

Software Development in Practice

How software engineering teams really work

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Objectives

- Learn the different roles that facilitate software engineering and their responsibilities
- Learn the responsibilities of a product manager
- Learn design thinking and build products in an MVP fashion
- Learn to write stories that empowers software engineers

The Roles

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Recap: Product Manager Responsibilities

- Product ideation - coming up with an idea and a hypothesis for the idea
- Product marketing - evaluating whether there is a market for a given product
- Product strategy - determine the minimal viable product and the value of the product
- Product roadmap - planning the feature development of the product

Recap: The Scrum Master/Project Manager

- Ensure the timely deliverables
- Surfacing it up early and removing impediments that engineers are experiencing
- Determine the risk of delivery and raising that up the chain

Product Manager vs Project Manager

Product manager is focused on a mission or a business opportunity in delivering software solution to a problem

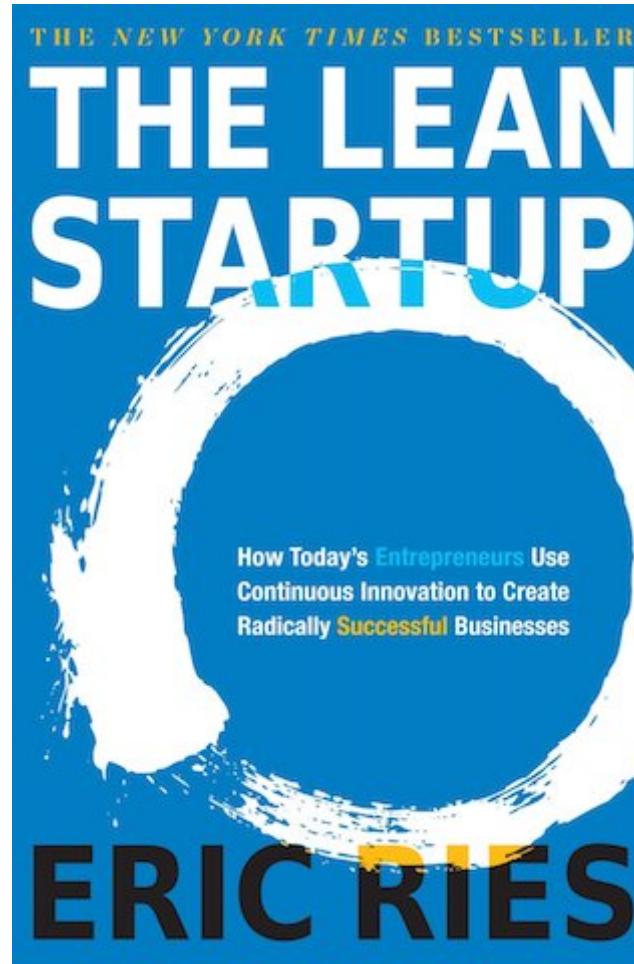
Project manager is focused on delivering the product in a timely manner

In today's teams, product manager and the lead engineer often play the role as the project manager

The Product Cycle

The Lean Startup by Eric Ries

Book that introduced the scientific approach to building startups



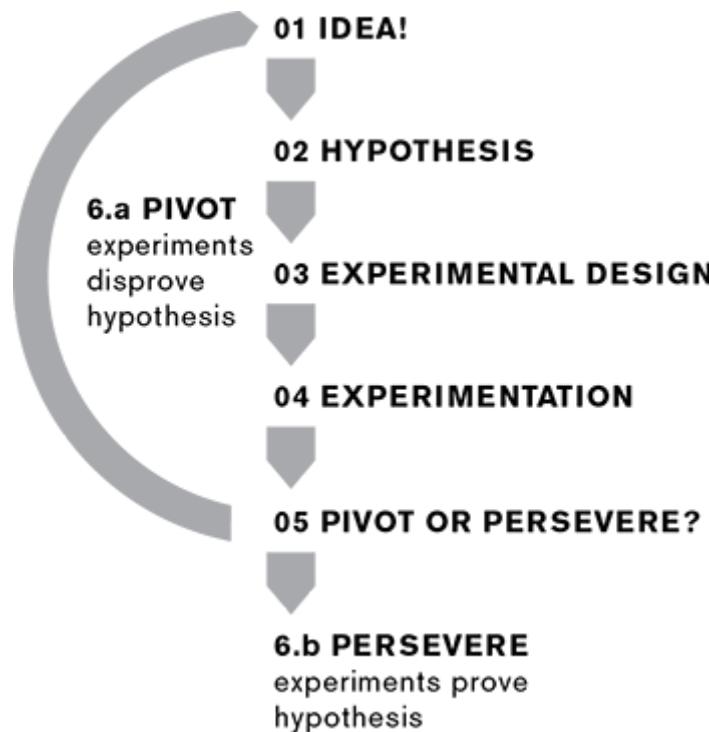
Product Development: 10,000 feet Overview



