivations to join initiatives where they think they can bring in crucial resources. The GPSDD Secretariat might want to take this into account and talk about the crucial role of IT MNCs within the partnership.

Capitalize on Motivations

The results from this study show that there are several motivations associated with IT MNCs taking part in the initiative. In the interviews with the GPSDD Secretariat, some of these motivations where hypothesized as well whereas others were not mentioned at all (I4; I6). It can be assumed that the GPSDD needs to understand that IT MNCs have a variety of motivations, and that the motivations of individual engaged employees from these organizations may differ from the organizational motivations.

One pillar of motivations is formed by individuals that represent an organization. The GPSDD understands that these individual motivations are important for the initial contact between the partnership and the organization, and that these individuals will promote the GPSDD within their organization (I4). Therefore, the authors hypothesize that a good onboarding process should be in place to make sure that these individuals will be good spokespersons for the GPSDD in their respective organizations. Regular international meetings like the Data for Development Festival might help to foster a community feeling and increase the affective bonding of these individuals. Also, these meetings could be a way to recruit new employees from organizations that are not yet a member of the partnership and get them engaged within the partnership.

The other important pillar includes organizational motivations. The authors assume that the GPSDD needs to understand that it is not enough to get a few employees interested and engaged in the partnership. Instead, it needs to make an offer that correspondents with organizational motivations as well. When approaching the individual employees of

an organization, the GPSDD Secretariat might have to address both the individual and the organizational motivations.

Based on the results of this study, it can be hypothesized that projects with the potential for shared value creation are more likely to be supported by private companies, since they may lead to business benefits that justify spending the resources needed for a collective action. This justification is supposed to be necessary to convince the respective internal department of an IT MNC that is responsible for choosing whether to participate in a sustainability project. Consequently, the GPSDD should investigate if and how shared value creation can be achieved in projects where input from IT MNCs is needed and highlight this opportunity next to addressing the individual motivations when approaching individual employees of IT MNCs. A selective incentive could be the opportunity to develop additional proprietary software together with the public good.

Use Targeted Communication

The lack of understanding the IT MNC's motivations results in uncertainty towards communication strategies on how to best approach and recruit further IT MNCs. As of today, the GPSDD relies on IT MNCs to express their interest to join the partnership on their own and does not proactively approach potential new members (I4).

The problems faced by the GPSDD show that it is important for the GPSDD to realize that the actor heterogeneity not only allows for more complementary resources to be spent towards the collective effort, but that it might also require a more granular approach when communicating with the various actors. The authors hypothesize that the GPSDD Secretariat should proactively engage in the latter in order to recruit new IT MNCs.

The authors speculate that a targeted stakeholder communication approach could allow the GPSDD Secretariat to adjust its messaging towards different members, as well as potential members. By doing so, the GPSDD can react on engagement trends within specific member groups and meet the diverse needs of its members.

For example, through targeted stakeholder communication the GPSDD could communicate with IT MNCs in other ways than with the rest of the group. As the results of this study have shown, IT MNCs have different interests and require different incentives than

other members. The GPSDD could react by talking about these needs and pointing out potential benefits in its messaging, for example selective incentives.

Foster Leadership

Recruiting IT MNCs is only the first step towards collective action within the GPSDD. The next step is engaging them. Therefore, the authors assume that it is important for the GPSDD Secretariat to further foster its leadership function.

The results from this study show that IT MNCs see a high value in some projects within the GPSDD, and that they are interested in creating shared value (I1; I3). However, as both SAP and the GPSDD Secretariat state, there are no structured processes in place to match the demand of some members with the supply of other members within the partnership (I2; I4).

The authors speculate that the GPSDD should foster the leadership function of the GPSDD Secretariat and establish better processes for brokering potential projects within the partnership. Since these projects are valued by IT MNCs as a potential source for innovation and business benefits (I3), the GPSDD should catalyze on the potential. The GPSDD might need to establish standardized procedures to match demand and supply for projects within the partnership.

One possible solution could be to hire more GPSDD Secretariat staff members whose main responsibility is brokering projects within the partnership. These employees could draw on the insights and recommendations from above to identify new potential projects, assess the scope of these projects and find relevant collaborators within the partnership. If an IT MNC is found to be especially relevant and useful for the project, it could be addressed with an individual messaging that refers to the special qualification of the company and that offers potential selective incentives associated with the project, if available.

