Sustainable IT Business in the Making

An exploratory case study

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Abstract— **Businesses have historically had a negative impact on the environment by contributing to pollution, the increase of greenhouse emissions, neglection of responsible waste disposal, and deforestation among other things. In this paper we present an exploratory case study of an IT consultancy firm and their perspective and work with sustainable development. As a consultancy firm, the company does not provide services directly to end users, but rather help clients in their business efforts. The aim with this project has been to explore how sustainability concerns can be integrated into the work processes of an IT consultancy firm, exploring both opportunities and challenges.**

Index Terms—**Digital Sustainability, green ICT, Net Positive, Sustainable Development Goals, Sustainable Business, ICT for Sustainability**

I. INTRODUCTION

Historically, businesses have had, and continue to have, a negative impact on the environment. Pollution, the increase of greenhouse emissions, neglection of responsible waste disposal, deforestation and much more, are consequences of unsustainable business [1, 2, 3, 4]. The demise of the environment is, and has been for years, an increasingly important issue. Focus on Sustainable Development have been underway for a long time, and already in 1987, the World Commission on Environment and Development published Our Common Future where they defined the term sustainable development "[as] meeting the needs of the present without compromising the ability of future generations to meet their own needs" [5]. However, there are still major issues facing humanity - and businesses need to be included in creating a better world.

There are several research areas investigating sustainability and technology; Information Communication Technologies for Sustainability, Sustainable Human Computer Interaction, Sustainable Software Engineering, Sustainable Business, and Sustainability Assessment are a few examples [6, 7, 8, 9, 10]. These are all relevant for IT companies that try to drive sustainable business. Recent research in Sustainability Assessment, for example, aim to identify problems that affect companies that are trying to generate more sustainable solutions for technology, and to propose solutions to these problems [11, 12]. Information Communication Technologies, being a part of the Fourth Industrial Revolution where new technologies fuse the physical, digital and biological worlds across all disciplines, economies and industries [13], bring a lot of possibilities but also responsibilities for sustainable development. Businesses need to take these, and other, factors into consideration and create strategies for developing and managing sustainable products and services.

In this paper we present an exploratory case study of an IT consultancy firm and their perspective and work on sustainable development. As a consultancy firm, the company does not provide services directly to end users, but rather help clients in their business efforts. The aim with this project has been to explore how sustainability concerns can be integrated into the work processes of an IT consultancy firm, exploring both opportunities and challenges. The work has been delimited to the early phases of projects, when the IT consultancy firm gives clients advice on digital strategies and business development. The research question for this paper is hence: what can be the challenges and opportunities when working with sustainability as an IT consultancy firm in the early phases of a business offer?

As the IT consultancy firm have been working with integrating sustainability in their business for some time, part of the result will cover the processes they have in place. The result will also cover how they have worked with SDGs and the Net Positive approach. One major finding concerns not the formal processes, but the prevalence of an underlying 'tech-culture' that might undermine some of the sustainability efforts.

II. THEORY AND RELATED RESEARCH

A. ICT and Sustainability

Information and Communications Technologies (ICTs) offer numerous of opportunities to address sustainability in society. These include, but are not limited to, digitalisation and dematerialization, increased energy efficiency and travel substitution [14]. Although these solutions offer contributions to sustainability and sustainable development, there are negative side effects of ICT as well. Development of ICT products and systems, the use of the technology, and the poorly managed recycling and disposal of these products and systems are some examples [15, 16, 17, 18, 2, 19]. All this further exacerbated by

the ICT sector being driven by a Cornucopian feedback cycle [20], stimulating a seemingly endless infrastructural growth (c.f Promethean discourse [21]). Sierszsecki, Mikkonen and Steffens define two different concepts within ICT and green software; Greening ICT and Greening through ICT [14]. In the first one, *Greening ICT*, the focus is on ICT itself, and lowering its energy consumption. *Greening through ICT* on the other hand, focus on decreasing energy consumption of systems that ICT monitor or control. Hilty and Aebischer make similar definition in that they call for action "1. To stop the growth of ICT's own footprint 2. To find ways to apply ICT as an enabler in order to reduce the footprint of production and consumption by society" [22, p. 4]. This is an important division, because in 2015 the ICT sector itself is estimated to have constituted 3.6% of the world's annual energy consumption and 1.4% of the greenhouse gas emissions [23], whilst ICT is estimated to have a much larger potential in reducing energy consumption and greenhouse gas emissions in other sectors [24, 25]. In the rest of the paper we will refer to these concepts as *Sustainability in ICT* and *Sustainability through ICT* to encompass all the potential sustainability aspects ICT have impact on.

