Using Storytelling to Identify Requirements

– Exploring Persona-Scenarios in Context

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ABSTRACT

In this paper we explore the persona-scenario method as a means for requirements determination. More specifically, we investigate how the method can support groups of diverse ISD project participants in constructing and presenting multiple stories that complement each other in generating many, new, and shared understandings and design ideas. As persona-scenarios are stories about personas using IT systems we draw on narrative theory to define what a persona-scenario is and which narrative elements it should consist of. The conceptual clarification is used as an analytical lens for understanding an empirical study of a workshop that was held as a part of a large project concerned with redesign of an e-report portal for Danish governmental bodies. The aim of the workshop was to develop persona-scenarios about the future use of e-reports. A key finding is that despite our inherent human ability to construct, tell, and interpret stories it is not easy to write and present a good, coherent, and design-oriented story without methodical support. The paper therefore contributes to the field of ISD with theoretical and empirically grounded guidelines that delineate a) what a design-oriented persona-scenario should consist of (product)

and b) how to write it (procedure) in order to generate and validate as many, new, and shared understandings and design ideas as possible (purpose).

KEYWORDS

Storytelling, personas, scenarios, narrative theory, information systems development, e-reporting

INTRODUCTION

> "Would like to have known more about the 'best' format for scenarios…would be nice to have more guidelines" (workshop participant, reflection on workshop, written at the end of the day)

Storytelling has been proposed as a relevant basis from which to theorize and collect, and analyze empirical data about organizations, information systems (IS), and information systems development (ISD). The organization has e.g. been conceptualized as a collective storytelling system, where members continuously construct, and perform stories to individually and jointly remember and make sense of the past, present, and future (Boje, 1991, 1995). It is argued that it is advantageous to research storytelling processes in situ because it allows for insight that goes beyond the neat, happy, and official managerial and public relations story and reveal that there are many, often divergent, and competing stories, and story interpretations in circulation when it comes to:

- Organizational decision-making and action (Boje, 1991, 1995)

- Executive sense making of IT innovations and the hype that surrounds them in the marketplace (Ramiller, 2001)

- IS development and implementation failure and its political implications (Brown, 1998; Brown & Jones, 1998),

- The understanding and performance of ISD as rational, methodical behavior and/or the enactment of myths, metaphors, and rituals (Hirschheim & Newman, 1991).

Based on an empirical study of an ISD project in which social actor network and a structural approach to narrative are used as foundation and data analysis method, it has also been suggested that: a) the ISD process can be researched as a story, b) conceptualization of the IS under development as a story, or metaphor, helps facilitate collaboration and the creation of shared

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understanding among project participants with different backgrounds and expertise, and c) when developed, the IS presents itself as a story to the user (Gazan, 2005).

ISD is a complex endeavor with a number of persistent problems (Kautz et al., 2007) because, among other reasons, the ISD process often involves diverse participants that have to work together and share their knowledge and because the mechanisms where by individuals share and integrate their expertise is not well understood (Gazan, 2005). Moreover, simply asking future users to specify requirements and come up with innovative ideas for the IS will not suffice (Davis, 1982) as it is difficult for people to talk about and relate to a non-existing artifact. For requirements determination this means a significant bias toward requirements based on current practices, already available information, recent events, and inference from small samples of events (Davis, 1982). The analyst and user have to compensate for these biases, e.g., via methods that provide guidance for overcoming them (Davis, 1982). In addition, it is difficult for users to describe requirements in terms of facts, fields, rules, and algorithms (Davis, 1982; Alvarez & Urla, 2002). One suggestion is therefore that it might be useful to focus on, interpret, and elicit requirements from the stories of existing and hypothetical practices that prospective users tell during requirements interviews (Alvarez & Urla, 2002).

Another suggestion is to use scenarios, which have been described as easy to relate to and remember as they draw on our human ability to individually and jointly make sense of, arrange, and convey information in a narrative form (Carroll, 2000). There are many different types of scenarios. For the purpose of this paper, we make a distinction between *scenarios* that are <u>not</u> and *personas-scenarios* that <u>are</u> based on personas descriptions. Our focus is on the latter.

The personas method and its belonging scenario part have gained popularity within ISD. However, even though the persona-scenario is a vital part of the persona method it is not commonly agreed and well defined what constitutes a persona-scenario, what types of understandings and design ideas persona-scenarios generate, and how they might be applied to generate as many new understandings and design ideas as possible. This is in part due to the scant literature on the topic. Numerous practitioner reports that describe experiences with the method can be found on the Internet, but there are few empirical studies at journal level and only three complete books (Cooper 1999, Pruitt & Adler 2006, Mulder & Yaar 2007) about the persona

method. In other words, the persona literature is conceptually and empirically weak with regard to the scenario aspect of the method.

To contribute to the field of ISD in general and to the literature about personas in particular, we set out to study and answer the following research question: how can ISD project participants with diverse backgrounds and expertise use the persona-scenario method as a mechanism for creating stories that generate as many, new, and shared understandings and design ideas during IS requirements determination as possible?

