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**CHALMERS**



UNIVERSITY OF GOTHENBURG

# **DIT045 H17 Requirements and User Experience**

## **Personas, Scenarios, Creativity & Priortization**

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# Agenda

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- Personas
- Scenarios
- Creativity (should have been in last lecture)
- Prioritization

# Personas (Another Elicitation Technique)

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- Who are your users?
- Instead of thinking generally (student, registered users), try to think of very specific people
- What do they want and need?
- Helps to come up with new requirements, view the system in a new way
- Comes from the world of UX, but also used in RE
- Also used in marketing to understand potential users

# Example Persona

## USDA Senior Manager Gatekeeper

From [www.usability.gov](http://www.usability.gov)

### Photo:

**Fictional name:** Matthew Johnson

**Job title/ major responsibilities:** Program Staff Director, USDA

**Demographics:** 51 years old, Married

Father of three children, Grandfather of one child

Has a Ph.D. in Agricultural Economics.

**Goals and tasks:** He is focused, goal-oriented within a strong leadership role. One of his concerns is maintaining quality across all output of programs.

**Spends his work time:** Requesting and reviewing research reports, preparing memos and briefs for agency heads, and supervising staff efforts in food safety and inspection.

**Environment:** He is comfortable using a computer and refers to himself as an intermediate Internet user. He is connected via a T1 connection at work and dial-up at home. He uses email extensively and uses the web about 1.5 hours during his work day.

**Quote:** “Can you get me that staff analysis by Tuesday?”



# Example Persona

**Rachel**  
Small Business  
Owner

- Social Media Marketing
- Key decision-maker

**Demographics**


- Age 32-39
- Skews female
- \$90,000/yr
- Urban location
- Master's degree
- Married, no kids

**Goals and Challenges**

- Save time online
- Find interesting content to share
- Maximize social media resources

**How we can help**

- Schedule posts to a queue
- Content suggestions



- From:  
<https://blog.bufferapp.com/marketing-personas-beginners-guide>  
(more examples here)
- More examples:  
[http://uiaccess.com/accessucd/personas\\_eg.html](http://uiaccess.com/accessucd/personas_eg.html)

# What's in a Persona

- Elements of a Persona (from usability.gov)
- Personas generally include the following key pieces of information:
  - Persona Group (i.e. web manager)
  - Fictional name
  - Job titles and major responsibilities
  - Demographics such as age, education, ethnicity, and family status
  - The goals and tasks they are trying to complete using the site
  - Their physical, social, and technological environment
  - A quote that sums up what matters most to the persona as it relates to your site
  - Casual pictures representing that user group
- Nice resource: <https://www.usability.gov/how-to-and-tools/methods/personas.html>
  - From the US government (!?)

# Where do Personas Come from?

- “But remember: your personas are only as good as the data-driven research that goes into them. They should be based on a combination of qualitative and quantitative data collected from multiple sources—not from the opinions and assumptions of your team.”
  - <https://www.usertesting.com/blog/2016/02/19/customer-personas/>
- Should be based on user research (similar to Elicitation)
- Ideally, don't make them up
- In this course it's hard to allow you to do elicitation with real users
- Solutions: use each other as users, ask users questions on the forum, make up personas

# Scenarios (still Elicitation)

- Viewing the interactions between the user(s) and the system considering:
  - Time
  - Ordering
  - Pre and post conditions
- Can do this via text or models
- There are many methods for this, we pick two:
  - Text: Use Case templates
  - Models: Customer Journey maps
- Previous methods (context, use cases, goal models) don't deal explicitly with time
- Can have time information in text requirements, but usually a fragmented picture, not a full sequence



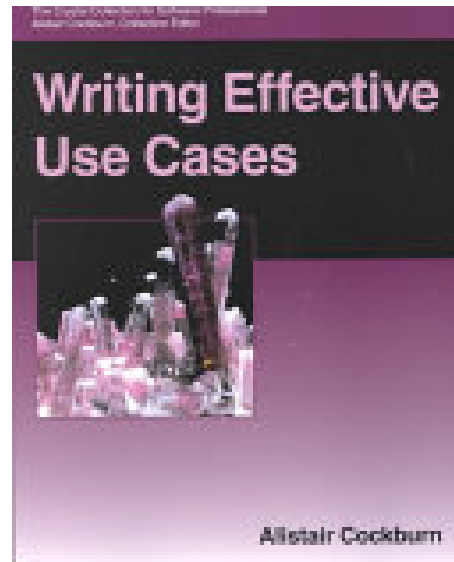
# Scenarios

- Why do we bother?
  - Thinking about the temporal flow often helps us to find missing important requirements
  - Another way to view the system

Method/ Dimension	Data Flow	Actors	Functions	Qualities	Depend- encies	Flow/Order /Time
Text Requirements						
Context Diagrams						
Use Cases						
Goal Models						
Customer Journey Maps						

# Use Cases (again, text part)

- Each use case in the model has a corresponding template that captures more information
  - A bit like the Volere template, but focusing on time and flow
- More than one type of Use Case Template
- We'll use the one recommended by Cockburn



# Cockburn's Use Case Template (part 1)

**Use Case:** <number> <the name should be the goal as a short active verb phrase>

## CHARACTERISTIC INFORMATION

Goal in Context: <a longer statement of the goal, if needed>

Scope: <what system is being considered black-box under design>

Level: <one of: Summary, Primary task, Subfunction>

Preconditions: <what we expect is already the state of the world>

Success End Condition: <the state of the world upon successful completion>

Failed End Condition: <the state of the world if goal abandoned>

Primary Actor: <a role name for the primary actor, or description>

Trigger: <the action upon the system that starts the use case, may be time event>

