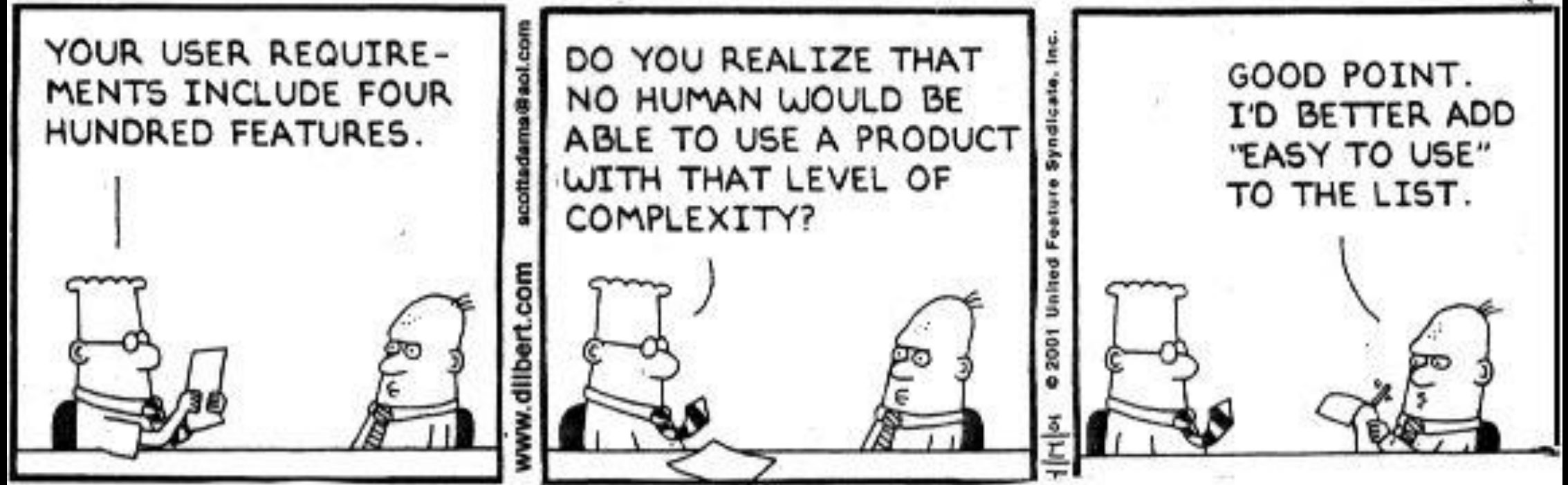


# User Interface Design

**DILBERT** by Scott Adams



# UI Design: Wednesday Aug 24 (Day 2)

- Dr. Jillian Aurisano
- Plan for today:
  - Reminders, course logistics
  - A bit more about design
  - Usability

# Course logistics

- Homework:
  - Everyone found it?
  - Questions?
- Syllabus:
  - Questions?
- Student hours:
  - Details TBD : I am going to try to find a room and a good time
    - I like having an opportunity to discuss and debug things together
    - Also a time for you to meet with me one on one

# Big picture: What is the ultimate goal in designing things

- (in our case- designing user interfaces to computer systems)

“Ultimately, we are deluding ourselves if we think that the products that we design are the "things" that we sell, rather than the individual, social and cultural experience that they engender, and the value and impact that they have. Design that ignores this is not worthy of the name”.

— *Bill Buxton*

-----> “User experience”

# Remember this.... (Sage2)



# When I started graduate school.... Sage



- Earlier version
- My experience with it. ....

# But....

- I went to try to get people at a company (not my lab) to use it, while I did an internship
  - STRUGGLE!!!
  - Couldn't figure out how to use it
  - Ran into little errors that discouraged them from continuing to use it
  - Had to install new software, multi-step installation -> barrier
- Eventually, my experience helped us build a new version with a more usable interface
- Lesson: Usability is a key component of building things that enable these amazing experiences with a computer system

# Take-away

- User experience is downstream of usability
  - It if isn't easy to use, no matter how great the experience is eventually (or for certain users), it won't get used.
- Usability is a key component of building things that enable these amazing experiences with a computer system
- So, let's start with Usability!



# What is usability?

- Usability is an attribute that assesses how easy user interfaces are to use

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- Usability is an attribute that assesses how easy user interfaces are to use



Let's dig in....

# Even designers at Apple, can make less than fully usable designs

- Facetime design iteration a few years ago
- Problem arose with the 'flip camera' button
- What might go wrong?



