

One Size Doesn't Fit All: Diversifying “The User” Using Personas and Emotional Scenarios

Antonio A. Lopez-Lorca
Swinburne University
alopezlorca@swin.edu.au

Antonette Mendoza
University of Melbourne
mendozaa@unimelb.edu.au

Tim Miller
University of Melbourne
tmiller@unimelb.edu.au

Alen Keirnan
Swinburne University
akeirnan@swin.edu.au

Sonja Pedell
Swinburne University
spedell@swin.edu.au

Leon Sterling
Swinburne University
lsterling@swin.edu.au

ABSTRACT

It is common practice in software engineering to develop a product for the “*user*”. The concepts of users and actors typically oversimplify the variety of people that could use a system in a given scenario. By developing the system for actors, many software engineers effectively develop the system for themselves, embodying the abstract actors with their own personalities — i.e. *how would I use the system if I was this actor?* A single perspective may be sufficient for situations with a well-defined workflow, however, many systems in the social and domestic domains should consider people’s *emotional* responses to systems, which impact whether a product is adopted or ignored. To ensure that emotional desires are met and that a product appeals to the intended audience, we advocate the use of *personas* within *emotional scenarios*. Personas and scenarios can be used to explore the diversity of people’s background, emotions and motivations, and how they would react emotionally to design decisions. We describe our experience using personas and emotional scenarios in three projects related to people’s health, where emotions are ever present, in the domains of aged wellbeing, psychosis treatment and depression prognosis.

Categories and Subject Descriptors

D.2.1 [Software Engineering]: Requirements / Specifications—*Elicitation methods*; H.1.2 [Information Systems]: User/Machine Systems—*Human factors, software psychology*

Keywords

Personas, emotional scenarios, requirements elicitation, product design, aged wellbeing, mental health

1. INTRODUCTION

Software engineering has traditionally focused on identifying the functional needs of stakeholders and implementing

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them as part of the final product. Some emphasis has also been placed on the quality needs of the product. Quality requirements can often be mapped to well established taxonomies [9]. However, it is becoming increasingly apparent that other factors, such as people’s emotions, have a deep impact upon the adoption of systems by their intended users. We consider an emotion to be a feeling that characterises a state of mind, such feeling joy, terror, or safety [12]. Emotional factors are elusive to identify and to be integrated with the design of the system.

A product designers’ work, such as in digital media design, focuses on creating designs¹ that resonate with users’ emotions. Designers use tools that help to identify people’s emotional requirements – e.g. a brand that permeates the ideas of innovation and friendliness – and reflect them in designs. Two valuable tools are *personas* and *scenarios* [17].

Software engineers are trained to build systems with desired functionality and to incorporate some non-functional aspects. However, systems are often designed poorly, detracting from the whole user experience. Cooper [4] refers to this as “the inmates running the asylum”: software engineers talk to an intended user base to elicit user requirements, and then design the product to fulfil the functionality as they themselves would like to see it, resulting in software that fails its users, with the view that simply fixing up the user interface will alleviate the problem. There has been some work on the use of personas and scenarios in software engineering [1, 8, 7] to help improve the link between design and software engineering. Our work builds on these approaches, focusing on the application of personas to *emotional scenarios* as a means to capturing emotional needs and translating them into requirements and designs.

This paper presents our experience using personas and emotional scenarios in three projects related to the development of software for health and wellbeing. In our simple approach, we take personas that provide a rich background to individual people, and combine them with scenarios outlining possible uses of the system to explore how particular personas could react in given situations. This helps us to explore and evaluate possible design decisions, especially with regards to emotions.

The first project concerns the analysis and re-design of emergency alarm systems for older adults as a mobile app to prevent social isolation. The second seeks to develop a mobile

¹In this paper, we use the term “design” to mean “product design”, not “software design”.

application for early diagnosis of depression in primary care. The third project looks at the design of a web application for self-managed treatment of psychosis. The potential users of all our projects have specific characteristics that make them different from a “standard” user; therefore, it is not straightforward to identify with them and understand their needs. This is particularly important in such applications where the decision to adopt or reject an application is so emotionally-laden.

