




Modeling and Prototyping

May 20, 2016



Others Talk,
We Listen.

2 Course Objectives

Today we will cover the basics of modeling and prototyping. By the end of the hour, we will:



- Understand why visualizations are an important part of requirements gathering
- Have a basic understanding of the different ways to visualize requirements
- Identify opportunities during a project where visualizations can create the biggest impact

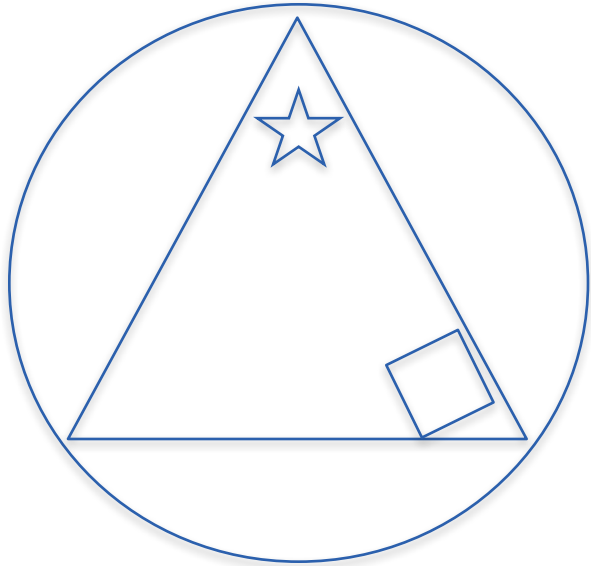
3 Activity 1

Individual Activity - Draw a picture based on the following requirements:

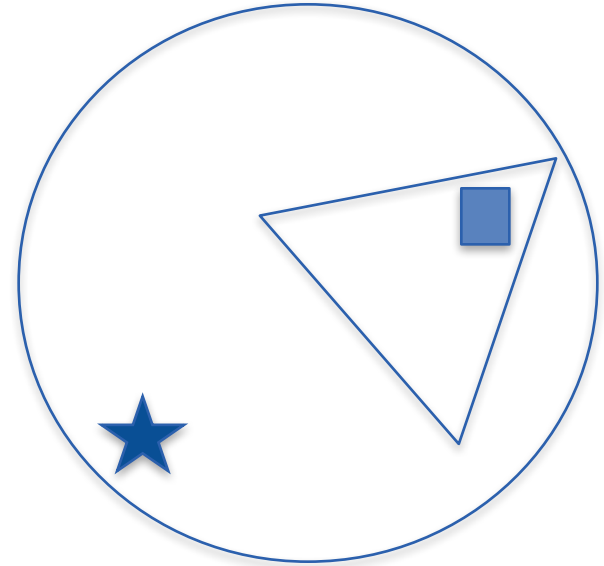
- Draw a circle
- Draw a triangle inside the circle
- Draw a star inside the circle and do not let it touch the border of the triangle
- Draw a square in the right-most corner of the triangle

4 Did we meet the stakeholder's expectation?

What the stakeholder wanted...



What we built...



5 Why use visualizations?

Visualizations improve communication and collaboration:



- Focuses discussions and brainstorming
- Aids in setting context (people, places, environmental factors) for a demonstration or discussion
- Avoid semantic arguments among stakeholders
- Speeds onboarding of new team members

6 Why use visualizations?

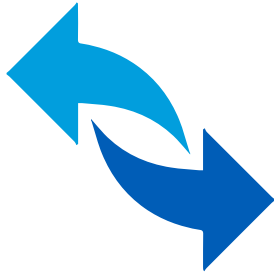
Visualizations help discover additional requirements:



- Helps to identify gaps or pain points in the current process
- Easily find flaws or gaps in a proposed process
- Sparks conversations with stakeholders that would not have happened otherwise

7 Why use visualizations?

Visualizations help gauge feasibility while reducing waste:

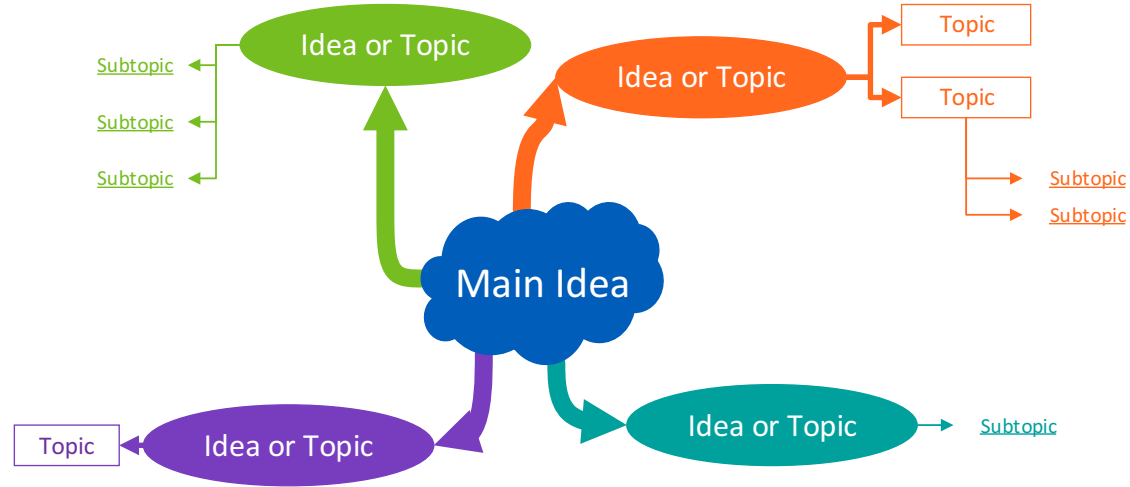


- Allows you to fail cheaply and catch mistakes earlier
- Increases level of effort estimate accuracy
- Reduces requests for clarification
- Prevents nonessential features from being built

8 Mind Maps

A Mind Map contains a central node for the project or product under discussion and a branch for each high-level area of exploration.

Ideas, concerns, and feature requests can be captured and linked back to each branch.



9 Mind Maps

Uses in requirements elicitation:

- Help stakeholders communicate how certain ideas fit together
- Focus group brainstorming
- Identify closely related subjects or processes across different departments
- Start identifying possible categories for information architecture or to inform card sort activities

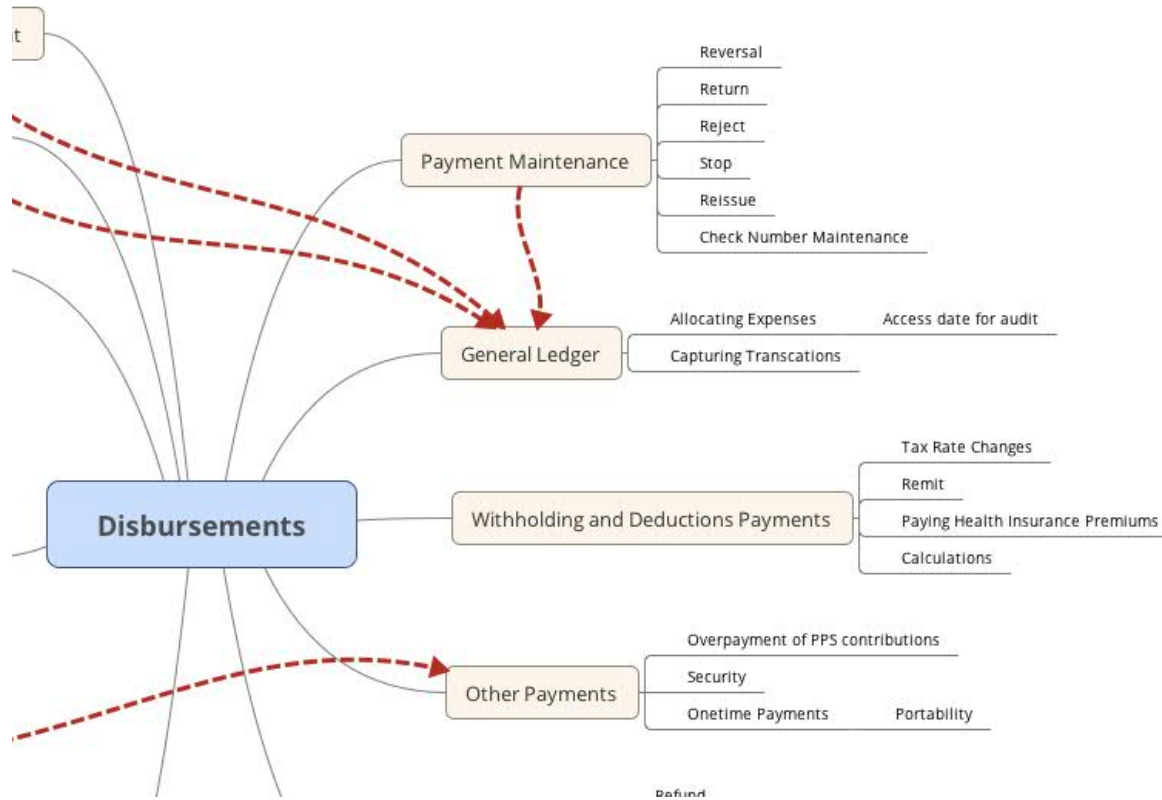
10 Mind Map Tools

There are many diagramming tools available and which tool you select will depend on the need of the project. These tools include:



- Whiteboards
- Pen and paper
- Visio
- Online tools such as Novamind, Xmind, Coggle, or LucidChart