To answer the research question we first look at scenarios as described in the persona literature and compare the literature to narrative theory. From this we develop an analytical lens that, in line with a structural approach to narratives (Gazan, 2005), defines a persona-scenario in terms of narrative elements. Using the developed lens, we analyze an empirical case study to understand the content of persona-scenarios, and the types, and number of understandings and design ideas generated. The empirical case study is based on a workshop held as part of a large development project concerned with redesign of a portal of e-reports for Danish governmental bodies. The aim of the workshop was to create persona-scenarios about the future use of the e-reports based on already developed personas. 16 people from several areas, such as IT development, user interface design, marketing/content, and project management participated and worked in groups during the workshop. Thus, in line with Boje (1991, 1995), and Brown (1998), we study the storytelling behavior of groups as and when it occur. However, in contrast to their focus on *understanding* the organization and the political aspects of information systems and information systems development as multiple, and *competing* stories created by individuals and/or groups, we wish to explore the persona-scenario method as a means for *supporting* groups of ISD project participants in constructing and performing multiple stories that *complement* each other in generating many, new, and shared understandings, and design ideas during requirements determination. As such, our study builds on Alvarez & Urla's (2002) research into how people use narratives to convey information about requirements. However, where Alvarez & Urla (2002) focus on future users and interviews, we investigate the creative and storytelling behavior of ISD project participants using the persona-scenario method. The findings from the analysis of the empirical case study are discussed and the analytical lens is refined in accordance with the findings and the discussion here of. The goal and final result of this research is a set of theoretical and empirically grounded guidelines. The purpose of the guidelines is to facilitate the construction of persona-scenarios as

good, coherent stories, which make sense to the storytellers and to the audience – and which therefore generate many, new, and shared understandings and design ideas.

PRESENTING PERSONAS AND SCENARIOS

A persona is a description of a fictitious user, based on data from user research. In ISD the persona description is used as the foundation for outlining a persona-scenario that investigates the use of an IT system from the particular user's point of view.

The scenario term and method is not a novelty in ISD. It has previously been used in the Scenario-Based Engineering Process that combines business process reengineering with systems development (McGraw and Harbison, 1997) and to refer to more abstract illustrations of systems use, such as use cases. Even though scenarios have been around for some time there is no single definition in common use (Karat and Karat, 1992). Some definitions are that scenarios are: "descriptions of natural, constructed or imagined contexts for user-product interactions." (Suri and Marsh, 2000) p. 153, "a description of a set of users, a context and a set of tasks that users perform or want to perform. A scenario sketches future technologies" (Nardi, 1992) p. 13, or that they are stories about people and their activities (Rosson and Carroll, 2002) p.17. At the broad level, there seems to be agreement that scenarios are stories and this is also the view we adopt in this paper.

Cooper et al. (2007) explains that both scenario-based design and use cases miss the central aspect of understanding the user. Scenario-based design focuses on describing how users accomplish tasks and sees the user as an abstracted role, while use cases treat all possible user interactions as equally likely and important, lack description of context, and use variables and class names instead of more literal descriptions. In contrast, persona-scenarios view the user as a particular person with emotions, actions, and needs and it is the persona who is the focal point of the persona-scenario, not the IT system. However, even though this is commonly recognized, there is no unanimous definition of what a persona-scenario is and what it consists of.

First of all the persona method authors suggest different types of persona-scenarios. Cooper et al. (2007) suggests a progression from initial, high-level persona-scenarios to more and more detailed ones with increasing emphasis on the user-product interaction. As a part of this progression, they distinguish between *problem scenarios*, which are stories about a problem domain as it exists

prior to, and *design scenarios* that convey a new vision of the situation after technology introduction. Pruitt & Adlin (2006) refer to Quesenbury's (2006) definition of different types of personas and to scenarios with different levels of detail placed in a continuum between evocative and prescriptive scenarios as well as along the development process. Mulder & Yar (2006) focus exclusively on web development and only propose one type of scenario that describes a persona's journey through a website. Second, the method authors provide different lists of elements that could/should be included in a 'complete' or 'good' scenario. Table 1 presents an overview over authors, the scenario elements they propose, and the scenario element definitions they give, if definitions are given.

	Cooper	Quesenbury	Pruitt & Adlin	Mulder & Yar
PERSONA	Are there *multiple users* on a single workstation and device?	*Characters* The persona is the main character, but other characters might also be involved	Specified *user* A persona	Document the mission from the persona's point of view. Others can be around influencing the decisions.
CONTEXT	In what *setting* will the IT system be used?			*Set the scene*: where is the persona? When does it happen? Who else is around?
BEGINNING		*Context/situation* The beginning of the story, motivation for what happens, and a focus on what the persona is trying to do	Particular *task* or *situation*	*Establish the goal or conflict*. Conflict: inner or outer conflict triggers the visit to website.
ACTION	Is the persona *interrupted* frequently? Will the IT system be used for extended amounts of *time*? Will other *IT systems or products* be used? What are the *primary activities* the persona needs to perform to meet	*Plot/action* Focus on what happens during the scenario and what influences the decisions the persona has to make *Facts* Gathered from user research	F*eatures* or *functionality* References to specific features or functionality the persona will need and/or use *Procedure* or *task flow information*	*Overcome crisis* along the way Describe intermediate steps and decisions Does the persona use other sites, email, phones etc.? How does the persona feel about the experience?

	his or her *goals*? How much *complexity* is permissible, given persona skill and frequency of use?			
ENDING	What is *the expected end result* of using the IT system?	*Resolution* The ending situation and a focus on what has changed during the story	Clearly defined *outcome* or *goal* for the task	*Achieve resolution* Reach denouement – what happens after the resolution
Table 1: Scenario elements				

Table 1 shows that the mentioned lists of scenario elements are somewhat similar, but also that only Quesenbury (2006) and Mulder & Yar (2006) explain the elements that should be included in a scenario and this only in a brief manner. Mulder & Yar (2006) state that the scenario elements they outline are the classic components of storytelling. However, they do not explain what classic storytelling is. In general, the persona literature is clearly inspired by, but does not explicitly reference narrative theory as an established knowledge base and source of already defined (if controversially discussed) key concepts, such as story elements. We suggest that it is relevant to look more closely at the narrative aspect of persona-scenarios and to draw more explicitly on narrative theory in doing so.