This paper is structured as follows: Section 2 discusses relevant related work; in Section 3, we present our approach to apply personas and emotional scenarios to systems design and software development; Section 4 presents our experience in our three projects; Section 5 discusses lessons learnt; and Section 6 concludes the paper.

2. RELATED WORK

In this section, we present some background on emotions, personas, and scenarios in the fields of design and software engineering, and review work most closely related to ours.

2.1 Emotions in software engineering

Failing to take into account people’s emotional needs in system development can have negative consequences. Thew and Sutcliffe [21] argue that stakeholder’s values and motivations can have an impact on requirements engineering activities. As an extreme example, the client might feel disgusted if the proposed design clashes with their values and their culture. Ramos et al. [18] discuss cases where functionalities or complete systems had to be abandoned because they were not aligned with the feelings of their intended users – in some cases causing fear or anxiety. These authors focus on traditional business systems, but in socio-technical systems the problem is exacerbated. For instance, health systems that are developed similarly to business systems tend to be poorly accepted by health professionals [22]. Proynova et al. [16] argue that in health care information systems stakeholders’ personal values should be taken into account as they may uncover hidden requirements. Sutcliffe and Sawyer [19] explore how motivations, values and emotions can hinder the achievement of the system goals. In recent work, Miller et al. [12] use agent-oriented modelling to explicitly integrate people’s *emotional goals* into requirements engineering, treating emotional goals as first-class citizens in the requirements engineering process.

2.2 Scenarios

Scenarios are a well-established tool for requirements engineering [20, 3]. They are typically textual descriptions of situations of use, described from the perspective of an end user. Carroll [2] states scenarios keep the future use of the technology in view, making the technology easier to design: “The defining property of a scenario is that it projects a concrete description of activity that the user engages in when performing a specific task, a description sufficiently detailed so that design implications can be inferred and reasoned about”.

The structure of a scenario follows the basic structure of a story and typically contains similar elements such as actors (or agents), events, goals etc. Stories enable readers to empathise with the people in the situation, which leads to questions about motivations, intentions, reactions and satisfaction. It is for this reason that we believe that scenarios

are powerful when designing and evaluating systems with requirements that users must engage emotionally.

Scenarios as currently used in software engineering lack emotional aspects [3]. According to Carroll [3], emotions are not a “nice to have” component of a scenario, but “a condition of comprehension”. In this sense, the interpretation of scenarios should include emotions so as to increase the reader’s understanding of the user and his/her use activities. This may be particularly important when focusing on less work-oriented and on non-instrumental aspects of design. However, the emotions felt by a specific user will differ widely based on their context, such as cultural background, gender, age, belief systems, and living situations. As such, emotions should not be tied to scenarios, but to individuals acting in those scenarios.

2.3 Personas

As described by Cooper [4] personas are hypothetical archetypes, or “stand-ins” for actual users that drive decision-making for designing systems. They are based on the data of a “real person” for whom the system is designed. Personas represent important demographics, have a personal background and relationships as well as tasks and goals. Designing for an archetype whose goals and behavioural patterns are well understood is a means of satisfying the broader group of people represented by that archetype.

Personas are usually used in combination with scenarios, because of the close connection between personas and the broader scenarios in which they are embedded. Pruitt and Grudin [17] state that scenarios themselves are only effective when used with personas, and they “provide a conduit for conveying a broad range of qualitative and quantitative data”. As a consequence, it is important to create a rich, but realistic view of these individuals; otherwise designers might base scenarios on people similar to themselves.

Nielson [13] argues that users (or characters) in scenarios are often not rounded enough and that the users described in scenarios are mere functionalities that illustrate the workings of the product being described. Therefore, Nielson suggests drawing from character-driven film scripts to generate more vivid and compelling user characters. We agree with the need for richer, novel-like characters, for reasons of understanding users’ needs and emotions: the more is presented of the user, the less is drawn from designers’ own experience, which might be misleading or too misleading. Instead, an understanding of the user is created by engaging with the persona introduced, giving users life.

There has been some useful work on scenarios and personas within software engineering [1, 8, 7], demonstrating that these can improve the design of interactions between people and software. As far as the authors are aware, none of these has considered how to use personas and scenarios to evaluate emotional aspects of software.

