

User Stories for Agile Requirements

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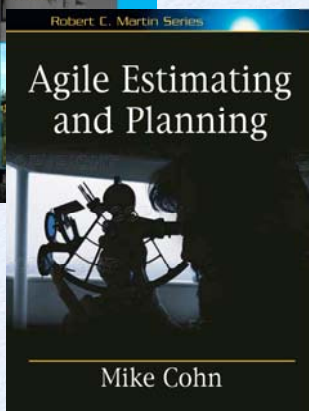


SD
WEST 2006

MARCH 13-17, 2006, SANTA CLARA, CA

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Mike Cohn - background



**Consultant, author,
and speaker**

- Founding member and director of Agile Alliance, Scrum Alliance, and Agile Project Leadership Network
- Founder of Mountain Goat Software



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What problem do stories address?

- Software requirements is a *communication problem*
- Those who want software must communicate with those who will build it



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Balance is critical

- If either side dominates, the business loses
- If the business side dominates...
 - ...functionality and dates are mandated with little regard for reality or whether the developers understand the requirements
- If the developers dominate...
 - ...technical jargon replaces the language of the business and developers lose the opportunity to learn from listening



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Resource allocation

- We need a way of working together so that resource allocation becomes a shared problem
- Project fails when the problem of resource allocation falls too far to one side



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Responsibility for resource allocation

If developers shoulder the responsibility...

- May trade quality for additional features
- May only partially implement a feature
- May solely make decisions that should involve the business side

If the business shoulders the responsibility...

- Lengthy upfront requirements negotiation and signoff
- Features are progressively dropped as the deadline nears



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Imperfect schedules

- We cannot perfectly predict a software schedule
 - As users see the software, they come up with new ideas
 - Too many intangibles
 - Developers have a notoriously hard time estimating
- If we can't perfectly predict a schedule, we can't perfectly say what will be delivered



So what do we do?

We make decisions based on the information we have

...but do it often

Rather than making one all-encompassing set of decisions

...we spread decision-making across the project

This is where user stories come in



Today's agenda



- What stories are
- Users and user roles
- Gathering stories
- INVEST in good stories
- Why user stories



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Ron Jeffries' Three Cs

Card

- ✓ Stories are traditionally written on note cards.
- ✓ Cards may be annotated with estimates, notes, etc.

Conversation

- ✓ Details behind the story come out during conversations with product owner

Confirmation

- ✓ Acceptance tests confirm the story was coded correctly



Source: XP Magazine 8/30/01, Ron Jeffries.

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Samples from a travel website

As a user, I want to reserve a hotel room.

As a vacation planner, I want to see photos of the hotels.

As a user, I want to cancel a reservation.

As a frequent flier, I want to rebook a past trip, so that I save time booking trips I take



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Where are the details?

- As a user, I can cancel a reservation.
 - Does the user get a full or partial refund?
 - Is the refund to her credit card or is it site credit?
 - How far ahead must the reservation be cancelled?
 - Is that the same for all hotels?
 - For all site visitors? Can frequent travelers cancel later?
 - Is a confirmation provided to the user?
 - How?



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Details added in smaller sub-stories

As a user, I can cancel a reservation.

As a premium site member, I can cancel a reservation up to the last minute.

As a non-premium member, I can cancel up to 24 hours in advance.

As a site visitor, I am emailed a confirmation of any cancelled reservation.

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Details as conditions of satisfaction

- The product owner's conditions of satisfaction can be added to a story
 - These are essentially tests

As a user, I can cancel a reservation.

- Verify that a premium member can cancel the same day without a fee.
- Verify that a non-premium member is charged 10% for a same-day cancellation.
- Verify that an email confirmation is sent.
- Verify that the hotel is notified of any cancellation.

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- What stories are
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“The User”

- Many projects mistakenly assume there's only one user:
 - “The user”
- Write all stories from one user's perspective
- Assume all users have the same goals
- Leads to missing stories



Travel Site—Who's the user?