Source: <http://theleanstartup.com/principles>

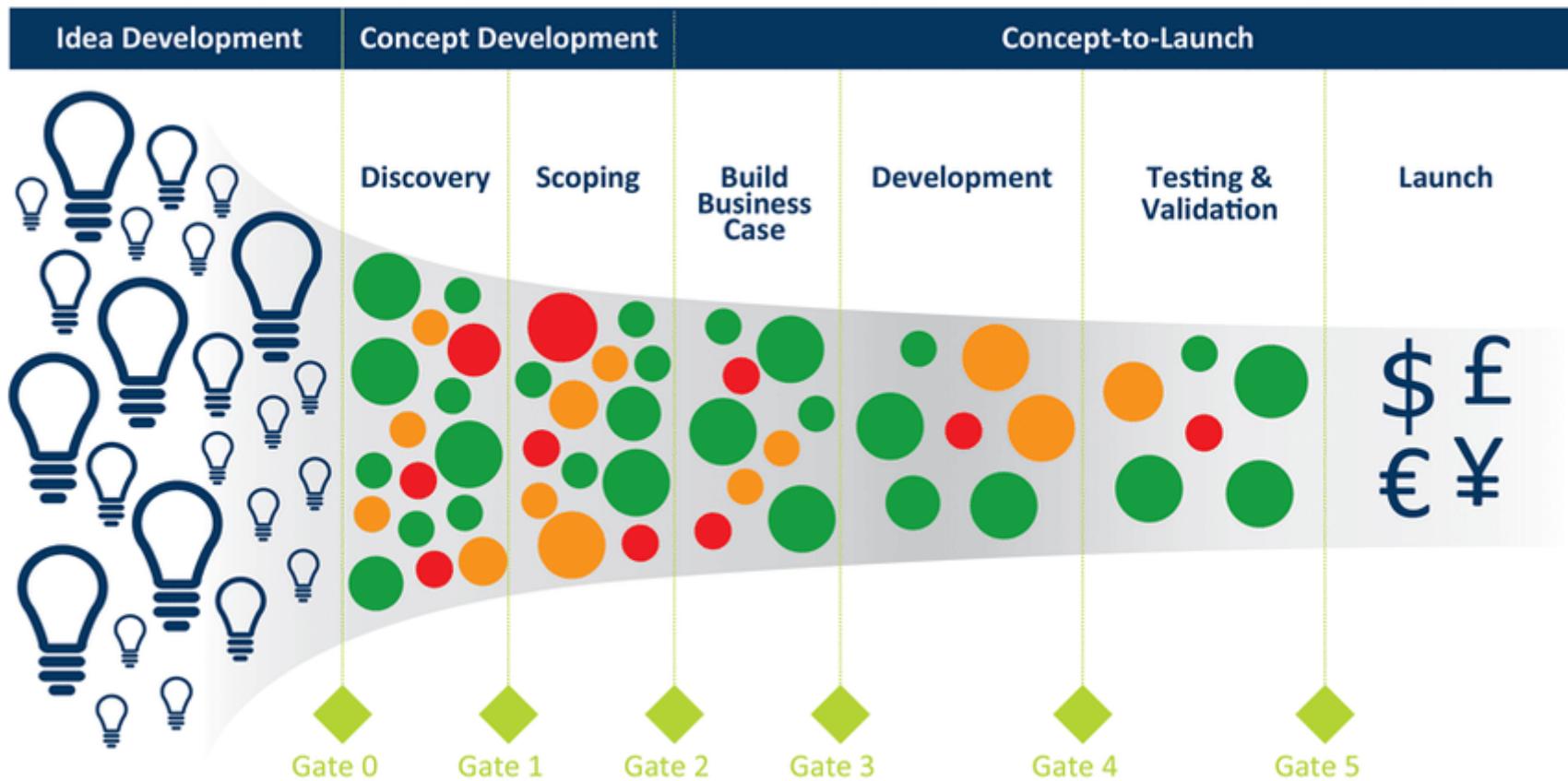
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Using the Scientific Method for Product Development