PRESENTING NARRATIVE THEORY

In this paper, we draw on narrative theory positioned within the cognitive and the technical approaches to the study of stories (Ryan, 2001). The cognitive approach describes narrative as an operation of the mind, as a way to create meaning. The technical approach defines narratives and narrative elements. Thus, narrative is considered both a process (mental story construction) and a product (Ryan, 2001); both performance and text (Boje, 1991).

Narrative theory refers to the narrative as consisting of the overall story and the narrative discourse (Abbott, 2002). The overall story is the events in sequence, bound by the laws of time and proceeding in one direction starting with a beginning, passing through the middle and arriving

at the end. The narrative discourse is the representation of events. The narrative discourse is not bound by the laws of time and can present the events in any order (Abbott, 2002).

Another relevant distinction is between 'being a narrative' and 'having narrativity' (Ryan, 2001). 'Being a narrative' refers to any semiotic object produced with the intent of evoking story construction in the mind of the audience, while 'having narrativity' means being able to evoke such mental story construction (Ryan, 2001). From this it follows that a narrative text can have low narrativity meaning that the audience is not able to (re)construct the overall story and that pictures, prototypes, etc. can have narrativity without being narratives in a literal sense.

It is by no means an easy task to define which elements a narrative consists of. Discussions range from how the smallest elements of a narrative are defined to whether media should be considered. We draw on the strand of theory that argues that a narrative has to have more than one event and that these events have to be causally connected (Polkinghorne, 1988), (Bruner, 1990), (Ryan, 2001), (Bordwell, 1997). Moreover, for a text (in the broadest sense of the word) to qualify as a narrative it must (Ryan, 2001):

- Create a world and populate it with characters and objects; the world must undergo changes of state that are caused by non-routine physical events: either accidents/happenings or deliberate human action.

- Allow the reconstruction of an interpretive network of goals, plans, causal relations, and psychological motivations around the narrated events.

According to the prototypical story form (Mandler, 1983) a story begins with a setting in which characters, location, problems, and time is presented. After this presentation, one or more episodes follow, each having a beginning and a development towards a goal. In the opening episode, the character reacts to the beginning events, sets a goal, and outlines a path to reach the goal. Each episode focuses on the goal, attempts to reach the goal, and obstacles for reaching the goal. The attempts are understood as the causes to the outcome. Each episode links to the overall story, thereby creating the plot.

NARRATIVE ELEMENTS	NARRATIVE ELEMENTS IN A PERSONAS-SCENARIO

Character(s): a protagonist as well as minor characters. A character can be any entity that has agency, involved in the action.	In persona-scenarios the persona is the protagonist. (In scenario-based design the main character and protagonist is the IT system.)
Time: both the time in which the actions take place, e.g. the future, and the story development over time - beginning, middle, and end.	Most persona-scenarios are set in present time but they can also concern a distant future. The story time can last minutes, days, months, etc.
Problem: a loss, a need, a lack of something, an obstacle to overcome, a conflict.	The persona has a problem.
Setting: presentation of characters, location, problems, and time.	The narrative begins with a presentation of the persona, his or hers problems, the place where the action takes place as well as the time (present time/distant future).
Opening episode: the character reacts to the problem, sets a goal, and outlines a path to the goal.	The persona defines the goal and starts to act.
Episodes: development toward the goal. Episodes consist of: • Beginning • Attempts • Events (accidents, obstacles, happenings, deliberate human actions) • Development	The persona-scenario develops through a sequence of episodes that concern the problem, the goal and the attempts to reach the goal, the events involved in these attempts and the obstacles hindering fulfillment of the goal.
Resolution: the problem is solved and the goal is reached - or not.	There are two types of persona-scenarios (as well as other types of scenarios) – one where the problem is solved and the goal is reached, and one where they are not.
Plot: the linkage and order of the episodes.	Most persona-scenarios (as well as other types of scenarios) are presented in a linear manner, without deviations from the story time.
Overall story: starts with a beginning, goes through a middle, and arrives at the end. The overall story is sensitive towards what is considered ordinary social practice within a given culture and explains deviations from accepted social practice.	Each episode links to and has to be meaningful in relation to the overall story. The persona-scenario has to explain why non-routine actions and events happen and how they are dealt with.
Narrator's perspective: The narrative is told by someone.	Most persona-scenarios (as well as other types of scenarios) are told in third-person allowing the narrator to be omnipotent.
Table 2: Analytical lens - The story form and its elements	

Table 2 presents an overview of the story form and our 'translation' here of to a persona-scenario context. The translation of narrative theory to a persona-scenario context address the theoretical gap and confusion about what a persona-scenario is and should consist of currently existing in the literature. Moreover, the translated story form constitutes the analytical lens, which we will now apply to an empirical case study in order to understand the content and level of narrativity of four persona-scenarios developed during a workshop. First the case study and the research approach used to conduct the study is described. Subsequently, the case study analysis is presented.

THE VIRK.DK CASE

It is the strategy in Denmark that all communication between companies and government is to be digital in the near future. Virk.dk is part of this strategy. It is a portal that contains more than 1500 forms, which can be used by companies to report to governmental bodies in Denmark. Today the forms can either be printed and sent by post or filled in digitally and returned by e-mail. In the future all forms must be reported digitally. Virk.dk has existed since 2002, but has not been widely used due to technical problems and a lack of focus on e-reporting.

