

ENHANCING AGILE REQUIREMENTS ELICITATION WITH PERSONAS

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ABSTRACT

The importance of good Requirements Engineering (RE) is repeatedly highlighted with many reports indicating how failure in this area contributes greatly to overall project failure. Agile Methods (AMs) have emerged as an alternative to traditional methods for software development. AMs recognize the failure rates of previous projects and promote increased collaboration with the customer as one of its main values throughout development. However, problems have been reported with the use of the most popular AMs in the area of requirements elicitation particularly with an over reliance on a customer and lack of elicitation guidelines. This paper describes a development process that combines personas, as used in Interaction Design, with eXtreme Programming (XP), the most popular AM, to overcome the problem. To investigate the value of this process a case study was conducted in which this process was used in the development of an internet application by a small team. The main findings are that the process used provided benefits but also threw up one or two other problems of its own.

KEYWORDS

eXtreme Programming (XP), personas, requirements elicitation.

1. INTRODUCTION

Requirements Engineering (RE) is the gathering, developing and managing of the requirements so that they are presented in a way that leads to the development of a successful software system (Pressman, 2000). The influences that RE activities have on project success and failure are often reported. Unsuccessful requirements elicitation is often a contributing factor. A survey (Taylor, 2000) carried out in 2000 revealed that only 12.7% of the 1,027 projects surveyed were successful. It outlined “unclear objectives and requirements” as the top reason for projects failing and *requirements definition* as the stage where the largest amount of projects fail. Taylor (Taylor, 2000) stated that in general “projects are often started when they are not clearly thought through”. Despite the existence of various elicitation methods few of

these are applied in practice which may in part be due to a lack of flexible guidelines for practitioners to follow (Coulin, Zowghi & Sahraoui, 2005).

Generally, with traditional approaches to software development the RE process is typically performed very early on in the project life cycle. It is viewed as a step-wise approach to presenting the requirements in a useable fashion (Pressman, 2000) with the output from one activity becoming the input to the next. For example, a requirements *document* would be produced as a result of the *documentation* activity and this document would be analysed in the *validation* activity. The main customer involvement is also often seen to be at the start of the project. This typically occurs during the early RE activities, mainly during requirements *elicitation* and requirement *analysis* and *negotiation*. The customer meets with project team members to discuss the functionality they require. Generally there is little communication between the customer and the project team during development.

The increasingly popular Agile Methods (AMs) (Augustine, 2005) recognize that a large number of projects still fail and try to resolve this problem. Many AMs exist but each fits under the umbrella of the agile manifesto (www.agilemanifesto.org) with eXtreme Programming (XP) being one of the most popular (Augustine, 2005). These approaches attempt to overcome the problems associated with traditional plan-driven processes by adopting practices that promote, among others, communication and collaboration between developers and customers. XP in particular encourages customer representatives to integrate with the development team anticipating rapid feedback from frequent delivery of software. This facilitates the development of evolving requirements. However, concerns have been raised. Specifically, the practice can lead to complacency assuming that the customer representative “already knows everything that needs to be known”. Also, there tends to be an over-reliance on a single customer who may not accurately represent all potential future users (Eberlein & Leite, 2002). In certain cases, particularly for internet development, a suitable customer or group of customers may not be available. Here, help is needed in representing groups of users with different expectations. Another issue arises from the fact XP is described as a process that starts with requirements specification (Abrahamsson et al., 2003). There is little guidance on how to perform elicitation.

Personas are a design tool associated with the Interaction Design process (Cooper & Reimann, 2003). Based on user research they represent hypothetical archetypal users of a system and are typically used to assist in making design decisions (Cooper, 2004). The intention with personas is that if you develop a system for a particular person (or a small range of people) you will get much more value from it than if you tried to develop a system to satisfy a large number of users. For example, when Microsoft decided to research the redesign of Microsoft Office Suite for the 1997 release, they found that four out of the five features potential users requested were already present in the product. But because the product was trying to satisfy as many users as possible they ended up with a system overloaded with functionality which satisfied few of its potential users (Head, 2003). This work explores the application of personas in the context of requirements elicitation within the XP development process.