Engage Continuously

The findings of this study show that motivations and interests are formed and expressed over time, and that the institutional design in collective action is established through an interplay of the actors involved. The authors hypothesize that the GPSDD should be aware that this interplay can only be understood through continuous engagement of the

GPSDD Secretariat. Therefore, the GPSDD Secretariat might want to engage in regular meetings with different member groups within the partnership, including its partners from the private sector. Through an ongoing dialogue, new challenges and opportunities, for example regarding the need for selective incentives, could be identified in advance and negotiated in the GPSDD community.

Big Data for Development Initiatives

The findings implicate that it is important to be aware of varying motivations across different members in the collective effort, and that a successful outcome requires leadership within this effort to understand these motivations and establish an institutional design that fosters collaboration despite the heterogeneity of actors.

As discussed in the introduction of this study, the GPSDD is not the only data-driven initiative that addresses sustainable development issues through a cross sector multi-stakeholder approach. Many of these networks have in common that the engagement of IT MNCs is crucial, but that sustainable strategies for recruitment and engagement of IT MNCs yet need to be developed.

The practical contributions of this study provide strategic guidance for practitioners who try to organize collective action. In specific, the results of this study offer guidance towards understanding the motivations of IT MNCs in collective action. It can be assumed that it is of practical relevance for most emerging collective efforts that include IT MNCs as actors to understand the different motivations of the heterogeneous actors and approach IT MNCs in a targeted way that focuses on the potential for shared value creation. As the GPSDD has shown, a separate staff can take on an independent leadership function within the initiative to guide vision and strategy towards private sector engagement, and broker collaborations.

6. 2. 2. Multinational IT Companies

As discussed in the previous part, the institutional design of collective action in BD4D multi-stakeholder networks is still evolving and formed through an interplay of actors. The example of SAP shows that IT MNCs are eager to take part in shaping the institutional design and express an interest in the creation of shared value through selective incentives. The results further imply that for IT MNCs, the emergence of new BD4D multi-stakeholder networks is associated with potential business and market opportunities. Motivations are not solely based

on the philanthropy of individual employees and corporate sustainability. Instead, the creation of shared value is considered an additional motivational force.

The findings of this thesis are restricted to the case of SAP's involvement in the GPSDD. But it can be assumed that other IT MNCs see BD4D multi-stakeholder networks as opportunities for shared value creation as well. During the GPSDD Data for Development Festival, more IT MNCs stated the business potential of voluntary projects that involved them and other GPSDD members. For example, the Senior Public Affairs Manager of the IT MNC Tableau refers to the potential of reconceiving products and markets through the involvement in BD4D multi-stakeholder networks by explaining the failure of other IT MNCs to enter the African market as follows:

> "And at the end of the day you can point to most of the challenges that they have run into are caused by the fact that they go in with their existing pricing model, their existing service model, and assume it just scales universally as opposed to being more thoughtful about listening to the customers, what are their values, what are their unique challenges in a given environment, and how can we be a good partner for them in this process. And some of it is in the technology, some of it is honestly in the pricing and service delivery" (W6).

Tableau is a member of the GPSDD as well. In a GPSDD project Tableau and PATH, a global health nonprofit, have worked voluntarily with the Zambian government on a predictive malaria model to make better informed decisions about how and where to tackle outbreaks. Tableau claims that in "just three years, Zambia's Southern Province has already seen reported malaria cases drop 93%, and the number of malaria-related deaths drop 97%" (Tableau 2018). Asked whether Tableau will make its solution available for free to other governments, the Senior Public Affairs Manager responded: "What if we made it really affordable [...] I mean we still have to pay the engineers, and keep it running" (W6).

For IT MNCs, the new opportunities through the participation in BD4D multi-stakeholder networks call for a strategic analysis, not only from a social responsibility standpoint, but also regarding the potential of creating shared value.

As stated in the topic delimitation, this thesis does not dive into the overall discourse around advantages and disadvantages of IT MNC engagement in sustainable development and does not assess the overall legitimacy of these companies. Yet, the authors want to neutrally state that the results of this thesis are of relevance for both sides – critics and advocates – on this controversial topic.

