

Translating Green IT: the case of the Swedish Green IT Audit

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ABSTRACT

In this paper we use translation theory from organization studies [1] to discuss the Green IT Audit, which is a consultancy model developed in Sweden, following the recent industry shock-wave of Green IT [2]. Translation theory is based on social constructionism [3], which inter alia posits that concepts, such as Green IT, do not have intrinsic meanings, but that meaning is created in social interaction. The theory is therefore part of an interpretive turn in organization studies, where effort is dedicated not to increasing the efficiency or effectiveness of organizations (the main concern of more functionalist studies), but to see how people that constitute them, make sense and interpret their work.

Keywords

Green IT, translation, Sweden, GIT Audit, interpretative

1. INTRODUCTION

In this paper we use translation theory from organization studies [1] to discuss the Green IT Audit, which is a consultancy model developed in Sweden, following the recent industry shock-wave of Green IT [2]. Translation theory is based on social constructionism [3], which inter alia posits that concepts, such as Green IT, do not have intrinsic meanings, but that meaning is created in social interaction. The theory is therefore part of an interpretive turn in organization studies, where effort is dedicated not to increasing the efficiency or effectiveness of organizations (the main concern of more functionalist studies), but to see how people that constitute them, make sense and interpret their work. The purpose of the paper is twofold: 1) to argue that even though Green IT, Sustainable ICT or similar concepts are technologically oriented, and that technology is certainly a main component for advancing greener solutions, theories from other fields (such as organization studies) might also be of use for understanding Green IT. We will argue that translation theory is a fruitful theory. 2) to give insights into some aspects of how Green IT has been translated into the Swedish context, thereby contributing to the understanding of the local actions and reactions to a global trend.

2. EXPLORING DIFFERENT PARADIGMS IN GREEN IT RESEARCH: FOCUSING ON THE INTERPRETATIVE TURN

In organization theory it is quite common to distinguish between different paradigms of research. Burrell and Morgan's [4] influential application of Thomas Kuhn's context to the

organizational domain, suggest that management and organization studies can and ought to be divided into four incommensurable paradigms: the functional, the interpretative, the radical humanist, and the radical structuralist. These four paradigms are derived from two axis where one axis is a whether the study is subjectivistic and objectivistic, and the second whether the study is regulating or radical. An objectivistic perspective means that there is an external angel from which the organization can be studied, and organization which consists of real and concrete processes and structures. The subjectivistic perspective means that an organization is a subjectively constructed phenomenon, a label that people use to create meaning and make sense of their lives. The regulating perspective means that the purpose of research is to describe what happens in the organization, and possibly suggest smaller changes, rather than critiquing it, or radically changing it. The radical perspective goes beyond regulation and suggests that research should be normative to what happens in organizations. The four perspectives are thus: Functional (objective/regulation), Interpretative (subjective/regulation), Radical Humanist (Subjective/radical), Radical structuralist (objective/radical).

This corresponds quite well to other characterizations of different forms of research in organization studies. In their study on entrepreneurship, Jones and Spicer describe that there are three streams of research in organization studies: the functional, the interpretative and the critical [5]. The functional is concerned with improving performance and to make things work in a better way, the interpretative is more concerned with sense-making and how different actors perceive organizational reality, positing that such interpretation is crucial for understanding organizational behaviour, and the critical is concerned with emancipation, particularly throwing light on practices of power and domination in organizations [5]. One could say that what Jones and Spicer call "critical" is the radical humanist and radical structuralist paradigms.

We hold that most work in Green IT could be seen as belonging to a functional paradigm in its efforts both to improve the efficiency and reduce environmental impact of ICT, and in its efforts to use ICT to reduce environmental impact and increase efficiency in other parts of society (the remaining 98%). While we have seen studies that draw on insights from organization theory, for example Molla who draws on institutional theory to emphasise that there is a need to pay attention to institutional context (culture, established practices, attitudes) for understanding the possibilities of implementing Green IT, still the focus is to understand how these institutional structures can be overcome and Green IT can be made to work in a better way [6]. Certainly, we concur with these efforts to create a more sustainable society, but

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in this paper we point out the possibilities of conducting interpretative and critical studies on Green IT. The reason is not just to show that there are more potential streams of research regarding Green IT. By taking an interpretative approach in the study of Green IT, we hope to bridge the divide between technical research and organizational research, since competence about both are necessary for propagating Green IT (for other similar approaches see [7]). We will not pursue critical approaches in this paper, but we will do that elsewhere. Rather, we want to see what interpretative approaches can offer.

3. SENSE-MAKING AND TRANSLATION

In this paper, we particularly draw on one interpretative theory from organization studies, namely translation theory, as described by Czarniawska-Joerges and Sevón [1], but to some extent also on sense-making and sense-giving literature [8,9]. While sense-making is focused on how actors make sense, individually and organizationally, of different things, for example organizational change efforts, sense-giving is focusing on the way (some) actors can have agency and add or change the meaning of similar efforts. Stemming more from an actor-network theory perspective [10], translation theory brings up the point that ideas (such as Green IT) are not automatically diffused throughout the world, but their very meaning and the success of their spread is dependent on the way different actors "translate" (e.g. modify, pass on, energize, ridiculize) these ideas. Czarniawska and Sevón find the concept of translation useful since it both captures the aspect of movement and that of transformation [1, p. 6).