B. Sustainable Business

Today there seem to be a disconnection between sustainable business and sustainable development. Firstly, there is a gap between academia and practice which needs to be addressed [9]. Secondly, a lot of businesses take on a positive stance towards sustainability with the notion that it benefits their company, but there is a lack of actual change on a global level [26]. One reason is the discrepancy between large global problems and considerations of sustainable business on a low organisational level within companies [27]. Dyllick and Muff [26] have in their paper sought to clarify the meaning of sustainable business and the different potential levels are presented in a business sustainability typology, see Fig. 1.

BUSINESS SUSTAINABILITY TYPOLOGY (BST)	Concerns (What?)	Values created (What for?)	Organizational perspective (How?)
Business-as-usual	Economic concerns	Shareholder value	Inside-out
Business Sustainability 1.0	Three-dimensional concerns	Refined shareholder value	Inside-out
Business Sustainability 2.0	Three-dimensional concerns	Triple bottom line	Inside-out
Business Sustainability 3.0	Starting with sustainability challenges	Creating value for the common good	Outside-in
The key shifts involved:	1st shift: broadening the business concern	2nd shift: expanding the value created	3rd shift: changing the perspective

Fig. 1. The Meaning of Sustainable Business, from [26]

The typology differentiates between Business-as-usual and Business Sustainability. A company engaging in what is called business-as-usual (BAU) have mainly economic concerns, focus on creating shareholder value, and have an inside-out organisational perspective. Business Sustainability (BST) is defined in three levels: 1.0, 2.0, and 3.0. In summary, there are three key shifts that are identified in this typology; from BAU

to BST 1.0: broadening the business concern to include sustainability when economically feasible, from BST 1.0 to BST 2.0: expanding the value created (to include triple bottom line), and from BST 2.0 to BST 3.0 changing the perspective, starting with the sustainability issues in the world and then building the business around these. This can be compared with the Mann-Bate maturity scale (Mann Bates, also used in evaluating ICT for Sustainability (ICT4S) research [28]) for HCI research, that also proposes a larger shift in perspective in their 5th and most engaged stage.

C. Sustainable Development Goals

The Sustainable Development Goals [29] were ratified in September 2015 and include 17 goals and 169 sub targets. The Sustainable Development Goals Compass is a tool aiming to aid companies to align their strategies and measure and manage their contributions to the goals by following five steps [30]. The first step, "understanding the SDGs", allows companies to explore the Sustainable Development Goals; what they are, their history, and the possibilities arising when working with them from a business perspective. The second step, "defining priorities", enables companies to outline what their priorities could be using three actions: (1) Map the value chain to identify impact areas, (2) select indicators and collect data, and (3) define priorities. Since not all 17 Sustainable Development Goals might be relevant to a company, this step help companies see where they can have the greatest impact. The third step, "setting goals", is based on the outcomes from the previous one. It is about specifying goals that are measurable and time-bound. This is done by (1) defining a scope of goals and select key performance indicators, (2) define baseline and select goal type, (3) setting level of ambition, and (4) announce the company's commitment to the Sustainable Development Goals. The fourth step will help companies with how to integrate the Sustainable Development Goals in their business strategies. This is done through describing how they can (1) anchor the goals within the business, how to (2) embed sustainability across all functions, and (3) engage in partnerships. The fifth and final step of the Sustainable Development Goals compass manages how to continuously report and communicate progress, which will deepen companies' understanding of their stakeholders' needs.

D. Net Positive

The Net Positive project aims to make businesses to go from 'doing less harm' to a more positive approach to do 'more good' overall [31]. The Net Positive project has established 12 principles that would characterise the Net Positive approach. To aid companies in establishing a Net Positive mindset in their organisation, the project has released two guiding documents; *Communicating Net Positive* [32], and *Measuring Net Positive* [11]. In *Measuring Net Positive*, companies can read about how to measure their positive impact, through principles, required management steps and best practice on how to measure (some) material impacts. In *Communicating Net Positive*, companies can access complementary examples of how to take action to be Net Positive, as well as learn how the framework relates to other sustainability practices and terminology. To become Net

Positive, businesses need to go beyond doing less harm or becoming Net Zero or Carbon Neutral; it is aiming to have a restorative approach to natural and social capital.