This paper reports from the redesign of the portal. Early in the redesign process it was decided to use the persona method as it was the hope that user centered methods could help overcome the problems with lack of use. Moreover, experience shows (Pruitt and Adlin, 2006) that it is of great importance to involve and get buy-in from all those who participate in the development process. A series of workshops, based on 10 steps to personas (Nielsen, 2004), (Nielsen et al., 2007) was therefore proposed and accepted.

This paper concerns the final full-day persona-scenario workshop. The 16 workshop participants were chosen by the customer as being key stakeholders in the development process. The participants were customer representatives, graphic designers, and programmers and covered several areas such as project management, marketing/content, user rights, user interface design, and IT development. Three of the customer representatives had participated in earlier workshops, but most of the participants had not previously partaken in the persona/scenario development process.

The aim of the workshop was to get the workshop participants 1) to engage in the persona descriptions, and 2) to use the persona-scenario method to create further insight into users as well

as new design ideas. The 16 workshop participants were divided into four groups. In the first part of the workshop the groups were asked to find and present a relevant photo that illustrated a written persona description. In the second part of the workshop the persona-scenario method was first introduced. Then each group got a short text with a start situation for their persona, developed a persona-scenario, and presented it to the other groups. This particular design for the workshop day was chosen because previous research has shown that the prerequisites for collective learning and generation of ideas are that a shared knowledge base is established, that insights are actively processed through joint reflection, negotiation, and expansion, and that storytelling is a relevant means for building a shared understanding, for making sense of past actions, and for envisioning the future (Bruner, 1990), (Nielsen and Madsen, 2006).

RESEARCH APPROACH

There are many different types of action research (see e.g. Baskerville, 1998). However, the defining features of all action research are intervention into and change of a practical problem situation for the dual purpose of solving the particular problem and contributing with new knowledge to the research literature (McKay and Marshall, 2001).

The scenario workshop under study in this paper was held for the dual purpose of 1) engaging the workshop participants in the personas descriptions and developing persona-scenarios for the Virk.dk portal and 2) contributing to the research literature with practical guidelines for what could/should constitute a persona-scenario to generate as many, new, and shared understandings and design ideas as possible. One of the authors of this paper acted in the role of workshop leader/action researcher, while the other author had the role of present, non-participating observer.

The data material available for this study is qualitative in nature and was collected using qualitative data collection techniques. It consists of: the video-filmed workshop (i.e. one group's work and discussions as well as all plenary sessions were filmed throughout the day), the participant observer's observation notes taken throughout the day, reflective feedback about workshop learning noted by the participants just before the workshop ended, the workshop leader/action researcher's power point presentations, scenario start situations written by the workshop leader/action researcher, the already developed personas, as well as the written persona-scenarios. The empirical material is in Danish. Included citations have therefore been translated into English by the paper authors.

To analyze the data we used the analytical lens presented in Table 2 to perform a narrative analysis of the content of each of the four groups' persona-scenarios and to organize the writing of the case study. In the analysis we looked for, distinguished between, and conducted separate analyses of a) the written scenarios and the oral presentations here of, i.e. between the text and the performance, b) scenarios that included all narrative elements, scenarios with missing elements, and/or comments and ideas that originated outside the narrative, c) the level of narrativity for each scenario, and d) the understandings and design ideas that were generated from each scenario.

THE CASE STUDY ANALYSIS

In the workshop, the four groups were introduced to the persona-scenario method, how to write a scenario as a narrative that follows the story form, and, briefly, to each of the story elements. The groups were given the task of writing a persona-scenario based on a short text that described the persona's situation and goal, and subsequently to give a short oral presentation of the scenarios they had developed, and to present their written scenarios on a screen. In this section, we present the analysis of the four groups' scenarios. For each group, the content of the written and the oral scenario is described and the use of narrative elements, the level of narrativity, and the generated understandings and design ideas are highlighted.

Group 1: Karina reports digitally

The first group received the following text: "Karina has a digital signature and would like to report wage statistics. She is busy because one of her colleagues is sick. What does she meet? She has reported sickness benefits before, which experiences can she use again? What would Karina always like to be able to find?" (Start situation, written by the workshop leader).

The group chose not to write anything during the scenario development session. The oral presentation of the group's work was a story that developed smoothly as the persona, Karina, did not encounter any obstacles. The plot of the persona-scenario was as follows. Karina is presented as an employee in a large company and as an efficient person, i.e. she is the oldest of four siblings, she is used to taking decisions, and she is therefore the company's administrator of Virk.dk. "Karina logs in on the front page, finds Statistical Denmark, presses wage statistics, and finds sickness benefits. Here she meets different areas that contain different kinds of information. She begins to report and ends by signing with her digital signature. The system asks her if she

wants to continue to some form of archive. Sometimes she searches for information. She then uses the search field." (Excerpt from the transcript of the oral presentation).

The causal plot has the minimum characteristics of a story. With regard to setting, the story unfolds in a non specified location, no problem is presented, and the time is a non described near future. The character and her actions are briefly described in line with the persona description, but apart from this the character is not elaborated during the story. In the opening episode the goal is presented as a need to report digitally. The goal drives the story forward. The story only has one episode, with several events, such as when she has to choose between a numbers of reports. As no problem has been presented the story does not include attempts to reach the goal, only events towards the goal. The resolution is presented as the fulfillment of the goal.

