Interaction Design 2

CSE333: Introduction to Human-Computer Interaction

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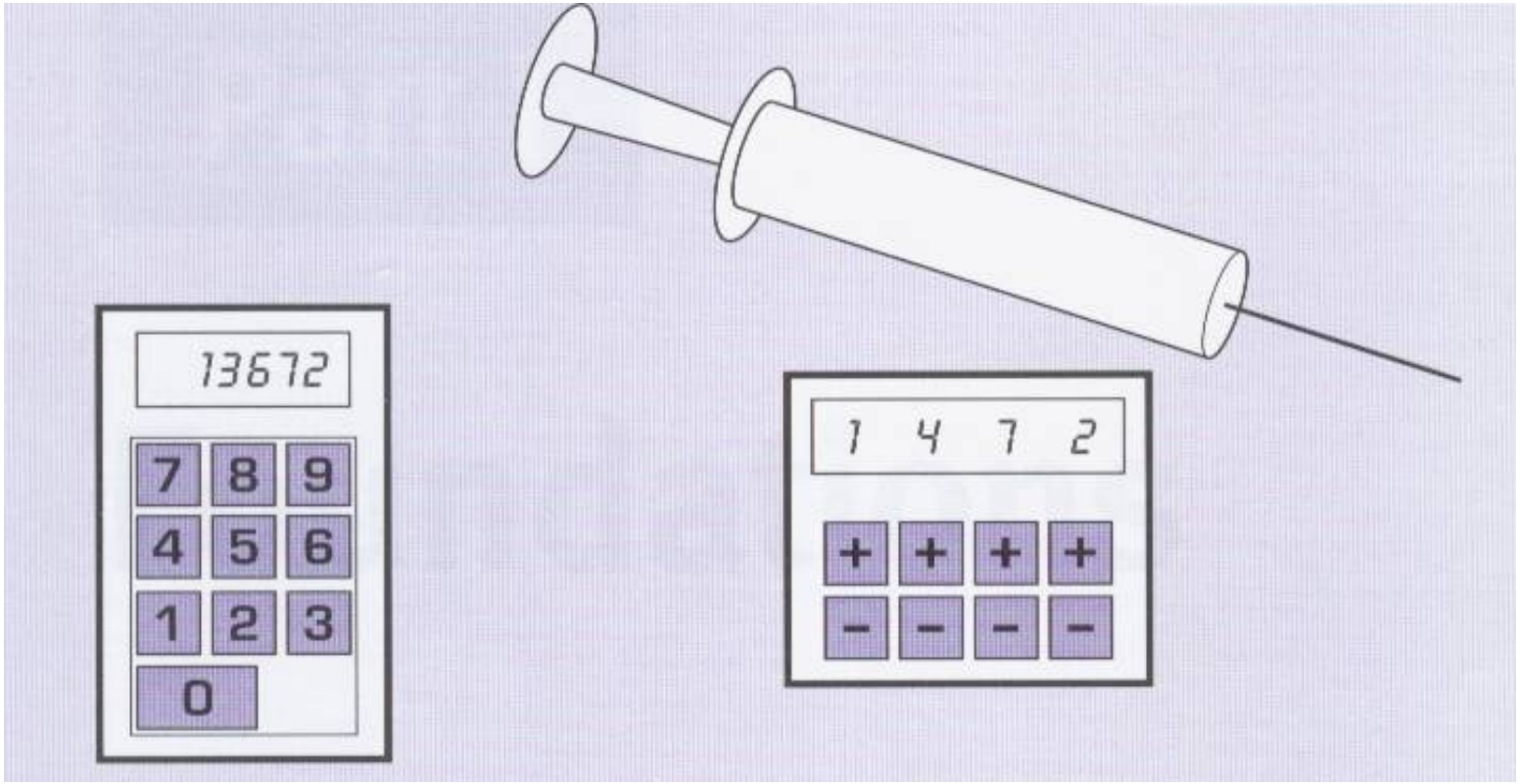
Spring 2023

Interaction Design Goals and Principles

Automatic syringe panel



- Q: Which one is better?
- Q: In what respect?