11 Mind Map Example



12 Activity 2

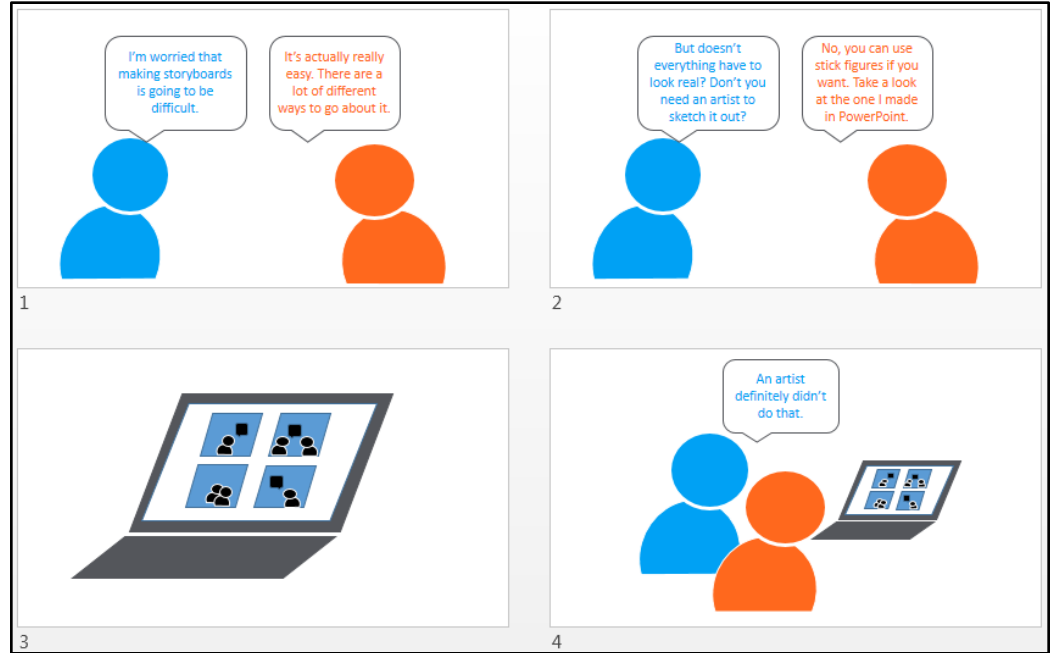
Small Group Activity – Create a mind map about "Enjoying This Weekend"



13 Storyboards

The storyboard is a tool which uses illustrations to communicate a scene or process.

Aid in storytelling, which is an effective means of persuasion.



14 Storyboards

Uses in requirements elicitation:

- When you want to keep conversations focused on people and their goals instead of getting bogged down in the details of a process
- You need to set the context (people, places, environmental factors) for a demonstration.
- Helps to communicate the severity of gaps or pain points in the current experience
- Can provide you insights into the motivations of users which can inform process changes.
- Put a human face on analytic data helping decision makers empathize with users.

15 Storyboarding Tools

There are many diagramming tools available and which tool you select will depend on the need of the project. These tools include:



- Whiteboards
- Pen and paper
- PowerPoint
- Online storyboarding tools such as <http://www.storyboardthat.com/>
- Diagramming tools such as Visio, LucidChart, Novamind, or Coggle

16 Activity 3

Small Group Activity – We've already thought about “coffee”, so...

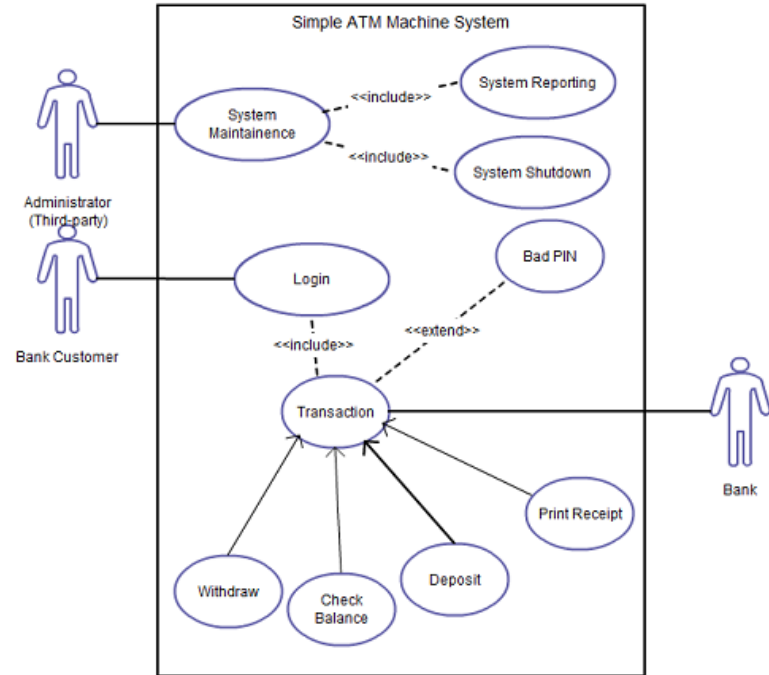
Draw a simple storyboard of how people get a drink at Starbucks.

17 Use Case Diagrams

Use Case Diagrams identify the functions of a system and how different roles interact with those functions.