3. OUR APPROACH

In this section, we outline our simple approach to using personas and emotional scenarios. The aim of our approach is to establish that the design of a piece of software aligns with the needs of its stakeholders, with particular focus on emotional needs. Personas and emotional scenarios are used to explore and evaluate how emotional needs are catered for in the case of the people using the system.

3.1 Personas

Categorising the types of users in a system into actors is useful for modelling, however, assuming that all people playing the role of an actor will be similar is invalid in many situations. Actors vary greatly in their motivation and goals to use the system. This is particularly true for socio-technical systems, as people are free to adopt the system if it suits their particular interests and inclinations, and where the emotional aspects of a product are as important for user perception as the functionality [14].

Personas should represent stereotypical users – i.e. actors – of the system. Many personas can be associated with the same actor to represent a range of personalities. For instance, a person suffering from psychosis could be embodied by three personas representing someone that just got diagnosed, someone midway through their treatment and one who is mostly over the illness and needs to manage the relapse risk. While it is not possible to exhaustively describe all possibilities, by defining several personas, each one quite different from the rest, readers get a sense of the different types of personalities. Personas should be tailored for the purpose of the system in development, and to the specific contexts in which it will be used. Including a rich background story helps to highlight relevant aspects of a personality; for example, their daily routines, values, hopes, fears and goals. A persona for a system for older adults might also include their attitude towards technology, mobility issues and communication habits; for example:

“Laura is a widow and lives alone with her dog... Laura enjoys her volunteer work at the op shop... Laura is determined to never live in a nursing home and dreads *getting old...*”

Personas must be based on realistic data of the people that will use the system. In our projects, we use data based in our own experience, gathered from interviews with users or other ethnographic studies. Normally, we create a persona by composing a textual description of background and other personality traits. We have found that we must also use visual representations of personas to convey emotional aspects, because textual descriptions cannot do this, as previously identified by Pruitt and Grudin [17]: “The characters were not communicated well. Often the main communication method was a resume-like document blown up to poster size and posted around the hallways.” In Section 4 we illustrate various types of visualisations of personas.

3.2 Emotional scenarios

The aim of personas is to give developers a better idea about the type of people that they can expect will use the system. However, they become truly valuable when paired with *emotional scenarios*.

Emotional scenarios provide a script template that allows developers to explore the way different personas react in the same situation. We are particularly interested in discovering how the emotional states of the personas determine their behaviour in the scenario. To create the scenario, we first choose the general setting based on real data; a short, simple example is: “an older person is alone at home and falls”. Then we place every persona in that situation and we explore how the scenario could develop. This requires the software engineer to *get into the mind of the persona*, understand their background, values, motivations and goals, to play the

character in a way that is logical and consistent with the persona and their emotions. Possible reactions of various personas to the situation described above might be to activate the personal alarm to call for help, not activate it because they are not wearing it, or not activate it because they do not want to bother anyone. Key findings are documented and complete scripts are produced to inform product design and in communicating with stakeholders.

We have explored various ways of visual representations of personas and scenarios, including role played scenarios – where researchers play the roles of the personas involved in the scenario – and graphical representations; some outlined in Section 4.

3.3 Using personas and emotional scenarios in software design

In terms of requirements engineering, our approach facilitates discussion between stakeholders. The visual language of scenarios is easily understood by non-technical stakeholders, and more importantly, helps them to engage with the emotions of the persona. They promote discussion and help to discover new requirements when personas do not behave in the way that they expected.

In terms of system design and evaluation, personas are useful for designers and developers as an internal testing tool. One can “test out” design decisions by playing the role of a variety of personas, exploring how they could react to new functionality and assessing if that reaction is consistent with the desired emotional response.

Finally, for a release of a system, the personas and scenarios can be used to pack up the experience, being used for marketing and training purposes, by showing how fictitious, but realistic, characters use the system.

4. OUR EXPERIENCE

In this section, we share our experience using personas and emotional scenarios in three projects in the domains of older people’s wellbeing, early detection of depression, and for treatment of psychosis. In this section we show only a few illustrative examples of personas and emotional scenarios. Larger prints of all personas and scenarios are available online².