Frequent flyer who never knows where she'll be

Wants to schedule her family's annual vacation

Frequent flier who flies every week but always to the same place

A frequent flyer's assistant; books her reservations

Hotel chain Vice President; wants to monitor reservations



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User roles

- Broaden the scope from looking at one user
- Allows users to vary by
 - What they use the software for
 - How they use the software
 - Background
 - Familiarity with the software / computers
- Used extensively in usage-centered design

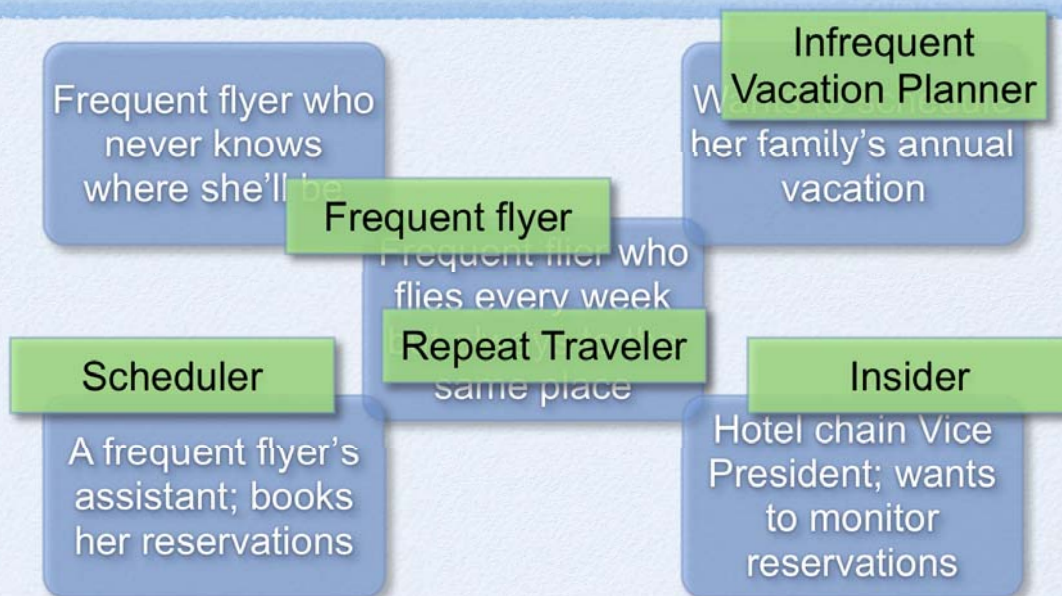


Source: *Software for Use* by Constantine and Lockwood (1999).

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Common attributes



User role brainstorming

- Brainstorming meeting
 - Customer, developers, anyone who understands a product's intended users
- Everyone grabs a stack of cards
- Write role names on cards
 - As fast as possible and with no judgment
 - No turns
 - Place card on table
 - Call out role name as you place it



User role brainstorming



We've been hired by fBay to create "the best new web auction site since eBay."

- Brainstorm the user roles who will interact with this site.