3.1 Sense-making

The theory of sense-making has been used to explain different phenomena since the seventies. The approach briefly means that actors involved in a certain until now unknown situation cannot proceed without making "sense" of this new situation [11]. According to Dunbar [12] and Goleman [13], the sense-making can be seen as a stimuli placed in a certain framework. The stimuli is the uncertainty that starts the sense-making process while the framework is both the current situation and experiences that the actors can connect with this situation. This means that all involved actors will make different sense of a certain situation from their different backgrounds and previous experiences. This stimuli lets the involved actors understand, explain and draw conclusions out of a situation. Three important elements in the process are sometimes described as the situation, the gap and the use. The situation is the events in an involved person's life that can be connected to what is currently happening, the gap is the lack of sense in this current situation and the use – the stimuli – is the bridge that will take you over the gap [11].

The making of sense has four different levels, where the first – and the most simple one – is individual sense-making, also known as intrasubjective sense-making [14,15]. The intrasubjective sense-making can be seen as the base point of sense-making, but in most social situations this can only describe a small part of what is happening. The second level is intersubjective sense-making, where sense is not made within the actors but instead between and among them [14] which creates a "giving, a taking and the feeling of connectedness" [16, p. 319]. In the case of Green IT Audit, the most interesting situations studied took place when the sense-making was collective, in a group of about ten people with different backgrounds, knowledge and values. This makes the sense-making much more complex. The next three

levels are different forms of sense-making. The following two levels are the generic subjective and the extra subjective sense-making. The first level leaves out the subjects, the concrete human beings, and the sense is being made continuously within the group. This meaning is not constant, but shifting when new uncertainties or gaps are being introduced. This form of sense-making may take the form of policies or standards which are rather concrete, while the extra subjective sense-making often results in the building of organizational culture or other more abstract matters.

Another important aspect of sense in the context of Green IT Audit is sense-giving [9]. The sense-giving is a process where one or more people are intentionally influencing the sense-making process for a group of people. While the sense-making process in some way seems quite adaptive - a person, a group, or a larger collective responds to some stimuli and tries to make sense of it, the sense-giving perspective introduces more agency and points out that the stimuli comes from somewhere. Sense-making and sense-giving therefore ought to be seen as complementary processes where sense-making is more reactive than sense-giving which is more active and where agency can be perceived.

In the case of Green IT Audit, this happens mainly between the auditor and the audit group which makes the auditor one of the most important actors in the sense-making (and translation) process. The sense-giving is possible in this case because the auditor already has made sense out of the situation because she or he has performed the audit before. Even so, there is still a dialectic relationship between the sense-giving auditor and the sense-taking and sense-making group, the auditor will also be affected of the sense-making process in the audit group and therefore continue her or his own sense-making process which will affect the way the auditor understands the model.

3.2 Translation

Besides the theories of sense-making and sense-giving, we've chosen to extend the theoretical framework to the Scandinavian neo-institutional way of discussing "translation". Translation, which derives from the actor-network theory, is a way to understand how ideas travel and change during this travel. The translation process is closely connected to that of sense-making, but has a more comprehensive focus, while the sense-making process is more focused on the actors and not so much on the whole process. While the conceptual apparatus of sense-making is useful when certain events of the Green IT Audit are studied, the translation theory can be used to study the whole chain of events from the birth of the idea Green IT to the implementation and institutionalization of certain Green IT related activities within an organization.

The traveling of ideas, or the idea model [1], explains how an idea is born, how sense of the idea is being made, how the idea is transformed into certain objects that can move from one place to another, and finally how the idea may cause certain related activities to be institutionalized within organizations. This means that the whole process of the birth of Green IT Audit can be explained with the idea model. This can be seen as an alternative to the maybe more conventional way to view idea-spreading, the theory of diffusion [17]. This process argues that an idea will travel as long as no obstacles for the diffusion exists. This means

that the spreading of an idea will slow down or stop when there are for example cultural or social tensions. The spreading of ideas using the translation perspective instead argues that the idea will spread as long as someone is willing to work for the sake of the idea [18]. The main argument to not use the diffusion theory in this paper is that the diffusion theory does not focus as much on the transformation of an idea to something new or to a cluster of new ideas and objects which is the case in the translation of Green IT.

The fundamentals of the translation which is a part of the idea model is that all events that occur is created by both humans and so-called nonhumans. Nonhumans are physical objects that as well as humans that humans can interact with within a network and between networks. When something new and thus far unknown enters a network of actors, the translation process begins. These “new things” are often called tokens and can be everything from new ideas to ideas that are on the verge of taking form as an object of some kind. How an idea initially arose in local time and space and how the concerned actors within an organization first caught wind of the idea is usually unknown and in this case, maybe not that important. What matters is that the idea somehow landed and that someone with a connection to the network thought that the idea was important or useful. When the idea somehow is introduced to the concerned network, the actors in this network is trying to relate to this new token by connecting with each other and their own context – background, values and so on [1]. The output of this process differs depending on the relationship between the token and the actor, and the relationship between the actors in the network. Some networks might make something useful out of the idea, while other cannot relate to the idea and will let it pass which in turn will slow down the spreading of the idea [18]. The useful things that might come out of the translation process will vary depending on the context. In the case of Green IT Audit and also of SIS TK550, these models are mainly focused on managerial issues. Other Green IT initiatives that has come out of other translation might be more focused on environmental or technical issues.