Source: <https://www.alexandercowan.com/creating-a-lean-startup-style-assumption-set/> 10

New Product Development Funnel

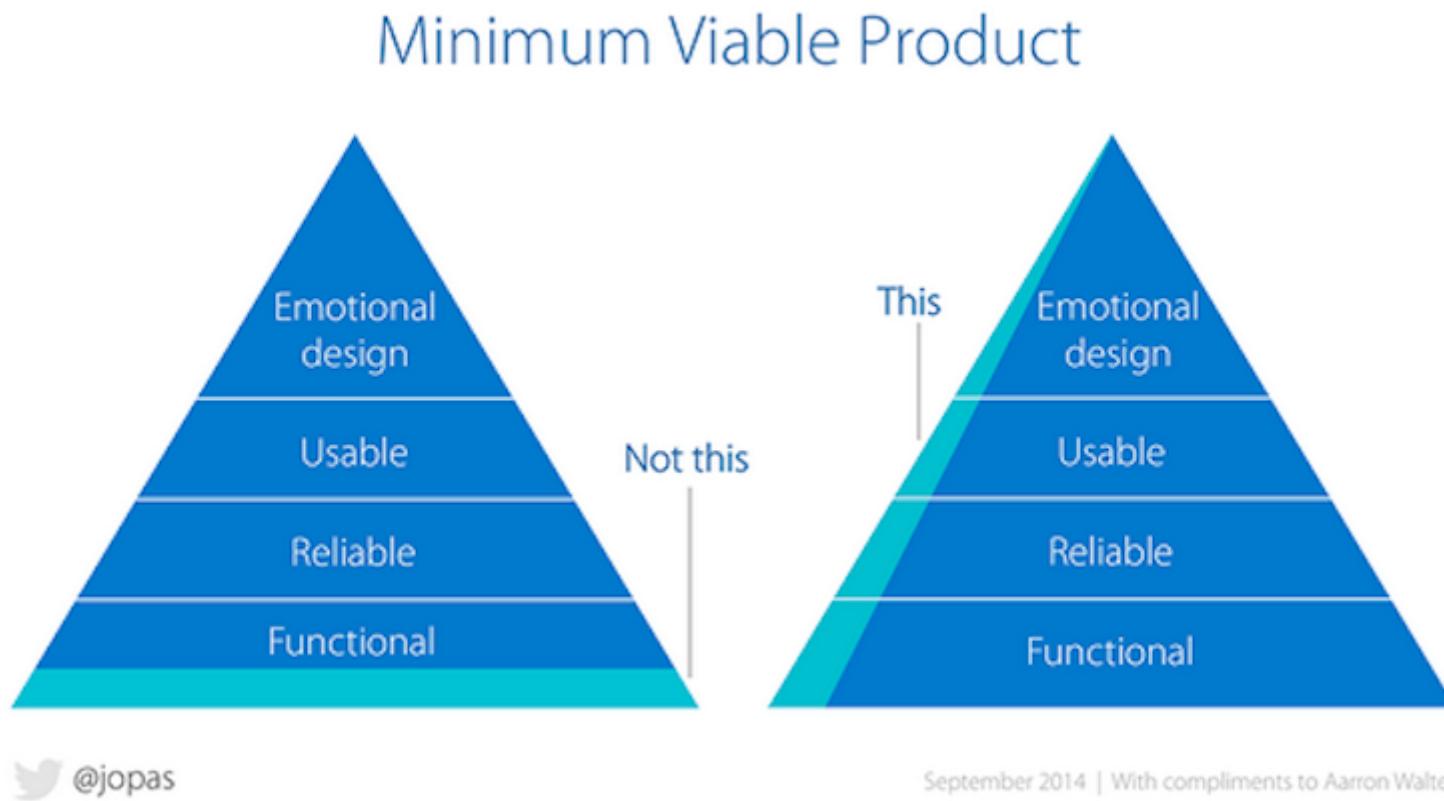


Source: https://www.researchgate.net/figure/Innovation-Funnel-Source-www-sopheoncom-idea-concept-development_fig3_282909259

Shaping and Defining Your Product

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The Minimal Viable Product Pyramid



Source: <https://twitter.com/jopas/status/515301088660959233>

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Developing an MVP is like Sketching



Source: https://mobidev.biz/blog/telling_the_difference_wireframes_prototypes_mockups 14