## MAIN SUCCESS SCENARIO

<put here the steps of the scenario from trigger to goal delivery, and any cleanup after>

<step #> <action description>

## EXTENSIONS

<put here there extensions, one at a time, each refering to the step of the main scenario>

<step altered> <condition> : <action or sub.use case>

# Cockburn's Use Case Template (part 2)

## SUB-VARIATIONS

<put here the sub-variations that will cause eventual bifurcation in the scenario>  
<step or variation # > <list of sub-variations>

## RELATED INFORMATION (optional)

Priority: <how critical to your system / organization>

Performance Target: <the amount of time this use case should take>

Frequency: <how often it is expected to happen>

Superordinate Use Case: <optional, name of use case that includes this one>

Subordinate Use Cases: <optional, depending on tools, links to sub.use cases>

Channel to primary actor: <e.g. interactive, static files, database>

Secondary Actors: <list of other systems needed to accomplish use case>

Channel to Secondary Actors: <e.g. interactive, static, file, database, timeout>

## OPEN ISSUES (optional)

<list of issues about this use cases awaiting decisions>

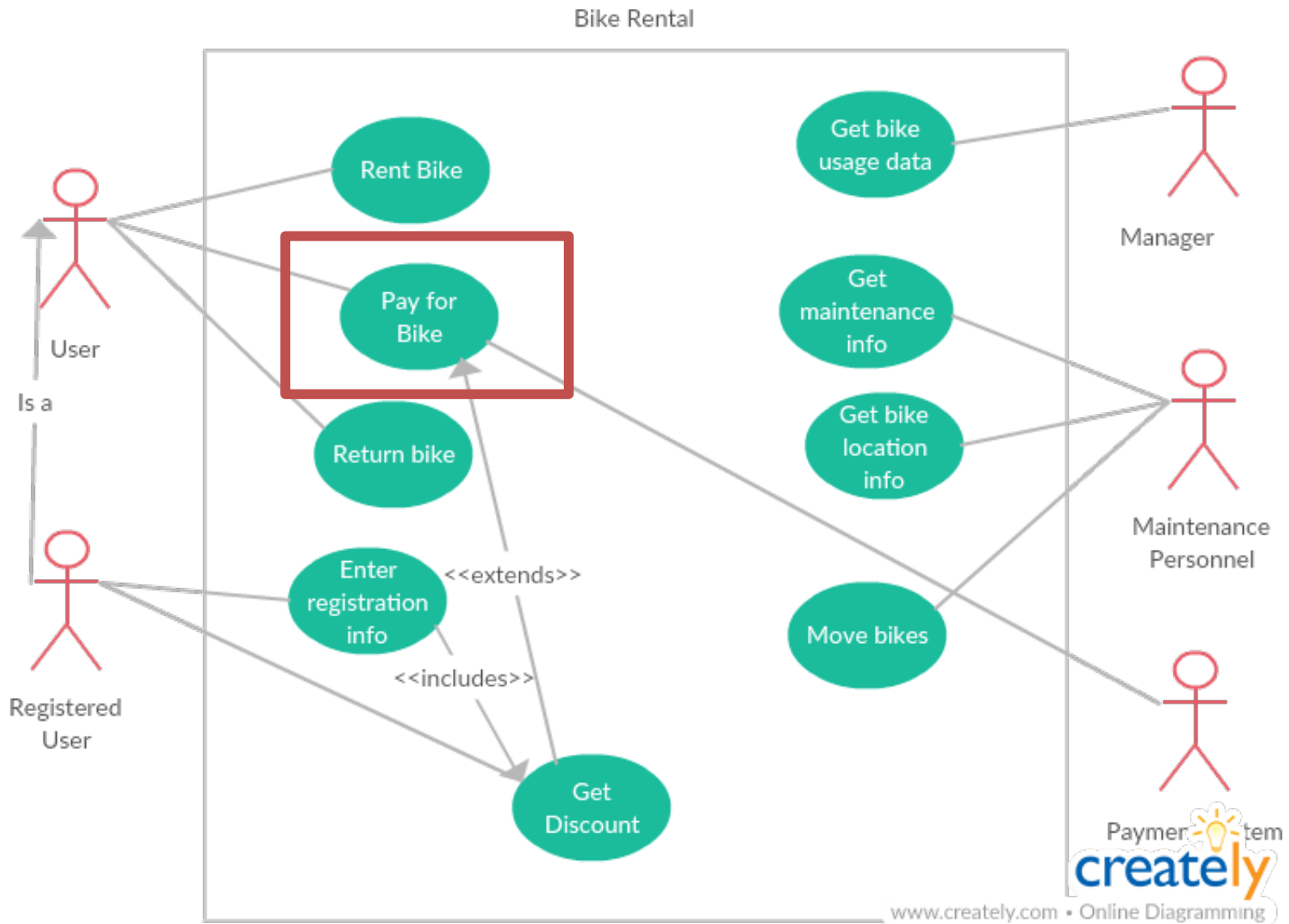
## SCHEDULE

<http://alistair.cockburn.us/Basic+use+case+template>

Due Date: <date or release of deployment>

...any other schedule / staffing information you need...

# Example: Bike Rental



# Example: Pay for Bike (part 1)

**Use Case:** #2 pay for Bike

## CHARACTERISTIC INFORMATION

**Goal in Context:** To give payment in order to rent a bike

**Scope:** For the bike rental system, paying only for bike rentals

**Level:** Primary Task

**Preconditions:** User has indicated they would like to rent bike, has selected a bike.

For registered users, user has logged in.

