Getting the full picture: Storyboarding our way to Stand Alone Moodle

Joanne Doyle
Australian Digital Futures Institute
University of Southern Queensland
Helen Farley
Australian Digital Futures Institute
University of Southern Queensland
Neil Martin
Australian Digital Futures Institute
University of Southern Queensland

The process of storyboarding has long been used in the cinematic industry for scoping out, through sketches and illustrations, the sequence of narrative activities for film production. More recently, storyboarding has been used for user experience design, multimedia prototyping and mobile app development. This paper describes how researchers in a project team used storyboarding as part of a User-Centred Software Engineering (UCSE) approach to determine stakeholders' needs when designing an internet-independent version of Moodle. Storyboarding proved to be an effective way to capture a wide range of functionality requirements and align project outcome perspectives for the 'ideal product'. Most importantly, the storyboarding process enabled early detection of knowledge gaps and skillsets so that strategies could be devised to bridge the gaps. This paper will outline the storyboarding process, the gaps unearthed and the strategies employed to overcome identified skills and knowledge shortages.

Keywords: storyboarding, technology, learning, digital, project management

Background

In December 2012, the University of Southern Queensland (USQ) was awarded $217,000 by the Australian Government's Office for Learning and Teaching (OLT) to develop a stand-alone version of Moodle for use by students with no access to the internet. Funding would be used to develop automation processes and modify existing Moodle software for Stand Alone Moodle (SAM). The aim of the project is to develop SAM so that it can be deployed effectively over a number of sites and for a number of courses, providing students without internet access with an equivalent learning experience to those able to study online. Varying perceptions of how SAM would function from the diverse range of stakeholders created early challenges for the project team. In order for the project to deliver high quality outcomes, there needed to be an early and accurate identification of stakeholder interests, critical success indicators and business requirements. Articulating business requirements and defining technical functionality was complicated by a university project environment with a solutions-focused culture. Furthermore, as an externally funded project, there were substantial time and budget constraints creating additional pressure on the need to devise a strategy for prioritising features of this new version of Moodle.

Overview of storyboarding

The concept of storyboarding has its origins in the film industry where the process has been used effectively over many years to depict the sequence of narrative activities in a film or television episode. Renowned film-

maker Alfred Hitchcock used storyboarding extensively for his films including the infamous 1963 movie *The Birds*. The storyboard was invented to support filmmakers when communicating with each other and their crew members about moving compositions (Goldman, Curless et al. 2006). The Advanced Computing Center for the Arts and Design at the Ohio State University describes storyboarding as "telling a story of an animation panel by panel, kind of like a comic book". Storyboarding is useful as it allows for a more complete picture of people's interactions, either with each other or with a software product or object, over time. Each frame represents a particular event (Greenberg, Carpendale et al. 2012).

More recently, the process of storyboarding has been used in software design processes and agile user stories where sketches are accompanied by narration to provide context (Crothers 2011). Narrative storyboards are very similar to the cinematographic storyboards used in planning movies, but applied to interaction design (Vertelney 1989). White (2013) lists three primary benefits of storyboarding:

1. Using storyboards allows the designer to quickly and easily add real-world contexts that involve place, people, and other potentially informative ambient artifacts. The storyboarding process can reveal unexpected things, and embedding that context into a design effort helps to keep the designing process grounded in the reality of the users' lives;
2. Since software almost inevitably involves a user interface (UI), storyboards allow designers to situate UIs in the real-world contexts in which they'll frequently be encountered; and
3. Storyboarding helps enforce a discipline of thinking in terms of experiential flow. The use of storyboards is one way to help keep a designer's mind on the flow of activities within a greater context, and reduce issues that may occur if the UI is designed as an isolated artifact.

In addition, Rutter (2011) promotes storyboarding as an effective tool in mobile app development. Mapping the flow of screens is an effective way to make sure members of the development team have the same basic vision of the app and its goals. Changes identified during the storyboarding stage are much easier to make – by 'grabbing an eraser' – before the design and development process has progressed too far (Rutter 2011).