The group presented the IT system at an abstract level by referring to icons and reports as: "an icon in some form", "a digital report or another kind of report". Moreover, the group did not investigate the obstacles that may be connected with reporting. Even a rather complex area such as control of user rights was dealt with in a superficial way. "She is Virk administrator. This means that no matter what she is reporting she will be able to control user rights." (Excerpt from the transcript of the oral presentation).

From the oral narrative the group identified two design ideas:

- An icon showing whether the report is in digital form or not.
- The user expects to be able to see reports dating 5 years back.

Analysis of the oral narrative shows that it is fragmented with regard to the overall story where the setting and the episode was described in abstract terms. With regard to the narrative discourse the presenter was unable to keep causality due to the lack of a written scenario. This made it difficult, both for the presenter and the audience, to create meaning from the narrative. The level of narrativity can therefore be characterized as low. Looking at when design ideas occurred, it happened at the few times when the episode developed towards the goal via concrete events, e.g., the need for an icon showing the type of report was identified in connection to the event of choosing between digital and non-digital reports. No additional understanding of the user was achieved.

From this it seems that in order for scenarios to generate new insight and design ideas, it is vital that they are explicit on setting and describe at least one episode that follow the narrative structure in full with beginning, attempts to reach the goal, the concrete events involved in these attempts, and the obstacles that hinder fulfillment of the goal.

Group 2: Michael looks for information

The second group received the following text: "It is after closing time and Michael tries to find information about a new country he is importing from. His problem is that he does not know what to report and which rules that exist for the particular country. How does he find the information? How does he report VAT for the foreign goods?" (Start situation, written by the workshop leader).

The group explored how their persona, Michael, uses Virk.dk as it is today. Michael, who is the owner of a small shop, closes his shop for the day and has dinner and a glass of wine with his wife. Then he turns on the PC and starts to looks for information on VAT on imports from Turkey. The plot advances despite Michael's lack of IT skills. He tries things out, follows links, and reads. "Michael begins with Google (as he always does) "VAT – import of food" and finds Startvaekst.dk (he knows it from earlier experience). Here he gets a good overview – he need to report on "Intrastat" – but there is nothing concrete, because it does not contain links to the relevant authorities." (Excerpt from the written scenario). The story continues as Michael finds a link to tax authorities, and surfs for fun on Virk.dk, where he does not find what he is looking for. The story ends as Michael gives up and decides to call his accountant the next day.

The story had a refined setting that introduces Michael as the protagonist as well as two locations, namely the shop, and the home. Moreover, it defines the problem as Michael's low IT skills, and the time is an evening in present time. In the opening episode Michael closes the shop, goes home, has dinner, and turns on the PC. Here, the goal is presented: to find information on VAT on imports from Turkey. Because the group spends a while on the opening episode it communicates Michael's reluctance to do the task. The story has several episodes:

- Opening episode: Closing the shop, dinner with wife, sitting down in front of PC
- Middle, episode one: Google search
- Middle, episode two: Startvaekst.dk search
- Middle, episode three: Virk.dk search for fun

- Resolution: Giving up

The middle contains three episodes of which only the two first are driven forward by the goal. In the third episode concerning Virk.dk, Michael has already given up. The scenario becomes a story in which the problem is not overcome and the goal not reached.

The group presented two design ideas in a post script to the written scenario:

- Search engine optimizing.
- Mutual text links to related sites, such as tax authorities.

The design ideas were not included in the actual story and therefore not seen and validated from Michael's point of view.

Analysis of the written and the oral scenario shows that the written scenario was very short, while the oral narrative was more enhanced. In both cases the overall story related to the persona and he was prominent in the plot, whereas Virk.dk received only little attention. Both narratives were coherent with regard to the overall story and the narrative discourse, and the level of narrativity was high. However, possibilities for helping Michael overcome the initially stated problem and identified obstacles, namely his low IT skills and the fact that Virk.dk does not appear in a Google search about VAT, were not explored, because the group had decided to describe Virk.dk as it is today. For this reason the group also did not get an increased understanding of their persona in relation to the new Virk.dk.

The distinction between problem and design scenarios (Cooper et. al., 2007) was not presented to the participants. For this group the narrative became a problem scenario that worked as a crutch for understanding the existing IT system, but at the same time it prevented the group from understanding and getting design ideas about the future IT system. From this it seems that if scenarios are to generate design ideas, the scenario developers have to be introduced to and understand the difference between problem and design scenarios and they also have to pay attention to and explicitly analyze the identified obstacles in order to get ideas for how to deal with them within the story.

Group 3: Dorte uses Virk.dk for the first time

The third group got the following text: "Dorte has finally received her digital signature, she has some time before lunch, and would like to report trainee wages. She opens the browser and types

Virk.dk. What does she see? What does she do? What would Dorte always like to be able to find?" (Start situation, written by the workshop leader).

The group wrote a scenario centered round their persona, Dorte, a secretary in a small company. During the presentation, they read from the scenario without showing anything on the screen. The narrative was very detailed and thoroughly explored the situation when Dorte tries Virk.dk for the first time and has a need for guidance.

The story runs as follows. Dorte has received her digital signature and invites her son to dinner to get him to guide her through Virk.dk. "Dorte writes "reimbursement of trainee wages" in the search form and activates the function. A new screen appears with a short list of hits. On top is a link to the form – Dorte recognizes the form because the title is the same as the paper form she has used earlier on. Dorte smiles to her son – that was easy. Dorte clicks on the link, but instead of getting the form, she gets a page that says: "in order to use this form to report, you must be logged on to Virk.dk – click here to log on" (Excerpt from the written scenario). Dorte gets confused, but her son reassures her. Dorte accepts, and begins her task of filling in the form. She sends in the form, receives an acceptance, and prints the form. When quitting she receives a message saying that the form is not saved under her favorites with an option to save. Again, Dorte gets confused, but with her son's encouragement she chooses "save as favorite".