**Success End Condition:** payment transaction successful

**Failed End Condition:** payment failed, payment aborted

**Primary Actor:** User (bike renter)

**Trigger:** The user tries to rent a bike

## MAIN SUCCESS SCENARIO

1. User is prompted to pay for bike rental, showing payment amount
2. User Oks amount
3. User chooses form of electronic payment (Debit, Credit, Touch payment)
4. User uses card to pay for bike
5. User enters card PIN
6. Payment confirmation is received from Payment System, confirmation shown to user

# Example: Pay for Bike (part 2)

## EXTENSIONS

1. <registered users> Payment amount shows registration discount

## SUB-VARIATIONS

2. User does not OK amount, bike rental cancelled
3. User does not choose form of electronic payment, bike rental cancelled
4. User does not provide card after 60 seconds, user notified, bike rental cancelled
5. User does not provide correct PIN, bike rental cancelled
6. Payment confirmation is not received from Payment system, user notified, bike rental cancelled

## RELATED INFORMATION (optional)

Priority: Coming later in the lecture (could be high/medium/low, or a number)

Performance Target: less than 30 seconds

Frequency: often, once every 5 minutes during peak periods

Superordinate Use Case: N/A

Subordinate Use Cases: N/A

Channel to primary actor: interactive

Secondary Actors: Payment System

Channel to Secondary Actors: network transaction

## SCHEDULE

Due Date: Before System deployment, Spring, 2018

# Customer Journey Maps

- Similar to:
  - Activity Diagrams (UML)
  - Sequence Diagrams (UML)
  - Business Process Diagrams (BPMN)
- But simpler...
- And used more commonly in UX
- Also used a lot in marketing
  - Which in practice means the examples look nice but are difficult to draw, i.e. no strict syntax



# What's in a Journey Map

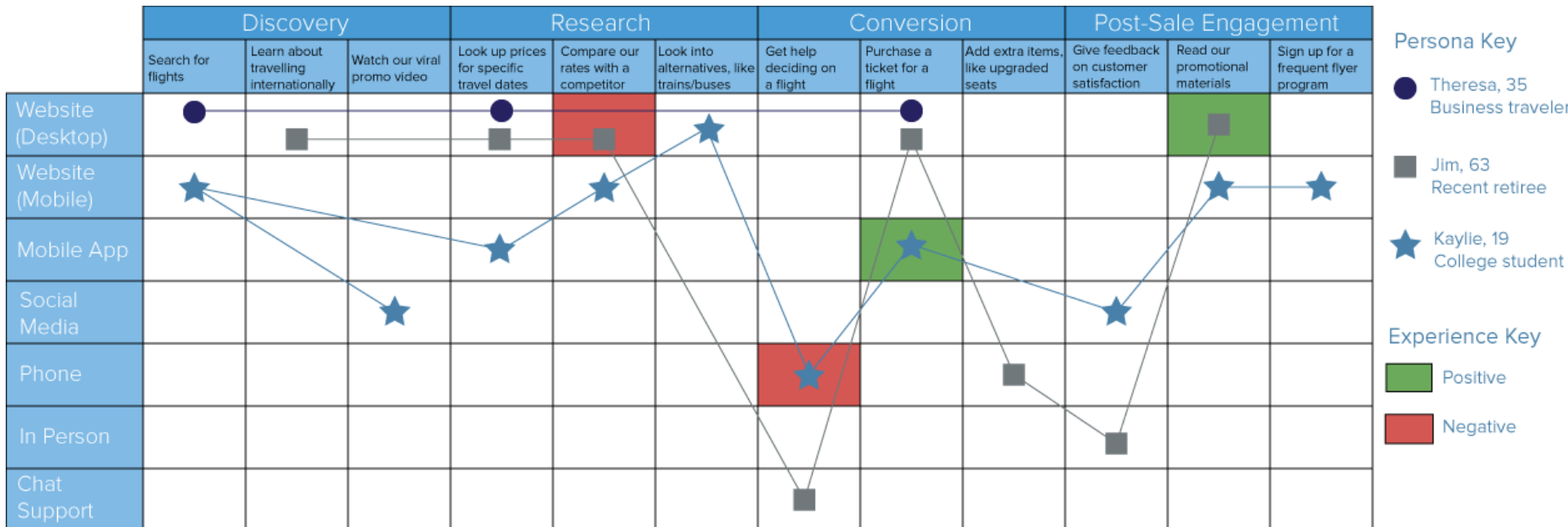
- **Personas:** the main characters that illustrate the needs, goals, thoughts, feelings, opinions, expectations, and pain points of the user;
- **Timeline:** a finite amount of time (e.g. 1 week or 1 year) or variable phases (e.g. awareness, decision-making, purchase, renewal);
- **Emotion:** peaks and valleys illustrating frustration, anxiety, happiness etc.;
- **Touchpoints:** customer actions and interactions with the organization. This is the WHAT the customer is doing; and
- **Channels:** where interaction takes place and the context of use (e.g. website, native app, call center, in-store). This is the WHERE they are interacting.
- From: <https://uxmastery.com/how-to-create-a-customer-journey-map/>