Common symbols:

- Actors
- Use Case
- Relationship
- System Boundary Box
- Package



Source: <http://creately.com/blog/wp-content/uploads/2012/01/Use-Case-Diagram.png>

18 Use Case Diagrams

Uses in requirements elicitation:

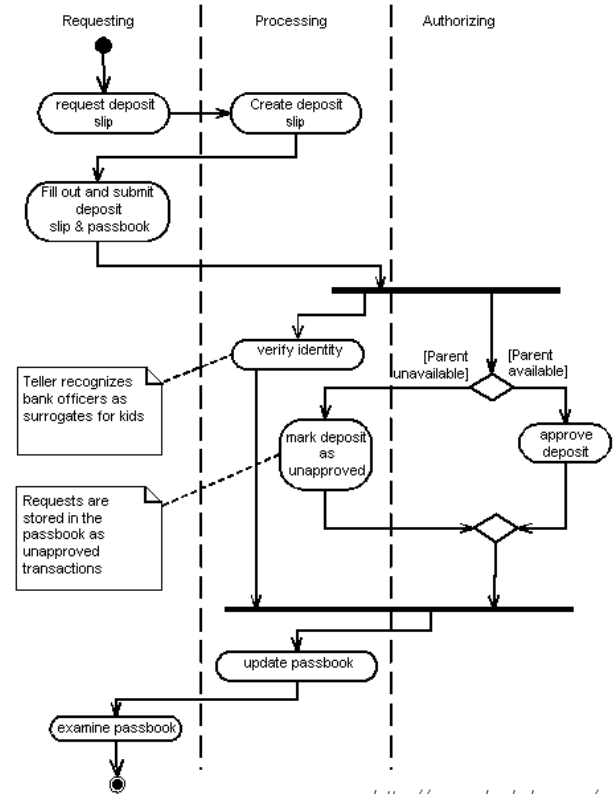
- Present a high level view of the system
- Communicate what actors are present and where they interact with the system
- Describe the basic requirements of the system
- Aids in the organization of use case documents

19 Activity Diagrams

Activity Diagrams are detailed representations of steps and decisions that people and systems make in a process.

They have a beginning and ending with clearly defined inputs and outputs.

Can use Unified Modeling Language (UML) as a common language for creating these diagrams.