7. CONCLUSION

Throughout this thesis, the role of IT MNCs in BD4D multi-stakeholder networks has been explored. A cross-literature review has been conducted on related topics and theoretical constructs, leading to the introduction of a theoretical framework for assessing key factors that influence collective action. Special emphasis was put on the IT MNC's reasons for participating in collective action for sustainable development. In the following empirical part, inductive and deductive elements were combined to allow for a partly descriptive and theory-driven, and partly explorative case study analysis. The thorough analysis of the findings has been presented and discussed, leading to a new perspective on the role of IT MNCs in big data for development, and the internal processes during and reasons for participation. In this last chapter, conclusions will be made based on the findings: The research question will be answered, and limitations of this study and suggestions for further research will be presented.

7.1 Answer to Research Question

This study has been guided by the research question outlined in chapter 1:

Through the lens of collective action theory, how can the role of multinational IT corporations in big data for development multi-stakeholder networks be described, and why do these companies take part?

The question has been explored through an empirical analysis and a contextualization considering related literature and theories. Based on the findings and the discussions above, the question can be answered in two parts:

How can the role of multinational IT corporations in big data for development multi-stakeholder networks be described?

IT MNCs are strategic members of high relevance because they bring in unique resources complementary to those of other members. IT MNCs have an impact on key factors affecting collective action and therefore have the potential to catalyze collective action in BD4D multi-stakeholder networks. Yet, their diverging interests pose a challenge for the traditional institutional design of sustainable development initiatives, are poorly understood by the other members, and can inhibit successful collaboration.

A static description alone is not enough to capture the role of IT MNCs in BD4D multi-stakeholder networks. A complementing process view discovers that the role of IT MNCs is still evolving and continues to be formed externally and internally through an interplay of the collective action organizers, the other actors within the collective action, the companies themselves and the involved individual employees.

Why do IT MNCs take part in big data for development multi-stakeholder networks?

The question is answered considering the underlying processes and motivations leading to participation in the networks.

In terms of processes, it was found that individuals within the company who are highly interested in the BD4D network play a crucial role both for initializing and for continuously driving the engagement. These individuals participate actively in the network and promote the engagement in the company. They are the primary drivers in the initial phase of the engagement, representing the company within the network and raising interest inside the company. In the continuous phase, the organization may become involved on a strategic company level and unlock additional resources.

In terms of motivations, it was found that a distinction is necessary between the underlying motives for engaging in the collective action on the level of the engaged individual employee and on the strategic company level. While individuals are primarily motivated by philanthropic, normative reasons of making a positive difference in the world, on a company level IT MNCs rather pursue the goal to create shared business and social value. The potential for shared value through the participation in BD4D multi-stakeholder networks is assumed by IT MNCs as the engagement is closely linked to these companies' core businesses. Even though direct business benefits are not apparent, the potential for new business opportunities and enhanced stakeholder relations serve as a justification for the participation and go beyond CSR benefits.

7.2 Limitations

As typical for case study research, this study is limited with regard to the generalizability of its results. While the findings can serve as a basis for further research, and contributions to theory can be made as stated above, the assumption that the same results will be obtained when investigating similar cases cannot be derived from this single case study. To enhance

the generalizability of results, replication studies including further companies, and additional multi-stakeholder networks in the field are necessary (compare Yin 2013) and proposed for future research.

This study is furthermore limited as it relies to a great extent on semi-structured interviews, which could be subject to biases in terms of poor recall of past events, inaccurate articulation and social desirability. This limitation was addressed by asking the same questions to several interviewees if possible, and using data from non-participant observations and secondary sources in addition to interview data. A third limitation is the concentration of data collection on one point of time, which lowers reliability especially of the time analysis presented in chapter 5.2.1. The data was triangulated with data from other sources. A study which analyzes data at different points in time would be desirable in future research.