4.1 Emergency alarm system

This section presents our experience using scenarios and personas in the design and evaluation of emergency alarm systems for older people, and how it led to an improved user experience over existing emergency alarm systems.

4.1.1 Overview of the domain

The aim of emergency alarm systems is to enable older people to live independently in their own home for longer. An emergency alarm has two features: (1) an *emergency alarm*, typically a pendant worn around the older person’s neck or wrist, which has a button that allows them to raise an alarm in an emergency (e.g. a fall); and (2) a *wellbeing check*, typically a button on a base station that allows the older person to “check in” each day with a service provider. If the person has not checked in by a specific time, the service provider initiates checks on them.

²<http://people.eng.unimelb.edu.au/tmiller/pubs/personas-annex.pdf>

Many in-home health-monitoring products ignore the personal and individual needs of older people [10]. In addition these systems often can be seen as stigmatising to elderly users, with the design and functionality of these products implying frailty of the older user [5].

4.1.2 Using personas and emotional scenarios

Designing a new wellbeing check. Our first task was to understand the domain and problems with existing alarms. As part of this, we defined a set of 12 personas, covering three actors: older persons, friends/relatives, and service providers. Personas were developed by viewing data on varying statewide demographics from the Australian Bureau of Statistics. The personas reflected a diversity of people within Victoria, Australia. The personas sought to ensure that a design process and outcome matched the sensitivities of multiple demographics with a plurality of cultural needs, enhancing emotional attachments to the emergency alarm system. Each persona contained a name, age, living circumstances, interests, an image of the persona, and a quote. Figure 1 shows one example persona from this project of an older person named Euginia, whose persona captures some of the problems the older people experience with current emergency alarms.



Figure 1: A persona for an older person in the emergency alarm system

A collection of scenarios was also defined for the project. These illustrate some issues people experience when using existing emergency alarms, and how these alarms can provide help to those who need it. Figure 2 shows Maria, a lady born in Greece, whose husband has passed away. Maria wears black to mourn her late husband, but the white and red colour of her alarm pendant contrast against her black clothing. This makes Maria feel as though she is not following tradition, making her reluctant to wear a pendant.

These personas were used to set the scene for project stakeholders, including the project team and our funding partner, based on our initial understanding of the problem. After modelling our initial understanding, we interviewed 12 participants about their impression of emergency alarms, including current users, family members of someone who has used one, and older people who have never used one. From this, we refined the personas and derived concrete emotional scenarios based on real field data to illustrate the problems

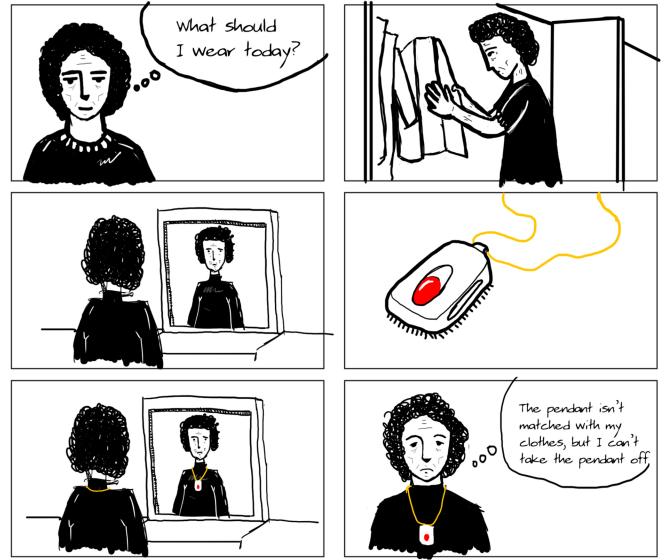


Figure 2: A short scenario outlining the issue of Maria's pendant clashing with her mourning clothes

with current emergency alarm systems.

Over the course of the project, as new data was brought into project meetings, individual team members started creating scenarios and personas “on the fly” based on real data they had read during the week from e.g. interview data, thus adding to the richness of the approach. These informal personas and scenarios were also useful to drive design, and particularly rich instances were recorded and documented to future use.

