

## **Design Process + Agile Methods**

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## **Design for PM**



## "Waterfall" Development Process (aka *Stage-Gate* or *Phase-Gate* Process)



"PRD" = product requirements document



Essentially the "concept development" portion of the waterfall/phase-gate process.

Adapted from UK Design Council "Double Diamond" model.

https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond https://medium.com/design-leadership-notebook/the-new-double-diamond-design-process-7c8f12d7945e

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#### **Design Thinking**

The design process applied to something other than visible artifacts (e.g., services, processes, business challenges).

#### Stanford dSchool process



#### Hallmarks of "Design Thinking"

- · Jobs analysis -- abstracting problem deliberately
- User orientation, focus on empathy
- Observational methods
- Early prototypes
- Iterative refinement
- Visual expression
- Culture of "yes"
- Bias for action

### 99 Bowls

Something yummy to eat, on hand all the time.

99bowls.com Revision of February 22, 2018



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## What is the job to be done?

## "5 Whys" "Abstraction Ladder"

"People don't want to buy a quarter-inch drill, they want a quarter-inch hole." Theodore Levitt





Theodore Levitt – Marketing Myopia

Clayton Christensen - Jobs-to-be-Done "theory" of innovation

## Jobs Analysis What problem are we really trying to solve?

Abstraction Ladder technique

How might we...

- Increase the well being of WFH professionals?
- Improve the quality of work experience for WFH professionals?
- Create an exciting midday break for WFH professionals?
- Provide a variety of yummy and healthy lunch options for WFH professionals?
  - Deliver ready-to-eat individual soup-like meals to work-from-home professionals?
  - Produce, package, and ship 12-unit cartons of frozen 500ml soup containers?
  - Create an automated soup bot?



#### "Needs" broadly defined

What attributes of the solution will result in satisfaction by the target user/customer?





The "Monster Thickburger" two 1/3-pound slabs of Angus beef, four strips of bacon, three slices of cheese and mayonnaise on a buttered sesame seed bun.

Sells alone for \$5.49, \$7.09 with fries and a soda.



## Example Needs List for a "Job to be Done" (as used in product development process)

#### The music player...

#### plays music I like.

- adapts to my preferences.
- \* adapts to my mood. learns from my actions.

#### keeps the music fresh.

introduces me to new music. plays music in random sequence.

"critical few" needs (N ~ 5)

#### let's me learn about the music.

let's me know what other people think of the music. teaches me about the song, artist, label, and/or genre.

#### lets me control the music.

allows me to specify a desired mood. allows me to listen to specific songs. allows me to listen to specific artists. allows me to listen to specific genres. lets me skip songs I don't want to listen to. lets me designate music that should never be played. lets me reduce frequency of play of a song. lets me increase frequency of play of a song. allows me to predetermine a sequence of songs. lets me easily find and play music I have enjoyed previously.

#### plays video content associated with music.

#### Notes:

- usually 30-50 distinct needs.
- clustered according to similarity of need expressed.
- cluster headings called "primary needs"
- maintain original "voice of customer" as much as possible.

#### is available anywhere.

provides audio via conventional speakers. provides audio via headphones. provides audio in car. can be used while exercising. integrates with my existing hardware and software. goes mobile without a tether.

accesses my entire music collection. provides access to specific music forever.

#### maintains my privacy.

- is affordable. is inexpensive to acquire. is inexpensive to use.
- \* just works.

plays music at high fidelity.

lets me share music with others. lets me learn about music from others.

#### plays voice/narrative.

allows speed of play to be adjusted. lets me access voice content easily.



#### Detailed method: K.T. Ulrich, S.D. Eppinger, M.C. Yang *Product Design and Development* <sup>7th</sup> Edition, McGraw-Hill, 2019

"latent" needs (N ~ 1-3)

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## Kano Diagram – Four Types of Needs





• Pulling solution from insights

## Example: Insight Pulling Solution Concepts

**OBSERVATIONS:** one user rinsing ground beef to control fat content in chili, and another – following a keto diet – buying 20% fat ground beef to reduce fraction of calories from protein.

**INSIGHT:** a lot of people attempt to tightly control the macro nutrient profile of their diet, but this is very difficult with take-out or prepared foods.