To design a usable interactive product

- Be clear about the primary goal of developing an interactive product for users
- The first things to know:
  - Who the **users** are
  - What **activities** are being carried out (**task**)
  - Where the interaction is taking place (**context**)
- You need to
  - **Study** them by asking, consulting, and observing.
  - Let them **participate** in design process
  - Verify (evaluate) the final design **with** them

Usability Goals

Usability Goals

- **Effectiveness:** effective to use
- **Efficiency:** efficient to use
- **Utility:** have good utility
- **Learnability:** easy to learn
- **Memorability:** easy to remember how to use
- **Safety:** safe to use

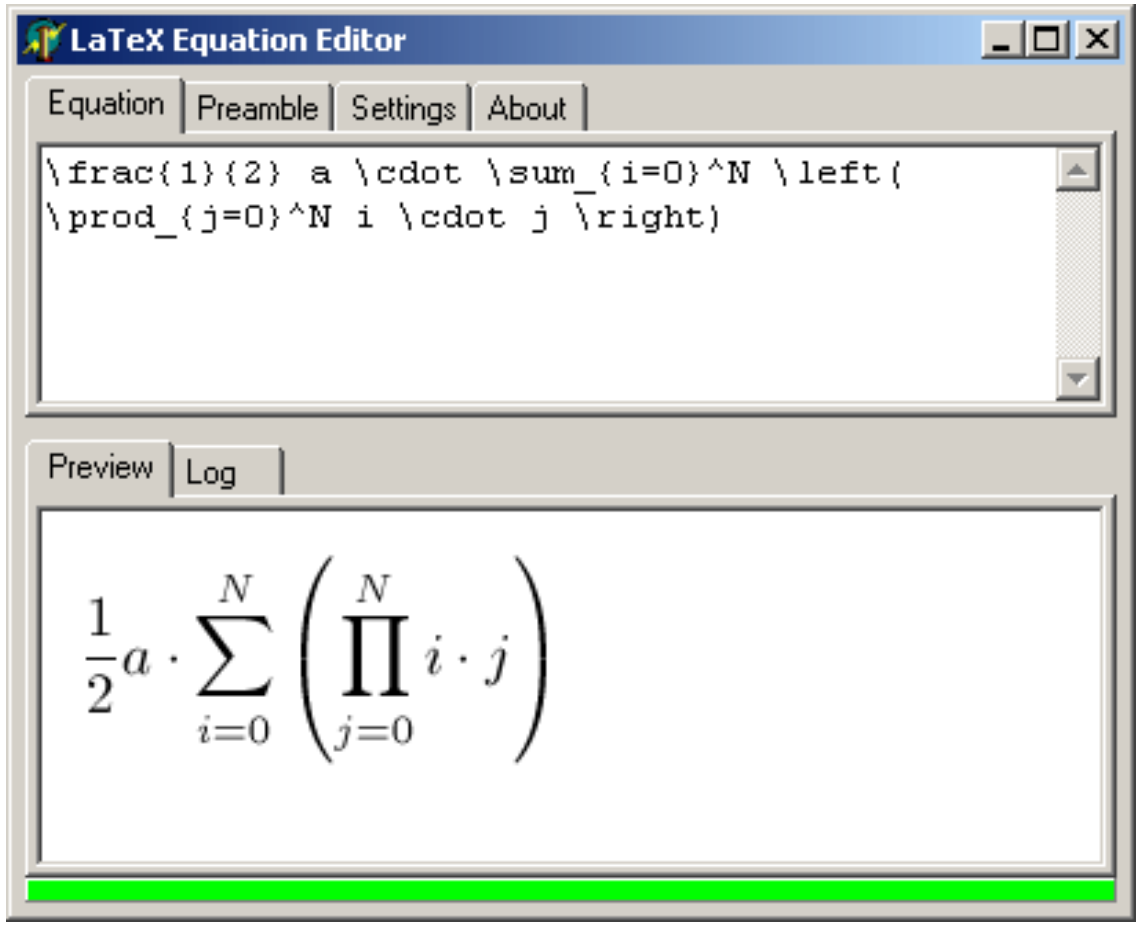
By Preece, Rogers and Sharp, in our textbook, <Interaction Design>