If a translation process begins and the idea doesn't pass, it will be translated into a quasi-object, and then into an object. The main concepts in the translation approach are: idea, quasi-object, object, activities, and institution. Quasi objects are objects that have not taken physical form, such as symbolic objects, metaphors, labels, and platitudes. Objects are more concrete - they can be prototypes or different types of documents such as guidelines or standards. These objects are quite decontextualised and need to be contextualised every time they will be used - for example the ISO 14001. These objects are then translated into activities which are institutionalised. Ideas do not become institutionalised automatically, but the work of people is crucial in the translation process. The implication of this theoretical framework is to explore "the travelling of ideas," in the case of Green IT in the Swedish context.

4. METHODOLOGY

The empirical study is based mainly on two methods: interviews and participant observation.

13 interviews were conducted from August 2011 to March 2012, spanning from 40 minutes to 3.5 hours. The interview questions

are attached as appendices to the paper. There are three main groups that are related to the implementation of GIT Audit. The first is owners and developers. This group includes the organizations that first embraced the concept of Green IT in this case and developed it into GITaudit and GITindex. This includes both IT- & Telekomföretagen that acknowledged and ordered the model, and Exido who created it. The next step was the sale of these two models to TCO Development, which today are the owners of these two models. TCO Development thus belongs to the group owners and developers. The next group refers to the partner organizations. Among these are the organizations that have a contract with TCO Development to perform the the model. We have chosen to anonymize the partner organizations for ethical reasons, we prefer not to mention these by name because they are basically in direct competition. These are mainly ICT and management consulting companies that often perform other missions than just GIT Audit. The third group we have chosen to call customers and includes the companies and agencies that have commissioned the model to improve their work with Green IT. We have chosen to anonymize these as well, partly because this was requested from the partner organizations that we worked with and partly because the only thing that is relevant to know about them is that they are governmental agencies.

The questions directed towards the partner organizations of the model had a clear actor focus. They were mainly divided into three sections where the first section regarded the auditor him or herself and their relationship to the model and to GIT Audit. The second section had the focus of the partner organization where the auditor worked, and this organization's relationship to mainly the model and GIT Audit, but also to the end customer. The last section focused on the auditor's view of the relationship between the customer and the model. These questions were important when we discovered the sense-making process about the end customer, where the auditor's prejudices about the customer affected the performance of the GIT Audit. The questions aimed at the customers mainly revolved around their organization's relationship to green IT, and their views on the execution of the model. They also concern the perceived institutionalization potential of the activities developed by the auditor. To give some feedback to TCO Development and the partner organizations, we also asked what they thought of the model and what they thought could be done better. We also interviewed the owners and developers of the model. We started doing interviews with the people who we thought were the leading actors concerning green IT in Sweden. The questions asked here were very different depending on which role they played in the translation process of green IT. The questions asked here revolves mainly around their relation to Green IT and their background so we could connect the different actors context with the translation process of Green IT. The selection of the interviews in this study has been chosen with the help of the method "snowball selection". This means that the first few interviews led to the next set of interviews by asking the interviewee if s/he knew any other persons that might be of interest to us. This approach led us from just being interested in Green IT to study the concept of the Green IT Audit.

Besides the empirical data gathered by interviews, we have also participated in important events where we were able to extract observational data. This kind of data is quite hard to analyze, because it is more or less based on our interpretations of the situation. It may be a matter of how we perceived the

“atmosphere” in different situations, which informal hierarchies that appeared within the groups or how participants expressed their opinions. This kind of data is important because it is only extractable when an event of great interest actually happened and not as easy to gather afterwards when the person interviewed reflect upon the situation. The data was extracted mainly when we participated in the execution of the Green IT Audit and when we socialized with persons somehow involved with the model. In the much cited scheme by Gold [19] one can divide the level of participation in the organization by the observer in 4 different groups. The highest level of participation is when the observer is a full member of the group and when one cannot distinguish the observer from another member of the group and the lowest level is when you are only observing and not participating. The latter was mainly used in this study, however, some elements of participation can be found when asking questions and participating in different conversations in connection with the execution of the Green IT Audit.

Apart from the formal interviews and the observations, the authors are involved in Swedish standardization work of Green IT, where many of the interviewed actors are involved. We have therefore been able to follow up on questions and also had informal conversations about the Green IT Audit and to some extent therefore been able to take a processual approach. We have also complemented the main research methods with the study of webpages and other publicly available material related to the Green IT Audit.

