

Week 2: Requirements Engineering and User Stories

Reading: Pressman Chapter 3 (Agility and Process); Robertson: [The user story considered harmful \(pdf\)](#)

Workshop Exercise The marketing team have been out to choose a project for a “personal productivity product for small computers that will sell at least one million copies at a retail price of at least \$200”. They have identified a market opportunity: “*MotivActiv* will give you friendly guidance and serious motivation to build healthy habits that help you reach your weight and fitness goals.”

1. Identify three or four stakeholders for the *MotivActiv* system. For each, give a brief justification for why they are important.

SOLUTION: Alex the young fitness enthusiast likes technology and wants to track his training program. Important because this group is probably the biggest market for our product, although they probably already have such a device.

Dorothy the senior hip replacement patient living alone at home and tracking her recovery and safety (note there are different types of end-users, not just one). Important because this is a big population, and likely they do not already have a device.

AMA the Australian medical association who will endorse the accuracy of the device and the safety of its training programs. Important because doctors can only recommend this device if it is safe.

Marty the marketer who understands existing products in this market and can help identify new requirements that are not offered by existing products. Important because this is a crowded market already and we need to make sure we have something better than FitBit etc.

Elly the manufacturing engineer understands the materials and electronics that will be used to build the device and their strengths and limitations. Important because software solutions depend on the hardware capabilities.

Phyllis the physiotherapist who wants to keep an eye on the programs of all her patients and maybe do some research with the

long-term data. Important because Phyllis' company might buy bulk devices for their practice.

2. Outline the boundaries for the *MotivActiv* software: which aspects of the system will be addressed by software, and which are outside your scope.

SOLUTION: Our project only concerns the software part of *MotivActiv*. That could include SW on the device as well as data management software to run on an end device such as a personal phone or web server. Its physical (electronic and material) design is out of scope, but we need to interface with it. Similarly for the medical endorsement, marketing niche.

3. Outline a strategy for eliciting the requirements for *MotivActiv*. Justify your choice of methods. Explain how they complement each other.

SOLUTION: Ethnography observing personal training and physios to see how people train. This would capture what activities people do, and so should be measured, but it doesn't capture the things the "need" but don't have now.

Interviews with stakeholders to clarify requirements. This would capture new needs and use cases.

Analysis of existing systems then interviews. Get some users to test existing systems (eg fitbit) and then interview them to discuss what is missing or what could be improved. This would clarify possible market opportunities and give you a better understanding of how the devices are used.

4. Identify one or two *functional* requirements for *MotivActiv*. Specify these requirements using an appropriate formalism.

SOLUTION: User stories are a good way of capturing requirements for a particular stakeholder.

You could also use a UML use case diagram.

See examples in class.

5. Identify one or two *non-functional* requirements for *MotivActiv*. Specify these requirements using an appropriate formalism.

SOLUTION: Snow cards are a good formalism (but not the only one) for non-functional requirements to capture the what and why.

Privacy

Description MotivActiv shall allow users to protect their training data from unauthorised use

Rationale Users have a right to “nothing about you without you” but they will have different privacy requirements

Fit Criterion Each of 3 levels of privacy are protected according to penetration tests for each level

Accuracy

Description MotivActiv shall accurately record steps (or ... other measures) Rationale Users and doctors need to be able to trust the accuracy of information in order to assess the safety and efficacy of training programs Fit The system shall record the steps to a correct value plus or minus 5% for X different users on Y activities, where ground truth is given by a second (trusted) device such as video evidence.

Note that requirements on the ruggedness of the device (reliably while running or swimming) are hardware constraints that are out of our scope.

Background Questions

1. Read the Manifesto for Agile Software Development available here <https://agilemanifesto.org/> and make a note of the 4 “values” of agile development. Can you think of the situation in which one or more of the four values could get a software team into trouble?

SOLUTION: Possible troubles (I have seen these all in student or research projects) Individuals and interactions: always meeting, never doing, running out of time

Working SW: system ends up being delivered but can never be used or built on because no one understands it

Customer collaboration: misunderstandings that surface late, then

no written agreement about what should have been done
Responding to change: as above, too much change can be counter-productive

2. Describe the concept of agility (for software projects) in your own words.

SOLUTION: Agility is the ability to respond effectively to changing circumstances or improved understanding.

from Pressman: Agility can be applied to any software process. However, to accomplish this, it is essential that the process be designed in a way that allows the project team to adapt tasks and to streamline them, conduct planning in a way that understands the fluidity of an agile development approach, eliminate all but the most essential work products and keep them lean, and emphasize an incremental delivery strategy that gets working software to the customer as rapidly as feasible for the product type and operational environment

3. Why do you think requirements change so much? After all, don't people know what they want?

SOLUTION: People don't necessarily know what they want; Delivering some SW may lead to new reqs; SW is complex with many stakeholders and so many requirements;

from Pressman: Requirements change so much, that it is difficult to predict in advance which software requirements will persist and which will change. It is equally difficult to predict how customer priorities will change as the project proceeds. It is often difficult for people to verbalize their software needs until they see a working prototype and realize that they had forgotten to consider something important.

4. Most agile process models recommend face-to-face communication. Yet today, members of the software team and their customers may be geographically separated from one another. Do you think this implies that

geographical separation something to avoid? Can you think of ways to overcome this problem?

SOLUTION: Communication is the key. If it is not available face to face then you need to find other ways to communicate effectively.

Face to face can be casual and unplanned eg in the tea room; Remote chat is more intrusive; but can be managed

Face to face has much more nuance than electronic text; Video chat and group chat can help

Local communication allows more than just talking with the person, eg also sharing documents, seeing how people behave; Not sure how to replace that - maybe with visits

Starting with face to face and getting to know team well, and then transferring to remote working, could help

Moving people upsets them and may lose staff; so learning to manage separation will be valuable

5. Read Robertson's [The user story considered harmful \(pdf\)](#)

Write a couple of versions of a user story that describes the “favourite places” or “favourites” feature available on most Web browsers. Compare your stories and determine which is the best one. Remember the idea is to express the business problem without assuming and implementation or design.

SOLUTION:

As a user browsing the web

(external customer or other external entity)

I can keep a list of sites I need frequently

(achieve a business goal)

So that I save time when I need to revisit those sites

(value to the external customer / entity / business)

Note, avoid deciding on an implementation or design, but clarify what is the *business value* (saving time).