MVP Tools

- Balsamiq - low fidelity; <https://balsamiq.com/>
- invision - med to high fidelity; <https://www.invisionapp.com/>
- JUSTINMIND - med to high fidelity; <https://www.justinmind.com>
- Adobe XD - med to high fidelity; <https://www.adobe.com/products/xd.html>
- OmniGraffle - med to high fidelity; <https://www.omnigroup.com/omnigraffle/>
- Gliffy - low fidelity; <https://www.gliffy.com/>

User Research & Usability Testing



Source: <https://launchdarkly.com/blog/the-new-way-to-conduct-real-time-user-research/> 16

User Research

User Research has some overlaps with market research, its a way of finding prospective customers but on the product level what your application will solve for them

- Persona - a specific demographic of users being targeted
- Problem hypothesis - hypothesis about the way the application solves a problem is valued
- Value hypothesis - comparison of how your product compares to similar products in the market

How to do Usability Testing?

Think of Usability Testing as a more interactive way to survey your users

- Contextual testing - observing how users will use your product
- User interviews - interview prospective and current customers to see how your product solves their problems
- Analytics - incorporate Google Analytics, Mixpanel or custom software to track user engagement and actions

What are somethings to measure in Usability Testing?

- How are they using your application?
- How long does it take for a user to successfully complete a task?
- How satisfied are the users with the application?
- What are some of the other feature requests do users have?
- What are the users looking at? (Eye tracking)

Hallway Testing

Ask a random person in the hallway and run them through the application and survey them as they use your application

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A/B Testing

Hypothesize an experiment that includes a change in the user interface that will influence a certain behavior and measure the behavior.

1. Have multiple versions of the application and send random users that visit the different versions
2. Track the way they use the application and see if there is a version of the application that yields better results

Example:

The Experiment: Changing the color of a button to red makes it more **findable**.

The Measurement: Tracking click through rates of the button to see if it had increased. 21

Analytics Tools

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Mixpanel



Source: <https://medium.com/@drewmck/how-to-measure-your-products-retention-the-most-misunderstood-and-undervalued-metric-c1515fcc1782>

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Google Analytics



Source: <https://www.techwyse.com/blog/website-analytics/a-beginners-guide-to-google-analytics-users-flow/>

Acceptance Testing

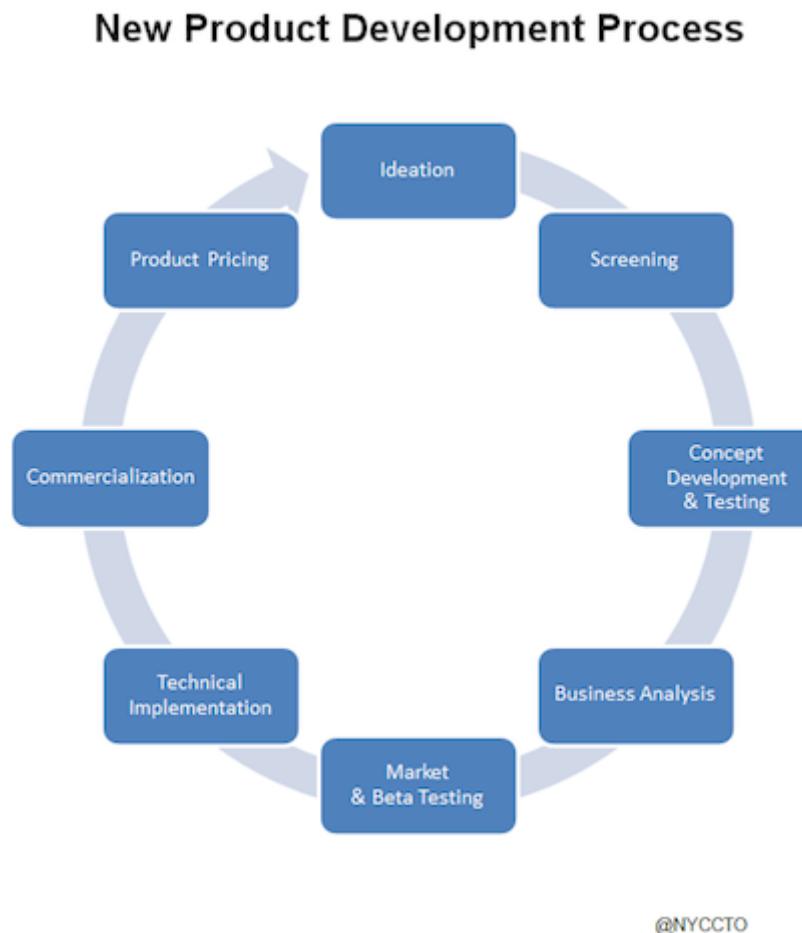
- Typically testing a feature to ensure that it satisfies the acceptance criteria from the product Manager
- Aligns tests to business functionality rather than testing just implementation