5. TRANSLATION OF GREEN IT INTO SWEDEN - THE CASE OF GREEN IT AUDIT

The GIT Audit is a consulting model used and carried out by a number of management and IT consultants. It was created by the Swedish information technology intelligence company Exido in 2008. Exido, like Gartner, is constantly following the trends of information technology and as a response to the Gartner Institute's report "Green IT: The New Industry Shockwave" [2], Green IT found its way into Sweden. Certainly, other activities linking information technology and the environment, such as the TCO labelling of monitors, had been ongoing in Sweden, at least since the 1990's [20]. Exido was not primarily interested in the environment, but rather in the trends in information technologies. Exido had been conducting questionnaire studies (IT-barometer, originally created by the company Universum) and added questions in 2008 related to Green IT. The answers to these questions formed the basis of the Green IT index, which received financial support by IT- & Telekomföretagen - a member organization for companies within the ICT and telecom sector. According to the person most involved with GIT Audit, Nick, after Exido developed the index, people asked for tools to analyse their own organization - whereby the Green-o-meter was developed and published on the website anvandgronit.se, and after that people asked how their organizations can be better, whereby the GIT Audit was developed. The CEO of Exido, Jim, became more interested in energy saving solutions and in 2010 Exido sold off GIT Audit and GIT Index to TCO Development, which had worked with labelling of ICT equipment since the 1990's.

Apart from GIT Audit, environmental certifications like ISO 14001 is available for the service sector, but these standards are

primarily designed for companies within the industrial sector since the companies there has long been considered major environmental villains in terms of both greenhouse gases and toxic chemicals. These emissions also occurs in the service sector, but they often take place indirectly rather than directly, which is not the case in most manufacturing industries. Emissions of greenhouse gases occur when the energy is used rather than being generated directly as in many manufacturing industries, such as the paper or the chemical industry. This makes it more difficult to measure the environmental impact of the service sector. Nick, who is more interested in organizational improvement than ICT or environment, also wanted to suggest that the framework of GIT Audit become an environmental management standard for the service industry. This standardization work is currently ongoing at the Swedish Standards Institute (SIS) under the label SIS TK 550. Nick has now stepped down from his work with the GIT Audit, and his successor is Robin, who has a background at TCO Development. Robin is also leading the standardization work at SIS. At present, the GIT Audit is not as successful economically (in relation to budgeted income) and there seems to be a need for reforming the Audit. The current work concerns reforming the GIT Audit.

GIT Audit works according to a partnership model. This means that consulting companies, mainly focused on management and ICT issues can perform GIT Audit on their customers and give some of the profit to TCO Development. The analysis of the data extracted from the audit takes place at TCO Development. When you are becoming a GIT Audit partner, you usually get training once a year plus an audit on your own company so you can compare your own result to the audits you perform on your customers. The reason why companies and agencies chose to perform GITaudit on their organization differs. For governmental agencies, the main reason to buy this service is to meet requirements from the government, while companies often choose to do this to get a more “green image”, save energy and money or to be able to show investors, suppliers and customers that they are working with sustainability issues. What they all have in common is that all these organizations want to know where they can save most money and energy with the least amount of economical effort.

5.1 Analyzing the GIT Audit translation process

The translation process begins with an idea, and in order that for the idea to travel further, it is important that this idea is packaged in a way that allows the recipients of the idea to understand and make sense of the idea [1,8] as mentioned in the theory section. The principles of Green IT was born mainly because of a societal discourse, which due to timing is closely linked to the climate changes we face, popularized by Al Gore in An Inconvenient Truth. In summary, one could say that the trend climate change gave the origin of the idea of a sustainable approach to ICT. This idea has been packaged - or objectified to use Czarniawska and Joerges terminology - as Green IT. When this objectification has occurred, the packaged idea is ready to travel. We argue that Green IT in this case can be seen as a quasi-object, and that the specific objects that actually got a sustainable approach to ICT to travel are different reports and articles about the phenomenon and consultant models like the GIT Audit for example. The translation that have occurred initially is when this idea landed at the

organizations in Sweden that has chosen to develop the idea into a consulting model. Exido's previous experience with making indices, led to the creation of a Green IT index, and Nick's interest in organizational development led to conceiving of the Green IT Audit not as an issue mainly concerning information technology. When the Green IT Audit triggered standardization work and also was sold to TCO Development, new actors became involved with developing Green IT - actors with different backgrounds and interests. Since Robin is working both with the standardization work and the GIT Audit, one might expect a more rigorous and environmentally based approach to the GIT Audit in the future.

When it comes to the very implementation of the model, the different actors played an important role for the institutionalisation of the activities created by the execution of the model. The implementation of every GIT Audit is different depending on the partners, their made sense of Green IT, and their understanding of the customer. The actors involved in this particular model have different views on the subject (Green IT) and different expectations of the outcome of the model. This may, in connection with how the partner chooses to present the model and the perspective he or she has on Green IT, imply that the model in some organizations is received with open arms and with great commitment, while in others it is forgotten relatively quickly. In interviews with partners, we have realized that most of them are not interested in Green IT, nor see the model as being marketable. Critically, one might suggest that it seems more important to have a sustainable product (GIT Audit) in the portfolio of ICT consultancy services, than to actively promote it. When doing the audits, partners seem to act as if the GIT Audit is a more or less rigorous framework, even though it is conceived by Nick as a way to provide a "not really scientific" background for a discussion about Green IT and organizational development. Time pressure - or the will to finish the audit on time - might also hamper sense-making about Green IT in the customer organization. The partner's views on the customer also have impact on the translation process. We studied the implementation of GIT Audit in two public sector organizations, and one of the partners expressed clear objection to the true motives of the public sector organization - that they had no interest in the environment whatsoever, which influenced the commitment of the partner in the very audit.