III. METHOD

To explore how sustainability concerns can be integrated into the work processes of an IT consultancy firm, one of the authors carried out meetings and interviews at a Nordic IT consultancy. The company has about 1300 employees and offers services in all stages of the development of digital systems: creation of digital strategies, idea and prototype generation, system implementation, testing, and management. For this study, the focus was on early stages of projects where the consultancy firm provides clients with advice on digital strategies and business development. This part of the process was chosen since it may be difficult to include sustainability concerns at later stages of projects if they are not accounted for already in a strategic stage.

Initially, three meetings with the company's head of strategic advice services were conducted to get an overview of the processes used when providing this type of service – either when the company is approached by a client or when the company approaches a client to sell its services. To gain a deeper understanding of how sustainability is, or could be, integrated into the work processes, semi-structured interviews were conducted with six people working with digital sustainability in relation to the company's advice services (see Table I for details). The interviews were carried out in person, except from the interview with R3 which was carried out over Skype, and all interviews were audio recorded.

The interview transcripts were analysed with a focus on identifying opportunities and challenges for integrating sustainability concern into strategic digitalization and business development processes. Furthermore, the company's processes were mapped in relation to current sustainability efforts and suggestions for how the company could continue refining their processes were developed.

TABLE I. INTERVIEW RESPONDENTS

Respondent	Role description
R1	Head of sustainability
R2	Head of the company's strategic advice services
R3	Employee working with strategic advice services
R4	Former employee who worked with strategic advice services
R5	Independent consultant supporting the company in developing a process for digital sustainability
R6	Employee at the company's sales department

IV. RESULTS

In this section results from the interviews will be presented. This includes the company's relation to sustainability in general, how the company work with sustainability in their strategic advice services, and the process the company is aiming for, and the opportunities and difficulties with being an IT consultancy firm attempting to work with sustainability offers.

A. Early Engagement in Sustainability

The IT consultancy firm was founded in 1995, and they focus on business to business sales. One respondent argued that sustainability has been there since the start, although it was not perhaps identified as sustainability as such. Rather the focus was on human resources and human rights, what perhaps could be coined as Corporate Social Responsibility (CSR) and environmental issues (although less specified). In 2010 they launched their first sustainability report and notably they were one of the first consultancy firms in Sweden to do so. Following this, the company has had several internal dialogues about how to further improve their sustainability work. This led, for example, to one of the owners suggesting that they should start looking at what kind of external impact they could have on sustainability issues, rather than only focusing on their internal impact. After this, the company started evaluating what kind of environmental impact they might have, and what kind of positive sustainability effects they could deliver through their customers.

Today, the company put a lot of effort in using the Sustainable Development Goals and Net Positive in their projects. They make an effort to work with an outside-in perspective, which is to say a perspective that focus on need rather than product. Namely, the proposed value propositions and business plan innovations that the IT consultancy firm offer to their clients are based on the knowledge of their client's marketplace. The greatest asset to this perspective is the customers, and the ability to differentiate between what the clients make and what the client's customers actually need.

Early on (even before the SDGs were launched) the IT consultancy firm formulated what sustainability effects they might contribute to through their services to their customers, namely Energy savings, Dematerialization, As-a-service, Decreased Resource Use, Safety and Other, which are further described in Table II.

Sustainability effect	What?
Energy savings	The IT consultancy firm's client, the client's customer, or the end user can decrease their energy use.
Dematerialization	Physical materials or products are digitized/digitalized, or the same level of functionality can be delivered with less or no material.
As-a-service	From product to service for the IT consultancy's client, or client's customer.
Decreased resource use	Less or no use of non-renewable resources
Safety	Safer digital spaces and/or increased security
Other product or service development	Development beyond the above, that contributes to the Sustainable Development Goals and sustainable development.

The IT Consultancy firm is committed to continue working with sustainability. One external aim is to become more proactive in their sales work which hopefully would enable them to contribute to greater changes within sustainable development. To reach this aim, the IT consultancy firm has developed a digital sustainability offer within its strategic advice services [14].