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Business-to-Business Products (B2B)

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New Product Development Process



@NYCCTO

Source: <https://nyccto.wordpress.com/2011/06/10/new-product-development-process-building-launching-products-the-right-way/>

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Training & Sales Support

- Demo the application and run through use cases of the application
- Prepare documentation to help new users get on boarded
- Hold training seminars to teach users how to use the application

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Maintenance & Technical Support

- Prepare documentation for support teams
- Organize the service level agreements on the feature set the product delivers
- Create a support organization that customers can reach to get questions answered

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User Experience

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7 Factors of User Experience

1. Useful - the product solves a problem for the user
2. Usable - the product makes it easy for a user to achieve a goal
3. Findable - features and content are findable in the product
4. Credible - the product is credible, highly adopted, and likely be around indefinitely
5. Desirable - the product builds identity and desirable eg. porsche vs skoda
6. Accessible - the product is easy accessible to people with disabilities
7. Valuable - the product delivers business value

User Experience Mapping



Source: <https://www.pinterest.com/pin/114349278014810532/>

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Requirements: What not to do

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A Cake Story

Customer: Hello, I'd like to order a cake.

Employee: Sure, what would you like written on it?

Customer: Could you write "So long, Alicia" in purple?

Employee: Sure.

Customer: And put stars around it?

Employee: No problem. I've written this up, and will hand it to my cake decorator right away.
We'll have it for you in the morning.

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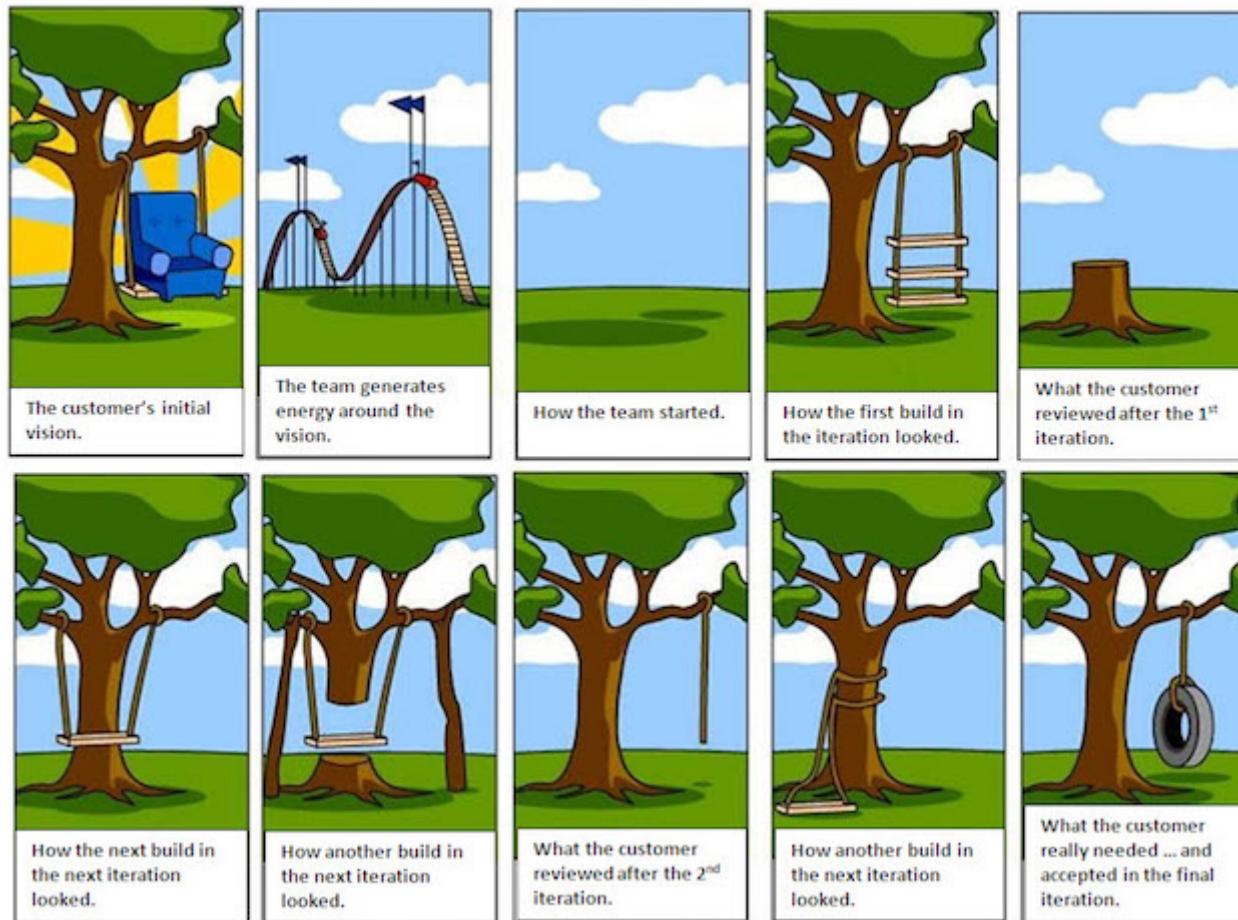
A Cake Story Cont'd