In the setting Dorte is presented as being at home. The time is after dinner. Her problem is that she has to use Virk.dk for the first time and that she is in need of guidance. The goal is to fill in the form of trainee wages. The story contains several episodes:

- Opening episode: Dorte receives her digital signature and invites her son for dinner.
- Middle, episode one: She logs in with the son by her side.
- Middle, episode two: She finds the form.
- Middle, episode three: She has to accept an agreement, gets confused, but accepts.
- Resolution: She fills in the form and is asked to save it, gets confused, but saves it as a favorite.

Each episode contains several attempts to reach the goal, and whenever the goal seems unreachable the son intervenes and solves the problem. In the resolution Dorte is able to both fill in the form and to save it as a favorite.

Based on the scenario, group three got:

- An increased understanding of Dorte as a person, and as an example of the first time Virk.dk user.
- An increased understanding of the importance of communication to Dorte, but not specific design ideas about when and how the IT system should facilitate this communication.

Analysis of the scenario shows a coherent story that establishes an understanding of Dorte and her needs. It has intense character descriptions of thoughts and feelings. Furthermore, the episodes and events are casually connected and the plot is easy to follow thereby creating high narrativity. However, as the son becomes the means of problem solving, the story never explores what the IT system can do to support Dorte. The group presented afterthoughts as they were aware that they had written an unrealistic scenario, where they did not explore the obstacles Dorte encounters from a design perspective.

Again, the way obstacles are dealt with seems to be important. Based on the analysis of this scenario, we suggest that in contrast to other types of stories that can overcome obstacle in many ways, the design scenario must close the world around the interaction between the persona and the IT system.

Group 4: Jesper reports an instance for a customer
The fourth group received the following text: "Jesper sits in his office and has to use the new Virk.dk for the first time. What does he meet? Jesper has a lot of bookmarked links within the advisory theme. How does he get these links into the new system? What would Jesper always like to be able to find?" (Start situation, written by the workshop leader).

The group wrote a story that introduced the persona, Jesper, as a family man, an accountant interested in getting prestige from his colleagues and superiors, and because he is an accountant he is also an experienced Virk.dk user. The persona-scenario starts on the 2nd of January 2008, the first day at the office after the Christmas holiday, where Jesper arrives and finds a huge pile of work that has to be done. The oral story described the context of Jesper's work day in even more detail than the written scenario.

The plot of the story is as follows. Jesper starts to work and has to report the first instance for a customer. He realizes that Virk.dk has changed. "He had forgotten it, when he, after talks about New Years Eve and with coffee in hand, grasps the work pile and turns on his computer. His homepage is possibly a deep link or the log-in to Virk.dk (or he uses a bookmarked page on his computer). The system shows him a friendly error page with information on the site being upgraded, links to a guide, a couple of ideas to what page he now wants and a possibility for log-in. Jesper immediately remembers what he knows about the changes on virk.dk. *The system must work and be fast in order to reassure him that he is on the NEW virk.dk, not on an unknown site. The system must react to 'old' deep links by transforming links to a search and show some search results on the error page. You can analyze log files from the existing virk.dk and look for links without referral and do some statistics on what pages the users has bookmarked. This knowledge can be used to make a mapping from old to new page."* (Excerpt from the written scenario; the story about the interaction between the persona and the IT system is in normal text, while technical description is in *italic*). The story continues: Jesper logs in, keeps focus on his task and finishes what he intends to do, but pays attention to the new functionalities and makes a mental note of exploring the new Virk.dk site later in order to set up 'MyPage', recreate bookmarks, and because he wants to be able to help his colleagues.

Based on the scenario, group four got:

- An increased understanding of Jesper as a person, and as an example of the experienced Virk.dk user.
- An increased understanding of and design ideas about Jesper's need for two personalized views: a view that concerns himself and one that concerns the companies he represents.

Analyzing the narrative it presents an elaborate setting in which the main character, the time, and the location is vividly described. This goes for the problem too: the forgotten relaunch of Virk.dk and new functionality to learn. The opening episode describes Jesper's work day, how he sits down with a huge amount of work and the goal of the scenario is here presented as reporting an instance for a customer. The story contains several episodes:

- Opening episode: Jesper arrives at work, sits down with a huge pile of work, clicks on one of his bookmarks and realizes that Virk.dk has changed.
- Middle, episode one: He log in to the new Virk.dk and performs his task of reporting.

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- Resolution: He makes a mental note of returning to Virk.dk later to explore the new functionality.

In the story, Jesper's focus on helping colleagues motivated by his interest in prestige creates a frame for probing into a problematic area, namely when and why experienced users explore and come to understand the new Virk.dk. However, the story only touches upon the subject without examining it further, as the matter is resolved via a quick and happy ending where Jesper decides to investigate the site later. During the scenario development session, the group realized that they did not solve the problem they had outlined in the beginning of the story, but the realization did not lead to changes to the written scenario and the presenter did not share and discuss the insight with the audience.