The XP-Persona process developed here combines personas with XP to create a process that encourages more user-centred discussion on requirements. The intended result is that clearer requirements will be elicited in a more inclusive manner than already used in XP. Also, as the team and the customer have participated it is hoped that there will be a better common understanding of the problem that will relax the requirement that the customer be constantly on site during development.

This paper describes a methodology that integrates personas with XP and an application within one particular development project. The next section provides a description of how requirements are typically developed in XP. This is followed by an overview of personas and how they are used. Section four describes the combined persona-XP process. In the fifth section the case study is outlined and results presented. To conclude the strengths and weaknesses of the approach are presented.

2. REQUIREMENTS IN XP

Originally XP outlined twelve practices, all of which needed to be carried out so as to support each other (Beck 2000). In the most recent edition XP outlines thirteen primary and eleven corollary practices that encourage the five values of *communication*, *simplicity*, *courage*, *feedback* and *respect* (Beck & Andres, 2005). Now the emphasis is on encouraging the values through gentle introduction of the practices and only implementing the corollary practices with the support of the primary practices or if the situation suited it. It is recommended that each situation should be considered separately and assessed to establish which practices to adopt.

In XP requirements are captured as *stories*. With *stories*, customers describe the required functionality in one line descriptions, typically recorded on post-it notes or cards. Each story has three C's associated with it; *card*, *conversation* and *confirmation* (Jeffries, 2001). The *card* is the card or post-it the information is recorded on. The *confirmation* lies in a user-defined acceptance test which along with a programmer-defined estimate of the scale of the story is recorded on the card. Small amounts of additional information in the form of notes may also be recorded on the card. When a story is implemented a *conversation* with the customer is required to clarify the requirement. Generally, not much detail is given on how you should establish the information for the story card apart from talking to the customer. An example of a user story is provided in Figure 1. This story card contains the customer-defined "story" in the Description. A unique "StoryTag" is recorded along with the author's name, priority and relevant dates. It is estimated at "4.1" with some considerations (notes). It is then broken up into tasks with a developer taking responsibility for each task and that developer estimating each task separately. Stories and tasks should be estimated using a unit of measure the development team and customer are comfortable with.

StoryTag:	DocBookToHTML	Release:	Book	Priority:	1
Author:	Joanne	on:	2/21/02	Accepted:	3/17/02
Description:	Make the DocBook files readable and printable.				
Considerations:	HTML has some drawbacks:			Estimate:	4.1
	<ul style="list-style-type: none"> • Printed version is not production quality. • Footnotes can't appear at end of page. 				
Who	Task	Est.	Done		
Rob	Simple tags: <chapter>, <title>, <para>	1	2/24		
Rob	Asymmetrical tags: <attr:latlon>	1	3/3		
Rob	Contextually related tags: <title>	1	3/11		
Rob	Stateful output: <footnote>	1	3/14		
Joanne	Acceptance Test: Print the first chapter	-1	3/17		

Figure 1. Sample Story (Nagler, 2004)

Originally XP required a permanent *On-site Customer* to participate in requirements specification and development (Beck, 2000). However, recently the emphasis has changed to *Real Customer Involvement* requiring “people whose lives and business are affected by your system to be part of the team” and advice is given to make visionary customers part of the *Quarterly* and *Weekly Cycles* (Beck & Andres, 2005). However not much is said on how these visionary customers should be used.

Although the recent version of XP does not give much guidance on planning, the first edition of *Extreme Programming Explained* (Beck, 2000) recommended the practice of *Planning Game*. This is the approach that practitioners typically adopt. The *Planning Game* practice presents guidelines on long term (release) and short term (iteration) planning. At the start of release planning the customer(s) and developers discuss and create new stories while also prioritizing them by value (customer) and risk (developer). The stories for the release under consideration are then selected. At the end of the release housekeeping of stories and issues takes place and can be worked into the next release. Within each release there are a number of iterations. At the start of each iteration the stories to be implemented are selected and broken into tasks which developers accept and then estimate. When all tasks have been selected and estimated development then begins on the selected tasks. In essence the iteration allows the developers to micromanage the project. Customers are encouraged to sit-in on development so that they can be asked questions on any aspect of the system at any time.