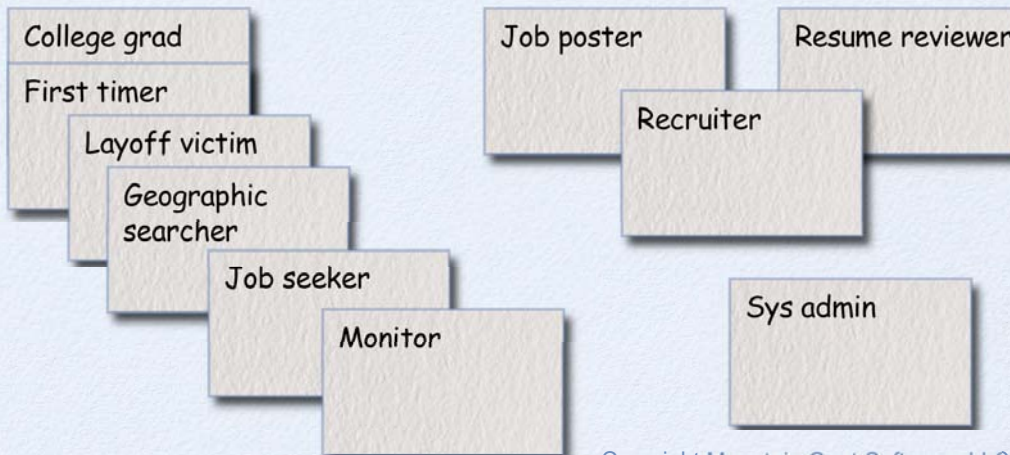
User role modeling steps

- Brainstorm an initial set of user roles
- Organize the initial set
- Consolidate roles
- Refine roles



Organize the initial set

- Arrange cards spatially to indicate overlapping and similar roles
 - Use any arrangement rules you want



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Consolidate roles

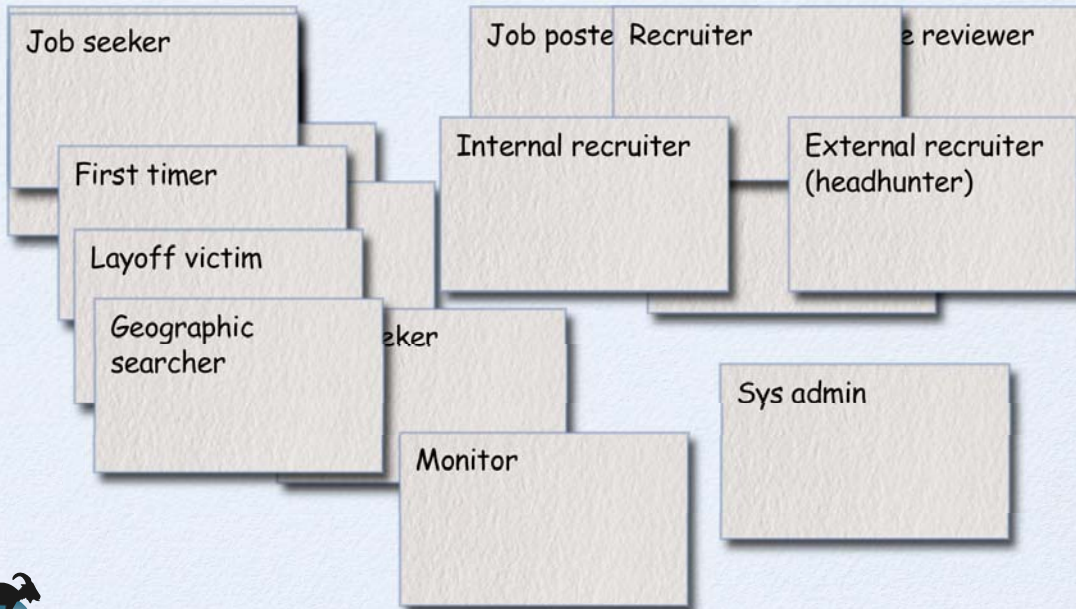
- Discuss what is meant by each card
- Arrange cards spatially to indicate overlapping and similar roles
 - Use any arrangement rules you want
- Look for cards to
 - Combine
 - Replace with a more generic/different card
- Eliminate cards that are unimportant to the success of the product

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Consolidating—an example



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Organize and consolidate



- Organize your initial set of user roles for fBay.
- Consolidate the user roles.

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User role attributes

Identify attributes that distinguish one user role from another

How often the software will be used

Level of domain expertise

General level of computer proficiency

Level of proficiency with this software

General goals for using the software



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Document the user role

Infrequent Vacation Planner

Not particularly computer-savvy but quite adept at using the web. Will use the software infrequently but intensely (perhaps 5 hours to research and plan a trip). Values richness of experience (lots of content) over speed. But, software must be easy to learn and also easily recalled months later.