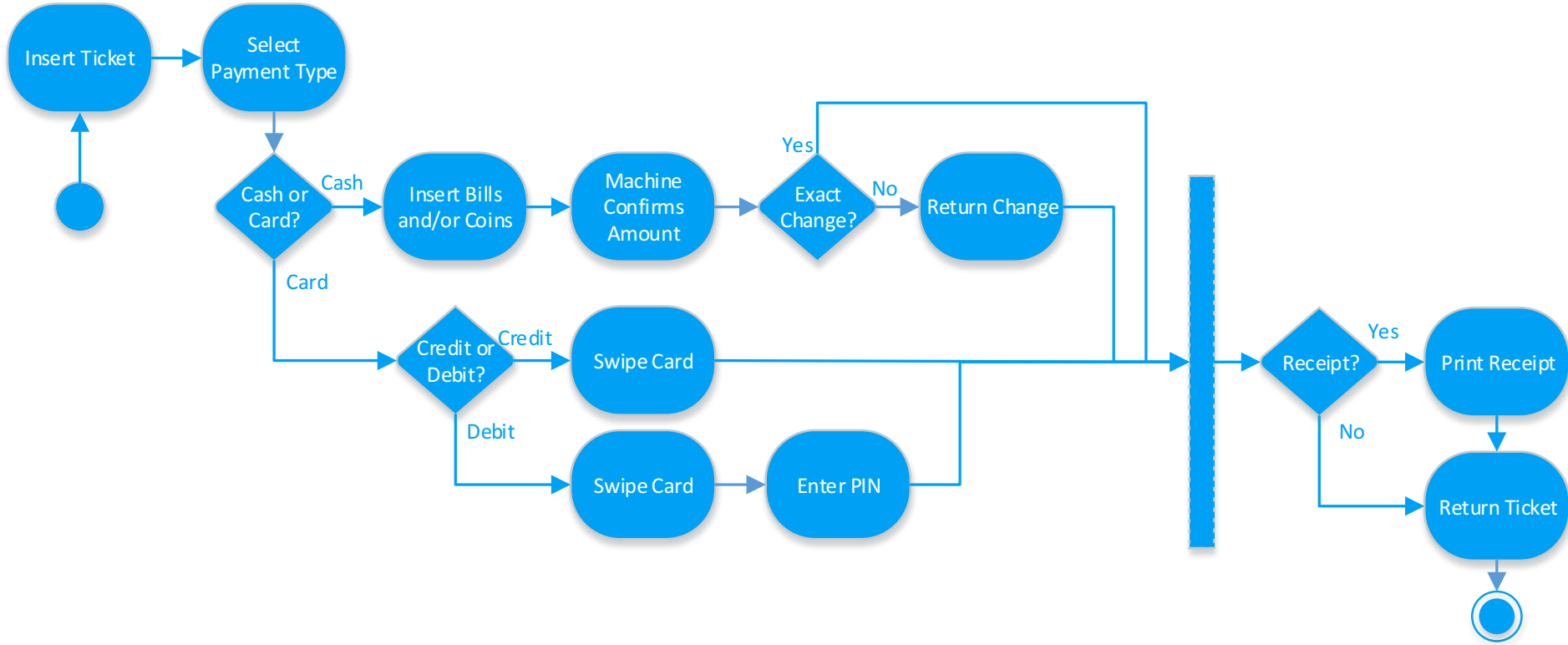
<http://www.holub.com/goodies/uml/>

20 Activity Diagrams

Uses in requirements elicitation

- Easily find flaws or gaps in a process
- Show concurrent, alternative and conditional threads in a workflow.
- Illustrate the workflow of events in a use case. You can describe how a business use case is realized by business workers and
- Helps to identify gaps or points in the current experience that are disjointed or painful such as the handoff of info between departments

21 Activity Diagram Example

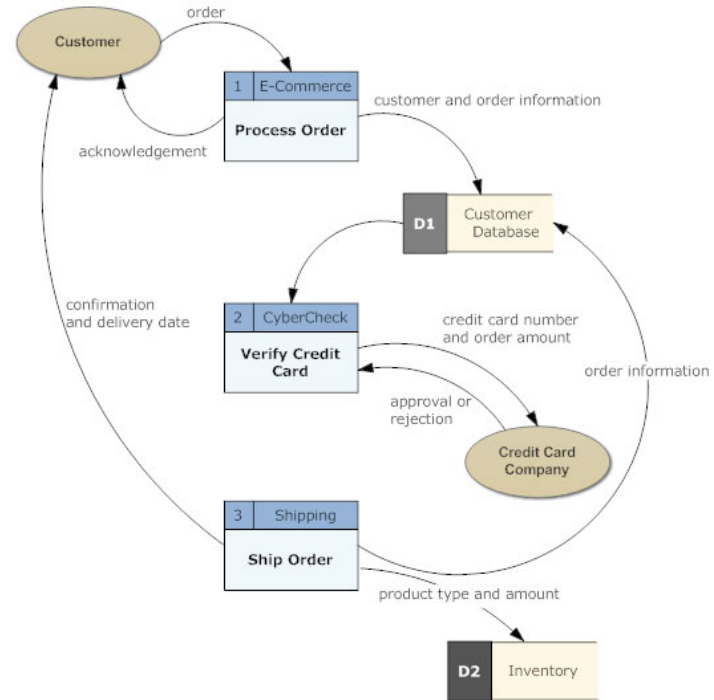


22 Data Flow Diagram

Data Flow Diagrams help fill the gap between how users see the real world and how they are represented in a database.

This diagram does NOT describe sequencing. It describes what objects contain data and how data flows between those objects.

Data Flow Diagram - Online Order System



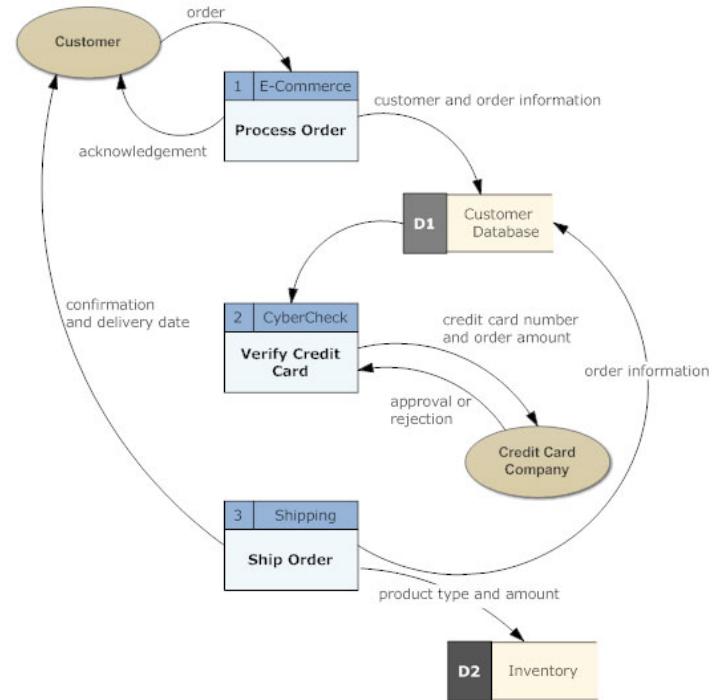
<http://www.smartdraw.com/data-flow-diagram/>

23 Data Flow Diagram

Data Flow Diagram components:

- Process
- Data Flow
- Data Store
- External Entity

Data Flow Diagram - Online Order System



<http://www.smartdraw.com/data-flow-diagram/>

24 Data Flow Diagram

Uses in requirements elicitation:

- Trying to understand how data moves and is transformed in a system and what triggers these actions
- Help explore a new high-level design in terms of data flow
- Provide users with an idea of how the data they input ultimately impacts the system and other users.



| Wireframes and Prototypes

| Others Talk,
We Listen.