Eberlein (Eberlein & Leite, 2002) reports two problems; one that the customer knows everything that is relevant and two, over-reliance on a single customer representative. Selecting the most appropriate customer representative is challenging. Beck (Beck & Andres, 2005) outlines high qualities that the ideal customer should possess including being visionary and being comfortable influencing a project while not controlling it (Beck, 2000).

There are further issues. While XP describes how to conduct a process that begins with specification (Abrahamsson et al., 2003), there is little guidance on how to conduct elicitation, and the closest artifact to a requirements document, the story card, makes a “lousy tool for communicating requirements” (Shore, 2005). These are better used as planning tools as opposed to complete requirements (Shore, 2005) and should be used to “represent customer requirements rather than document them” (Cohn, 2004).

With internet development the challenge is greater as typically a website has a very large number of likely users and as such this group of users will vary greatly in terms of their expectations of the system. Here a distinction needs to be made between a user and customer in that a web site could have one customer investing in it’s development and a huge number of potential users. So even if the customer is available to sit in on development, the whole benefit of the customer may not be apparent as the customer may not be one that will be interacting with the system when it is finished. When requirements are to be elicited it is necessary to examine different user groups to ensure that the overall problem is considered. The proposal here is to use personas as used in Interaction Design in conjunction with story development in XP.

The next section describes the typical use of personas and highlights how the approach has been used in different development environments and combined with other approaches.

3. PERSONAS

Personas are a design tool generally used within Interaction Design (ID) that help to give the ID team an idea of what a user may desire from a system (Cooper, 2004). Personas are typically used to guide decisions regarding functionality, navigation and design (Head, 2003) by examining what is really needed of the system from a prospective user's point of view. Along with *personal attributes* (to increase empathy), other attributes such as *goals* and *scenarios* are associated with each persona. Goals are considered the most important attributes of a persona as "a persona exists to achieve his goals, and the goals exist to give meaning to a persona" (Cooper, 2004). Scenarios provide descriptions of how a persona interacts with a system to achieve a goal. It is recommended that no implementation aspects should be mentioned within the scenarios.

All of this information can be stored in different ways with one company going as far as to have an email account set up for each persona with an informative email sent out from the persona each week (Pruitt & Grudin, 2003). If a number of personas are used, as is often the case, a primary persona should be selected. Cooper (2004) describes the primary persona as being "someone who *must* be satisfied but who cannot be satisfied with an interface designed for any other persona". There are no hard and fast rules on which persona to choose as the primary persona but typically the persona (or personas) who is the main focus or whose goals cannot be achieved through another persona's goals is selected as the primary persona although some thought should be put into the selection. A number of primary personas may be selected if necessary but typically each primary persona will have their own separate interface. For example when developing a site for selling computer games do not automatically assume a 12-25 year old, computer savvy male would be your primary persona. Although this might be a typical user a better primary persona may be the grandmother of one of the computer savvy boys wishing to buy him a present. Developing for the computer savvy youngster may alienate less computer literate users such as the grandmother. Once the grandmother's needs have been met (perhaps ease of use of site or content rating of games) you can add in extra functionality for the more computer savvy youngster, one of your secondary personas (Levin, 2004).

Organizational goals can also be identified. The need for the development of the system should be reflected in these goals. This helps to give the development team an idea of the organization's intention for the project.

The idea of an abstract user representation goes back to early marketing techniques to assist with market segmentation (Pruitt & Grudin, 2003, Cooper, 2003). Cooper (2003) coined the term "personas" and introduced them in the early 90's in an ID capacity with his focus staying on design issues and content. Since then they have been used in other aspects of software development such as web development (Levin, 2004), user documentation (Calde, 2004), requirements gathering (Baird, 2002) and even bug bashes (Pruitt & Grudin, 2003) albeit, with support from, or to support other techniques. There have been a number of reports of personas being used in agile projects with Microsoft (Pruitt & Grudin, 2003, Ambler, 2006, Miller, 2005) incorporating them into their new agile methodology, Microsoft Solution Framework (MSF) for Agile Software Development (Pruitt & Grudin, 2003). Another author speaks of using personas within agile projects that use multidisciplinary teamwork to help focus the teams (Ghosh, 2004). Other approaches that they have been combined with include use cases (Stephens, 2004, Randolph, 2004) and work models (Schmidt, 2001) from

Holtzblatt's Contextual Design process. There have also been a few papers that discussed using the whole Interaction Design (or User Centred Design) process in conjunction with XP. Another author (Baird, 2002) discusses using personas to discover requirements, recommending a workshop to develop the personas and associated attributes. Props and pictures are sometimes used to depict the different attributes of the persona including goals, features, scenarios and behaviours.

