CSC301

Product management in an Agile environment
# Project vs. Product

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<th><strong>Project Management</strong></th>
<th><strong>Product Management</strong></th>
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<tr>
<td>How to organize your team?</td>
<td>What should the team build?</td>
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<td>Delegating tasks, time estimation, scheduling, tracking performance, etc.</td>
<td>Scoping, prioritizing, collecting and analyzing feedback, etc.</td>
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<td>Requires understanding of your team members, their abilities and working habits.</td>
<td>Requires understanding of your users and their needs.</td>
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<td>Requires organizational skills</td>
<td>Requires domain expertise.</td>
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Lack of project and/or product management leads to jokes like this one →
Agile Product Management

- Agile approach:
  - Iterative, ongoing process
  - Work in short cycles to allow frequent delivery
  - Between iterations/cycles, review your work and adjust the plan (if necessary)
  - Focus on the user!
Agile Product Management

- Each iteration involves roughly the following steps:
  - Planning
    - Articulate goals and success metrics
    - Make some decisions
  - Doing work
    - Ex: build (and test) software, perform market research, etc.
  - Reviewing outcomes
    - Collect feedback and evaluate decisions in retrospect
Example 1

- **Planning:**
  - Goal: Get visitors to our promotion page.
  - Metric: Number of visitors who see the promotion / Total number of visitors to the site
  - Decision: Add a big, red button at top-right corner of the home page.

- **Work:**
  - Add the button
  - Make sure we can track which pages are visited by each visitor
  - Optional: Allow for A/B testing (i.e. some users see the a different button, or don’t see noe at all)

- **Review:**
  - Check the percentage of users who saw the promotion.
  - Are we doing better than we did last week?
  - If we did A/B testing, is there correlation between the button we put on the screen and likelihood that a user will visit the promotion page?
Example 2

Consider a hypothetical automated assignment-submission system at a university (e.g. MarkUs, Blackboard, the tools we use in this course, etc.)

- **Goal:** Minimize the need for human intervention.
- **Metric:** Percentage of assignments that require human intervention.
- **Decision:** When a student submits an assignment, validate the file names and present a friendly message in case of an error.
Example 2, Cont’d

● Work:
  ○ Option 1 - Build the feature
    ■ Instructor can specify which files/folders are required
    ■ If a submission is missing a required file, reject it and show a friendly error message.
  ○ Option 2 - Try to validate the hypothesis*, without building anything
    ■ Collect data from past courses.
    ■ Out of those assignments that required human intervention, how many had an issue with missing required files?

* In this case, the hypothesis is that submissions with invalid file names cause the need for human intervention.
Example 2, Cont’d

- Review:
  - Option 1 - Count how many invalid submissions were detected.
  - Option 2 - Estimate how many submissions such a feature will detect (which will allow you to decide whether it is worth the cost/effort of implementation).

Notice that, in both cases, collecting data might be tricky:
1. “Running experiments” is not so easy.
2. Historical data is usually not tracked.
Pragmatic Product Management

- Use intuition to come up with ideas.
- Use a scientific method to validate intuition:
  - Instrument (i.e set things up), experiment, measure & conclude.
- Use tools to collect and analyze feedback.
  - Various analytics tools
  - Product management tools
  - Custom, in-house tools
- Gradually, it should become easier to ask (the right) quantitative questions.
  - And get statistically significant answers
Product Management

● Once you have a product and active users, it’s easier to articulate goals:
  ○ User actions and feedback drive decisions
  ○ Business goals drives decisions
  ○ Easier for all team members to understand the overall vision

● But, at the beginning, things are much less clear and structured ...
Product Definition

- How do we get from an initial idea to a working product (or even a prototype)? Incrementally!
- Start with high-level concepts, and gradually create more detailed plans
  - Goals
  - Requirements
  - Design
- It is not always clear where one stage ends and the next one begins. We will try to clarify that by reviewing some of the tools/techniques/standards that we use along the way.
Step 1 - Goals

- High-level, concise English description
  - Ignore most technical details
- Focus on:
  - What is the **objective** of your product?
  - Who are your **users**?
  - Why would they use the product? That is, what **value** will your product offer to its users?
- The focus is the problem and users, not the product.
- Plan first, don’t build it just because you can!
- Borrow techniques from the marketing world ...
Objectives

- Articulating objectives can change the priorities and full nature of your product.
- For example, here are different objectives for a “TTC app”:
  - Provide ETA of next vehicle(s) to nearby station(s).
    - Accuracy of vehicle data is a high priority
  - Help tourists and visitors explore the city and its attractions using the TTC.
    - Internationalization is a high priority
    - A good database of attractions & events is a high priority
  - Help commuters plan trips that combine driving and TTC
    - Accurate traffic reports are a high priority
    - Parking (at TTC stations) information might be a high priority as well.
  - Help TTC employees plan schedules/routes.
    - Collecting and visualizing data can be very useful

Notice: We only talk about the problem we want to solve. We don’t say what the product is, and we definitely don’t mention any technical details at this point.
Personas

- A tool/technique used for identifying users/customers.
- Popularized by marketers
- Goals:
  - Identify and understand our users
  - Remember the details of our “user profiles”
  - Efficiently discuss our archetypal users (by using names, instead of full descriptions).
- The idea is simple:
  - Develop a character (name, picture, background story, etc.)
  - The character represents an archetypal user
  - A named character is much easier to remember (and to use in a conversation) than a list of characteristics and attributes.
Personas

● Here a few examples:
  ○ Dan The Commuter (student)
  ○ Suburban (Family man) Joe
  ○ Shirley & Mike (retired culture vultures)

● And more online resources:
  ○ A nice video tutorial on developing personas
  ○ An article about the origin of personas
  ○ And another nice blog post
Step 2 - Requirements

- What is needed in order to achieve our goals?
  - High-level description of the main concepts of our system and the interaction between them.