26 Wireframe and Prototyping Tools

There are lots of wireframe and prototyping tools you can use depending on the fidelity you're going for:

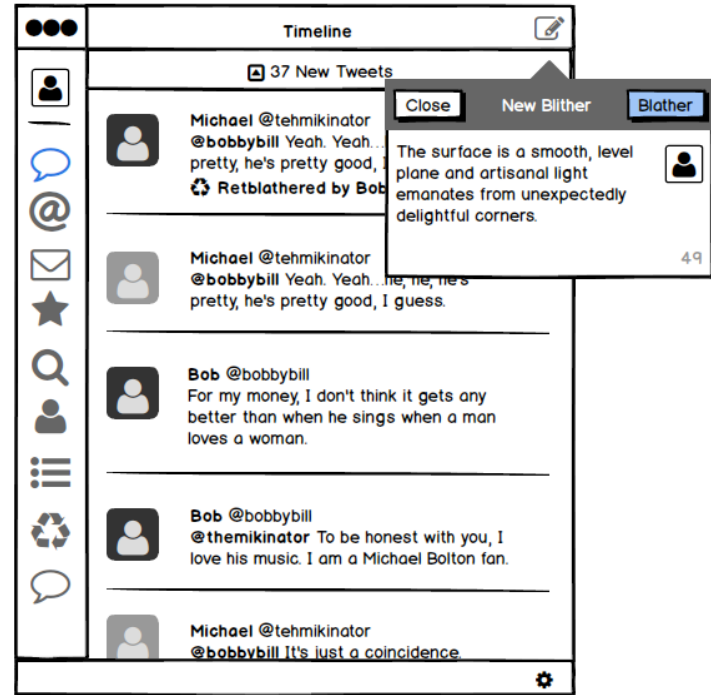


- Paper or cardboard
- PowerPoint / Visio / Keynote
- Balsamiq
- Axure
- HTML/CSS

27 Wireframes

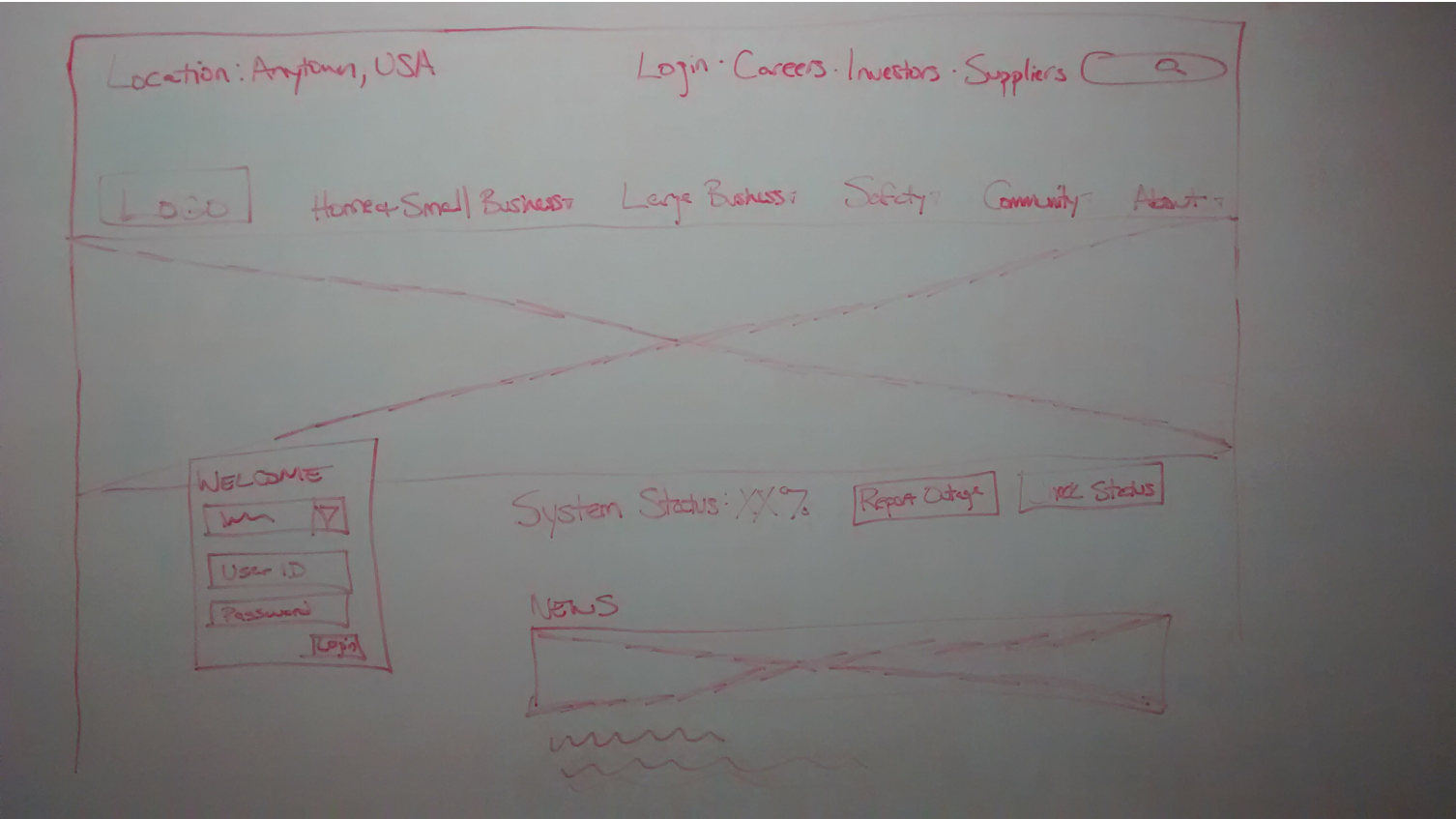
Wireframes are *static* layouts of a screen with a primary focus on what the screen does, not what it looks like.