In Interaction Design the personas are used in a Big Design Up Front (BDUF) approach to software development. Interaction Design believes that behavioral issues should be addressed and the interaction design should be complete before any code is written (Nelson, 2002). It is proposed that extensive ethnographic research in the form of interviews should be carried out to gain an insight into the potential users (Levin, 2004). Contextual inquiry (observing users in their work environment) and other user research methods can also be used along with other information gathered from within the organisation (Quesenbery, 2003) to help develop the personas. The personas are then used to establish requirements by walking through scenarios, while taking the context and goals into consideration (Fore, 2007). Development does not start until a fully detailed plan outlining the requirements established through this initial investigation is created.

ID also believes that customers can not articulate fully what they desire from a system and developers should not design user interfaces. The general assumption is that good design will come from designers and not users (Pruitt & Grudin, 2003). Thus, to use personas in an agile development context some modification is required.

The intention of this paper is to examine how to combine, in a manner consistent with the agile philosophy, personas with XP to help address some of the problems associated with XP. This requires identifying the minimum amount of beneficial investigation before development begins and then allowing requirements and plans to evolve.

4. THE XP-PERSONA PROCESS

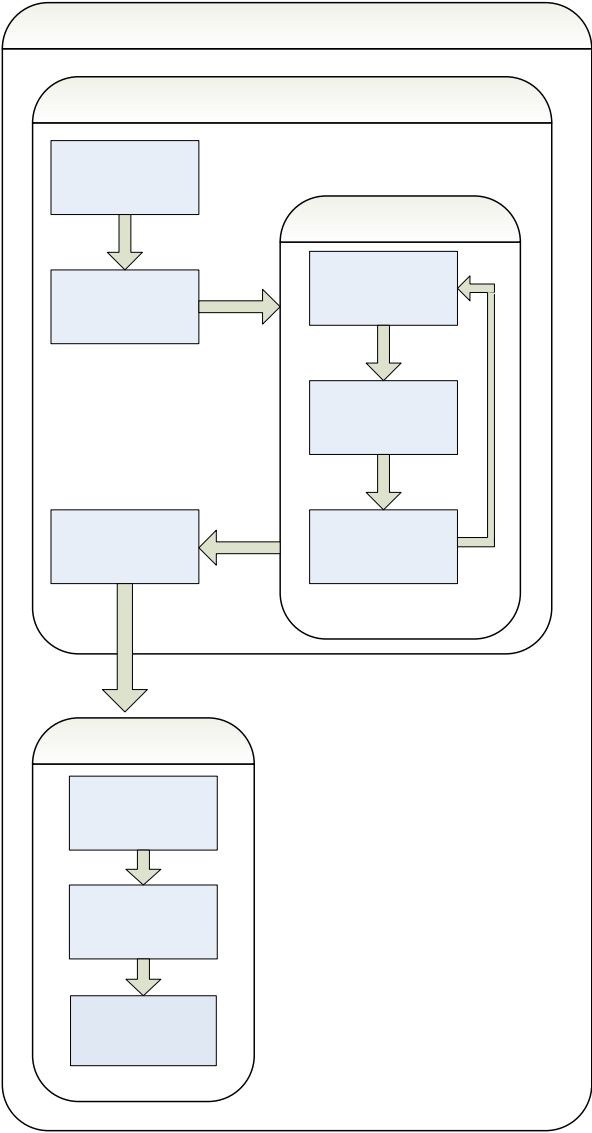
The XP-Persona process includes a number of steps conducted before development begins. Steps one to six are based on Interaction Design that are added to steps seven to nine that are based on typical development of stories in XP. These steps are carried out during an interactive workshop that should include all interested parties. Typically, developers, customer representatives and management participate. Figure 2 illustrates the activities of the process. These are further explained:

1. *Brainstorm organisation goals.* This gives the developers an idea of what the organisation wants to achieve through the project. A list of organisational goals are developed and recorded on a large flipchart sheet.
2. *Brainstorm possible personas.* Initially the number of personas could be quite large but after discussion it should be possible to combine a number of the personas. All possible interactions with the system should be captured between all of the different personas needs and depending on the size of the project, 2 to 12 personas could be created. Also, each persona should have a name as the development team should refer to the personas using this name when making decisions. This helps the development team see the functionality from a user's perspective as opposed to the system's perspective. It is recommended that unless some user research is available

when confirming suggested personas, the customer should have the final say in any decisions made. When the personas have been agreed the next steps involve giving each persona a personality, goals and scenarios.