# Even designers at Apple, can make less than fully usable designs

- What might go wrong?
  - No immediate feedback on the action (camera blocked)
  - What is the 'X' button? Close the menu? End the call? Confusing and too easy to initiate an action you didn't intend
- Designers at apple did this- why is it so hard to make a good design?



# Why is UI design hard?

- Why can't we just make good designs?

# Why is UI design hard?

- You are not the user
- Most software engineering is about communicating with other programmers, who may be a lot like you
- UI is about communicating with the users who are NOT like you
- User's are not designers. They may not be able to tell you what is wrong.
  - They know they are frustrated
  - They know they can't accomplish their tasks.
  - But, we can't expect them to diagnose the problem

# Temptation: blame the user

- You are the engineer, you know the requirements you were targeting, the features you wanted to enable
- If users can't use the UI, they must be.... (slow, lazy, inefficient...)
- I certainly had this temptation when I worked on Sage

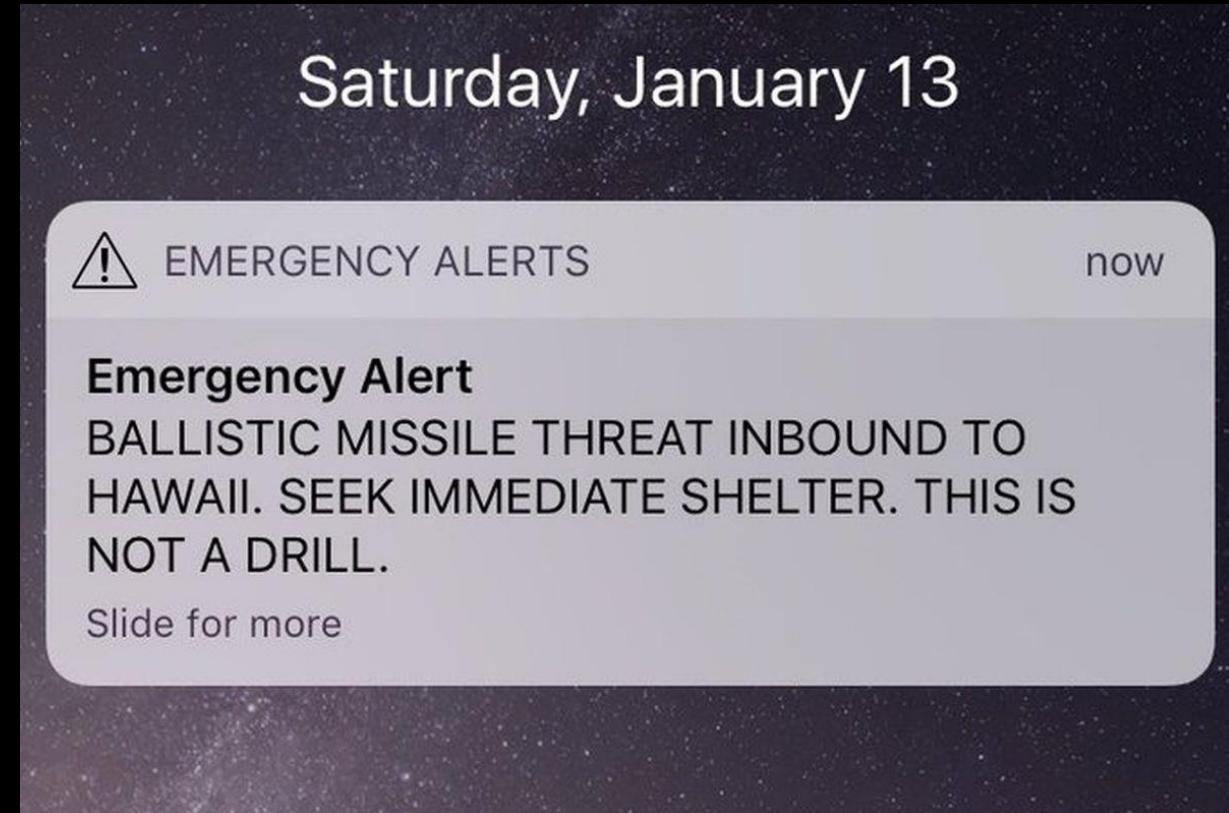
# Temptation: blame the user

- You are the engineer, you know the requirements you were targeting, the features you wanted to enable
- If users can't use the UI, they must be....
- The user is ALWAYS right- usability problems are the design's fault