7.3 Suggestions for Further Research

Based on the results of this study, the authors recommend further exploration of the role of IT MNCs in big data for development initiatives in general, and their reasons for participation in specific. Among others, suggestions for further research include:

- Further exploration of the role of IT MNCs in big data for development initiatives through the conduction of case studies with other IT MNCs, and other big data for development initiatives, with the potential to confirm, criticize or expand the findings of this research
- Longitudinal studies on the interplay of the collective action organizers, the other actors within the collective action, the IT MNC itself and the involved individual employees
- Examination of alternative existing and potential institutional designs that can foster the participation of IT MNCs in collective action
- Exploration of the impact of IT MNCs on the provision of public goods
- Exploration of perspectives of other members in BD4D multi-stakeholder networks for thorough understanding of this emerging field

- Studies on the desirability of the participation of private actor engagement in these networks from a political perspective, and assessments of the outcome of such collaborations

As presented in chapter 5 and discussed in chapter 6, the participation of IT MNCs in BD4D multi-stakeholder networks is a new trend that has the potential to significantly improve collective sustainable development efforts. Yet, major collective action challenges need to be overcome in order to facilitate the participation. With the rising literature on both big data for sustainable development, and collective action in information systems research, this emerging interdisciplinary area calls for more academic attention.

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Primary Data

All primary data is made available to the reader via the digital data base. All phone interviews are available as audio files and transcripts. All workshops that the authors of this thesis attended during the Data for Development Festival are made available via audio files. In addition, all direct quotes from the Data for Development Festival that have been used in this thesis are also made available as transcripts.

Secondary Data

All secondary data cited below is also made available to the reader via the attached digital data base (PDF versions).

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9. APPENDIX

All relevant material for this thesis – including audio files and transcripts - is made available via the attached DVD and via the cloud in the "digital appendix", the digital data base of this thesis: https://drive.google.com/drive/folders/15fW7jvFJXh3EE4HAr4ywEULx42B8Xh-H?usp=sharing

Additional appendices are listed here.

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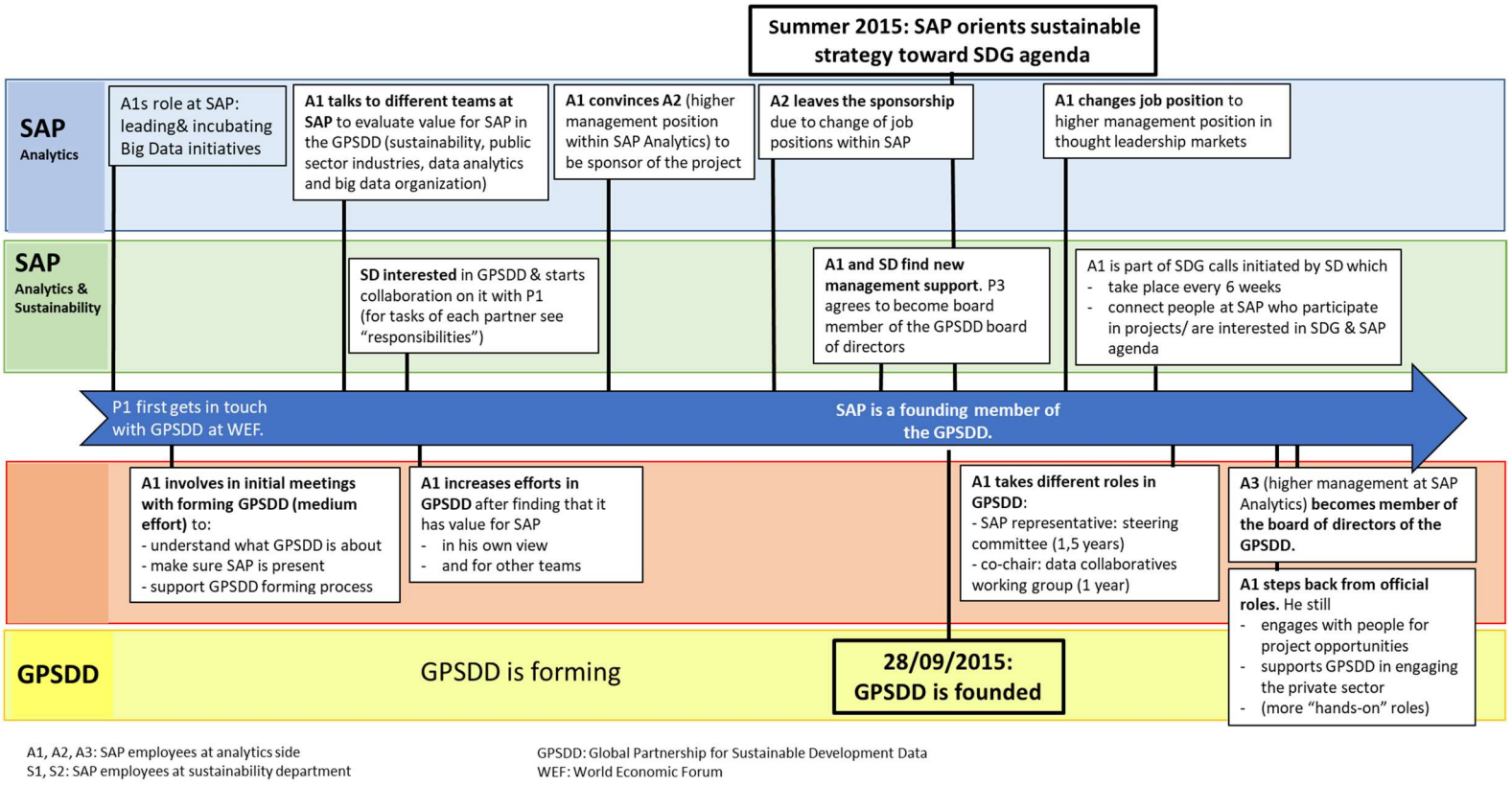
Appendix 1: United Nations Sustainable Development Goals