The narrative was coherent with regard to the overall story, but less so with regard to the narrative discourse. The opening episode was presented fully, but as the narrative discourse progressed the presenter shifted in and out of the story sometimes forgetting about Jesper in favor of describing and explaining technical aspects of the current version of Virk.dk as well as design ideas to the other workshop participants. This made it challenging for the audience to reconstruct the overall story. The digression to technical description were also present in the written story as shown in the excerpt, were focus shifted from the interaction between the persona and the IT system to technical explanation. The level of narrativity can therefore be characterized as medium.

From this scenario it can be seen that both with regard to the written and the oral scenario presentation of technical aspects can create deviations from the story, where the persona disappears from view. It can be argued that this is not problematic as the scenario is meant to be a container for good ideas in any form. However, it becomes problematic if the story never gets back on track and the technical solution overrules the understanding of the interaction between the persona and the IT system.

Summary and Discussion

Design-oriented persona-scenarios are stories about personas using IT systems. Because persona-scenarios are stories, they are "good at establishing a sort of interdisciplinary understanding" (workshop participant, reflection on workshop, written at the end of the workshop day) and they help in that "everybody got the persona 'under their skin' – a shared understanding" (workshop participant, reflection on workshop, written at the end of the workshop day). The purpose of the

stories are to serve as a mechanism for generating and sharing many new understandings about the prospective users as well as multiple design ideas for the future IT system. In this section, we summarize the case study findings, discuss the role the IT system plays in the four scenarios, and outline the implications for research and practice.

The case study analysis shows that:

- Group 1 was able to generate design ideas when events were described in a concrete and detailed manner.
- As Group 2's narrative described the current situation rather than the use of the future IT system no design ideas are identified within the story as such. They emerge after the story and are therefore not validated from the persona's point of view.
- Group 3's narrative generated an increased understanding of the persona as an example of an inexperienced user and of her thoughts, feelings, and actions. The group's work shows that when another character - here, the son - is introduced to handle the obstacles the group do not discover how the IT system can support the persona. While it is likely that in practice an inexperienced user will seek guidance from another person, the idea of writing the persona-scenario is to discover how the IT system can help the persona. The group was subsequently aware that they had not solved the problem in a convincing way, and especially not from a design perspective.
- Group 4's scenario generated an increased understanding of the persona as an example of an experienced user as well as a number of design ideas. However, in this case there is also a mismatch between the problem and the way it is solved. Where group 3 used another character as an 'outside' intervening source to help their persona reach the goal, group 4 does not address the problem formulated at the beginning of the scenario within the story. Instead they introduce a quick and happy ending where the persona decides to investigate the new Virk.dk later. Again, while group 4's work might be in line with what will actually happen in practice the persona-scenario is not used to fully explore how the IT system might help the persona overcome the problem outlined in the particular scenario. Already during the development session the group realized that they did not solve the problem, but they did not share this insight with the audience.

Narrative theory (Abbott, 2002) suggests that humans have an intuitive understanding of and expect stories to follow the story form. For scenario writers this means that once the story is started it develops in its own course. When a certain setting and the elements here of, such as a son invited for dinner or an accountant with a huge pile of work, are introduced they can have unexpected consequences for the story and can lead to plots and endings that are too simplistic - *from a design perspective*. Such plots and endings are intuitively perceived as unconvincing, both by the scenario writers and the audience. However, the case study also shows that it is much easier to instinctively interpret a scenario's level of narrativity and plausibility than it is to write a scenario that follows the story form, and solves the persona's problems in a design-oriented way.

To construct a convincing design scenario, we propose that while the persona is the protagonist the future IT system has to play a prominent role as well. But how? Orlikowski & Iacono (2001) argue that it is essential to explicitly conceptualize the IT artefact and based on a literature study, they suggest that it can be done as follows. IT can be seen as: 1) a labor substitution, productivity, information processing, and social relations *tool*; 2) *proxy*; 3) *ensemble*, i.e. as one element among many; 4) *computation*; and as 5) *nominal*, i.e. the IT system is abstract or even completely absent as the emphasis is on other topics (Orlikowski & Iacono, 2001). Especially the last view is prevailing in the literature – and in this study. In the first scenario about Karina the future Virk.dk is described in abstract terms, in the second scenario about Michael the future system is absent, and in the third story about Dorte the new Virk.dk is present and somewhat concrete, but the focus is on other aspects. Only in the forth scenario about Jesper does the future IT system take on the role of a main character, or object, conceptualized as a productivity and information processing tool. In line with Orlikowski & Iacono (2001), we agree that it is necessary to conceptualize the IT system in a concrete way. However, when it comes to persona-scenarios the IT artifact is a part of the story and therefore, it also has to be conceptualized as a part of the narrative elements that make up a story. Thus, within the story and with regard to the narrative elements, the IT system is a part of the events - rather than a character or tool-like object - because the emphasize should be on, and the IT system becomes tangible in, the interaction that takes place between the user and the IT system. This also means that the more detailed and concrete the events are and the more they address obstacles and design-oriented ways of overcoming the obstacles, the more concrete the future IT system and design ideas for the future IT system stand out within the story and get

validated from the persona's point of view. Therefore, we also recommend that in design scenarios the problem should always be solved and the goal should always be reached.

The implications of the presented findings for research and practice are as follows. The existing organizational, IS, and ISD research on storytelling tends to stress how easy and natural it is for people to construct, tell, and interpret stories. However, our research shows that it is difficult to write and present a good, coherent and design-oriented story without methodical support. This suggests that more theoretical and empirical research is needed to investigate what kind of theories, methods, and detailed guidelines that are needed to support the practical work of generating IT systems requirements via storytelling. In particular we suggest that more research is needed to refine the persona-scenario method by providing clearer definitions of concepts and 'how-to' guidelines based on narrative theory and narrative analysis of the content and performance of persona-scenarios. For practice, our research suggests that it is important to design persona-scenario workshops so that they are organized around a focus on the story form and to provide guidelines and templates for working with the story form.