# Example



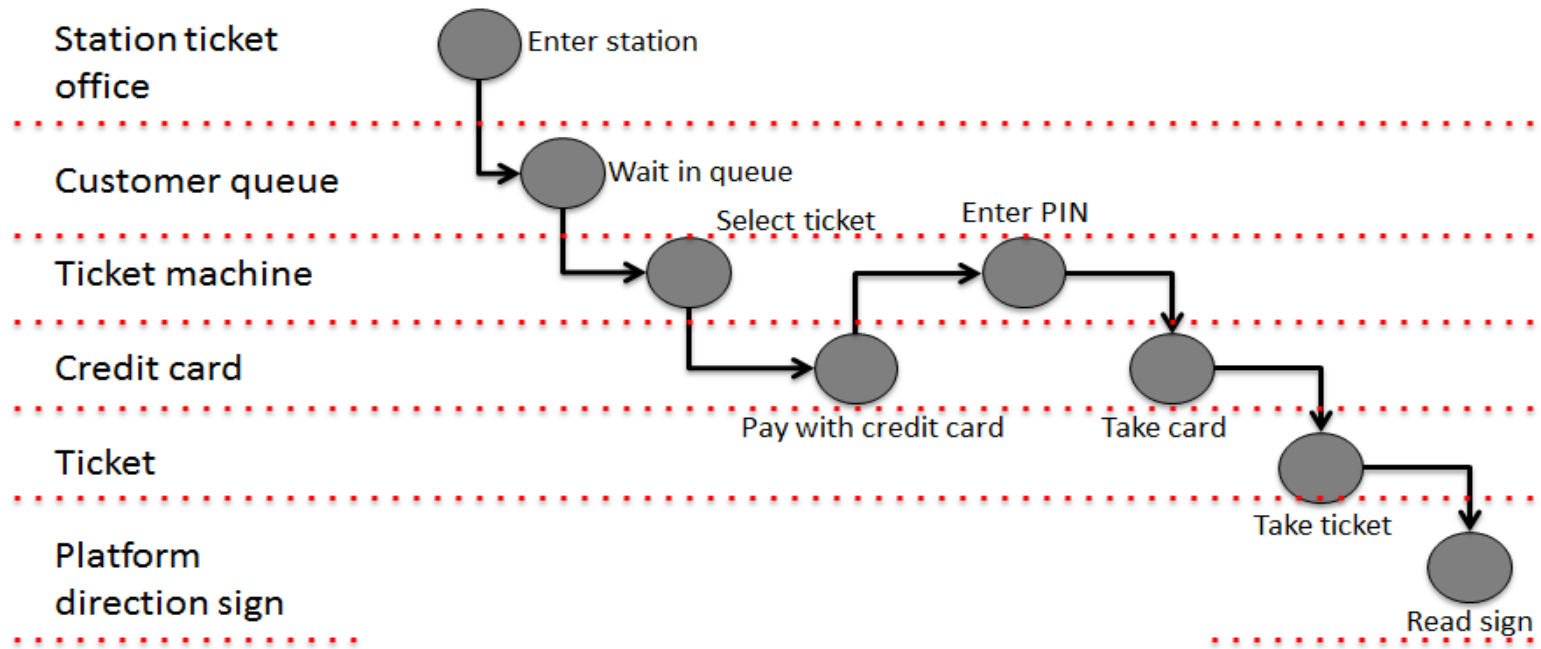
<https://www.mycustomer.com/experience/engagement/why-customer-journey-mapping-must-evolve-into-experience-design>