What are some solution concepts pulled from this insight?



#### "Soup Bot"

- Typical constraints
  - Gluten free
  - No peanuts
  - No cilantro
  - Vegetarian
- Macro nutrient preferences
  - Total calories
  - Carbohydrate grams/%
  - Protein grams/%
  - Fat grams/%
- Flavor profile
  - Spiciness (1-5)
  - Saltiness (1-5)

#### Base Recipes

- Hearty beef
- Chicken noodle
- Tomato
- Cream of X
- Chili
- Black bean
- Chowder

#### For example: Custom Chili

Base includes tomato, mirepoix, garlic, chili powder.

Create macro profile by adding these items:

- Pre-cooked [impossible burger, ground beef, ground turkey]
- Pre-cooked [black beans, chickpeas, navy beans, corn]
- Olive oil
- Salt
- Red pepper
- [Cilantro, Scallion]
- Sides [tortilla chip, sour cream, guacamole]





#### **Logistics Concept**

- "soup bot" uses bases plus add-ins to create profile.
- Cold-chain shipping using curbside recyclable Temperpack carton.
- Rigid microwavable deli containers or poly pouches.
- Carton ~ 12" x 12" x 12", 14 lbs. gross shipment weight.
- If include at least 2-4 frozen containers, then do not need additional ice pack in package.
  - Could have some staple items that are always frozen (e.g., soup stock, marinara sauce).
  - Some items might be best provided only fresh (e.g., salsa).
  - Number of required frozen items determined by transit time and season.







Agile

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## "Mythical Man Month" (c1975)

Brooks' Law: "Adding [staff] to a late software project makes it later."

(...because coordination requirements scale as n<sup>2</sup>)



Brooks' solution:

- Formal documents
- Realistic estimates
- Constant communication
- "Surgical team" of coders
- Code freeze and versioning



Ref also "daily build" c1990

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## The Agile Manifesto (2001)

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#### agilemanifesto.org **Manifesto for Agile Software Development**

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals and interactions over processes and tools Working software over comprehensive documentation Customer collaboration over contract negotiation Responding to change over following a plan

> That is, while there is value in the items on the right, we value the items on the left more.

> > James Grenning

Jim Highsmith

Andrew Hunt

**Ron Jeffries** 

Jon Kern

**Brian Marick** 

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Kent Beck Mike Beedle Arie van Bennekum Alistair Cockburn Ward Cunningham Martin Fowler

Robert C. Martin Steve Mellor Ken Schwaber Jeff Sutherland Dave Thomas

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## **Agile Manifesto - Principles**

- 1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
- 2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
- 3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
- 4. Business people and developers must work together daily throughout the project.
- 5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
- 6. The most efficient and effective method of conveying information to and within a development team is face-toface conversation.
- 7. Working software is the primary measure of progress.
- 8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
- 9. Continuous attention to technical excellence and good design enhances agility.
- 10. Simplicity--the art of maximizing the amount of work not done--is essential.
- 11. The best architectures, requirements, and designs emerge from self-organizing teams.

12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

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Photo: http://common\_s.wikimedia.org/wiki/File:M%C3%A9I%C3%A9e\_st\_ASM\_clermont.jpg

## Agile Development ("Scrum" version) SCRUM FRAMEWORK



References <u>https://en.wikipedia.org/wiki/Agile\_software\_development</u> <u>https://www.scrum.org/</u> Wharton 🛛

## Agile – Scrum Stories

Describe functions, jobs, and user needs in terms of *stories* about the user. Examples:

- As a user, I can backup my entire hard drive. [Complex stories are called *epics*.]
  - As a power user, I can specify files or folders to backup based on file size, date created and date modified.
  - As a user, I can indicate folders not to backup so that my backup drive isn't filled up with things I don't need saved.



#### MORE:

https://www.mountaingoatsoftware.com/agile/user-stories

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## **PRD & Agile**

- Not really either/or.
- Many tools for PRDs use "stories" and other key concepts from agile.