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Advantages of using roles

Users become tangible

Start thinking of software as solving needs of real people.

Avoid saying "the user"

Instead we talk about "a frequent flier" or "a repeat traveler"

Incorporate roles into stories

"As a <user role>, I want to <goal> so that <benefit>."



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Techniques for gathering stories

Questionnaires

Observation

User Interviews

Story-writing
workshops



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Questionnaires

- Good technique for learning more about stories you already have
- If you have a large user base, great way to get information to help prioritize stories
- Not effective as a primary means of trawling for new stories



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Observation

- Great way to pick up insights
- Two approaches
 - Just observe, with or without user's knowledge
 - Have the user demonstrate to a group how she uses the software



Observation example

- Stated need:
 - “We need a large text field to summarize.”
- Observed need:
 - Have the system record the user's choices



Interviews

- Default approach taken by many teams
- Selection of interviewees is critical
 - Try to interview as many user roles as possible
- Cannot just ask “So whaddaya want?”
 - Most users are not adept at understanding their true needs



Context matters

“My wife and I
split up...”



“He’s no longer
with us...”



My context isn't your context

"Dad, make it warmer."



You hear

"Increase the temperature."

He meant

"Move the temperature closer to what we call warm."



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A horrible question

"Would you like it in a browser?"

"Of course, now that you mention it!"

- A problem:
 - The question is closed
 - {Yes | No}



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We can do better

“What would you think of having this app in a browser rather than as a native Windows application, even if it means reduced performance, a poorer overall user experience, and less interactivity?”

- It's open
 - Full range of answers
- But it has too much context



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The best way to ask

“What would you be willing to give up in order to have it in a browser?”

- We want to ask questions that are
 - Open-ended
 - Context-free



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It's my problem, I know the solution

- Having a problem does not uniquely qualify you to solve it
- “It hurts when I go like this...”



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We need to stop asking users

- Since users don't know how to solve their problems, we need to stop *asking*
- We need to *involve* them instead

Empirical
design

- Designers of the new system make decisions by studying prospective users in typical situations

Participatory
design

- The users of the system become part of the team designing the behavior of the system



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Story-writing workshops

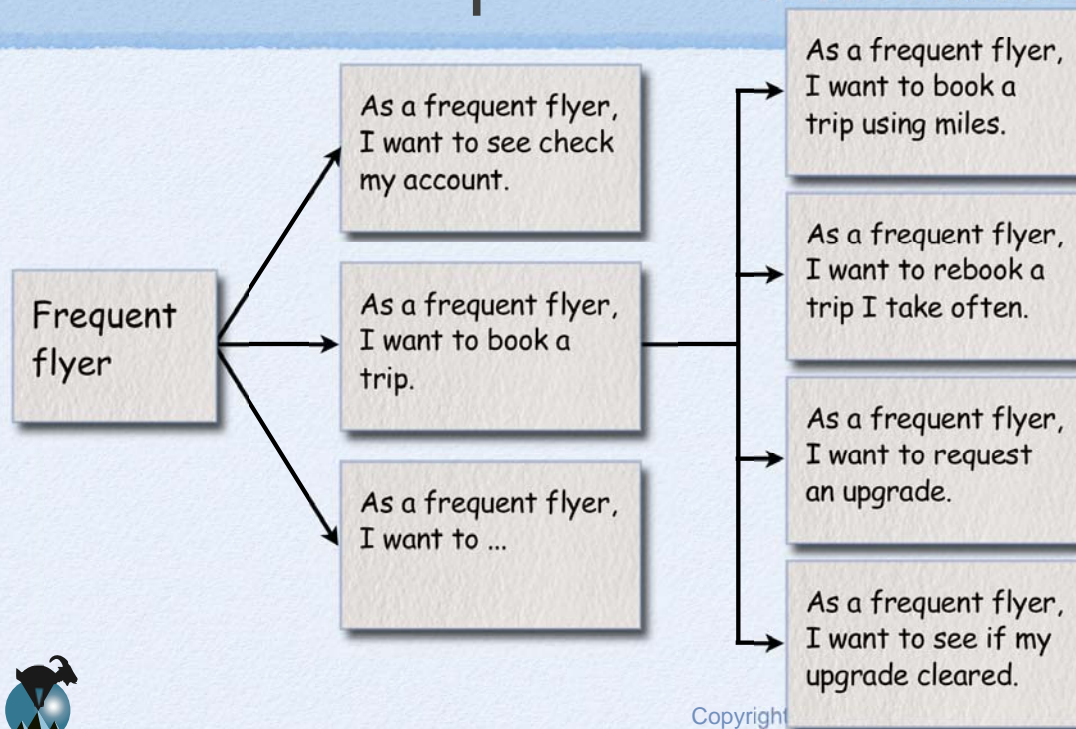
- Includes developers, users, customer, others
- Brainstorm to generate stories
- Goal is to write as many stories as possible
 - Some will be “implementation ready”
 - Others will be “epics”
- No prioritization at this point