The personas and emotional scenarios provided us with contextual input to our design, and importantly, a structured way to informally validate that our new design addressed many of the emotional aspects important to the personas defined. We trialled our new design – a picture frame mobile app to support the communication between older people and loved ones – in the home of nine older people over a period of two weeks, and our results showed an improved user experience for those older people who already had an emergency alarm. Further details of this study can be found in Miller et al. [12].

4.2 Early diagnosis of depression

4.2.1 Overview of the domain

Early identification and treatment of depression is highly correlated with successful outcomes [6]. The aim of this project is to develop a tablet-based questionnaire to determine whether an individual is at risk of developing depression in the following six months. The questionnaire is provided to patients in waiting rooms of general practitioners (GP), with the aim of discussing their risks with their GP during their appointment. The questionnaire and diagnosis are based on a longitudinal study carried out over seven years by some of our research partners [6]. In this project, our stakeholders comprised of a research team that included researchers, psychologists and general practitioners, as well as seven patients suffering from depression.

4.2.2 Using personas and emotional scenarios

Our experience in this domain has been helpful to help us, the software engineers and designers, understand the emotional requirements and other nuances of the application problem. Reaching this understanding has been invaluable to strengthen our arguments to guide other stakeholders in uncovering important hidden requirements.

Understanding the problem. To understand the domain and stakeholder requirements, we conducted a brain storming session with some stakeholders (GPs, psychologists, and researchers on the project), and also interviewed seven people suffering from depression, to gather their views, feelings, needs and values of the system. From this data, as well as data provided by our research partners, we created several emotional scenarios and personas; for example, patients and research assistants. Figure 3 illustrates one of these personas – a “no nonsense”, hard-working individual that dislikes doctors and is set in their ways. These artefacts allowed us to empathise with a potential patient and visualise the different types of patients, their feelings and reactions while using such an application as they waited to see the GP. They provided us with contextual input to our design, and importantly, aided in playing the role of a “devil’s advocate”, allowing us — as software engineers — to quickly point out conflicts in stakeholders’ goals and limitations in our understanding of the problem.

Challenging misconceptions. It was evident that our research partners were highly embedded in their ideas and research questions, and were therefore not aligning themselves with how a patient might react. To assist in this alignment, we used the personas and scenarios to enact – as role-played scenarios – patients in different situations. This enactment helped the stakeholders visualise and empathise with the persona. This helped our research partners to systematically structure their ideas, including the variety of people they would have to accommodate. For example, one emotional goal of patients was for *privacy*, not just of stored data, but of personal details. During the design, our research partners requested that a handful of question about sexual abuse were added to the questionnaire. By placing them in the mindset of a privacy-concerned persona who had been sexually abused, highlighting the issues this could cause, and ultimately resulting in these questions being dropped, despite the fact that including them may lead to more accurate diagnosis.

The feedback from our research partners has been highly positive; for example:

“Yes the scenario was beneficial because it provided a context for the stakeholders to consider the application and impact of the consent process from the participant perspective. It provided some insight into the possibility of patient disappointment and frustration and also gave further insight into the timing of the recruitment process. In this respect it enabled the patient’s voice to be present at an earlier stage than prior to piloting and getting this kind of feedback then.” — Psychologist.

“Using a case scenario approach does make it easier to visualise potential enactments of a situation. . . At our last meeting, your detailed step by step enactment of potential scenarios helped us to focus on specific details within these potential scenarios. In particular, it high-