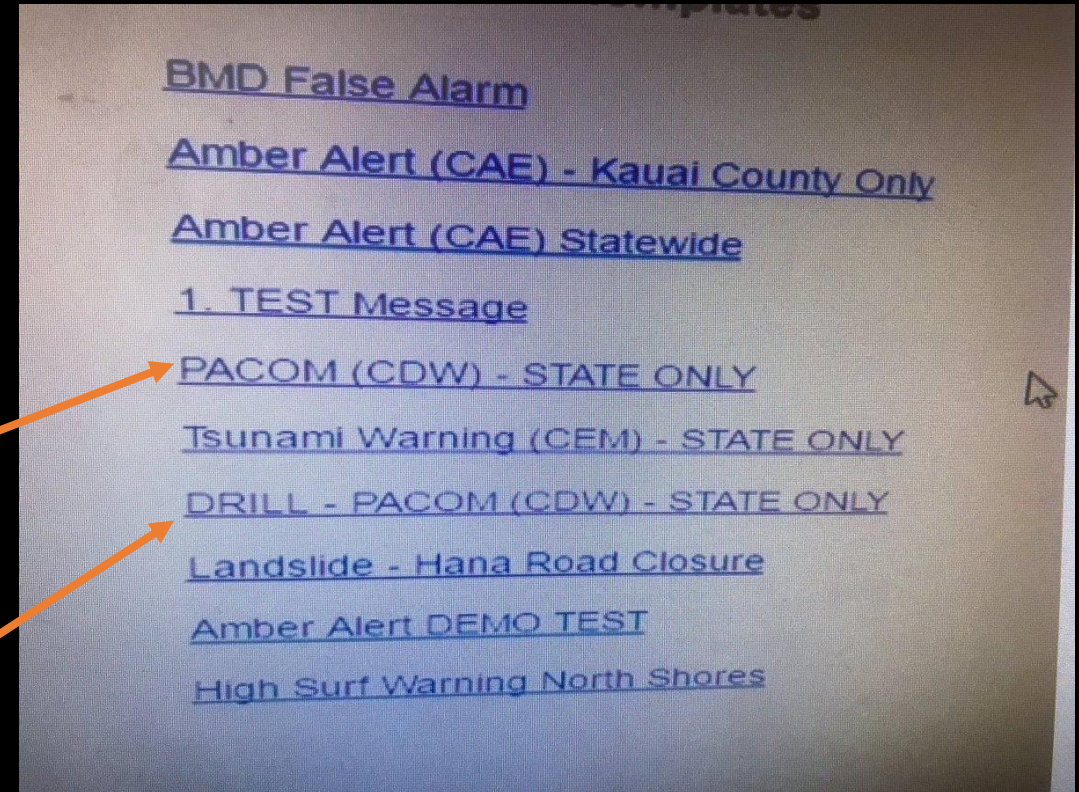
# Hawaii Ballistic Missile Threat example

- <https://www.fastcompany.com/90157153/don-norman-what-went-wrong-in-hawaii-human-error-nope-bad-design>
- Human error or bad design?
- “An employee pushed the wrong button” Governor David Ige
- A person does something wrong so must mean we need....
  - Fire the person who made the mistake
  - Require more training
  - Require higher standards in hiring