Wireframes help describe the what, when, and how of certain information or functions available on a screen.

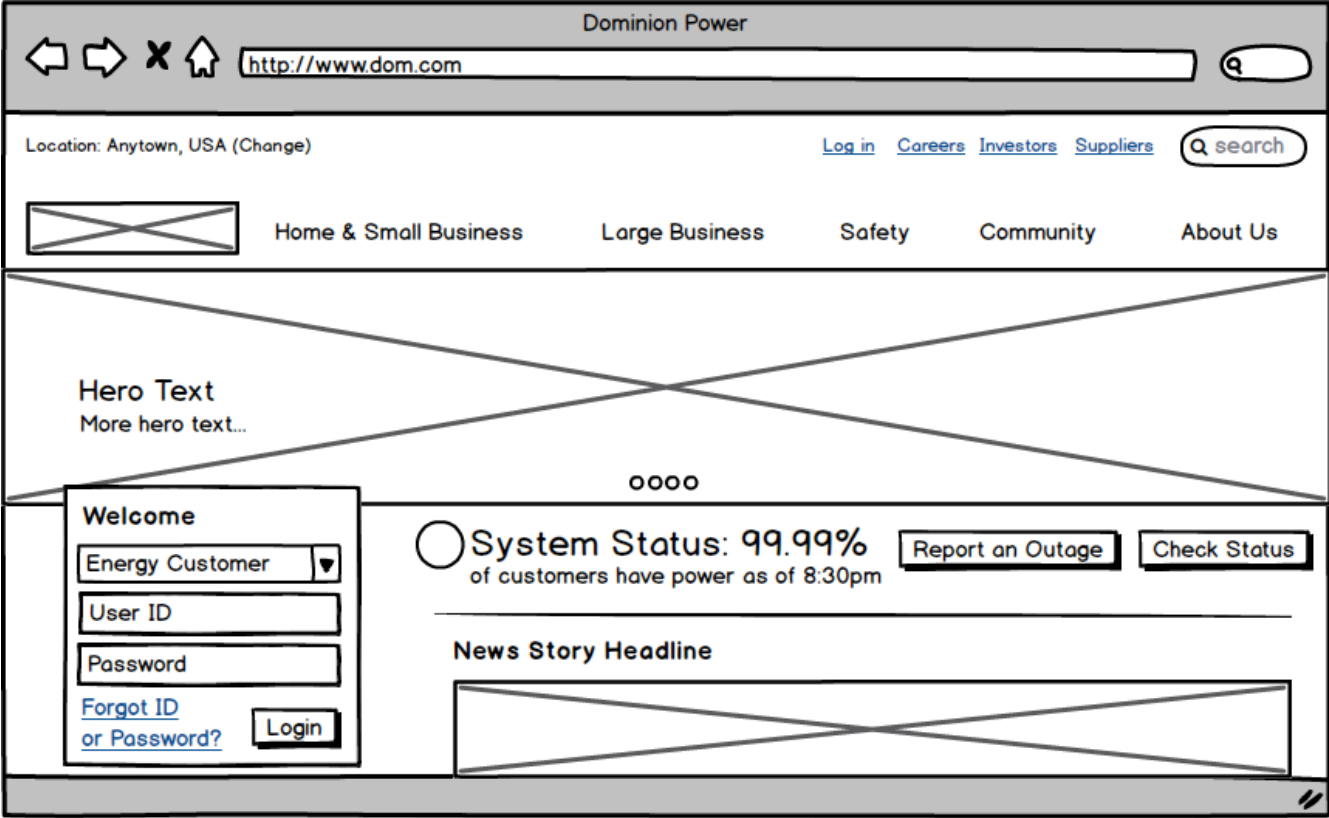


<https://balsamiq.com/products/mockups/>

28 Wireframe example: Whiteboard

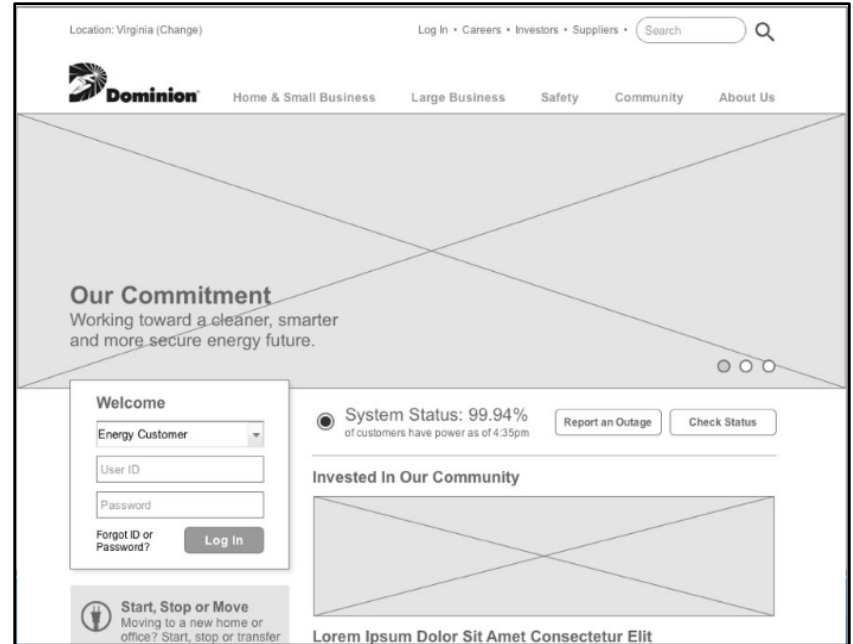


29 Wireframe example: Balsamiq



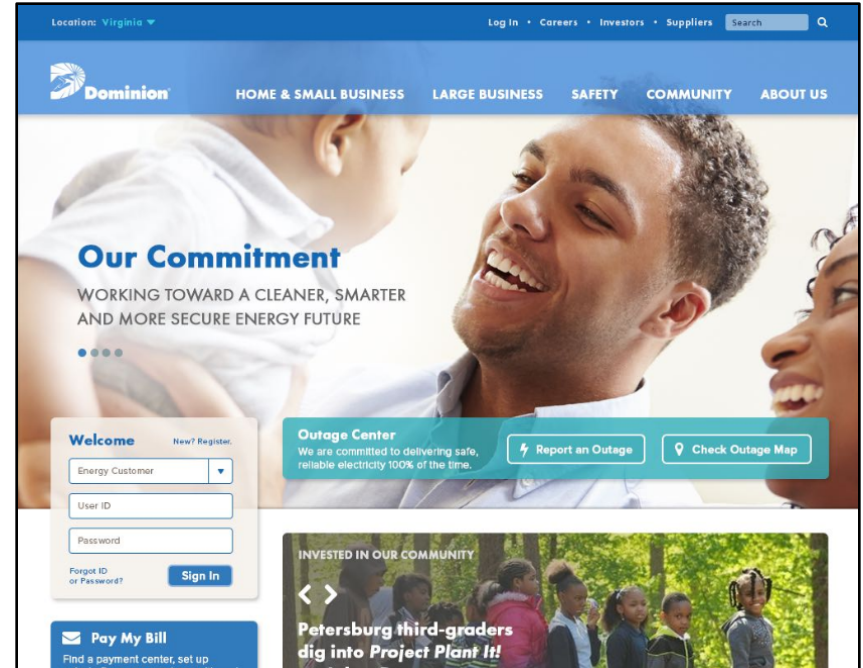
30 Wireframe example: Axure

This wireframe was created as an early artifact to communicate both the design direction and functionality that would be present on the homepage.



31 Example: Dom.com

After confirming the direction with the client, a high-fidelity wireframe was developed for approval which were used to guide the development of the site.



32 Prototypes

Prototypes are *interactive* representations of the end product which are capable of representing multiple states of the application.

If wireframes are the blueprints of a house, prototypes are the model home.



<http://www.axure.com/features>

33 Think of prototypes like cake

Some prototypes are thin slices of working functionality

Other prototypes are the user experience without an application or data layer (aka the frosting)



34 Wireframes and Prototypes

Uses in requirements elicitation:

- Generate “yes, but” conversations which elicits information stakeholders don’t think of until they see what an application might look like
- Prompt stakeholders for feedback that focuses on high-level concepts rather than execution
- Allows you to test usability earlier
- Aids in communication because prototypes are easier to understand than documentation
- Decreases the number clarification requests
 - Stakeholders are able to answer their own “what if” questions by using the prototype

35 Review

Using diagrams, wireframes, and prototypes make requirements gathering easier by:

- Increasing opportunities and quality of communication and collaboration
- Helping uncover additional requirements prompted by detailed visualizations
- Identifying gaps or pain points in a proposed process
- Gauging feasibility of a proposed solution before committing resources to develop

36 Review

These techniques are not tied to specific methodologies. Instead you should choose to use these techniques and tools based on your specific situation:



- What is the goal of the activity?
- What deliverables have been agreed upon with the client?
- Is the technique appropriate for the audience?
- What stakeholders are available?
- How much time is there?