# Example with Many Personas

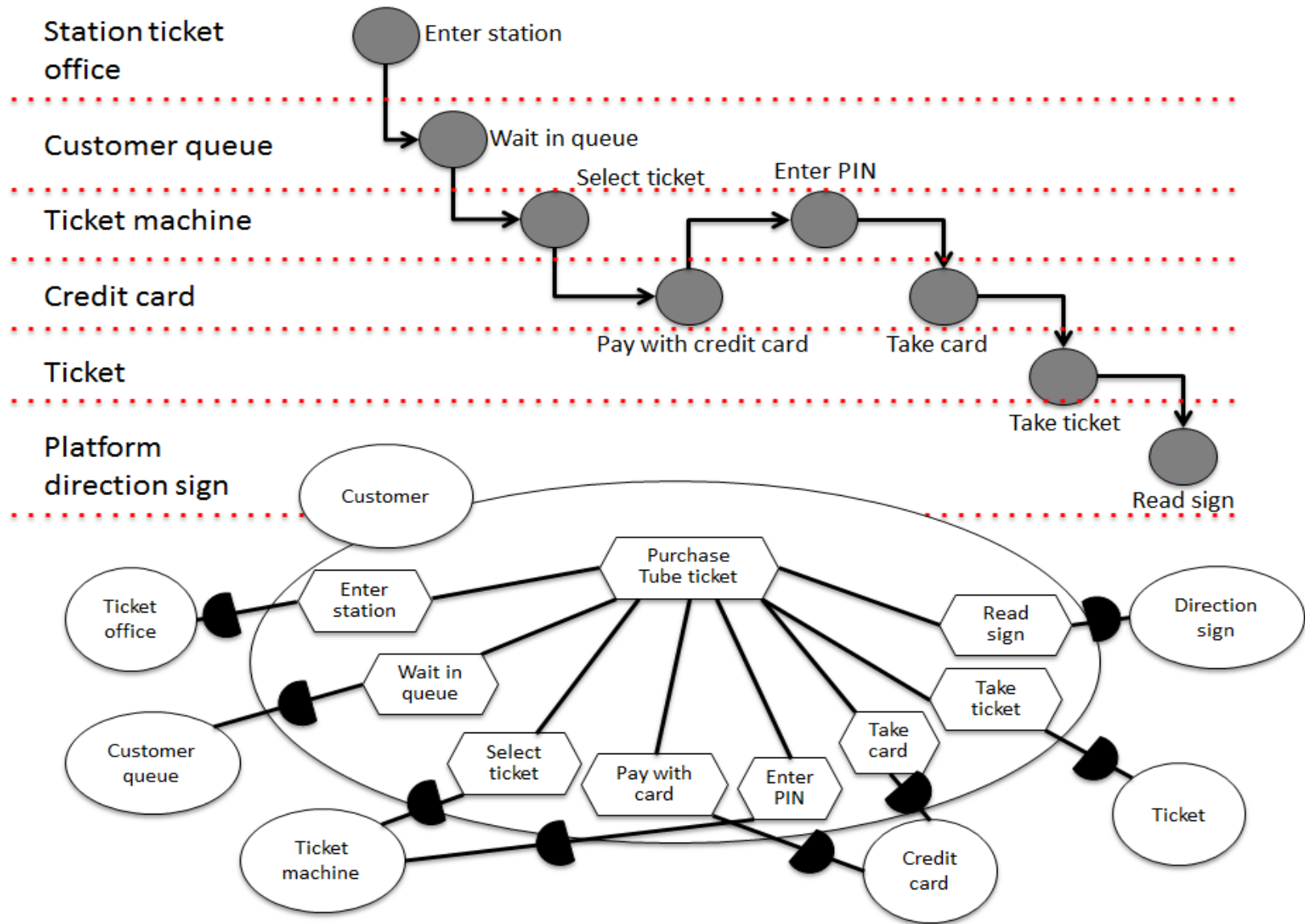


<https://www.mycustomer.com/experience/engagement/nine-sample-customer-journey-maps-and-what-we-can-learn-from-them>

# Journey Map with Goal Model



# Journey Map with Goal Model



# Bike Rental

	Acquisition				Riding		Return		Feedba ck
	Bike Select ion	Select Option s	Payme nt	Confir mation & Info	Bike Riding	Remin ders	Return Bike	Confir mation	Feedba ck
Bike Rack	★								
Rental Display		★							
Payment Panel			★				★		
User Device				★		★		★	
Bike					★				
User Device									
Email									★

# Creativity

- Stakeholders are limited by what they perceive to be possible and influenced by their experiences
  - I want the (current) system to do some extra functionality
  - The extra functionality is probably something they've already seen somewhere else
- Creative RE is about discovering requirements stakeholders were not aware of
- Creative requirements are those that are both novel and useful
- Innovation is the implementation of creativity
- The idea of studying creativity in RE is that there are method to help average people who are not particularly creative come up with creative ideas
  - You don't have to be a creative genius to be creative

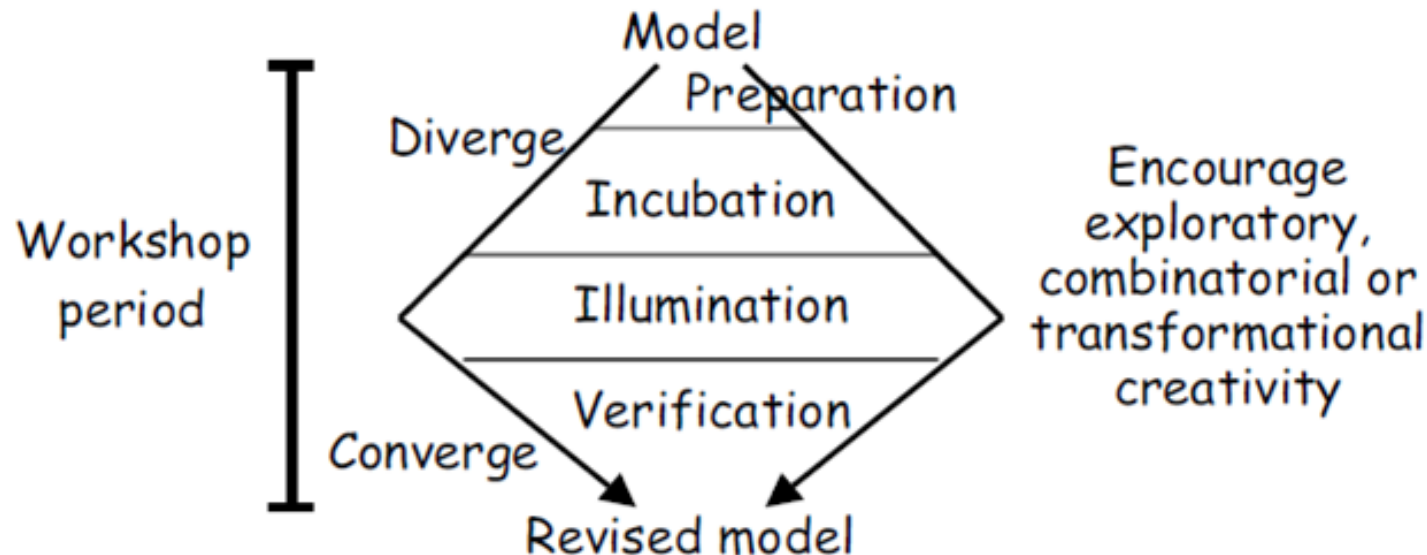
# Example: Parking Lot App

- Imagine you (or your students) must develop the requirements for a parking lot app, that lets you pay for parking using an app on your phone
- Some basic (but useful) requirements:
  - App should work on all phone types
  - App should accept all payment types (credit, paypal, contactless)
  - App should be able to email receipt
  - Register with facebook/google
  - Make it impossible to cheat app, take spot without paying
- Some (more) creative requirements:
  - App should alert you when your time is almost up, allow top-ups
  - App should include a parking space finder
  - Promote app in garages
  - Should be able to “pay it forward” with parking credit