5.2 Analyzing the actors

This chapter will be an analysis of the model, focusing on the different organizations and actors involved. The different organizations have been split into three different groups that will be presented in three sections. The analysis will focus on the different actors' relation to the model GITaudit and to each other. For the owners and developers of the model, the focus is on how the model was created and why it was created. For the partner organizations, it is about their motivation to perform the model and for the customers, it's simply about reasons for ordering this consultant service.

Given the sense-making and translation theory that we use in this paper, different actors identify the concept of Green IT differently (see also [6]). These interpretations depend on what the translator of the concept is interested in and works with. Green IT for an organizational theorist or management consultant is not the same as for an ICT technician. It is also clear that the concept is

constantly becomes wider and wider. If you draw parallels to the model GIT Audit, the number of questions and the areas which these questions concern constantly grows. Green IT has moved from being solely a technology issue to interest an ever larger group of people. Basically, why interpretations of the term exists is mainly because many people choose which parts of the concept that they are personally interested in. This is a very good example of sense-making. Based on your own context, you create a picture of what the concept of Green IT is.

Three main aspects of the concept has been identified. These are the environmental aspect, the managerial or organizational aspect and the technical aspect. The environmental aspect is often focused on the issue that ICT equipment is an environmental villain even if there is some potential in using ICT as clean tech. Many with a personal interest in environmental issues usually choose this viewpoint. The most important reason for being interested in Green IT is the will to decrease greenhouse gases and toxic waste, and not to save money or to make the organization more efficient. The environmental aspect may be the least common aspect, though the environmental movement can be seen as the initiative that brought the concept of Green IT up on the agenda. The technical aspect of Green IT often focuses on the specific technical solutions that Green IT often uses. People focusing on this aspect argues that IT can be used as green tech and rarely mentions the problem that IT can also be an environmental villain. This is often justified by the argument that IT accounts for only 2-4% of the total carbon dioxide emissions in the world, while it can be used to reduce the remaining 96-98% with the help of smart IT solutions [6]. According to a report by KTH released in 2010, the actual potential to reduce those 96-98% is by about 10-15 percentage points [21].

The organizational or managerial aspect is basically about considering that technology can be used a tool, but the most important thing is that you are managing it by using processes and standardized approaches. Nick, one of the creators of the model GIT Audit, claims that he has shaped model after models like lean and agile project management that basically is about organizational development. They often talk about how organizations can be made more efficient by using Green IT, and that this in turn leads to environmental benefits. Efficiency and environmental issues can often go together according to many; if you work effectively with your processes, you can reduce the use of both material and electricity.

Simplified, one say that those who has the more environmentally oriented view of Green IT has identified the problems, the more technology oriented came up with solutions and the group of people involved in managerial and organizational issues has the responsibility to coordinate these technologies with the rest of the organization in order for something to happen. All aspects are important but in different stage of the implementation process. The organizational perspective as a coordinating perspective, while the technological and the environmental perspectives are used as tools and incentives for change.

5.2.1 The owner and developer

We have previously argued that GITaudit can be seen as a response to the 2007 hype surrounding Green IT. When Gartner

Institutes released the 2007 report Green IT: The New Industry Shock Wave [2], this opened the eyes of many actors and organizations in the service sector, in particular those active in IT-intensive areas. It was then primarily because nobody wanted to be that was the last organization to be working with this hot topic, because there was a risk that this would undermine the organization's reputation. The developers of GITaudit realized this too, and also realized that these organizations would need some sort of guidance when it came to the implementation of Green IT.

The translation process begins with an idea and for that idea to be able to travel, it is important that this idea is packaged in a way that allows the recipients of the idea to understand and make sense of the idea. The principles of Green IT was born mainly because of a societal discourse. The translation that occurred initially when focusing on the case of GIT Audit is when this idea landed within the organizations in Sweden that have chosen to develop the idea into a consulting model. These organizations are what we call the owners and developer of the model. More related initiatives have also been born in the same way, but has taken different forms depending on the context in which this initiative has been created. One example would be that GIT Index that was created at Exido, which is a analysis and consulting company, involves analysis of quantitative data. Why TCO Development started taking an interest in Green IT is primarily because they have a history of environmental certifications and environmental improvement work related to ICT. As early as 1992, the first certification for computer monitors was designed by TCO Development [20].

The driving force for the development of the model for these actors were initially to be able to offer a complete model that can help organizations to implement Green IT. However, it has proved that this is not the whole truth. In the current situation TCO Development primarily offers the model to consulting companies to use it in order to be able to do business with new customers. Since the model fits well into many, primarily IT consultants', portfolios it can be used as a "door opener" to sell other ICT related solutions to a customer that has decided to order a GIT Audit. This is something that TCO Development is using as a USP for the model. This could potentially be a threat to the model; if the partner organizations only use it to sell in other solutions and customer sees this through, it contributes to distrust from the customer. This in turn may cause the activities that are set up during the prioritization workshop not being taken seriously by the customer.