GIO'S STORY

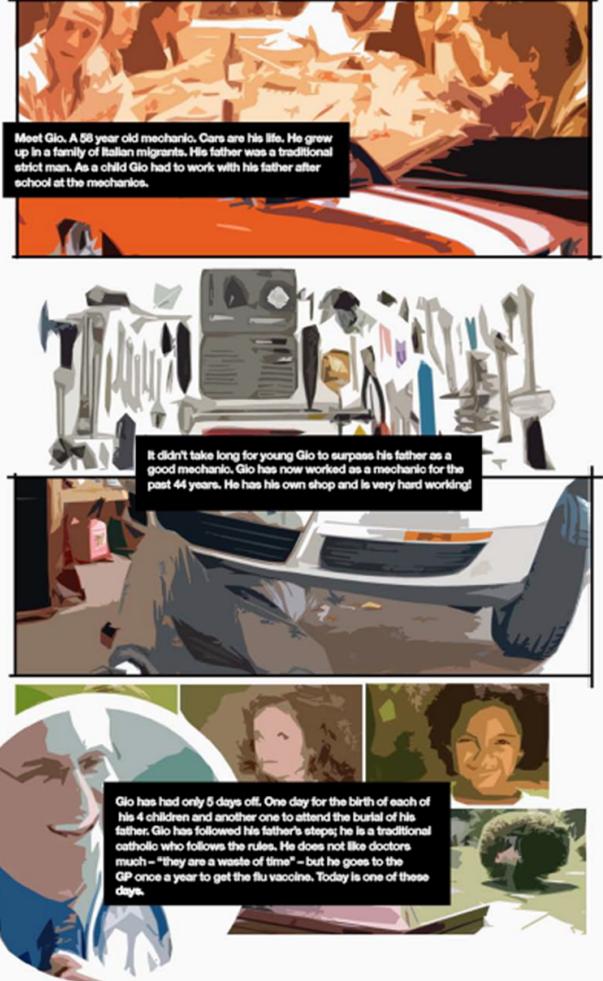


Figure 3: A persona for a patient of a GP in the depression study

lighted the possibility that individuals might be annoyed by not being eligible for participation.” — Researcher.

The methodology of using scenarios and personas helped the stakeholders provide us with better requirements for a user-friendly and emotional driven design of the application – a design that would capture all types of patient-users based on individual emotional needs.

In conjunction with our research partners, this application will be rolled-out for a year-long trial over 2015 as part of a larger research project. Over this period, participant feedback will be used to evaluate whether our approach led to a design that satisfied the emotional goals identified.

4.3 Online support for psychosis treatment

4.3.1 Overview of the domain

The aim of this project is to develop a web application to support the recovery of people who suffer from psychosis – referred to as *consumers*. Traditional intervention delivery

approaches for psychosis assign a passive role to consumers. The project seeks to develop a web resource that consumers can use together with the mental health workers, their carers or by themselves to work towards their recovery. The emotional requirements of the application are its main motivation and include making the consumer feel empowered, connected, hopeful and normal, amongst others.

4.3.2 Using personas and emotional scenarios

In this domain we are using the personas and emotional scenarios to inform the design of the web application and to advertise the solution capabilities. Development of this application is currently underway, so the primary results we have from this project are from the personas and emotional scenarios used internally in our research team.

Informing the design. In this project, we initially created the personas to support the development team. During the requirements workshop between the psychology experts and the developers, we discussed the emotional needs of the expected audience of the application – consumers, carers and mental health workers. These emotional needs had been identified and validated through consultations with focus groups. In addition to this, we derived personas and emotional scenarios to the user experience designer in the development team (development was done external to our research team), as they saw the value in these for validating their design. We wrote the backgrounds and detailed description of three consumer personas at different stages of their recovery path. Figure 4 shows one of these: a teenager who struggled with undiagnosed schizophrenia, attempted suicide and finally survived to face the diagnosis, stigma and social isolation.

The psychology team saw the value in the use of personas. However, they were doubtful of using personas that had not been *directly* generated by the consumers to influence the software design. In a number of sessions with their focus groups, they produced new personas for consumers, carers and mental health workers. We are currently in the process of producing visualisations of these.

As an advertising tool. To encourage the adoption of a new system, it may not be sufficient to have a useful tool, but rather to make people want to adopt it. The personas will be used for advertising purposes. This is a sensitive domain and using real people to publicise the application is controversial. Personas are fictitious, albeit realistic, users that introduce the application to the potential users. They will star in user stories and promotional clips.

5. DISCUSSION

In this section we discuss some lessons learnt about the use of personas and emotional scenarios in our projects.

Empathetic reading. Emotions build a bridge between the reader and the user. There is a difference between such empathy and a mere verbal description of users' emotions. It is easier empathise with a person with a rich background story, with goals and motivations, who is affected by realistic emotions. A visual representation of a persona magnifies even more its impact. For instance, we ask the reader to consider which of the following descriptions causes a deeper impact on the reader: (1) a patient with psychosis; (2) a teenager who suffers from schizophrenia and has difficulties concentrating; or (3) the persona depicted in Figure 4.