CONCLUSION

In this paper we investigate persona-scenarios as a mechanism for supporting the work of diverse ISD project participants during requirements determination. We conclude that because persona-scenarios are stories and thus, draw on our human ability to intuitively arrange and understand information conveyed in a narrative form they allow for interdisciplinary knowledge sharing and creation of a common understanding about personas and their use of the IT system. However, despite our inherent human ability to construct, tell, and interpret stories, it is not easy to write and present a good, coherent story that generate many new understandings and design ideas. A set of guidelines concerning how to construct and present persona-scenarios is therefore needed.

Narrative theory suggests that stories that are in line with the story form and its narrative elements are easier to relate to, remember and in general more convincing. Narrative analysis of the content of four persona-scenarios supports this and further shows that:

- In order to generate design ideas the events in the persona-scenario have to be described in a concrete and detailed manner.

- In order to generate as many new understandings and design ideas as possible the persona's problem presented in the beginning of the persona-scenario as well as the obstacles the persona encounters as events unfold should be investigated and solved within the story. Thus, design scenarios should have a happy ending.
- In order to validate understandings and design ideas from the persona's point of view the persona-scenario should concern the use of the future IT system.
- The IT system is a part of the events and becomes tangible in the interaction that takes place between the user and the IT system. Therefore, the more concrete and detailed the events are and the more they emphasize obstacles and design-oriented ways of overcoming the obstacles, the more concrete aspects of and design ideas for the future IT system will stand out and get validated from the persona's point of view.

Below, we present a set of theoretical and empirically grounded guidelines that outline a) the narrative elements that a persona-scenario should consist of (see Table 3; literature-based findings are shown in normal text, case study findings in *italic*) and b) a procedure for how to construct and present persona-scenarios to generate as many, new, and shared understandings and design ideas as possible.

Narrative elements	Narrative elements in Persona-Scenarios
Character(s):	The persona should be the protagonist, not the IT system.
Time:	Most persona-scenarios are set in present time but they can also concern a distant future. The story time can last minutes, days, months, etc. *The persona-scenario should concern the use of the future IT system.*
Problem:	The persona has a problem. A problem can be a loss, a need, a lack of something, an obstacle to overcome, a conflict, etc. *The problem should be investigated and solved within the story.*
Setting:	The persona-scenario should begin with a presentation of the persona, his or hers problems, the place where the action takes place as well as the time (present time/distant future).
Opening episode:	In the opening episode, the persona should define the goal and start to act.
Episodes:	The persona-scenario should develop through a sequence of episodes that concern the problem, the goal and the attempts to reach the goal, the events involved in these attempts, and the obstacles hindering fulfillment of the goal.

	Events have to be described in a concrete and detailed manner. *The IT system is a part of the events and it (only) becomes tangible in the interaction that takes place between the user and the IT system.* *Obstacles should be overcome as a part of the events to as high a degree as possible.*
Resolution:	*In design scenarios, the problem should be solved and the goal reached.*
Plot:	Most persona-scenarios are presented in a linear manner, without deviations from the story time.
Overall story:	Each episode should link to and be meaningful in relation to the overall story. The persona-scenario should explain why non-routine actions and events happen and how they are dealt with.
Narrator's perspective	Most persona-scenarios are told in third-person allowing the narrator to be omnipotent.
Table 3: What a design-oriented persona-scenario should consist of	

In order to write and work with persona-scenarios in future workshops we suggest the following procedure:

- **Introduction**: The workshop leader a) introduces the workshop participants to the persona-scenario method and the distinction between problem and design scenario as well as the story form and the guidelines presented in Table 3 and b) hands out the scenario start situations, the guidelines in Table 3, and a template that can support the groups in working with the story form (see Appendix A).
- **Preparation**: The workshop participants fill in the template.
- **Writing**: The workshop participants write the persona-scenario, using the filled-in template.
- **Analysis**: The workshop participants analyze the written persona-scenarios in accordance with the narrative elements and guidelines outlined in Table 3. Special attention should be given to whether the initially stated problem and encountered obstacles are defined, investigated, and solved in a convincing, design oriented way within the story. Based on the analysis, the persona-scenarios are revised.

- **Requirements determination**: The written persona-scenarios are read out loud, and from each persona-scenario, understandings, design ideas, and requirements are collaboratively extracted by the scenario writers and the audience.

More research is needed to investigate and understand how the guidelines in Table 3 can best be implemented in a supporting template and how an intermediate step, where the written persona-scenarios are analyzed in accordance with the story form and its elements, will affect the workshop experience and the understandings and design ideas generated.

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APPENDIX A

Narrative elements	Please list…:
Episodes and events:	All the situations the persona might experience or needs he or she might have with regard to the handed out start situation.
Obstacles:	All the obstacles the persona might experience with regard to the handed out start situation.
Opening episode:	Where the action takes place. When the action takes place. What the persona's goal and problem(s) are.
Episodes:	How the story develops towards the goal in a number of episodes. For each episode: - Which interactions (with the future IT system) that take place.

	- What the persona thinks.
	- Which obstacles that occur, when, and how they are overcome.
Resolution:	How the persona reaches his or her's goal.
	What happens / If something has to happen once the goal has been reached.
Table 4: Preparation Template for Design-Oriented Persona-Scenarios	