Adding 1	wo-factor Authentication
Target release	End of Q3 2018
Epic	OPD-24 - Adding 2 factor authentication using Google Authenticator     IN PROGRESS
Document status	UNDER REVIEW
Document owner	
Designer	@ Designer
Developers	@SDM @SDE 1, @SDE 2, @SDE 3
QA	@QA 1, @QA 2

Goals

- Offer clients and users the option to add an additional layer of security when accessing their accounts through porta
- Ensure the integrity of the client-server connection when a user's Google Authenticator app is used
- Streamline 2FA enablement for users using the same sleek interface expected of a product
- Develop a marketing campaign to communicate with our customers about this new feature
- Offer a clear recovery path for users that lose access to their device

#### Background

Tao-factor submitrication (2FA) has been widely adopted by every large technology platform and is a component of sociality that customers have come to specific homo businesses. Here a submit even handle highly simulative documents and information and it is imperative that we add this additional layer of security for customers that request 1. Additionally, in the case of User Orbibanding and High Tais. Transactions, we should consider making 2FA a mandatory part of the sign-approcess is these use acase have the highlest probability of tracks.

27 A registe users to have access to an additional identifier beyond username and password. When a user enables 27A recoupt Google Authenciator, a personal key is created as an identifier for the device user. There more users with 27A enabled will need their username, password, and device in order to log in. While this in itself serves as a layer of security, the Google Authenticator app also introduces a time variable: each code generated is only valid for 30 security.

#### Assumptions

- · Customers will use 2FA when they log in through mobile, web, and desktop portals
- Users do not need a Google Account to use Google Authenticator
- All devices with Google Authenticator installed will use NTP for clock syncronization

#### User Types

The option to enable 2FA will be available to all users with an account. As such, no distinction will be made between different user types.

#### **Use Cases**

When reviewing the requirements below, consider that users may be logging in through our mobile app, through our website, or through our desktop portals. While implementation and UX may differ between these channels, core functionally and features should be consistent and the experience should be seamises to the end user (i.e., huj) implyands as a native feature).

#### Requirements

The below requirements use the MoSCoW method of prioritization; from greatest to least importance: Must have, Should have, Could have, Won't have

,	Title	User Story	Importance	Notes
ţ	Google Authenticator Implementation	Developer: I need to design and implement framework to interact with the Google Authenticate across. The final framework to induce the data log parential occess, validate codes, and display a QH code to facilitate quicker 27A enabling $\oplus$ 313). For locative to constraints, codes gravemental durated multiple to the communication occess gravement of the number of unsuccessful welfcattons per session should be lemind.	Must have	PD-25 - Goog le Authenticator Implementation DONE
	2FA Onboarding	User: I'm a bit of a security novice, though I recognize its importance. It would be really helpful if your app or website walked me through the process of enabling 2FA and setting up Google Authenticator on my device.	Could have	PD-26 - 2FA Onboarding TO DO
5	2FA Indicator	User: I recognize the importance of securing my account and since my company uses Jumio products to handle sensitive information it is only beneficial to add this eath sayer of security. I speed a client indicator of whether not of 2FA is enabled. And the option benafie dFA if it is not currently enabled. I would expect this feature to exist in the same tab my other password and security book.	Must have	PD-33 - 2FA Indicator TO DO
•	2FA Enabling	User: I want the fastest and simplest way to enable 2FA. The Google Authenticator app allows me the option to use a CIR code to connect my device with my accounts on other websites. Some websites required ne to manually type in an identifier into the ago on my phone - insuit have option I wrong three times before it finally went through. Using the camera on my phone is much assist and faster.	Must have	PD-31 - 2FA Enabling IN PROGRESS
5	2FA Disabling	User: I lost my phone and need to enable 2FA on a new device. I've already installed Google Authenticator on my new phone and would like to temporarily disable 2FA so that I can set it up again.	Must have	PD-27 - 2FA Disabling TO DO
ŝ	2FA Login	User: Now that I have enabled 2FA, I expect the login process to prompt for the code from the Google Authenticator app on my device.	Must have	PD-30 - 2FA Login TO DO
1	Access Recovery	User: My Google account was hacked into and Google support is taking a long time to help with the Authenticator app. I need another way to recover access to my concount as a last resort. Since this is my last resort, I don't expect this to be an easy or convenient task.	Must have	PD-28 - Acce ss Recovery TO DO
	in-app Walkthrough	PM: I want an engaging way to let customers know about our new 2FA leature and we have historically gotten best mach through these types of leature turinsis. This should briefly explain the feature, how to enable it, and then overlap graphics on the landing page to help users identify where the feature is located. The waithrough should only be visible the first line a user logs in after deployment.	Should have	PD-32 - In-ap p Walkthrough TO DO