Source: https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Appendix 2: Comprehensive Timeline – SAP's Engagement in the GPSDD



Sources: I1, I2, I3, I4, I5, I6, Website SAP, Website GPSDD

Appendix 3: Categorized Motivations - SAP

Category	Motivation	Citation example	Description
Classic CSR business advantages	Sustainability is a trend topic	"You see a real trend for companies in general, that they want to, somehow serve some higher purpose." (I1, Min 41) *(Man sieht da jetzt einen [richtigen] Trend generell dann bei Unternehmen, dass die ja irgendeiner - also jetzt über einfach nur Geldverdienen hinaus, irgendwie nem gewissen Purpose dienen wollen dann.)*	Sustainability is becoming a trend for companies, and SAP as a company is part of this trend
	Brand reputation enhancement	"It has all the advantages of… also the classics, right: of brand and reputation, […]." (I1, Min. 38) *(Es hat die ganzen Vorteile von… die üblichen aber auch nä: Von Brand & Reputation; […].)*	Engagement in the GPSDD enhances Sap brand value, reputation and external standing
	Employer Branding	"It has all the advantages of… also the classics, right: of brand and reputation, certainly also employer branding, that it is important for employees." (I1, Min. 38) *„Es hat die ganzen Vorteile von, die üblichen aber auch nä: Von Brand & Reputation; sich differenzieren; tatsächlich irgendwie auch als Employer-Branding Aspekt, dass es für die Mitarbeiter wichtig;"*	Engagement in GPSDD makes SAP attractive for future employees.
	Strengthening investor relations	"And the third aspect is then of course that when you talk to investors, you can refer to this, right. Because this is increasingly important that investors, at least socially responsible investors, ask: which role are you actually playing in society? And then you can say, those are the solutions or solution approaches for the individual SDGs, and look here, we are also engaged in a partnership, Goal 17, for data development, that is actually our core competency, right." (I3, Min 17) *„Und der dritte Punkt ist dann natürlich auch, dass wenn du mit Investoren sprichst kannst du darauf auch referenzieren, nä, weil das wird ja dann auch immer wichtiger, dass die Investoren, zumindest die socially responsible Investoren fragen, welche Rolle spielt ihr*	The engagement in the GPSDD is a good way to attract investors or strengthen existing investor relations.