Storyboarding and how we did it

Early attempts to define business requirements for the Stand Alone Moodle (SAM) project generated a multitude of extensive and complicated diagrams. Each member of the project team differed in his or her understanding of how the end-product would function. Group brainstorming was considered as one option but was dismissed due to its focus on generating ideas for consideration, rather than rationalizing existing perspectives (Wilson 2006). The project team decided to investigate alternative ways of capturing information about participants, actions, locations, work flows and interactions. One of the team members recalled that storyboarding had been highlighted during a conference he had attended in the United Kingdom as an effective tool in mobile app development. The project team was enthusiastic to trial the technique given the funded project's focus on digital technology.

The first step was locating a storyboard template that could capture the sketches and narrative. A quick search of the internet revealed a multitude of templates ranging from blank templates to populated film storyboards to computer-generated screenshots. The project team selected a simple six-image-per-page blank template with space for annotations to provide context. The next task was to identify someone who could prepare the sketches for the storyboards.

> Storyboards are typically rendered by hand using pencil or charcoal. These are often rendered quickly without significant detail, texture, or shading. Often the dominant subject is rendered in the most detail, with static background objects rendered more loosely (Goldman, 2006).

Fortunately, one member of the project team was reasonably skilled in sketching and was nominated to prepare the storyboard sketches. A series of meetings of key stakeholders was scheduled for the next two weeks to facilitate the narrative storyboarding process. Storyboards were created to detail the process from the moment a course leader finalized a course in Moodle, to the student using the new version of SAM software, to the course leader closing a course at the end of a semester.

Prior to the first meeting, the nominated project team illustrator developed caricatures of the three most significant people who would interact with the SAM software. This would enable easy identification of key personnel and facilitate the sketching process. During the storyboarding meetings, project team members and key stakeholders verbalized the process flows for SAM – finalizing course content, uploading course content,

enrolling students, deploying SAM, and so on. Many questions were asked and assumptions were challenged. The illustrator captured each person interacting with SAM in a series of sketches showing equipment, location and context. In some areas, the team were unsure as to the best way a process could be approached so alternative storyboards were prepared to make alternative processes explicit, and in that way determine the preferred approach.

Figure 1: Storyboard for Stand Alone Moodle

Stanford University's Academic Computing Services (n.d.) warned that early in the storyboarding process there are likely to be gaps in the story that need to be further expanded. Persevering with the process would ensure that the project – whether it be a feature film or a PowerPoint presentation – would stay on track. This proved to be the case with the SAM project team: the most valuable outcome of the storyboarding process was identifying inconsistences in perceptions about how the software would function, and identifying misalignment of expectations. It also highlighted the assumptions the project team were making about university administration of student grades, identification of students and a number of other administrative matters. Once these assumptions were identified, the project team could seek the correct answers and fathom the university processes already in place with which the deployment of Stand Alone Moodle would have to align. A failure to identify and accommodate these assumptions would have significantly impacted on the deployment and administration of Stand Alone Moodle.

For the SAM project team, storyboarding proved to be an effective and enlightening process for identifying business requirements for software development. Storyboarding streamlined the complex process of isolating activities and dependencies. In the words of Little (2013), 'stories are an effective and inexpensive way to capture, relate and explore experiences in the design process.'

Alternative approaches to storyboarding

Storyboarding has been used extensively by a range of companies across a number of industries over recent years. Storyboarding's cross disciplinary application (Catchmedia, 2011), visual appeal and its potential for exploring issues and synthesizing perceptions, will ensure the process continues to be adopted and utilized for technological applications. Though the SAM project team started with a pen and paper, it can be facilitated with software such as Xcode (To 2013). Software that has been specifically developed for the purpose can take rudimentary sketches to higher fidelity designs without losing the real-world contexts that storyboards provide (White, 2013). A range of software products has been specifically developed for the purpose of digital storyboarding (O'Rourke 2009). These products facilitate 'paperless storyboarding' by providing libraries of characters, objects and backgrounds that can be placed in frames and panels. Common functions (copy, move, zoom, export, print, and so on) enable storyboard frames and panels to be prepared and shared efficiently in terms of time and cost. The project team would probably use one of these software packages in the future to ensure consistency between representations of characters, environments and so on. It is also anticipated there would be a significant saving in terms of time.