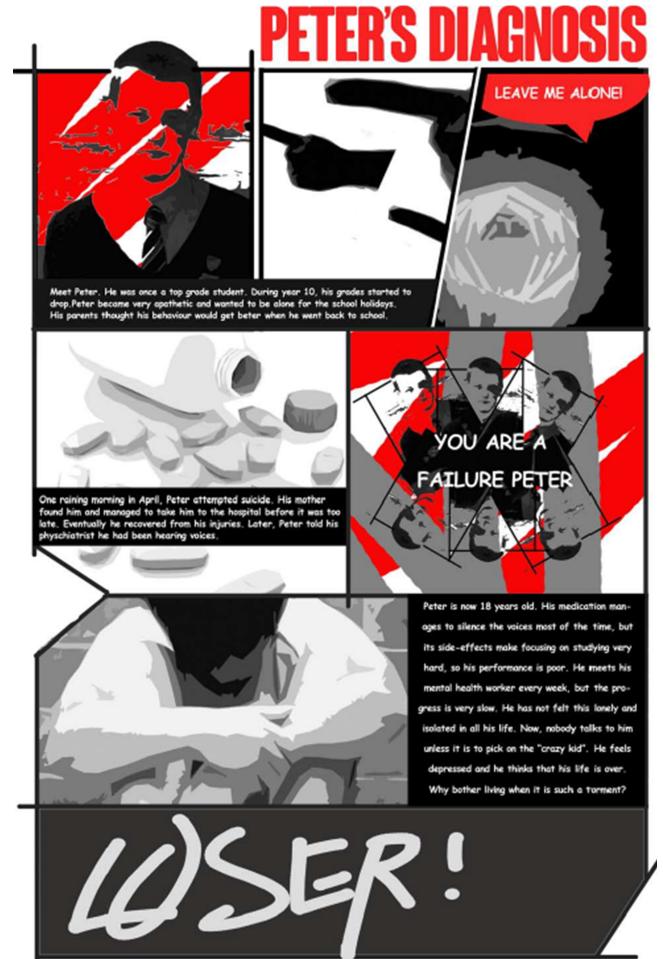


Figure 4: A persona for a consumer of the psychosis web application

Our observations are aligned with former research from one of the authors [15], which compared textual scenarios with visual scenarios, and observed that emotional aspects can form a powerful connector between the visualised scenario and the reader. Emotional aspects help to provide and understand context, which cannot be achieved by simply verbalising the emotions of the user.

As Kress and Leuwen's [11] note, design ideas spin off when an emotional state is changed for the better (e.g. due to better communication about a mental condition) or when situations of happiness are made more likely (e.g. talking to a family member). In this regard the emotional quality bouncing between the visual scenarios and the designers' own emotions seems to play a key role in the process of finding design ideas.

Improved communication. Personas and emotional scenarios are valuable as communication tools within a team and externally. In our experience, they seem more valuable internally as our team was familiar with them. In internal discussions, we could just refer to a particular persona and discuss their reaction, anticipate behaviour and build on the rich shared knowledge around the persona, without the need to explicitly talk through all of it again. That said,

personas and emotional scenarios also have value to mediate discussions between teams. As illustrated in Section 4.2, they were effective at communicating ideas outside our team; in our case to point at weaknesses in the requirements.

More traceable designs. Personas and emotional scenarios can be useful as a traceability tool by linking design decisions to a particular persona-scenario combination. More precisely, to tie design decisions back to the life context and the emotions of certain personas and arguing their case instead of personal opinions. In this regard they become a design rationale that can be recorded.

As user documentation. Due to the traceability between requirements and design, they are excellent additions to the user documentation. They are visually attractive and they are easy to read and understand. This is particularly important in agile development, which often disregards heavyweight documentation. Personas and emotional scenarios can also be used to ‘sell’ the product and be incorporated in the marketing of the system, as we are exploring our psychosis case study.