B. Strategic Advice Services

Strategic advice services, where the IT consultancy firm first meet their clients is the first phase where the company can help their clients with digital sustainability. A simplified overview of their general approach is displayed in Fig. 2.
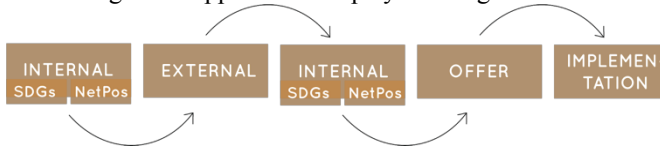

Fig. 2. Overview of the general approach used in Strategic Advice Services

The initial *Internal* stage begin with research of the current client in order to gather an understanding of what they offer, what their products or services are, and how they profile themselves regarding sustainability. They also attempt to find possible synergies, and do a trend analysis which involves looking at what other companies in the same industry or with similar products/services do. Other than this, they create a possible value proposition where they do a Sustainable Development Goals inventory, and analyse the possibly relevant indicators for their client.

After this, they move on to the second phase, *External*, which includes meeting with the client and getting their interest. In addition, they collect additional information about their client's products/services and their work within sustainability. They focus on information that they might not have been able to find out by themselves.

During the second *Internal* phase they try to further analyse the client's needs and possibilities, also with the Sustainable Development Goals and Net Positive in mind. This time around they have more information about the client's products and/or services than during the previous internal step. They might also have gained greater insight into what the client might want or need.

This then leads to an *Offer*, which includes a process of workshops in collaboration with their client, as well as data gathering from their client's customers. The implementation of the offering usually contains three separate workshops. The first workshop covers inspiration and innovation, aligned with the client's business. The second workshop is about business model innovation, and the last workshop as about tying it all together by refining, reworking, and defining ideas and solutions. The idea is that the Sustainable Development Goals and Net Positive should be integrated during all the workshops. However, in the interviews it became clear that the above described general approach are in practice performed differently within the Strategic Advice Services. During the interviews, two different particular approaches were identified.

1) Approach 1

One of the approaches used for the Strategic Advice Services' digital sustainability offer were described by one of the respondents as the double diamond. A summary of how it is used in conjunction with Net Positive and the SDGs is displayed in Fig. 3.
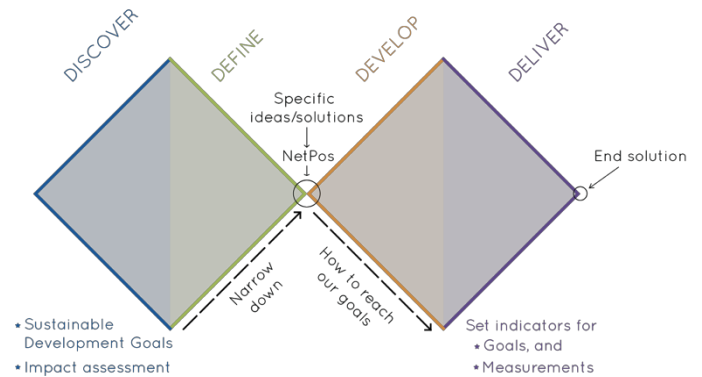

Fig. 3. Approach 1, the Double Diamond as described in the interviews

The double diamonds approach is common in design, and the employee at the IT consultancy firm who use it argued that it is because of his/her background within industrial design that it is used.

"I think that it's probably because I'm so strongly influenced by having a background in industrial design that I am drawn to this double diamond model, but I think even in non-designy projects, it translates really well. You start somewhere and you don't know what the problem is so you have to explore, you have to go broad and you have to maybe look for details, maybe you don't know exactly what the problem is don't know exactly what you're looking for and then you start

to design it to a more specific case [...] there's always an iteration between diverging, opening up, and converging, making things more specific." (R3)