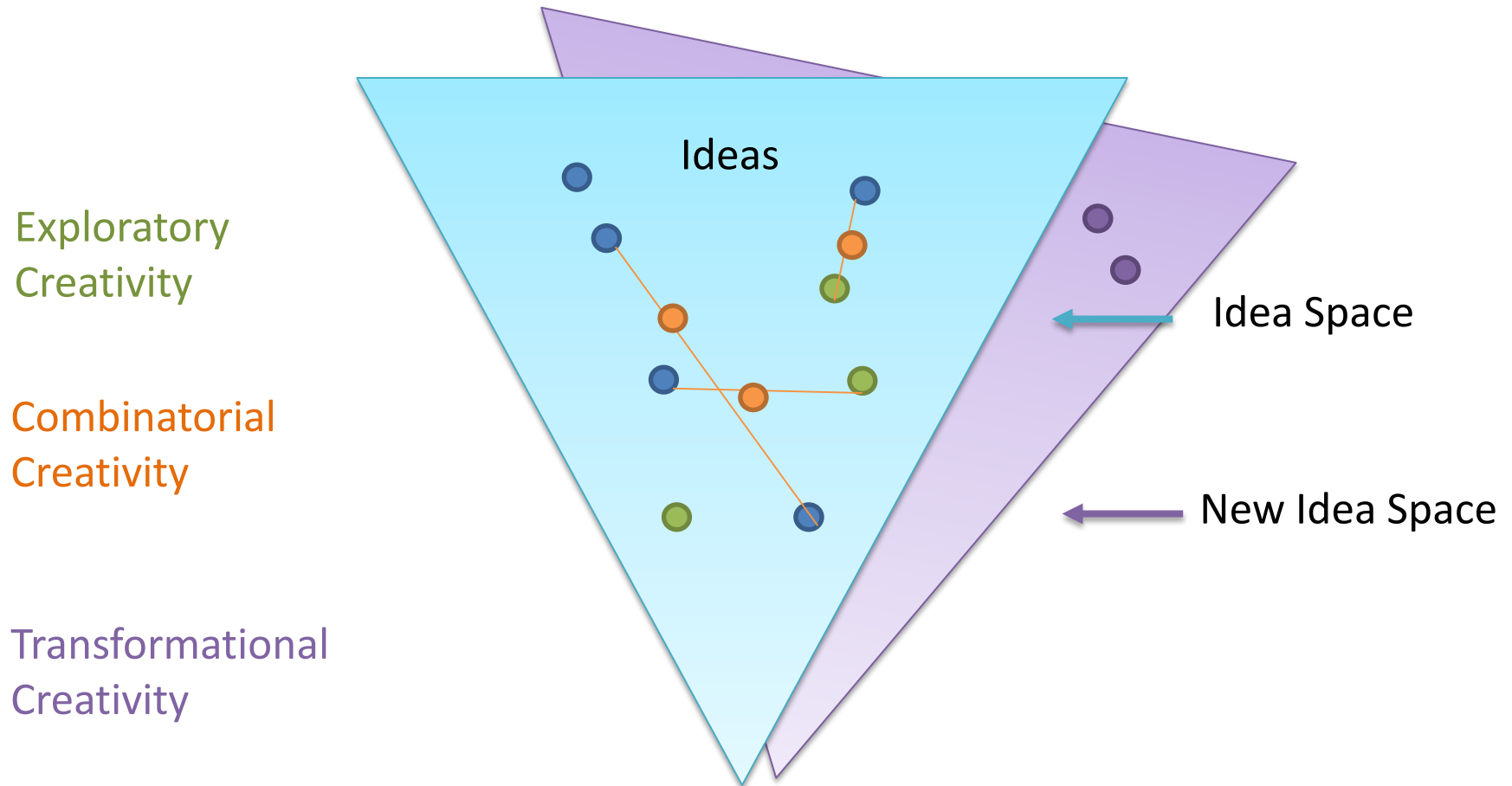
# Creativity Theories

- Divergent and Convergent Creativity (Creative Problem Solving)
- Preparation, incubation, illumination, verification (Poincaré)
- Exploratory, combinatorial, or transformational creativity (Boden)
- RE Creativity Workshop conducted at City University London (Maiden et al.)



# Exploratory, Combinatorial, Transformational Creativity

- (Presentation idea via N. Maiden)



# Creativity Activities

- (Somewhat) structured techniques in order to generate ideas
- E.g., Brainstorming, Hall of Fame/Bright Sparks, Creative Search, Pairwise Comparison, Creativity Triggers, Assumption Busting, Roleplaying, ....
- Can be performed manually, or can be supported by tools
- Usually conducted on groups of people
- Long list found at:
  - <http://becreative.city.ac.uk/>