3. *Brainstorm persona goals.* Depending on the amount of functionality required, a number of goals should be created for each persona. The goals should represent what the persona wants to achieve through using the system. For example an office manager's goal maybe to have the office running smoothly. There are many different tasks within in a computer system she can use to achieve this but the overall goal stays the same no matter what tasks are carried out to achieve it (Cooper 2004) Then the group divides into smaller groups, dependent on the size of the group and number of personas. If possible, the groups should take personas familiar to them. Within these groups the participants carry out steps 4 and 5.
4. *Brainstorming persona personalization.* The personas are given a personality and technical ability in relation to the system. If possible some user research should be incorporated into this step. A short paragraph or some bullet points outlining personal details and nuances should be created. Technical ability in relation to the system should also be included.
5. *Brainstorm persona scenarios.* Care should be taken to create interactions and not tasks. All possible scenarios for a persona using the system are outlined. When the persona personalisation and scenarios are complete the group reconvenes to agree all the decisions made and to complete steps 6, 7, 8 and 9.
6. *Select primary persona.* A primary persona is selected and is given highest priority which feeds through to the story prioritization. Typically one primary persona is selected but more may be used, however because of their needs normally a separate user interface is required for each primary persona.
7. *Create stories.* Using the persona goals and scenarios, create the user stories. These stories are recorded on post-it notes or index cards and are displayed on wall in clear view of the development team.
8. *Prioritise stories.* When the stories are created it is then possible to prioritise them using the primary persona as a guide and to arrange them on the wall so that the prioritisation is clear.
9. *Estimate stories.* The stories are estimated, and agreed by the customer and developers, with the estimates recorded on the appropriate post-it note (or index card).

The focus here has been on the elicitation of requirements. Through the process a greater and more useful set of expert information on the profile of potential users is gathered thus reducing the need for contact with the customer during development. Later, when the *conversation* associated with each story takes place it is hoped that this can be achieved without the need for a constant on-site customer. The next section presents an overview of the case study used to examine XP-Persona process the along with observations and feedback collected.



The XP-Persona

Persona

- 1. Brainstorm Organisational Goals
- 2. Brainstorm Possible Personas

Figure 2. The XP-Persona Process.

5. CASE STUDY

The case study centered on a project to create a website that would serve academic researchers and industry professionals interested in spreadsheet development. It was conceived as both a

- 6. Select Primary Persona

repository for information and a communication tool to support sharing of expert knowledge and experience.

The development team consisted of four developers and a project manager who also acted as the customer. The first author was present in a XP/Persona coach capacity throughout the project. The customer and developers were part of a research team that had a common interest in spreadsheet technologies and had identified a need for the internet system. While the manager had some clear ideas about the functionality he wished to be part of the system, he was particularly keen that the system satisfy the needs of a variety of potential users, most of which were not personally known to the team. Furthermore, as customer he did not have the time to spend with the development team discussing all of these ideas and making decisions that would become apparent during development

5.1 The Workshop

Development of the personas took place over two sessions. During the first session the first five steps of the process were carried out.

1. *Brainstorming organisational goals.* The customer had the most input during this stage, however there was discussion within the group and five organisational goals were decided. The goals were documented on a large flip-chart sheet. The goals identified are reproduced in Table 1.

Table 1. Organizational Goals

-
- Promote spreadsheet research in research group.
 - Promote spreadsheet engineering research in the whole area.
 - Encourage industry contacts between industry and researchers.
 - Initially only start displaying information on areas of interest already explored and perhaps a few other aspects.
 - Provide more resources in spreadsheet engineering.
-

2. *Brainstorm possible personas.* All of the participants became more involved at this stage. Five personas were initially picked, although after some discussion it was felt that four would be better as most of the functionality for the fifth persona would be covered by the others. Each of the four personas was recorded with a flip-chart page showing their name and job. The four personas agreed are recorded in Table 2.