Realistic personas and scenarios. As our experience has progressed, we have used more realistic visual representations of personas. In our earlier use, the personas were cartoon-like, rather than looking like real people. While these supported us well, we believe that more realistic looking personas help the reader to empathise with the persona in particular scenarios, especially those involving negative emotional reactions. In cases where we were able to disassociate from the persona, the effect of applying the personas to a scenario were minimised from an emotional viewpoint. Therefore, we need a “reality check” with representative users that the personas and scenarios they are embedded in are believable. The overhead introduced by the development and validation of the personas and emotional scenarios might be seen as a weakness. However, in our experience the validation saves time in later stages and avoids rework; the weakness is in having unrealistic personas.

Realistic scenarios are also more effective, however, we have used simple versions of these. For example, a software engineer from our team created the emotional scenario shown in Figure 5, using crude stick figures instead of realistic graphical representations. Nevertheless, it describes a situation that is logically consistent with the described persona (see Section 4.2). Compare this style with the equivalent one for the depression case study (Figure 3).

Scalability. A limitation of our approach is the combinatorial explosion when combining the personas and scenarios; that is, with m scenarios and n personas, we should, in theory, consider $m \times n$ combinations. However, this becomes impractical when working with even a small number of scenarios and personas. Instead, we had to selectively direct our attention to specific combinations that best illustrated good or bad design decisions, and best evaluated certain design decisions and trade offs.

In our studies, the two time-consuming tasks for creating personas were: (1) eliciting emotional needs; and (2) creating the artwork. Identifying the emotional needs requires interactions with stakeholders, possibly in the form of requirements workshops or interviews and subsequent content analysis. However, this step was an important step in the requirements engineering whether we use personas or not. In



Figure 5: A scenario drawn by a software engineer using pen and paper

applications where such analysis is not considered valuable for requirements engineering, we believe it would not be required for creating useful personas either. The creation of the digital artwork for the personas and emotional scenarios was far less time consuming, but still requires time to make them convincing.

Emotion-informed developments. We envisage the future of emotion-informed software engineering as a multidisciplinary approach involving software engineers, product designers, and end users. A typical emotion-informed project will involve requirements engineers applying ethnographic techniques to elicit the users’ functional and emotional needs. Software engineers will require basic soft skills to elicit emotional needs from the interactions with users. Requirements engineers will analyse the gathered data to produce early requirements, and we envisage that this will continue along side the current push away from heavyweight text-based requirements in favour of agile *model-based* methodologies. Personas and emotional scenarios will form part of this set of models. Product designers, in the form of digital media designers or user experience engineers, will collaborate with requirements engineers to produce designs that consider the elicited emotions. Tools like personas and emotional scenarios will help teams understand and evaluate their designs, and make design trade offs. Tools like focus groups can be used to help select designs. From here, the designers will work closely with software developers throughout the development to evaluate, with the participation of end users, that the emotional needs are being addressed adequately. The role of a trained product designer will be key in the software development process to improve user acceptance of software.

6. CONCLUSION AND FUTURE WORK

Design of socio-technical and domestic systems that fulfill the stakeholders' emotional needs is likely to result in improved uptake. We propose that software engineers harness tools from designers to impact in various stages of the development process. In this paper, we advocate the use of personas and emotional scenarios to inform and evaluate how well software systems fulfil emotional needs. We discuss our experience using these tools in three projects in the domains of aged wellbeing and mental health.

As future work, we are organising workshops for the psychosis project to use the personas and emotional scenarios to evaluate the design of that application, and to publicise the platform and attract users.

In the longer term, we plan to improve repeatability of these tools within software engineering by investigating more systematic methods for using personas and emotional scenarios throughout the development lifetime of systems to evaluate how well emotional needs are fulfilled.

Our experience demonstrates that some emotions, such as feeling empowered or in control, occur across case studies. We are planning new work to study to what extent emotions are characteristic of certain domains or population groups. As an associated research topic, we will study how belonging to certain cultural groups determines emotional needs.

We conclude the paper by repeating the testimony of a psychologist in the context of the depression study, which we believe summarises our goals perfectly:

“... [scenarios] enabled the patient’s voice to be present at an earlier stage than prior to piloting and getting this kind of feedback then”

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