Source: User Story Mapping by Jeff Paton and Peter Economy

Note: For more cake stories, see <http://www.cakewrecks.com/>

Developing a Swing



Source: <http://stevedempsen.blogspot.com/2013/08/agile-software-requirements-comic.html>

Requirements Breakdown

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Ticket Breakdown

In order or *largest to smallest*

- Epics - large groups of user stories that comprise of a larger feature implementation that often spans multiple iterations
- Spikes - a story that can not be estimated until some investigation is done
- Stories - non-technical software requirement in the perspective of a user
- Tasks - break down of a list of things that need to be completed for a story; subtasks
- Bugs - when the software doesn't function as intended

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User Stories in More Detail

User stories are short descriptions of a feature in the perspective of the person that benefits from the feature

They are made to be simple to facilitate discussion. If it were too descriptive, it would prescribe how the implementation may be done.

Since they are often written by product managers, we don't want them to prescribe the technical implementation since they are not the experts.

Format:

As of <user persona>, I want <goal> so that <reason>.

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Sample Requirement for An Ecommerce Application

Epic: As a customer, I want to be able to buy a product

User Stories:

- As a customer, I want to be able to see the product listing so that I can choose from a list of products to purchase
- As a customer, I want to be able to add a product to my cart so that I can check out later
- As a customer, I want to be able to checkout to complete my order

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Acceptance Criteria

Criteria that the implementation must satisfy in order to be *accepted* by the product owner.

In other words, it's the definition of done after a discussion among the team about what the story entails. The definition of done spans the acceptance criteria and additional details that affect the implementation.

Example:

As a customer, I want to be able to see the product listing so that I can choose from a list of products to purchase

Details:

- Only list products that are in stock
- Only list the products that are available to be shipped to the customer's location

Acceptance Criteria:

- The customer can reach a page that lists all the products that the company offers
- The customer can click into one of the products to see more details of the product

Estimation: Story Points

Story points are an abstraction over time. They are often better because a team may have other obligations other than delivering software on time.

Time and dates put engineers at a disadvantage because

- There are tasks like meetings, interviews, emails, etc that a team member may have
- Deadlines and time has an emotional attachment and may push developers to work overtime
- Story points are relative to teams so team comparisons are discouraged
- Story points remove the much needed debate between members getting too specific on time
- Story points focuses on level of effort and value delivered rather than time spent delivering aligning with the business rather than the act of just shipping something

Estimation: How does story points work?

All team members participate in estimating every story

- The team has full transparency on what they're committing to
- Team members can discuss the requirements and what goes into the story to define the level of effort
- Morale decreases if team members are excluded
- The team owns the backlog and the opportunities it presents

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Summary

- Product Manager roles focuses more on business value while project manager focuses on execution and delivery
- The Lean Startup is a methodology of using the scientific method to create a valuable product
- A minimal viable product is a product that has a minimal feature set that produces value and can be iterated on
- Focus on developing low fidelity wireframes to test user workflows to limit the amount of investment into building a user experience that doesn't work
- Leverage user research and usability testing techniques to fine tune your audience experience
- B2B products differ from B2C products as they have have an commercialization life cycle the company will be expected to provide support
- Different types of tickets can help you organize your product feature development
- User stories help guide discussions for implementing features in the user's perspective⁴⁴

Thank you

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