Table 2. Chosen Personas

-
- Tom the accountant.
 - Greg, an experienced researcher involved in the area but not the research group.
 - Jill, a post-graduate researcher involved in the research group.
 - Margaret, an internal researcher (within the college) but not involved in the research area or the group.
-

3. *Brainstorm persona goals.* Each persona was discussed separately to establish their goals. Between two and six goals were decided for each persona and the goals were recorded on the flip-chart of the corresponding persona. Table 3 shows the *goals* for one persona (Greg).

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Table 3. Goals for the Persona Greg

Persona	Goals
Greg (External spreadsheet researcher)	<ul style="list-style-type: none"> • Be aware of latest work. • Give feedback on information. • Get research group's work. • Access some general spreadsheet info. • Access info on other researchers.

The group was then divided into two subgroups, one of three and the other of two (with the author supporting the smaller group). Steps 4 and 5 were carried out in these smaller groups.

4. *Brainstorm persona personalisation.* The participants discussed this in the groups and short paragraphs on fresh sheets of paper were used to record the persona personality. Examples are reproduced in Tables 4 and 5. Pictures were also chosen to represent each persona to help improve empathy. These were attached to the flip-chart pages.

Table 4. Personalization for the persona Greg

Senior lecturer from Cambridge. 2 children and a dog. Likes walks along rivers, playing golf, mountain biking and fencing. Enjoys traveling and going to conferences for this purpose.

Table 5. Personalization for the persona Tom

Accountant within a large firm with four staff reporting to him. Lives a 9 to 5 life. Likes things to be structured, organized and in a routine. Enjoys golf, hill walking, cricket and puzzles. Divorced with no children.

5. *Brainstorming the persona scenarios.* The scenario information was then added to the personal information, with between two and six scenarios for each persona. In the third column of Table 6 the scenarios are added for the *Greg* persona. The group then reconvened to discuss all of the information decided and to ensure that everyone agreed.

Table 6. Details recorded for the persona Greg

Persona	Goals	Scenarios
Greg (External spreadsheet researcher)	Be aware of latest work Give feedback on info Get research group's work Access some general spreadsheet info Access info on other researchers	Wants to find paper on site Wants to give feedback on research paper Wants to check profile of researcher

In the second session the remaining four steps and all activities were carried out as a group.

6. *Select primary persona.* This was done following the guidelines from Interaction Design that "to be primary, a persona is someone who *must* be satisfied but who cannot be satisfied with an interface designed for any other persona" (Cooper, 2004). There was a short discussion on primary personas with each candidate persona considered in turn. Two primary personas were decided, Tom and Jill, and were then noted by everyone in the group. Tom was chosen as he represented one of the key target groups and he needed to be able to find important information quickly. Also, it was felt that due to his work environment it would be very hard to gain his attention. Jill was chosen as she would need her own logon facility.
7. *Create stories.* Between four and six stories were created for each persona with some similar stories combined. A few extra development stories were also added and the stories were documented on index cards. Three flip-chart sheets were used to organize the stories during development. These were titled *Today*, *To Do* and *Done* and each sheet was used accordingly. At the start of development all stories were on the *To Do* sheet. At the beginning of each development day it was decided, based on the priorities, which stories would be carried out that day and they were placed on the *Today* sheet. As the stories were completed they were moved to the *Done* sheet. Also, all the stories on the *To Do* sheet were organized according to their priority (see next step) so if there were no stories left on the *Today* sheet the development team could easily pick the next stories to complete on the *To Do* sheet during development. These flip-charts were displayed clearly in the development area. At any stage the customer could gauge how far development was progressing and assess the priorities by looking at these sheets. Developers could also easily see the status of the project and what needed to be carried out next.
8. *Prioritise stories.* First, the stories were grouped according to persona (and marked accordingly) and then within the personas each story was prioritized and marked following discussion by the group. The stories were then displayed in rows representing each persona with the primary personas on the top rows, indicating that they have a higher priority than the stories associated with other personas. For each row (persona) the stories were ordered from left to right according to their priority. In practice some stories had to be implemented before stories with higher priority due to implementation constraints. Through this process it was relatively easy to establish the order in which stories should be developed.
9. *Estimate stories.* Finally, each story was estimated and the estimates noted on the corresponding cards.