# Hawaii Ballistic Missile Threat example

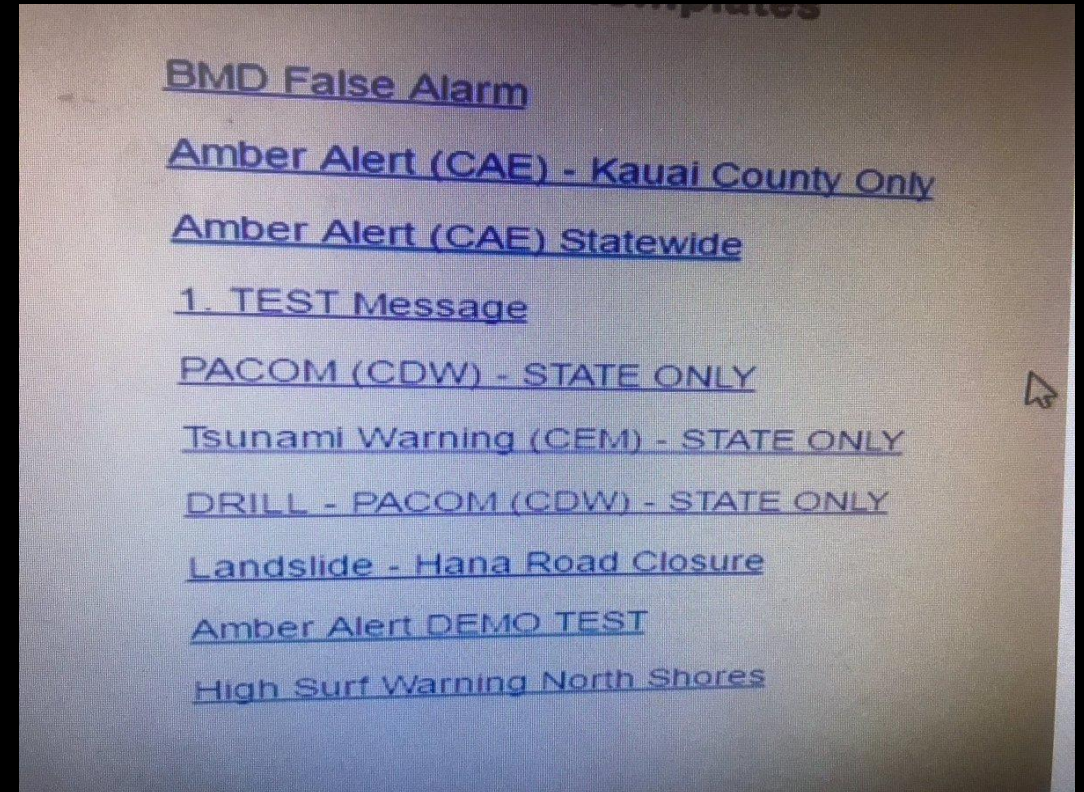
- But what is the **root cause** of the human error?
- Poor design
- The system is tested 2x's a day, person doing the test selects from the list
  - They selected:
  - They were supposed to select:
- Let's fix it!!
  - Take a minute and brainstorm ways to fix it