As can be seen in the quote R3 argues that the double diamond is relevant in all kinds of projects. Fig. 3 shows that the Sustainable Development Goals are assessed during the phase *Discover*. The questions asked during that step is "which Sustainable Development Goals are relevant?", "how is the work we do today related to any goals?", "and which goals are for us (the client) possible to look at in the future?". At this point an impact assessment is also made. To do that, the question "where do we (the client) want to have an impact as a company?" attempts to be answered. The first step is rather broad, and it is during step two, *Define*, that more specific ideas and solutions may form. When this narrowing down has been accomplished, the outcome should be one or a couple of ideas/solutions. These can then be assessed from a Net Positive approach in the third step, *Develop*. An important question at that point is "is the ideas/solutions actually contributing to something good, or are they only focused on not doing any harm?". In the last step, *Deliver* and *End solution*, respondent R3 expressed that the IT consultancy firm have work to do regarding measuring a project's impacts, as in the following quote:

"When you come to your final solution, I think it's gonna be a lot more about doing actual measurements, and I think that's one of the areas where [the IT consultancy firm] maybe has… more space to develop, that we haven't really done a lot of as I would see, fact-based impact assessments. [describes a particular case with sustainability goals but not indicators of success] I can sort of see the intent behind that, but I think for… for this process to be [...] credible, later people are going to ask those questions like 'how did it actually work? was it actually more sustainable', and if you cannot prove that you're probably gonna set it off as a… as a green-washing thing or as a marketing, or whatever." (R3)

Respondent R3 argued that if they were to use the last stage to set indicators for goals and measurement, it would be easier to make fact-based assessments of their impacts.

2) Approach 2

Another approach that emerged during the interviews is displayed in Fig. 4. The first step in the approach is *Finding synergies* between the IT consultancy firm and its client. It is a sort of evaluation of what the IT consultancy firm can offer their client through collaboration. Step two, *Research*, includes research about the client and their business, their products/services, what they do within sustainability, and their current partnerships. The aim is to know as much about their client as they can to suggest relevant development. After this, a trend analysis is conducted. This is a benchmark of what other companies or organisations in the client's industry are doing, what technical developments and trends might be relevant, and what is being, and can be done, in the said industry regarding sustainability. After these three steps, the information gathered makes it possible for the IT consultancy firm to create a value proposition for their client. The Sustainable Development

Goals and Net Positive is to be considered during phase two, three, and four.

Fig. 4. Approach 2 as described in the interviews.

C. SDGs and Net Positive

When Strategic advice services assess which Sustainable Development Goals are relevant to a project they start by exploring the overview of the 17 goals. When they identify one or several relevant goals for a project, the second step is to look further into the goals by assessing their sub targets. The sub targets are presented both during the potential value proposition and later in their sustainability report. Two respondents expressed that the presence of or relation to the goals can sometimes feel vague, and that there is room for improvement and development in this area:

"The SDGs, it's still a bit vague exactly what we should do with them, how are we to address them and I believe that if we can get those two [SDG and Net Positive] together in a synergy, then I think that is the best way forward." (R1)

As of now, Net Positive is integrated in the IT consultancy firm's digital sustainability in such a way that they talk about environmental opportunities rather than obligations. They suggest an approach where digitalisation might help their client to contribute to the environment and to society, rather than only minimizing their negative impact. One respondent stated that it is rare to do this within consultancy firms, and that the IT consultancy firm aim to embrace the possibility to actively contribute to a positive development within digitalisation. What the same respondent also expressed, was that it is still a rather new approach and therefore not widely accepted in different industries as in the following quote:

"The drawback with Net Positive is that it isn't used that much, and there aren't that many that who understands it, and it is a bit difficult to actually, or not a little, it's actually quite hard to measure it" (R1)

Hence it is difficult to measure the impact or success, which makes it more difficult to prove that the IT consultancy firm's actions actually make a difference.

D. Consultancy and tech culture

Being a consultancy firm makes it possible for the IT Consultancy to affect companies cross-industry and this does bring both difficulties and opportunities to the fore. Three respondents stated that they as an IT consultancy firm are used to fast changes, and one respondent said that they have the possibility to connect disruptive technical opportunities to business opportunities. The same respondent also expressed that some difficulties may be that consultancies are often considered to only be interested in selling their services, that is making profit, which makes it important to be confident in their sustainability focused offer and be able to present the customer value of working with sustainability. This respondent also stated that

"there is a 'tech-culture' that focuses on efficiency within existing systems among many of those who work with IT" (R5), which can be an issue when trying to accomplish a Net Positive approach. Another respondent mentioned that there are engineers at the company that do not see the purpose of digital sustainability and state that they are an IT firm that should focus on tech, as exemplified in the following quote:

"This is a way to think, that we should use this fantastic development [digital sustainability] in a positive way so that we bring value to the society, it does appeal to many of our employees and especially the younger ones, but then there are of course people who think it is only mumbo jumbo kind of, and then I think they have not really understood it, and that is something I sometimes meet within the company." (R1)

This might indicate that there are some 'tech-culture' members at the IT consultancy firm a well. This respondent also pursued the issue with lack of data. Often, because they are a consultancy firm, they don't have access to all the data that relates to a product or service that they contribute to. It could be because they sometimes are not involved in an entire project, only parts of it, or that they don't have access to data about how a product or service is used. This then makes it harder for them to address the right issues, or going deep enough into issues.

E. Formalizing a process - SPRING

Just before the interview study presented in this paper was done, the IT consultancy firm had started to formulate a new more formalized process for their strategic advice services. The process, called Digital Sustainability - Global Sustainability as a Driver for Innovation and Growth, also referred to as SPRING, was finished during the winter of 2017/2018 in the form of a white paper [33]. This white paper contains a description of a process the strategic advice services are expected to use when providing a digital sustainability offer to a client. The whole process has at the writing of this paper, been piloted in one project. An overview of the process is displayed in Fig. 5.

Fig. 5. An Overview of the SPRING process from [14]

Three of the respondents (R2, R4, and R5), have been involved with the creation of the SPRING process. These three respondents, as well as respondent R3, were all involved in the pilot project at some stage. Respondent R3 expressed that the process seemed interesting when reading about it, but since he/she was only part of one stage of the pilot project it was not enough to understand it fully, as in this quote:

"So, I think it looks really promising but for me, personally, it needs to become more concrete, like going through it like in a specific case, one or two times before you can actually... I feel like right now it's hard to judge like, 'oh this is missing and that is missing' because I haven't experienced it." (R3)

The respondent did however continue to argue that it looks really promising, but that it needs to become more concrete.

Overall, three of the respondents expressed that they liked the entirety of SPRING and idea behind it, and that its presence itself urges the sustainability work at IT consultancy firm forward. However, two respondents said that the process is too complicated, and need to be simplified or further explained as in the following quote:

"So, I think the whole idea behind it is great, but on the other hand, I don't believe they have succeeded in making it simple and understandable, I think there's much left to be done there." (R4)

Another aspect that two respondents highlighted was that distributing the SPRING process and its purpose outside of strategic advice services has not succeeded fully as exemplified by R2:

"We have not really succeeded in anchoring this with everyone else at [the IT consultancy firm] [...]there are some very good thoughts behind this and we talk about it, but there isn't always a match perhaps on how we view things, and we might need to revise the SPRING document compared to today, and the process, in order to do it more clear" (R2)

Moreover, two respondents expressed that the customer value is not clear enough, and need to be further developed to a more tangible value.

"Well, sometimes it is hard to explain to them, the value of it. It is like, when we come to them and talk about digitalization and sustainability and such, then it can be as if they are on a totally different level, and we have to start to, like, lift the discussion a bit before we can even start to talk about this process." (R6)

Other than this, there was one respondent who argued that the process is not too difficult, but that it needs to be implemented into the strategic advice service processes.

V. DISCUSSION

This paper has reported results from an exploratory case study of an IT consultancy firm, with the aim to explore how sustainability concerns can be integrated into the work processes, and the opportunities and challenges of doing so.

The IT consultancy firm in this study has worked with CSR and sustainability for a long time, and communicate widely their sustainability engagement. Compared to many other companies in the industry, they have a high profile as a sustainability engaged company, and have the reporting track record to back it up. As a consultancy firm, they have the possibility to work with clients cross-industry, and hence have a high potential to use ICT as an enabler to reduce impact in other sectors [22] or in other words to work with Sustainability through ICT, reaching larger impact than just greening their own internal ICT use. Furthermore, the top-down management approach, with a highly engaged owners and top managers, strengthen the

ongoing work of introducing more sustainability focus in their work processes. Although, there are a few challenges facing the company.

A. Unclear process

The sustainability work has evolved over the years, and new metrics, frameworks and ideas have been added to the earlier efforts. An example of this is the SDGs, that have been added on top of the Sustainability Effects presented in Table II. Furthermore, the Net Positive approach has also been added to the mix, without removing, or aligning this with what was there earlier.