		eigentlich in der Gesellschaft, und da kannst du natürlich schon sagen, das sind die einzelnen Lösungen für die, oder die Lösungsansätze für die 16 Ziele, und guck mal hier, wir sind da auch in ner Partnerschaft, Ziel 17, für Data Development drin, das ist ja eigentlich unsere Kernkompetenz nä.“	
Unique Business Value GPSDD	Suits SAPs vision	“It is in this way… it suits with our vision “Help the World Run Better and Improve People’s Lives”, yes.” (I1, Min 37) *“Es ist insofern, es passt zu unserer Vision "Help the World Run Better and Improve People's Lives", ja.”*	The interviewees explicitly mention SAP’s vision, and that the engagement in the GPSDD is supporting the vision
	Business opportunity: Solution can be sold later	“My idea at that time was […] that we should also position ourselves as solution providers there, and say: so, we can not only help you to analyze the data but we also have products that you can buy to do these things.“ (I3, Min. 9) (*meine Idee damals war[…], dass wir uns da auch als Lösungsanbieter positionieren und sagen: So, wir können euch nicht nur helfen, Daten zu analysieren, sondern wir haben da auch Produkte, die ihr käuflich erwerben könnt, um sowas zu machen.)*	The interviews state that SAP sees business value in the partnership through contributing some services for free but having in mind that the respective organizations are then more likely to buy the solution portfolio later.
	Customer Relationship Strengthening	So, we have looked at this for us, and there are indeed not so few customers of SAP who are also engaged there. And that can of course strengthen a customer relationship or engagement, in the sense of joint efforts, and working towards a common goal. I think that this is one aspect.” (I1, Min 44). *(Also wir haben das für uns auch mal angeschaut, es sind tatsächlich nicht wenige Kunden von SAP-Seite, die darin auch engagiert sind. Und das kann natürlich ne Kundenbindung oder ein Engagement stärken, im Sinne von auch gemeinsamer Solidaritäten, gemeinsamer Bemühungen dann, auf ein gemeinsames Ziel hinzuarbeiten dann. Und ich glaub, das ist sicherlich auch ein Aspekt dann.)*	The engagement in the GPSDD can strengthen the relationship with customers who are also engaged in the partnership.
	Suits SAP’s sustainable strategy and enabler approach	“It suits wonderfully with the realization of our enabler approach, where we help other organizations through our solutions.” (I1, Min 37)	It is integral part of SAP’s sustainable strategy to act as enabler (and not only exemplar), in the way that the solution portfolio is used to promote sustainability. Interviewees mention that this

		„Es passt wunderbar dann zu der Verwirklichung dann wirklich unseres Enabler-Ansatzes, wo wir mit unseren Lösungen dabei helfen, anderen Organisationen.“	enabler approach is realized through the engagement in the GPSDD.
	Showcase Building and Story Telling	“And the analytics organization said, look there is an opportunity here for us to maybe build some showcases, show what’s possible with SAP technology, was really the thinking around that.” (I2, Min 6)	Through the GPSDD and individual projects, showcases and stories that make SAP technology more tangible and appealing can be built.
	Strengthening partner relationships	“So it is a sort of a mix of things that we would look for in a project. One is: are there SAP partners participating in the project?” (I2, Min 20)	Strengthening the relationships with partners who are also engaged in the partnership.
	Developing suitable solutions for specific application areas	„So our vision and our dream would actually be that when you do the project with the UN or the UNIDO or whoever, and then that Digital Boardroom [SAP solution] would become the standard reporting tool for the UN.”, and related “and then you can basically sell that to 192 countries.” (I3, Min 15) *„Also wäre eigentlich unserer Vision und unser Traum, dass man das mit der UN macht, mit der UNIDO oder mit wem auch immer, und dann würde so n Digital Boardroom wäre eigentlich Standard Reporting die Lösung für die UN.“* And related *„und dann kannst du das im Grunde genommen an 192 Ländern verkaufen.“*	In GPSDD projects, tools for specific applications areas – as reporting tools for SDGs globally and nationally – can be developed and later sold.
	Opportunity for new Business Models	“And then you would be in the area, data as a service, right. And we could not only consolidate the data and get pad for that, but we could also sell the data.” (I2, Min 31) Und dann wärst du nämlich in dem Bereich, Data as a Service, ja, und wir könnten die Daten nicht nur zusammenziehen und könnten uns das bezahlen lassen, sondern wir könnten die Daten auch verkaufen	Engagement in GPSDD can not only open traditional business opportunities in terms of selling software and services, but potentially support new business streams (e.g. data as a service)
	Enhancing employee satisfaction	“But there is also a greater purpose out there and I think people like working for a company where there is a greater purpose than just making money. And this is one way in which our employees, myself included, get the opportunity to do something that leverages our expertise in our area of professional passion, but also makes us feel good about getting up in the morning and being part of a bigger	The engagement in the GPSDD makes employees feel good about their daily work, e.g. by showing that SAP solutions serve a greater purpose and giving opportunities to leverage these technologies