- Artifacts can be
  - Structured English documents
    - For example: User stories, Use cases
  - Diagrams
    - For example: UML use case diagrams
User Stories

● A tool/technique used for specifying high-level requirements.
  ○ Specified from the user’s perspective.
  ○ Follow a pattern: As <role>, I want <action>, so that <benefit>

● For example:
  ○ As an instructor, I want to specify which files/folders are required for a given assignment, so that students know what they need to submit.
  ○ As a student, I want to see a clear error message if something is wrong with my submission, so that I can fix it and not lose marks.
Use Cases

● Another convention/standard for specifying requirements
● More verbose and detailed compared to user stories
  ○ Identifier, name, description
  ○ Pre & post conditions
  ○ Basic and alternative courses of action
● Serve the same purpose as user stories, but they are not the same
● Here is yet another nice example of a hypothetical use case versus user story
  ○ User stories are about needs, use cases are about the complete behaviour of your program
  ○ User stories are easy to read (for non-technical people as well), use cases are “a recipe” for technical team members (who need to implement the use case)
Use Case Diagrams

- **Use case diagrams** are part of the UML standard.
- Visually connect between use cases and related *actors*:
  - Which user(s) participate in a certain use case?
  - Which external/internal application(s) participate in a certain use case?
- Optionally, organize further using **system boundary boxes and/or packages**.
- Can provide a high-level view of the dependency graph.
Step 3 - Design

- Implementation details
  - Need to “invent” them
  - We’re “getting closer” to code
- Typically written by the dev team
- Artifacts can be:
  - **CRC cards** - Highlight the important classes, their responsibilities and the dependencies among these classes.
  - **Class Diagrams** - Part of the UML standard. More detailed than CRC
  - Mockups & Wireframes - There are many cool tools out there that help you describe/demonstrate/simulate the UX (user experience) of your program
  - Storyboards, English descriptions, interfaces in code, etc.
Step 3 - Design

- Focus is always a challenge.
- Need to distinguish between two types of objects/components
  - Domain objects - Related to the specific problem your program is solving.
  - Other objects/components used as “plumbing” that connect domain objects together.
    - Can be used (and reused) in different applications/domains
    - In many cases, these are implementations of various design patterns (adapters, factories, listeners, etc.)
    - Frameworks are good examples:
      - With JUnit, you write the logic of your tests and JUnit takes care of running them and producing reports.
      - With various JavaScript frameworks, you create the UI and/or server logic, and the framework takes care of packaging everything as a mobile/web application.
Agile Planning, Summary

- Planning artifacts can be very useful:
  - It’s easy to forget why you are building something. Planning artifacts help remember.
  - Once again, traceability is important.
    Utopia ... Could trace every:
    - Requirement to a goal,
    - Design feature to a requirement,
    - Line of code to a design feature,
    - Bug fix to issue.

- But, we still want to be agile and focus on deliverables not documentation.
Agile Planning, Summary

- There is no silver bullet!
  - Different teams, projects and points in time may require different tools and approaches.
- Constantly evaluate which new features offer users the most value.
  - Better to deploy minimalist features sooner than rich feature sets later.
  - Failing fast is better than failing slowly!
- First release is no exception:
  - Minimal Viable Product mantra of startups
Minimal Viable Product (MVP)

● Concept guiding modern startup thinking
● So you have an idea?
  ○ What value proposition does it offer which users?
  ○ What user pain does it alleviate?
  ○ What problem will they “hire” your product to solve?
    If you have a few minutes, watch Clayton Christensen, Understanding the Job (but please don’t start drinking milkshakes for breakfast).
● Isolate minimal set of features
  ○ Maximize return on risk/cost
Why MVP?

- If you are right, and close to minimal set:
  - You get to market as quickly as possible, for the least cost
- If you are wrong, you “fail fast”
  - Collected feedback ⇒ Which features were lacking (or wrong)
  - Could be a chance to *pivot*
- Investors look for intelligently chosen MVP
  - Watch: Steve Blank, [No business plan survives first customer contact](https://www.youtube.com/watch?v=qk9bEFqGmEg)
- Past experience ... Waterfall plans frequently led to multi-year, multi-million dollar, startup trainwrecks.
MVP and Your Team Project

- Officially, you are expected to build a prototype, not a product.
  - In this context, prototype = some parts can be faked
  - Expectations depend on how ambitious your project idea is
- Regardless, the MVP concepts still apply - Produce maximum value with minimum cost/effort.
- The main challenge: Scoping
  - Deciding what to build and what not to build.
  - Focusing on the important features.
  - Being realistic with your plans.
- The first few weeks are all about planning.
  - And producing useful artifacts as part of the process.