Considering the six main sustainability effects that the IT consultancy firm contribute to (Table II), it is not clear which effects are prioritized or to which effects most effort is put in to. As an example, the *energy saving* effect lies within the scope of *sustainable ICT*. *Dematerialization* and *as a service* is more aligned with *sustainability through ICT*, which has a greater potential of affecting the environment than *sustainability in ICT* [14]. None of the respondents acknowledged these two perspectives of ICT and sustainability, and it has not been displayed as a parameter or indicator during any of the processes for their digital sustainability offer. Adding this parameter to their processes might make it possible for the IT consultancy firm to consciously focus more on *sustainability through ICT* projects.

The strategic advice service is today carried out with an aim of considering both SDGs and Net Positive, but the interviews showed that this was approached differently by different people (as in the reported approach 1 and 2). The more formalized SPRING process has been developed, but not widely tested and spread in the whole organization. The interviews also showed that although the SPRING process is detailed, it is still not concrete enough. There is a need to clarify and break down the different steps, and the connection to both SDGs and Net Positive, better.

1) Clarifying the Sustainable Development Goals

To increase the credibility of the assessment process used within strategic advice services, it could be beneficial to use the Sustainable Development Goals Compass [30]. There are five steps, where step one, that includes understanding the business opportunities and challenges, is already accomplished by the current process. Step two (defining priorities) could be applied to any project that the IT consultancy firm is involved in. This step involves mapping the value chain to identify impact areas, select indicators and collect data, and thereafter define to which goals a company will have the greatest impact. The third step involves setting goals, that are measurable and time-bound. This is also a step that could aid the IT consultancy firm in developing their work with the Sustainable Development Goals further. Furthermore, by adding the indicators connected to this step, it should be easier to communicate impacts. The fourth step, integrating the goals within the organisation, is something that the IT consultancy already attempts to do. The fifth and final step is about reporting and communicating progress. This is also done by the IT consultancy firm to some extent, by linking projects to specific goals in their sustainability report.

However, since the interviews indicated that measuring impact is somewhat lacking today, there is room for improvement. It might not always be possible to measure all projects quantitatively, but by setting indicators and goals early on in a project they will have the possibility to communicate what kind of change or impact that their projects are striving for. That could be a way of making their contributions more credible [30]. By refining or applying the above discussed steps, the process of creating and communicating technical solutions within the digital sustainability offer would be improved.

2) Clarifying Net Positive

The Net Positive approach is still rather new and not widely adopted in industry, which can be considered both an advantage and a disadvantage. It can communicate that the IT consultancy firm is at the forefront of sustainable business work leading to being approached by sustainability engaged companies and organizations, at the same time as it to some might seem complex and unproven. Another drawback is that measuring the impacts of a Net Positive approach is not necessarily easy. Good practice for measuring is still developing, and there are guidelines in *Measuring Net Positive* [11] that could be helpful.

In the interviews it became clear that the IT consultancy firm had not communicated to their employees how to set indicators for measuring Net Positive impact. The measurement does not necessarily have to be quantitative, and cannot always be presented in such a way either. A few basic questions for increased transparency for companies when reporting Net Positive are the following: What has changed? What was the baseline? Has the problem shifted elsewhere (rebound and displacement)? How long will the benefit continue into the future before it is replaced (drop-off/future benefits)? [11]. Using these indicators when creating and evaluating a technical solution that the IT consultancy firm has provided to a client would improve the credibility of the product/service.

Another aspect to consider is wherein which area a company, or a project in the IT consultancy firm's case, should focus. There are five of these areas presented in *Measuring Net Positive*; carbon (including energy), water, social, material use (including forestry and waste), and ecological (including agriculture and biodiversity) [11]. The relevance of these areas will depend on what kind of projects the IT consultancy firm engages in, and should be implemented and considered as impact measurement points during the strategic advice service processes. This can increase credibility, both with clients and the general public.