5.2.2 *The partner organizations*

Something that is clear when talking about GIT Audit with representatives from various partner organizations is that there are few who believe that the environmental aspect of the model is particularly important. There are of course exceptions here; auditors with a personal interest in environmental and sustainability issues, gladly presses on the environmental aspects of GIT Audit. However, it is very common to see GIT Audit as a tool to reduce costs and increase efficiency. Most people who are working with performing GIT Audits are, as mentioned earlier, ICT and management consultants who has the technical or organizational perspective of Green IT, which means that the environmental perspective is somewhat lost in the execution of the model. If this is problematic for the model itself is hard to say, since it entirely depends on the background of the participants of

the GIT Audit group within the customer's organization and what this organization is working with. If the group is focused on ICT which is often the case, you may want to direct the focus towards the purely technical solutions because it is easier for these people to relate to these questions. This can facilitate the translation process. The question is whether this means that the model simply miss the point. On the one hand, one can see that the environmental perspective of GIT Audit neglected, on the other hand, one can see that many of these solutions are ultimately leading to environmental improvements, although this is not the top priority. This question is interesting, but unfortunately nothing we could find out within the frame of this study.

5.2.3 *The customers*

Mainly, the customers that the partner organizations are currently working with are governmental agencies, often one of the 18 pilot authorities that participate in the Green IT project announced by the government. They chose this model mainly because it is the easiest and most cost effective way to fulfill the goals of the pilot project. There are individuals within those organizations that believe that GIT Audit is inadequate and that GIT Audit is somewhat a "shortcut". It has come up in the interviews with the participants from the end customer that on one hand, thinks that the model is fairly good, and on the other hand that they would like the model to give them more. For example, some consider that the action plan that is the model's main output is not good enough and that "it is clear that ... [the partner organization's] packaging of the concept is not quite finished." Speaking of the action plan, the same actor within one of the pilot agencies considers that "we will have to make a relatively great deal of work with it too before it's done." TCO Development however, believe that they deliver a finished action plan. Some suggestions regarding the action plan will be presented later in this paper.

Something that is often requested from the customer is the ability to somehow be able to certify against GITaudit or against any equivalent model. This possibility does not exist today but there are signs that something like that is under way. SIS TK 550 is an initiative that aims to help organizations to work more standardized with Green IT. As things stand today, this standard will not be certifiable. However, this initiative is a step in that direction. Many people are thus critical to this standard because it is based on ISO 14001 that many organizations already are certified against. The skeptics think that it is redundant with another standard that is not even certifiable, while those who are in favor of the proposal believe it will help organizations with a more standardized way of working with Green IT. The future is in many ways uncertain, but the working group discussions at SIS TK 550 suggest that Green IT issues will be featured in future certifiable standards. The work on SIS TK 550 has always been based on many of the interview questions included in GIT Audit. However, there are now signs that the formulations and methods that may seem too similar to those in GIT Audit are being taken away from the standard. This can be due to many things, such as they do not want to be associated with a specific consultant model, because they want the standard to be generic and independent. The work on the standard, however, could benefit TCO Development as the owner of GIT Audit if it was more suited for their model, because organizations that wanted to use the standard could then use the GIT Audit as a very well suited tool for this standard.

One, from the customer's point of view, very important driving force to start using Green IT is the increasing consumer pressure. This is particularly important for companies active in the consumer market. A representative of IBM explains: "People are making active choices. There is a survey that Veckans Affärer performed on how companies experienced the increased consumer pressure. And the result is very clear. You have to be innovative, you must find new ways to relate to market, especially those who work in the consumer market. If you get a reputation that you are an environmental villain, or just that you do not think about the environment as much, then the sales will drop a lot. And the rumors spread fast ... "

This requires basically that as a company in the consumer market you need to communicate your environmental work externally. That GIT Audit is not certifiable is problematic here, because a completed GIT Audit does not really need to say anything about the company's environmental efforts. This is because there is no inspection of the customers' responds to the questions from the interview seminar of GIT Audit. A GIT Audit simply does not weigh heavy enough for it to benefit the company's marketing, which may be one reason why it is mainly used in government agencies and in municipalities.

However, the increased consumer pressure is a fantastic development that will provide great opportunities to several environmental initiatives for companies in the service sector of the consumer market. The most important thing here is that the environmental work must be communicated externally, an aspect that GIT Audit has not solved fully yet. Potentially, this can be improved by the initiative SIS TK 550, however this is too early to say.

6. SUMMARY AND SUGGESTIONS FOR FUTURE RESEARCH

In this paper we have argued that it is important to discuss Green IT, Sustainable ICT or related concepts, also from non-technological perspectives. In this paper, we used theories from an interpretative paradigm of organization studies and hopefully we have shown that Green IT is much more than implementation of technology. In earlier research we have done a similar study about the translation of Green IT into Japan [22]. While we, in this paper, have used the interpretative paradigm in organization studies, we also invite studies inspired by the critical paradigm, as well as studies drawing on the wide range of theoretical resources from philosophy, science and technology studies (STS), and so on. We believe that a broad take on Green IT will not only lead to an increased understanding of it, but hopefully also trigger interest from more parts of society.