# Example Technique: Assumption Busting

- Challenging assumptions, often referred to as assumption busting, is a simple technique that involves listing all of the assumptions that are important to your problem, including the obvious ones, and then challenging the correctness of each assumption in turn.
- Undertake the technique in 3 simple steps:
  - First of all, list all of the assumptions that are relevant to your problem or situation. Look at the situation you are in. What are the assumptions you are making about it? What is so obvious that you would not normally think about challenging it? Make all of your assumptions explicit and list them out, especially the obvious ones that you would not consider challenging. Typical assumptions include: that is not possible, the customer will not accept it, and it will exceed the project budget. If you cannot find assumptions, you are assuming that they do not exist.
  - Pick one assumption at a time, and challenge it by asking under what conditions it might not be true. Explore these conditions using different scenarios, no matter how extreme, of what might happen, to explore the space of possible ideas. You will start to make new assumptions as you challenge some assumptions, so simply add these to the list, and challenge them later.
  - For each assumption that you discover might not be true, brainstorm new ways in which it might be true, or could be forced to be true, and right down the resulting new ideas and opportunities.
- <http://becreative.city.ac.uk/details.php?id=2>

# Creativity Triggers (PDF in GUL)

## Light

Try to simplify your solution, to make its structure **slighter**, more **lightweight**

Consider also to...

... remove parts of the solution to make it more **less busy**, **time consuming**



... revise your solution to make it looks **thinner or smaller**

Example



Apple initiated the trend of ultra-light portables by reducing the size and weight of its MacBook Air's structure, to make an extra-flat laptop.

Stimulating Stakeholders' Imagination: New Creativity Triggers for Eliciting Novel Requirements  
Burnay, C., Horkoff, J. & Maiden, N.

## Adaptable

Can you replace multiple products with one **adaptable** product?

Consider also to...

... add a new feature to your solution to make it able to **change**



... try to make your solution more **malleable**, more **flexible** for the user

Example



Microsoft's Surface is a tablet that turns easily into a fully functional laptop. It can adapt to multiple contexts of use, and satisfy with various user needs.

Stimulating Stakeholders' Imagination: New Creativity Triggers for Eliciting Novel Requirements  
Burnay, C., Horkoff, J. & Maiden, N.

# Example Activity: BrightSparks

- Personas, but... with famous people
- <http://brightsparks.city.ac.uk/>



New Persona

Film

## MARY POPPINS

*Magical English nanny helping children everywhere.*



### Characteristics

Stern and sensible, she uses magic and self control to take care of her young charges. Along the way she teaches children, and adults, valuable lessons to become the best people that they can be. She has a loving, caring side and an array of magical abilities including talking to animals.

[Learn more about Mary Poppins via the Web >>](#)

PDF

New Spark

Think about how *Mary Poppins* would go about your design challenge...

### Creative clues

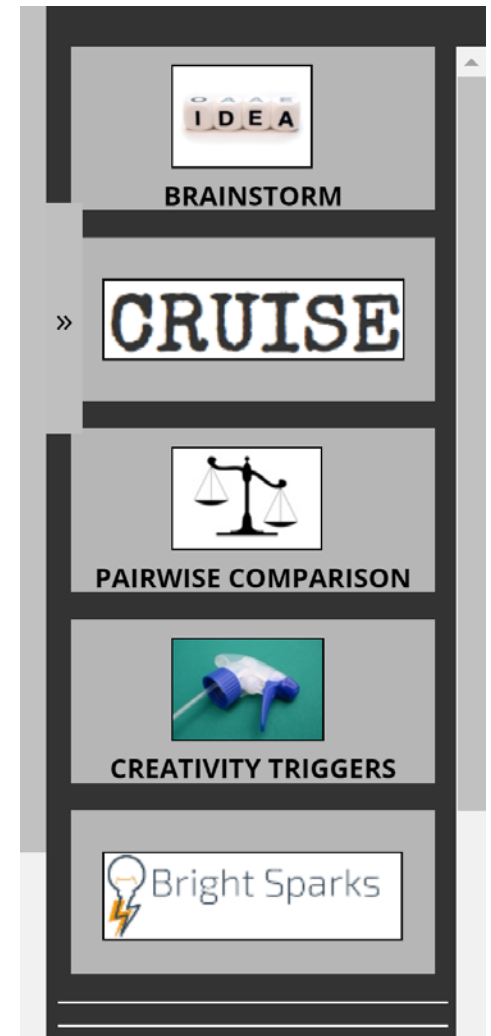
💡 What if Mary Poppins joins your project team? What new ideas and concepts will Mary Poppins come up with? [+idea](#)

💡 Imagine you interview Mary Poppins for your project. What do you predict that Mary Poppins would want? [+idea](#)

💡 Does Mary Poppins have any friends or colleagues? What new ideas and concepts would you expect this person to come up with? [+idea](#)

# Creative Leaf Again

- The left hand side has a bunch of creativity techniques built in.
- Use parts of the goal model as input
- Output ideas which can be linked to the goal model elements
- Tutorial Videos
- <https://sites.google.com/site/creativitygm4re/tutorial-videos>