Conclusion

The storyboarding process used by researchers at the Australian Digital Futures Institute facilitated identification of the activities, sequences and interactions of Stand Alone Moodle within the OLT-funded project, 'From Access to Success: Improving the Higher Education Learning Experience for Students without Internet Access'. The visually appealing nature of storyboarding stimulated discussion amongst the project team and facilitated alignment of functionality perspectives. Storyboarding was used because of its ability to transcend disciplinary boundaries because of its highly visual nature, and to ensure that team members shared a common understanding of processes and challenges. Using sketches to map out the people, processes and technology enabled the project team to develop accurate and timely business requirements to support product development.

Storyboarding offers a number of potential benefits in the project planning stages, particularly when business and technical requirements are not being well-articulated. Firstly, it can be introduced in the early stages of a project and act as document to refer back to during the software development processes. Secondly, the process is low cost, requiring teams to give over a couple of hours of their time and make use of pen and paper. Additionally, the creative energies of the team can be captured and exploited during this process, resulting in enthusiastic discussion and group flow experience (Csikszentmihalyi 2008) with ideas being expressed and problems quickly identified including gaps in knowledge.

In terms of evaluating the effectiveness of storyboarding as part of a project planning process, further work needs to be done. Informally the team felt that it was a useful experience and agreed that they would use it again. However, it is only small part of the project planning process and should not be seen as a replacement for using established project management techniques but as an additional tool. The Australian Digital Futures Institute plans to apply the storyboarding technique within future projects and undertake a formal evaluation of storyboarding as a tool for scoping digital technology research initiatives.

References

Academic Computing Services (n.d.). "Storyboarding." Retrieved July 9, 2013, from http://acomp.stanford.edu/tutorials/storyboarding.

Advanced Computing Center for the Arts and Design (2011). "Storyboards." Retrieved July 9, 2013, from http://accad.osu.edu/womenandtech/Storyboard%20Resource/.

Crothers, B. (2011). Storyboarding & UX – Part 1: an introduction. *Johnny Holland*. 2013.

Csikszentmihalyi, M. (2008). *Flow: The Psychology of Optimal Experience*. New York, Harper Perennial.

filmmakeriq.com (2010). "Hitchcock's Storyboards from 13 Classic Films." Retrieved July 9, 2013, from http://filmmakeriq.com/2010/11/hitchcocks-storyboards-from-13-classic-films/.

Goldman, D. B., B. Curless, et al. (2006). "Schematic storyboarding for video visualization and editing." *ACM Transactions on Graphics (TOG)* 25(3): 862-871.

Greenberg, S., S. Carpendale, et al. (2012). "The Narrative Storyboard: Telling a story about use and context over time." *Interactions* 19(1): 64-69.

Little, A. (2013). "Storyboarding in the Software Design Process." *UX Magazine* (February 8 2013).

O'Rourke, T. (2009). Storyboard Software Buyer's Guide. *Videomaker*. 2013.

Rutter, A. (2011). Lesson 1 – Storyboarding. *Multimedia Design and Communication: Lessons of Teacher and Lecturer*. A. Rutter. 2013.

To, M. (2013). How To Prototype In Xcode Using Storyboard. *Design Blog*. M. To. 2013.

Vertelney, L. (1989). "Using video to prototype user interfaces." *SIGCHI Bulletin* 21(2): 57-61.

Wilson, C. E. (2006). "Brainstorming pitfalls and best practices." *Interactions* 13(5): 50-63.

Author contact details:
Joanne Doyle joanne.doyle@usq.edu.au
Helen Farley helen.farley@usq.edu.au
Neil Martin neil.martin@usq.edu.au

Please cite as: Doyle, J., Farley, H., & Martin, N. (2013). Getting the full picture: Storyboarding our way to Stand Alone Moodle. In H. Carter, M. Gosper and J. Hedberg (Eds.), *Electric Dreams. Proceedings ascilite 2013 Sydney*. (pp.247-251)

Copyright © 2013 Joanne Doyle, Helen Farley & Neil Martin.

The author(s) assign to ascilite and educational non-profit institutions, a non-exclusive licence to use this document for personal use and in courses of instruction, provided that the article is used in full and this copyright statement is reproduced. The author(s) also grant a non-exclusive licence to ascilite to publish this document and its associated digital poster on the ascilite web site and in other formats for the *Proceedings ascilite Sydney 2013*. Any other use is prohibited without the express permission of the author(s).