We have also given insights from the Swedish context - however, our focus on the (quite problematic) GIT Audit might suggest that this is the most important activity taking place in Sweden in relation to Green IT, which it is not. There are certainly other activities such as the SIS standard, the GIT index, entrepreneurial firms working within the context of energy-saving technologies, that are worth studying in other papers. Many of these other Green IT initiatives can certainly also be analysed through a translation perspective. What is important to note and probably the main point about this paper is that even though the same concept (that of Green IT) is the foundation of the initiative, the translation

process allows the actors to form the concept after their own preferences [18]. In the context of the Green IT Audit, it is essential for the auditor to activate and interest the audit group in order for the group to find the model interesting. This may help removing the obstacles that prevents the translation of the model and thus help the institutionalization of the Green IT activities (ibid.)

7. SUGGESTIONS TO PRACTITIONERS

This section of the paper will take a more functionalistic perspective of the Green IT Audit. Some concrete suggestions will be presented. These suggestions have been formulated through the analysis when the theoretical framework was applied on the empirical data.

7.1 The importance of the auditors as translators

We have discovered a great deal of mistrust from the auditors, mainly because many of them do not believe in the model. This may depend on many things, but the most distinct reason is that they are mainly interested in other things than Green IT. They are often using the model as a door opener which will help them to sell other things than the Green IT Audit to the customer. If the auditor has decided that she or he thinks that the customer is not interested in the model, this will show in her or his performance during the audit which will ultimately result in an inferior result. What is also important is the auditors attitude towards the customer's organization. If they think the audit group is not particularly interested in Green IT or the model itself, this will also result in a poorer result. We argue that the way to solve both these problems is to limit the number of auditors to only a few auditors (this can be done due to the low interest in the model) which are interested in both the environmental and the technical issues of Green IT. During the work with this paper, we helped TCO Development to choose a couple of auditors that we considered appropriate for this job.

It is clear that it is not very easy for an auditor from a partner organization to create an action plan for the customer in just a few sessions and possibly some phone and mail contact. As we have previously argued for, the action plan will be an important part of the translation process internally for the end customer and will ultimately help the organization to institutionalize the activities determined in the plan. We believe that more time should be given to compile this plan in a good way. An alternative would have been if the persons responsible within the customer's organization and the auditor from the partner organization together had another meeting to ensure that the action plan becomes so detailed that the activities can be implemented in the customers' existing action plans. This is because the auditor representing the partner organization has expertise in the Green IT area while the persons responsible within the customer's organization has insight into their own organization's activities. Instead, this work is put on the responsible actor at the customer's organization that then might miss important points because of the lack of experience in the Green IT area, which can lead to wrong prioritizing when the action plan is designed.

7.2 TCO Development and their role

It seems that the interest in the model is relatively weak. We have heard this from several sources, however, the reason for this is

uncertain. Some believe that there is no interest of this tool, while others believe the model will grow larger and that the interest will increase over time. Why we believe that TCO Development should take a more active role in the performing of the model is because the model today addresses different areas depending on the partner organization performing the model. This will cause uncertainties among the customers concerning what the model really is about. Is it a tool for energy saving, money saving, efficiency increase or an environmental management system, or all of these? The focus is somewhat diffuse and we argue that the focus of the model must be better defined. TCO Development should figure out what they really want the model to achieve for the customers, and normalize the execution of GIT Audit to fit that. Today, GIT Audit is defined through a complex series of translation processes and re-interpretation of the original model and the model would thrive on a shortening of this interpretation chain. At the moment this is not feasible because the number of employees involved in work at TCO Development is low. As we argued earlier, it is up to TCO Development to select a few auditors that they tie a much closer bond with and only work with those partner organizations. This will help with the defining of the model, because closer ties mean that the partner organization and TCO Development will create mutual sense around the model's goals and execution.