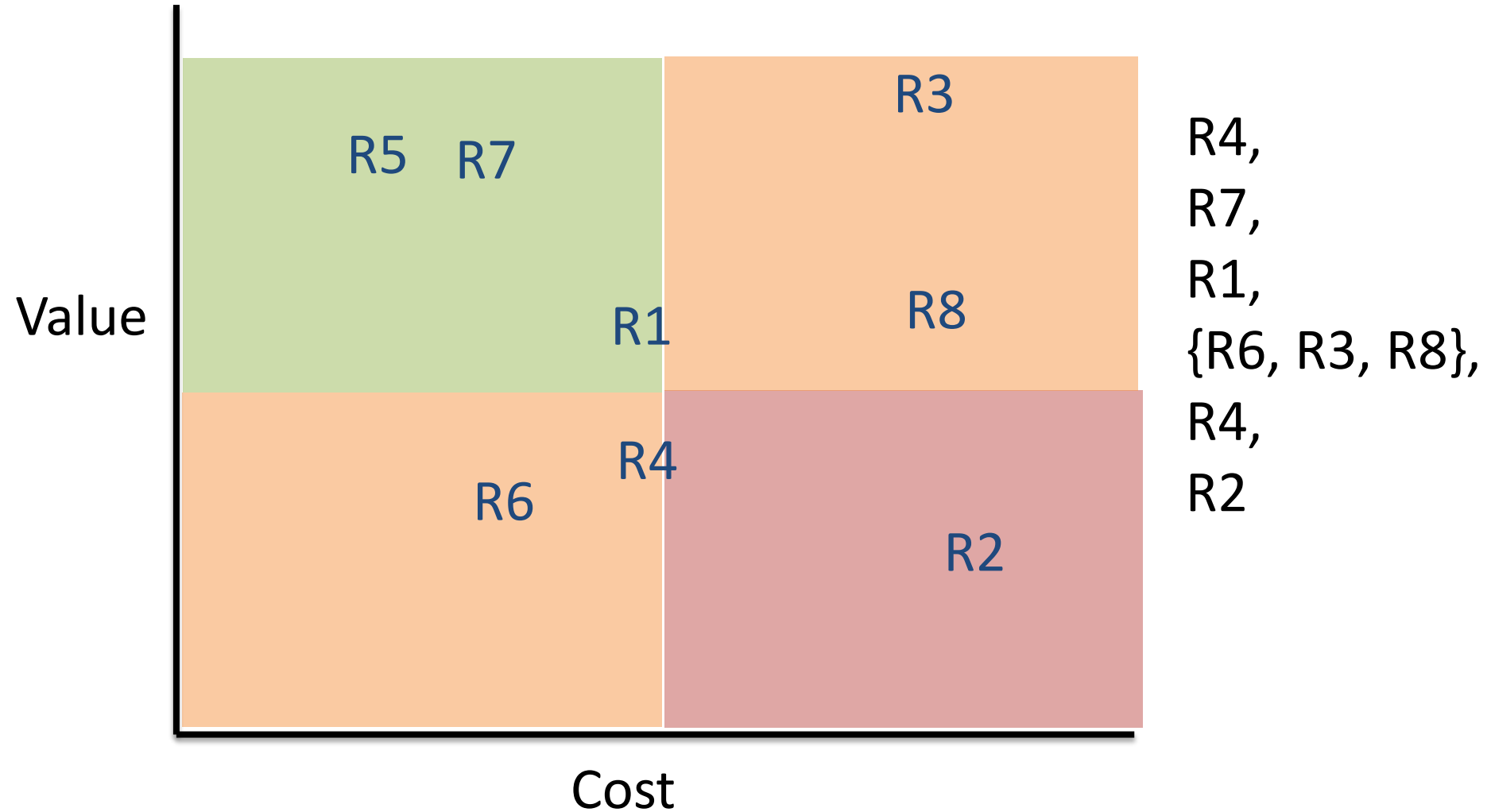


# Proiritization

- Which requirements are the most important?
- How do we figure this out?
- Ask users
  - Sure, but what if different users disagree?
- Many methods for requirements prioritization, as always, we'll pick a few well-known methods:
  - Value vs. cost
  - \$100 method
  - AHP (Analytical Hierarchy Process)



# Value vs. Cost



# Estimating Costs/Time

- Big, complicated area, many methods
- User Story: Story Points
  - Estimates of effort, risk, & complexity of a user story
  - Assign raw value (number) to each user story
  - <https://www.mountaingoatsoftware.com/blog/what-are-story-points>
- Other methods (we're not really covering this)
  - Use historical company knowledge
  - Ask experienced people
  - Boehm's COCOMO
  - Function point analysis
  - Use case analysis
  - Planning poker
  - Etc.

# \$100 Method

- You have \$100 to spend (or whatever currency)
- You have a certain number of requirements (not too many)
- Ask a group of people to pay money for the requirements
- How much would you pay for each?
- Capture “why?”
- The ordering of spending is the relative priority

\$100 TEST		
Item/Topic/Issue	\$	WHY?
Internet Access	\$21	to tell others & ask for help
alarm clock	\$7.50	the only one often available
Telephone	\$55	connect with EMS
SMS	\$8.50	help during emergencies
camera	\$4.25	documentation for insurance
Solitaire	.75¢	stress relief
voice recorder	\$3	capture disaster interviews

<http://gamestorming.com/100-test/>

# Analytical Hierarchy Process

- Developed by Saaty in the 1970's
- Have: goal, criterial, alternatives
- Stakeholders compare all combinations of two options with respect to a criterion
  - Option 1 vs. Option 2 with respect to criterion 1
  - ...
- Equations to calculate best option
- Don't do the math yourself, find an online calculator:
  - <http://www.healthstrategy.com/ahp/ahp.htm>

# Analytical Hierarchy Process

## Analytic Hierarchy Process (AHP) - example



Goal:

New product  
group:  
wooden toys

Criteria:

Safe to use  
(1)

No toxic  
processing  
agents (2)

Educational  
(3)

Fit in  
cardboard  
packaging (4)

Able to be  
manufactured  
sustainably  
(5)

Alternatives:

In-house  
production

Partnership  
with  
manufacturer

Outsource  
production

Read more: [www.toolshero.com](http://www.toolshero.com)

<https://www.toolshero.com/decision-making/analytic-hierarchy-process/>

# Questions?

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