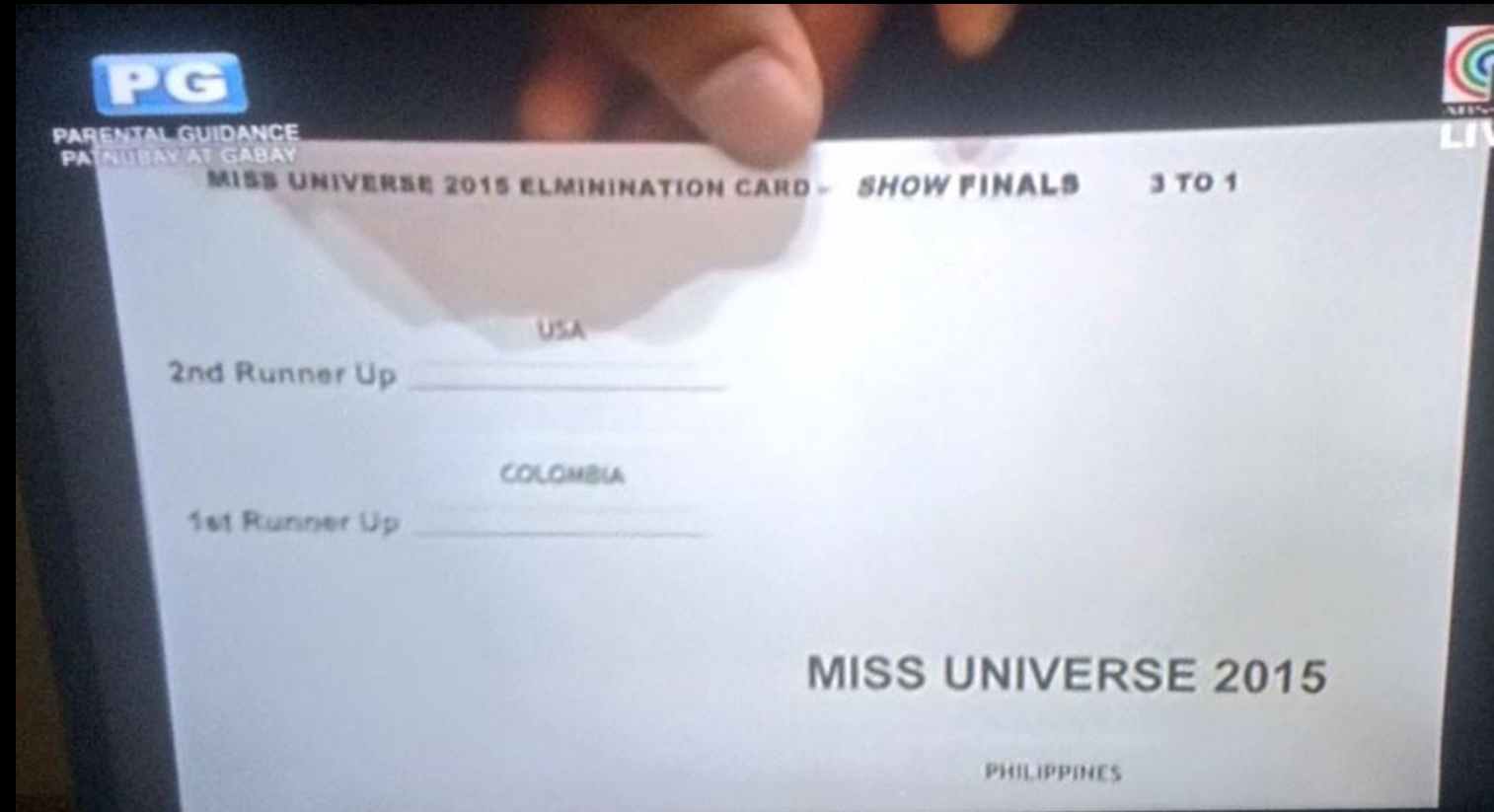


# Hawaii Ballistic Missile Threat example

- Let's fix it!!
  - Confirmation before sending for non-test messages (there was one... but this isn't the best design...)
  - Test mode that has to be de-activated to get to the real messages
  - "Two-lock" system: two independent people must sign off
  - A way to correct the error immediately



# Similar example (less life threatening...)



Errors happen

But: Font, layout- terrible to direct the reader to the winner

Good design- minimize these errors

# Usability vs Utility vs Usefulness

- Sound similar....

# Usability vs utility

- **Utility** : do the features provided by the UI or computer system enable you to accomplish your task
  - Does the system have the features you need?
- **Usability**: is how well users can take advantage of the UI's functionality
  - Is it easy to get to these utilities?
- Is the design useful?
  - Usability + utility
  - It has the features you need, it has good features
  - You can use these features easily

# Can we think of examples of....

- Something that is usable, but is lacking in utility
- Something that has utility, but is not particularly usable

# Can we think of examples of....

- Something that is usable, but is lacking in utility
  - Google photos to make photo collages of my kids at the same ages
- Something that has utility, but is not particularly usable
  - Unix terminal



# What is usability?

- Usability is an attribute that assesses how easy user interfaces are to use

# Other attributes of a system

- Functionality
  - Performance
  - Cost
  - Security
  - Maintainability
  - Size
  - Reliability
  - Marketability
  - .....
- 
- Let's focus for now on usability

# Dimensions of usability

- There are lots of formulations, but here's one:
  - **Learnability**: is it easy to learn?
  - **Efficiency**: once learned, is it fast to use?
  - **Errors/Safety**: are errors few and recoverable?

## Some others:

- **Memorability**: When you come back to the design after a time away, how easy is it to re-establish proficiency
  - **Satisfaction**: How pleasant is it to use the design
- Note: you can measure these qualities. We will learn about some ways in our evaluation learning modules

# Questions to ponder...

- Dimensions of usability:
  - Learnability: is it easy to learn?
  - Efficiency: once learned, is it fast to use?
  - Errors/Safety: are errors few and recoverable?

Before we dig into these dimensions....

- Do all of these dimensions matter equally all the time when designing something?
  - Let's come up with some examples where one dimension may be more important

# Let's critique this example (Interface hall of shame)

- Dialogue box prints award certificates
- Presents the task of selecting a template for the certificate
- Graphical interface
- Mouse-interactions with common widgets (scroll bar, buttons)
- What-you-see-is-what-you-get with the preview of the award shown
- So, why is this perhaps not a great design?



# Some comments....

- Scrollbar problems:
  - Why is a scrollbar used for selecting a template? Scrollbars are for scrolling through continuous content.
    - Will a new user see the scrollbar and register that it is for selection? Will they skip the opportunity to select because of this?
  - No marks on the scrollbar- no indication of how many templates. How far do you drag it to get to a new template?
  - The 'affordance' of a scrollbar is continuous scrolling, not selection (think of our door handle which says 'pull me').
  - Will a frequent user remember how to find their favorite template that is 56% of the way into the scrollbar?
    - No shortcuts for frequent users
- Help text:
  - So long!! If it needs a sign, probably bad design.
  - Press OKAY. Actual button: OK.
  - Why is it right justified?