#### User interaction and design

Here is an example of what the enabled feature could look like in the Security tab:

#### https://www.reddit.com/r/ProductManagement/comments/95w0rl/a\_sample\_prd\_product\_requirements\_document\_i\_made/



## Kanban version of Agile

Pool of	Feature	Feature	User Story	User Story	User Story	Feature	Deploy-	Delivered
Ideas	Preparation	Selected	Identified	Preparation	Development	Acceptance	ment	_ shire. su
Epic 431 Epic	3 - 10 Progress Ready Epic Epic 444 662	2-5 Epic	30	In Ready Progress Story 602-02	In Ready (Done)	In Ready Progress Epic 401 609	5 Epic 694	Epic 294 Foic
478 Epic 562 Epic	Epic 589	602 Epic 302	Story         Story           302-03         302-01           Story         Story           Story         Story           502-02         502-06	Story 602-03           Story 302-07         Story 302-09           Story 302-08         Story 302-08	Story 602-04         Story 602-01           Story 303-05         Story 302-04	Epic Epic 468 577 Epic 362	Epic 276 Epic 339	386 Epic 419 Epic
439 Epic 329 Epic	Epic 651	Epic 335	Story         Story         Story         Story           535-00         335-10         335-04         355-03           Story         Story         Story         3tory           335-08         335-01         355-03         355-03	Story         Story           535-05         335-06           Story         335-07           Story         335-07			Epic 521 Epic	388 Epic 287
287 Epic 606	Discarded Epic Epic 511 213 Epic 221	Epic 512	Stery         Stery <th< td=""><td>512-01</td><td></td><td></td><td>582</td><td>Epic 274</td></th<>	512-01			582	Epic 274
	Policy Business case showing value, cost of delay, size estimate and design outline.	Policy Selection at Replenishment meeting chaired b Product Director.	Ŷ	Policy Small, well- understood, testable, agre with PD & Tea	Policy As per "Definition of Done" (see) m		Po Risk assi Continuo ment po	licy essed per us Deploy- licy (see

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https://en.wikipedia.org/wiki/Kanban (development)

What characteristics or approaches are likely to be most effective for non-technical product managers to work with agile developers?

### Zero-to-one phase vs. Tuning phase



## **Elements of the "Concept" for Web-Based Products and Services**

- Job to be done core functionality (e.g., retail goods, provide credit scores, index information...)
- Platform (e.g., desktop, mobile, watch, other device)
- Format or delivery mechanism (e.g., sms, email, app, web site)
- Central use metaphor (e.g., search, radio station, desktop, newspaper, card deck)
- Key modes (e.g., "ratings mode" and "recommend mode")
- Unique "hook" or feature (e.g., "music genome" project)
- Key benefits delivered by concept (e.g., "no late fees")
- Basic business model (e.g., subscription, commission, advertising, referrals, fee for transaction)



For digital products, concepts usually represented by "screens"

### Modular vs. Integral Architectures



modular

Shimano brake and shift lever system

integral



## (Podcasts with Blake Scholl, founder and CEO, in modules)

BOOM

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#### Agile has the power to transform work—but only if it's implemented the right way.

For decades, business leaders have been painfully aware of the huge chasm between their aspiration for a nimble, flexible enterprise and the reality of silos, sluggishness, and frustrated innovation. Today, <u>Agile</u> is being hailed as the essential bridge across that chasm. Agile, say its enthusiasts, can transform your company, catapulting you to the head of the pack.

Not so fast. In this clear-eyed and indispensable book, Bain & Company thought leader and HBR author <u>Darrell Rigby</u> and colleagues <u>Sarah Elk</u> and <u>Steve Berez</u> provide a much needed reality check. They dispel the myths and misconceptions that have accompanied Agile's growth—the idea that it can reshape your organization all at once, for instance, or that it should be used in every function and for all types of Where might agile methods be applied effectively in managerial life outside of product/software development?