		world and knowing that what we are doing for work is not only about how to make the company [better].” (I5, Min 18)	
Greater good	“SAP should because SAP can”	„It‘s a little bit the „core“, the heart of SAP where we think that we could of course use this, to make a contribution.“ (I1, Min 37)	From the statements of the interviewees it becomes clear that in “the same breath” as stating other motivations, they see SAPs expertise in the topic of big data as “a reason” why SAP should indeed contribute
	Doing good as a company (in addition to business benefit)	“So, when I was looking at the Global Partnership I thought that this was a great opportunity for us to 1) find some big data project that might have some business value to SAP but at the same time make a positive difference for the world” (I2, Min 3)	Interviewees mention that the company should do something good, in a single sentence or in addition to business value
	Doing good as personal motivation	“And so for me thats the thing. Its just the scale of the ability to make a positive impact on the world. It makes involvement with this organization really compelling.” (I5, Min 31:00)	Interviewees mention “doing good” as their personal motivation to take part in the engagement

Sources: I1, I2, I3, I5

Appendix 4: Exemplary Version of Questionnaire for Semi-Structured Interviews with SAP

SAP Interview with A1 (SAP Analytics)

General Questions

- Can you explain your role at SAP?
- As we heard from Christine you were the one who started SAP's involvement in the Global Partnership for Sustainable Development Data. Why did you initiate the partnership at SAP?
- What is your role in the initiative?

30-35 min: GPSDD

- In your view, how can new big data solutions solve current challenges for sustainable development?
- Can you explain what the "Global Partnership for Sustainable Development Data" initiative is about and what SAP's role is within this initiative?
- What GPSDD projects did you conduct at SAP?
- Can you give one example of the process of conducting such a project?
- (How does SAP decide which projects within the partnership it will participate in?)
- What motivates you personally to take part in this initiative?
- What strengths / capabilities of SAP make the company an important partner of the initiative?
- Where do you see common goals between SAP and the initiative?
    - What do you think motivates SAP as a company to take part in the initiative?
    - (In general, why do you think companies take part in this new multi stakeholder network?)
- Where do you see the initiative and SAP's engagement in the future?

10min: Conclusion

- Are there any other important aspects about SAP's engagement in the GPSDD that we have not talked about and that you would like to mention?
- You have talked about collaborating with other people. Can you think of a few colleagues who we might talk to about the initiative and their experience as well?
- Are there any other multinational IT companies in the initiative that you think we might be able to interview about the initiative?

Appendix 5: Exemplary Version of Questionnaire for Semi-Structured Interviews with GPSDD

GPSDD Interview with GPSDD1 (Executive Director)

Introduction: Initiative & Role

- Can you, just briefly, explain what the "Global Partnership for Sustainable Development Data" initiative is about?
- Can you explain your role in the initiative?

GPSDD & Private Sector: General

- What is the role of the private sector within this initiative?
- What strengths / capabilities of the private sector make the commitment of companies so important for the initiative?
- How do you get the private sector engaged in the initiative?
- What is your value proposition towards the private sector?
- Why do you think companies take part in the initiative? Both initially and continuously?
- Where do you see common goals between companies and the initiative?
- Where do you see the initiative and the private sector engagement within this initiative in the future?

GPSDD & Private Sector: Organization and Processes

- How do you recruit companies for the GPSDD?
- How do you get these companies engaged (continuously)?
- What opportunities and challenges are you facing when trying to involve the private sector?
- How do you get companies updated on and involved in certain projects of the initiative?

A Broader Outlook at the End: Big Data & Sustainable Development

- In your view, how can new big data solutions solve current challenges for sustainable development?

Additional Questions

- Is there anything we have not asked you yet but which you would like to mention?
- Do you know other persons involved in the initiative with whom we could speak, preferably employees of IT corporations involved in the GPSDD?

10. STATUTORY DECLARATION

We declare that we have authored this thesis independently, that we have not used other than the declared sources / resources, and that we have explicitly marked all material which has been quoted either literally or by content from the used sources.

……	……	……
Place	Date	Mirjam Sophie Chinnow

……	……	……
Place	Date	Jonas Boeckmann