# Some comments....

- Help text:
  - So long!! If it needs a sign, probably bad design.
  - Press OKAY. Actual button: OK.
  - Why is it right justified?



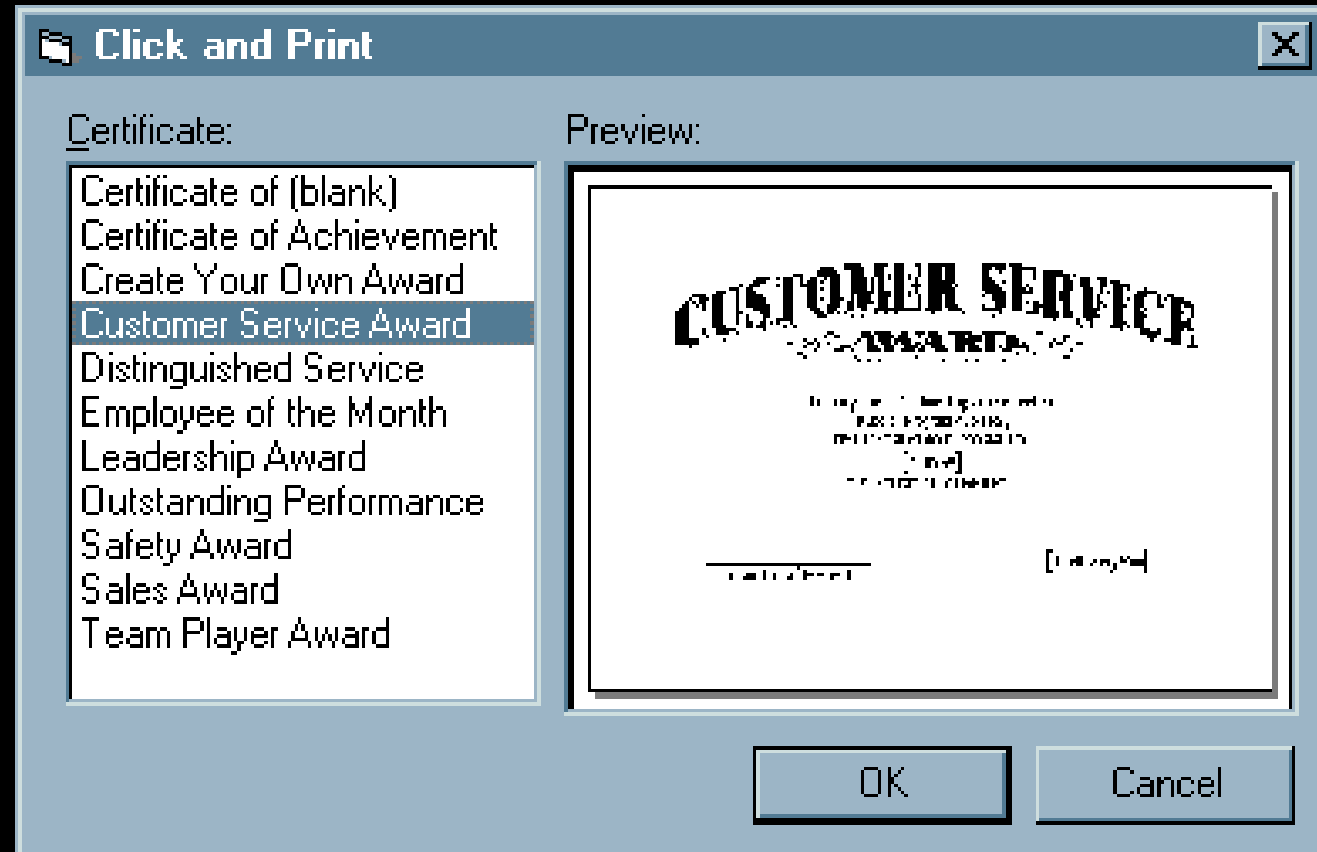
# Let's redesign this....

- Create a couple of alternative sketches
- Task is selection of the template, seeing the output (wysiwyg)
- Let's see if we can do better



# Redesign

- Is this better?
- Why?



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If the user can't easily understand what they can do next, it is not very usable, and probably bad design


(and your user may go elsewhere for what they need)

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# Example

- Where do I press?





- If the user is confused, it's not very usable and probably bad design.