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Start with epics and iterate



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A story-writing workshop



Write some user stories for fBay based on the roles you identified.

Tip: try this template:
“As a <user role>, I want <goal>
so that <reason>.”



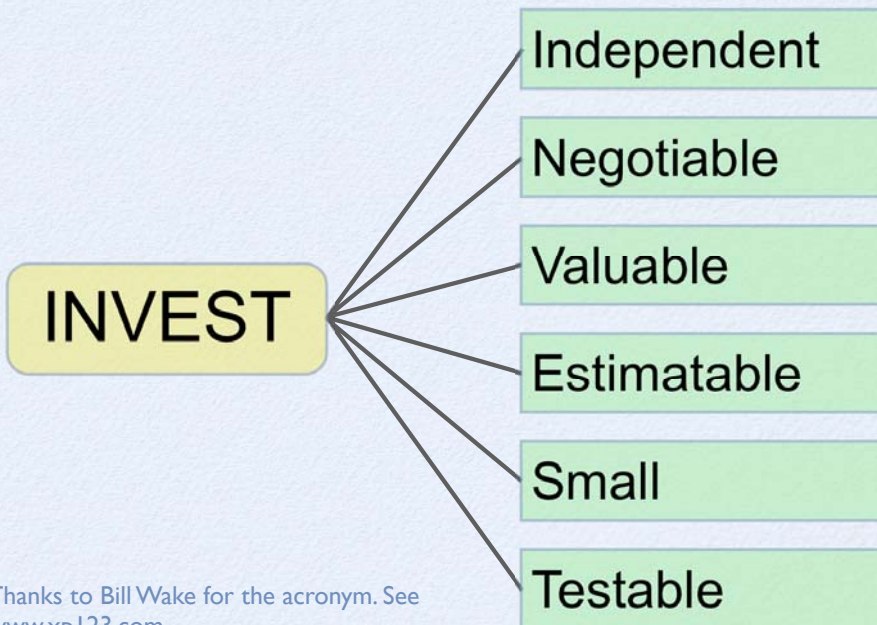
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What makes a good story?



Thanks to Bill Wake for the acronym. See www.xp123.com.

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Independent

- Avoid introducing dependencies
 - Leads to difficulty prioritizing and planning

As a recruiter, I can pay to post a job opening with a Visa.

As a recruiter, I can pay to post a job opening with a MasterCard.

As a recruiter, I can pay to post a job opening with an American Express.

- First story will take 3 days to develop
- It doesn't matter which is first
- Others will each take 1 day



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Making stories independent

Combine the stories

- As a customer, I can pay with a credit card.

Split across a different dimension

- As a customer, I can pay with one type of credit card.
- As a customer, I can pay with any of three types of credit cards.