8. REFERENCES

- [1] Czarniawska-Joerges, B. och Sevón, G. (1996). *Translating organizational change*. Berlin; New York: Walter de Gruyter.
- [2] Mingay, S. (2007). *Green IT: The New Industry Shock Wave*, Gartner.
- [3] Berger, P. L. and Luckmann, T. (1966) *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. London: Penguin.
- [4] Burrell, G. and Morgan, G. (1979), *Sociological Paradigms and Organizational Analysis*, Heinemann, London.
- [5] Jones, C. & Spicer, A. (2009). *Unmasking the Entrepreneur*, Edward Elgar.
- [6] Molla, A. (2009). *Organizational Motivations for Green IT: Exploring Green IT Matrix and Motivation Models*, PACIS 2009 Proceedings, <http://aisel.aisnet.org/pacis2009/13>
- [7] Orlikowski, Wanda. & Barley, Steven. 2001. *Technology and Institutions: What can research on Information technology and research on Organizations learn from each other?*, *MIS Quarterly*, Vol. 25 No. 2, pp. 145-165/June 2001
- [8] Weick, K. (1995). *Sensemaking in Organisations*. London: Sage.
- [9] Gioia, D. A., & Chittipeddi, K. (1991). *Sensemaking and sensegiving in strategic change initiation*. *Strategic Management Journal*, Vol. 12.
- [10] Latour, Bruno (2005). *Reassembling the social: an introduction to actor-network-theory*, Oxford:University Press, 2005
- [11] Dervin, B., & Dewdney, P. (1986). *Neutral questioning: A new approach to the reference interview*. *Research Quarterly*, 25 (4), 506-513.
- [12] Dunbar, R. L. M. (1981). *Designs for organisational control*. In P. C. Nystrom and W. H. Starbuck. Eds. *Handbook of organisational design*, 2. New York: Oxford University Press
- [13] Goleman, D. (1985). *Vital Lies, Simple Truths. The Psychology of Self-Deception*, New York: Simon & Schuster.
- [14] Wiley, N. (1988). *The Micro-Macro Problem in Social Theory*. *Sociological Theory*, 6.
- [15] Czarniawska, B. (1999). *Writing management*. Oxford, UK: Oxford University Press.
- [16] Ferm Thorgersen, C. (2009). *Lärares didaktiska val i relation till deras levda erfarenhet av musikdidaktik*, *Didaktisk tidskrift*, vol 18, no. 1.
- [17] Rogers E. M., *Diffusion of Innovations*, 4th edition. New York, NY: Free Press, 1995
- [18] Latour, Bruno. "The Power of Associations." In *Power, Action and Belief: A New Sociology of Knowledge*, edited by John Law, 261-77. London: Routledge and Kegan Paul, 1986.
- [19] Gold, R.L. (1958), *Roles in sociological fieldwork*, *Social Forces*, 36:217-223.
- [20] Boivie, P. E. (2007). *Global Standard – om hur TCO-loggan hamnade på datorskärmar jorden runt*, Premiss Publisher.
- [21] Malmödin, J., Moberg, Å., Lunden, D., Finnveden, G. och Lövehagen, N. (2010). *Greenhouse Gas Emissions and Operational Electricity Use in the ICT and Entertainment & Media Sectors*. *Journal of Industrial Ecology*. Vol 14.
- [22] Yotsumoto, M., Lennerfors, T.T, and Majima, T. (2011) *The current trends and issues of Green IT*, *The Japan Association for Management Information (JASMIN) Conference*, Japan, Oct 29-30.

9. APPENDIX: INTERVIEW QUESTIONS

Questions to auditors:

Besides GIT Audit, what are you engaged with in your organization?

How come you became involved with GIT Audit? Active choice or were you just told to by your manager?

Have you got any personal interest in environmental issues, mainly the concept of Green IT?

What is your opinion about Green IT? Is it a tool to make money or does it have a bright future as an important sustainability tool?

Do you think the interest for Green IT will increase or decrease?

What are the most important aspects of green IT? Anything extra exciting/important/fun about it?

How many GIT Audits have your organization performed? How many have you participated in?

Do you know if the execution of the model differ depending on the auditor, or is it the same thing no matter what organization or actor involved?

How come your organization chose to invest in GIT Audit? Was it just a “door-opener” and do you think that Green IT is a growing field that you had to go along with to not lose business?

What do you know about the customer’s Green IT efforts and if they are interesting in the concept?

Why did they choose you as the executing partner organization for the model? Why not any of the other partner organization involved with the model?

Do perform other services for the partner organization, or is this the only mission?

Have the customer done a GIT Audit before, or is this their first?

Questions to customers:

Can you tell me about your background? What are you working with at present and what areas are you interested in?

How come you became interested in Green IT?

Do you have any other issues besides Green IT that you are interested in work-wise?

Had there been any talk about GITaudit or Green IT after the execution of GIT Audit within the organization? What has been said?

Can you speak freely about GIT Audit and how you think it went?

What was good, what was bad?

What were your expectations on the model before the audit had started, and how has these expectations changed during the GIT audit?

How do you think the action plan that you have developed together with the auditor will be perceived by your organization and the Director General?

What do you think is important for your organization when continuing the work with Green IT?

Do you feel any personal responsibility as orderer of the model that the model will have to contribute with any concrete results? How will you help to make the model count?

Questions to owner/developer:

Can you tell us about your background?

Recent work activities?

Education?

Where have you worked earlier? Career path?

How come you began to take interest in Green IT?

Can you tell us a little about Green IT Audit?

How has the work with Green IT Index developed since TCO Development took over the responsibility of the model?

Do you think there’s an ethical reason for companies and governmental agencies to become more “green”?

Why does the model looks like it does today? Does it depend on your professional background?

What do you think is important for the potential of Green IT to be taken more serious?

What is important to make a behavior change where people actually care about energy saving and other environmental issues?

Is visualization an important issue in the case of Green IT?

SIS (Swedish Standard Institute) has begun working with a standard concerning Green IT. Is this something you are involved with as well?

If yes, what do you think about it?

Where will this lead, what consequences can we expect?

Around the year 2008 the interest in Green IT peaked. In the recent years this interest has been reduced. Do you have any comments or explanations?

Hype? Financial crisis? IT trend?

Are you a driving force in other Green IT related questions?

Besides Green IT Summit, Audit and Index and the SIS standard obviously.

How does the future of Green IT seems to you?

What is the next step?

What needs to be done?