Following this second session, which extended over a three-hour period, development took place over two days. The following sections describe observations and feedback that took place during and after development.

5.2 Observations

The developers worked in pairs for most of the development. Other XP practices that were adopted included: Sit Together, Whole Team, Informative Workspace, Energized Work, Stories, Weekly Cycle, Slack, Continuous Integration, Incremental Design, Real Customer

Involvement, Shared Code, Single Code Base and Daily Deployment. During development the personas were used to make some decisions and to keep the project in-line with the expectations of the potential users. The customer, while not present throughout the whole development duration, was easily accessible to the development team through phone or email and would call into the office at least once a day, although not at a specified time.

The initial meetings appeared to go very well. They were well balanced with the whole group participating. Different aspects of the system were discussed. The persona attributes were discussed from a functional perspective with no implementation aspects mentioned to keep the discussion user-centred. While the stories were being outlined some discussion took place on the likely issues and the possible solutions. All of the personas were referred to during this activity not only because the stories were based on their goals and scenarios but also because the group were thinking about how the system would fulfill the personas' needs. Different implementation approaches were considered and discussed as it was necessary to decide on appropriate estimates for the size of the stories.

During development the team did refer to the personas, albeit with a little encouragement. When discussing design issues they took the personas into consideration and tried to make decisions based on them, although there were one or two issues they felt more comfortable confirming with the customer before implementing. It did appear as if some of the developers were not completely comfortable with the idea of using the personas to make all decisions.

Some issues did arise from the process during the initial meetings and development. The first issue was that the initial meetings went on for too long. For a short project too much time was spent on developing the personas and stories/tasks. Secondly, during the initial meetings a few of the members had some difficulty developing certain aspects of the personas and sometimes the group would stray from the point during this aspect. Thirdly, it would be untrue to say that during development the team developed a genuine empathy with the personas.

5.3 Feedback

Interviews were conducted with the developers and the customer representative after development finished, to establish what they thought of the process. Overall the developers were quite happy with the process and the customer was satisfied with the website produced.

The customer saw some benefits in the process. He felt that the personas gave the developers "something to hang their arguments on" and that having the whole group together for the initial meetings "was of huge benefit". He also felt that the approach used gave him "a better understanding of what [he] wanted" and that it was "time well spent".

The developers felt that the process gave them a good idea of what needed to be done and that the initial discussions were of great benefit. They also felt that the discussions at the start did uncover aspects that would not have been uncovered otherwise and so assisted in elicitation. On the issue of the personas not being embraced by the developers, one developer felt that the project was too short to embrace the personas properly.

There were some aspects that the developers were not particularly happy with but these elements were felt not to be central to the overall process. One developer did have an issue with the prioritisation approach used, which was also shared with the customer. They did not agree with a primary persona chosen (which would receive top priority) and felt that as a result the development was inappropriately skewed.

Other issues that the customer had were with the restrictive nature of selecting one user to represent a potentially large user group and similarly picking one picture to represent the group. The customer felt that ideally just a name or even just a job title should suffice as it doesn't restrict the development team's view of users of the system and potential functionality. This however takes away from the benefit of personas in being able to feel empathy with them through their personalisation.

6. CONCLUSION

This paper has argued that agile methods in general, and XP in particular, can be enhanced in certain situations by spending time and effort at the beginning of the project to investigate the characteristics of different user groups. A process has been developed that combines personas, as an early analysis technique, with XP. This has been used in a case study that involved internet development. The findings show that the approach helped the team to get a better overview of the problem and assisted in eliciting requirements particularly with the creation of user stories in XP. It also supported the customer role in that developers were confident in making some decisions by interacting with the personas instead of requiring constant customer involvement. The use of personas in this situation required that they were used in an agile manner. The minimum amount of information that was useful was recorded by hand and made publicly visible in the development area. The development team were involved in the development of the personas whereas typical persona development which is conducted by a design team. Some problems, including workshop duration and lack of persona empathy, were reported. These will be used to refine the Persona-XP approach. The results from this limited study have been encouraging and more experiments using a refined process are planned.

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