Write two estimates and move on

- 3 days if done first; 1 otherwise



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Another example

As a user, I can search for a hotel on fields such as hotel brand, quality rating, availability on specific dates, proximity to an attraction (airport, amusement park, etc.), and more.

As a user, I can do an advanced search for a hotel on 2-3 of these fields.

Possible fields: hotel brand, quality rating, availability on specific dates, proximity to an attraction, etc.

As a user, I can search for a hotel on additional fields.

Possible fields: hotel brand, quality rating, availability on specific dates, proximity to an attraction, etc.



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Negotiable

- Stories are not
 - Written contracts
 - Requirements the software must fulfill
- Do not need to include all details
- Too many details give the impressions of
 - false precision or completeness
 - that there's no need to talk further
- Need some flexibility so that we can adjust how much of the story gets implemented
 - If the card is contract then it needs to be estimated like a contract



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Is this story negotiable?

Print dialog allows the user to edit the printer list. The user can add or remove printers from the printer list. The user can add printers either by auto-search or manually specifying the printer DNS name or IP address. An advanced search option also allows the user to restrict his search within specified IP addresses and subnet range.



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Valuable

- Stories must be valuable to either:

Users

- As a user, I can search for a job by title and salary range.

Customers

- As the sponsor of this project, I want it to pass an ISO 9001 audit.
- As a sponsor of this project, I want it to produce documentation in compliance with CMMI level 3.
- As a system administrator, I want all configuration information for all users stored in a central location.



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Stories valued by developers

- Should be rewritten to show the benefit

All connections to the database are through a connection pool.

As a purchaser of this system, I want it usable by 50 users with a five-user database license.

All error handling and logging is done through a set of common classes.

As a user, I want all errors presented and logged in a consistent manner.



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Estimatable

- Because stories are used in planning
- A story may not be estimatable if

Developers lack domain knowledge

As a new user, I am given a diabetic screening.

Developers lack technical knowledge

As any user, I can zoom in on a map without delay.

The story is too big

As a job seeker, I can find a job.



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Small

- Large stories (epics) are
 - Hard to estimate
 - Hard to plan
 - Won't fit in a single iteration
- Two types of large story
 - Complex story
 - Compound story



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Complex stories

- A story that is inherently large and cannot easily be disaggregated into constituent stories
- Very rare
- Some stories look complex because we don't know enough
- Use a *spike* in those situations
 - First iteration: acquire knowledge
 - Second iteration: do the work



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Compound stories

- An epic that comprises multiple shorter stories
- Often hide a great number of assumptions

As a job seeker, I can post my resume.

- A resume includes multiple sections (education, job history, salary history, publications, etc.).
- Resumes can be inactive or active.
- A user can have multiple resumes.
- A user can edit a resume.
- A user can delete her resume.



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Splitting a compound story

Split along operational boundaries (CRUD)

- As a job seeker, I can create a new resume.
- As a job seeker, I can edit a resume.
- As a job seeker, I can delete a resume.
- As a job seeker, I can have multiple resumes.
- As a job seeker, I can activate and



Splitting a compound story

Split along data boundaries

- As a job seeker, I can add and update educational information.
- As a job seeker, I can add and update my job history.
- As a job seeker, I can add and edit salary history on a resume.
- As a job seeker, I can delete a resume.
- As a job seeker, I can have multiple resumes.
- As a job seeker, I can activate and inactivate resumes.



More advice on splitting stories

Remove cross-cutting concerns

Don't meet performance targets

Avoid splitting stories into tasks



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Testable

- Tests demonstrate that a story meets the customer's expectations
- Automate, automate, automate

A user must find the software easy to use.

As a novice user, I am able to complete common workflows without training.

A user must never have to wait long for a screen to appear.

As a user, I want to see new screens within 2 seconds 95% of the time.