B. Data as a challenge and opportunity

One challenge to the IT consultancy firm (and any consultancy) in their digitalisation and sustainability work, is the lack of data access. Even if the IT consultancy firm aims to contribute to sustainability effects such as energy savings and products or services with a positive effect on the environment, how will they be able to prove this if they do not have long term access to their clients' data? Although it is not possible to measure everything quantitatively, there are still possibilities to indicate positive changes. An area where the IT consultancy firm could

engage in, is business to business data sharing with other companies. This would correspond to changing the rules as argued by Dyllick and Muff [26] Today, it is most common that business to business data is shared and re-used within the same sector, and the most common data to be shared is that which is generated by internal IT business systems and Internet of Things [13]. According to [13] the concept of business to business data sharing is not yet commonly understood. The study claims that companies that engage in this kind of data sharing are not giving away complete datasets or lose "data ownership" rights, but they allow third-parties to get involved with the process. The third-party might be involved as intermediaries or as enablers. Both technical and legal skills are of significant importance if engaging in business to business data sharing [32], but if the IT consultancy firm were to establish that kind of competence this could be a way of accessing more data.

C. Tech-culture and maturity

Despite the high engagement of management, and despite sustainability being on the agenda within the company for a long time, there is still issues in spreading this focus within the organization. In the interviews it was mentioned that the SPRING process had not spread through the organization, and that there are still employees that do not understand the value of working with the SDGs and Net Positive. Furthermore, there were respondents that alluded to a 'tech-culture', within the company as well as in the industry in general, which prioritizes technological development above sustainability concerns, which can be compared to the Cornucopian paradigm described by Preist et al. [20]. Addressing this tech-culture might be the biggest challenge for the IT consultancy firm, since the sustainability processes, goals and aims otherwise may be circumvented in the daily practice. This could be compared to the focus on computational thinking pervasive in computing education and practice [34], which delimits the focus of computing to only address solvable problems without considering widened system boundaries. Besides this being a problem adherent to IT companies, or tech industry, it is also a strong discourse in society in general [21]. In the light of maturity models and the Business Sustainability Typology, the highest level is when an organization has gone through a shift in perspective - placing the societal and environmental concerns at the forefront instead of profit. Or as argued by Dyllick and Muff, "[...] only a shift in organizational perspective, from inside-out to outside-in, will allow a company to develop strategies and the business models needed to make relevant contribution to overcome societal and planetary challenge, thereby contributing to the common good" [26, p. 168]. In such a shift, a majority of the employees must be engaged. To some degree, there are already high aims from the top management to shift the company towards having societal and environmental concerns as a top priority. But being a (profit-dependant) company within a larger economical structure, even the well-intent ambition of higher management might be thwarted by the over-arching system. Changing this system from within might be hard, but aspirational. As alluded to in for example [20, 26, 28], there is a larger transformational shift needed in both values and practices.

D. Future work

This study has been an exploratory case study, based on interviews with respondents within the IT consultancy firm working with sustainability. As such, the results are applicable in other settings, but perhaps not yet generalizable. A natural extension to this work would be to not only focus on internal respondents, but to also interview clients of the IT consultancy firm. Furthermore, the focus has been on the early stages of strategic advice services, and the work can be extended by looking at later phases of the process.

One thing that often lacks in sustainability work and initiatives in practice is how to make actions and results tangible enough. This is something that needs to be further investigated and explored. There is a need for longer studies that focus on specific projects from the start to finish, and even further than that. A possible obstacle with this is that actual environmental impacts may not be apparent until years after a product or service has been implemented. One way of approaching this could be to investigate both short- and long-term impacts. Another aspect that should be explored further is how to agree on measurements cross-industry, or at least within same industry. Without a generally accepted and adopted language and measurement indicators it is difficult to compare different results. Hopefully, further work with business to business data sharing might contribute to general measurement indicators being adapted.

VI. CONCLUSIONS

The aim of this paper has been to explore how sustainability concerns can be integrated into the work processes of IT consultancy firm, exploring both opportunities and challenges. As such, the IT consultancy firm in the study has already been integrating sustainability in its processes, and is underway to further integrate it. There are opportunities in using the SDGs and Net Positive to drive their strategic advice services, although more clarifications are needed, as well as more work to spread the process within the organization. A potential threat to this work is a tech-culture, both within the company and within the industry, which may resist sustainability work. Furthermore, lack of data and measurement might undermine the sustainability focus effort pushed by the IT consultancy firm, in general, there is a need for more fact-based assessments of sustainability effects.

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