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Improving your stories



- 1) Assess the stories you've written for fBay against the INVEST attributes.
- 2) Rewrite those that do not meet these criteria.
- 3) If you can't figure out how to rewrite a story, save it for class discussion.

Independent
Negotiable
Valuable

Estimatable
Small
Testable



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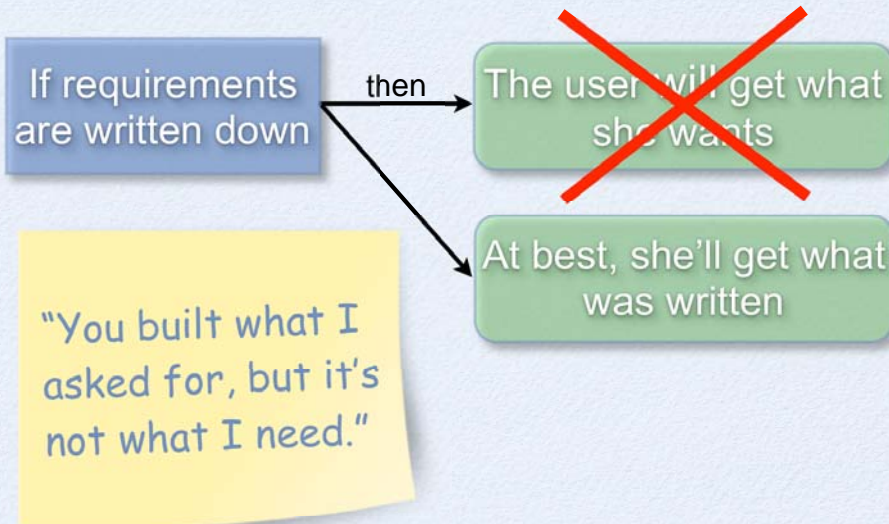


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So, why user stories?

- Shift focus from writing to talking



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Words are imprecise

Entrée comes with
soup or salad and bread.

- (Soup or Salad) and Bread
- (Soup) or (Salad and Bread)

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Examples

The user can enter a name. It can be 127 characters.

- Must the user enter a name?
- Can it be other than 127 chars?

The system should prominently display a warning message whenever the user enters invalid data.

- What does *should* mean?
- What does *prominently display* mean?
- Is *invalid data* defined elsewhere?



What are we building?

We often start design based on the first specifications we encounter

1. The product shall have a gas engine.
2. The product shall have four wheels.
 - 2.1. The product shall have a rubber tire mounted to each wheel.
3. The product shall have a steering wheel.
4. The product shall have a steel body.

Source: Adapted from *The Inmates are Running the Asylum* by Alan Cooper (1999).



What if we had stories instead?

As a user, I want to mow my lawn quickly and easily.

As a user, I want to be comfortable while mowing my lawn.



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Additional reasons

- Stories are comprehensible
 - Developers and customers understand them
 - People are better able to remember events if they are organized into stories[†]
- Stories are the right size for planning
- Support and encourage iterative development
 - Can easily start with epics and disaggregate closer to development time



[†]Bower, Black, and Turner. 1979. *Scripts in Memory for Text*.

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Yet more reasons

- Stories support opportunistic development
 - We design solutions by moving opportunistically between top-down and bottom-up approaches†
- Stories support participatory design
 - Participatory design
 - The users of the system become part of the team designing the behavior of the system
 - Empirical design
 - Designers of the new system make decisions by studying prospective users in typical situations

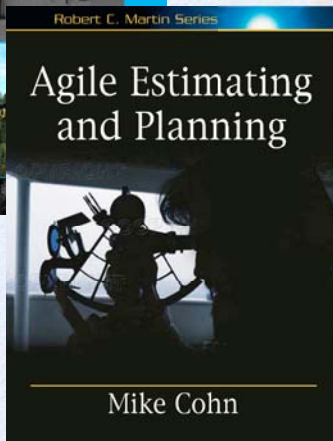


†Guindon. 1990. Designing the Design Process.

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