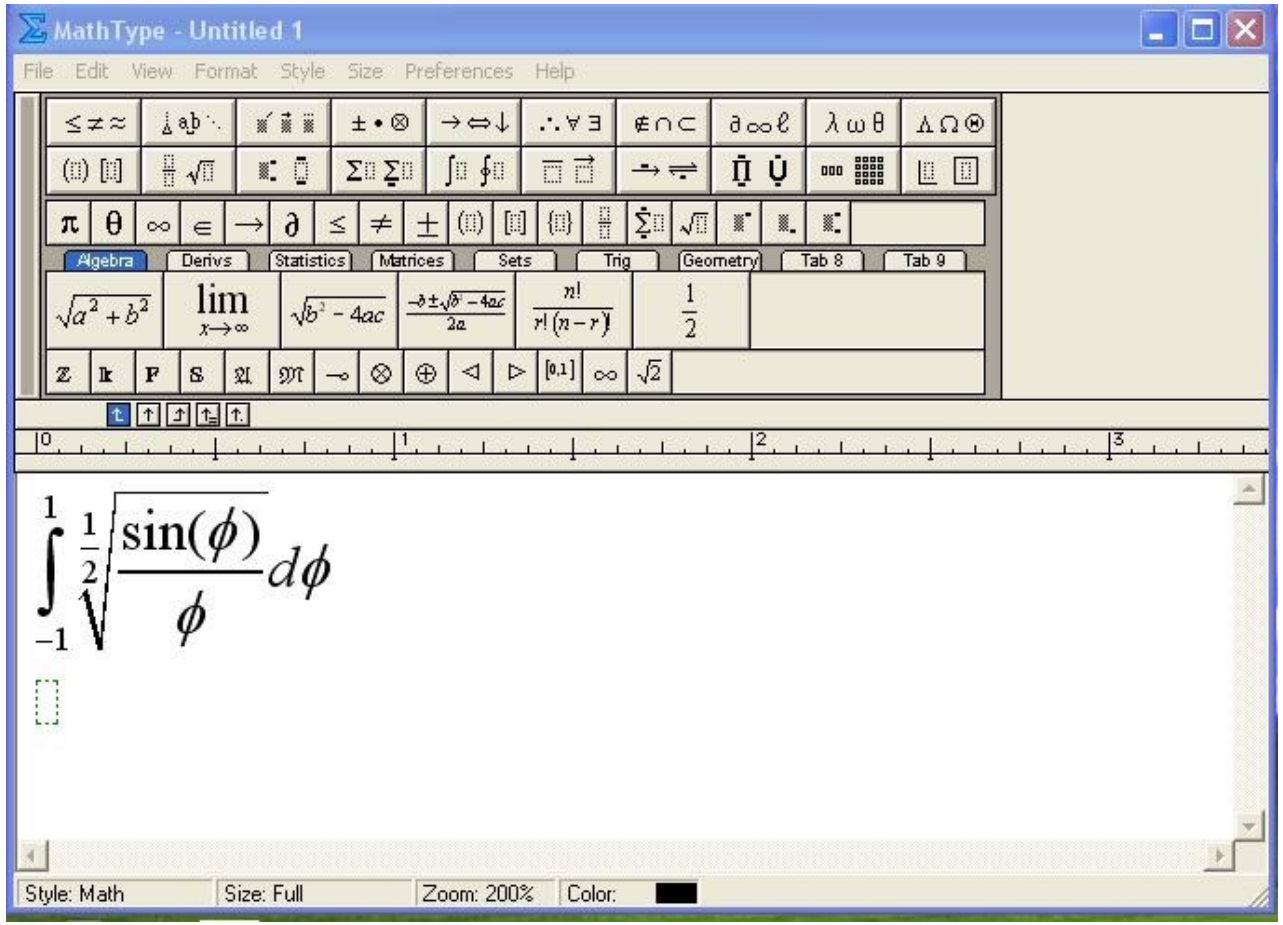
Effectiveness

- How good a product is at doing what it is supposed to do
  - Specifically, the degree to which errors are avoided and tasks are successful, measured by "**success rate (or number of errors)**" or "**task completion rate**".

- Question:
  - "Can users use the system to do the work they need to do?"

* Equation Editors





Efficiency

- The way a product supports users in carrying out their tasks.
  - Specifically, **the rate or speed** at which a product enables a user to accurately and successfully complete a task.

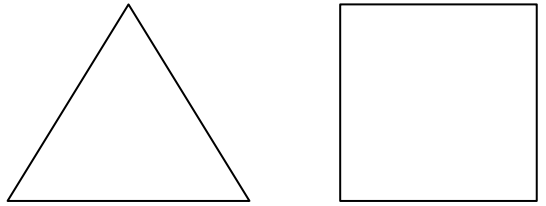
- Question:
  - ” Can experience users be productive using the system?”

Utility

- The **extent** to which the product provides **the right kind of functionality** so that users can do what they need or want to do.

- Question:
  - “Does the system provide all the functionality that users needs?”

- Ex) Drawing tool
  - A triangle, a rectangle and so on can be created using a line function, but there should be a better way.



Learnability

- How easy a system is to learn to use.
  - Time to learn a task, Time to reach an expert level for novice users
- Question:
  - “Can users figure out what to do by exploring the interface?”
- Ex) Equation editors
  - It is possible for a user to create an equation without consulting a help page or a manual?

Memorability

- How easy a product is to remember how to use, once learned.
  - number of errors when carrying out a given task over time

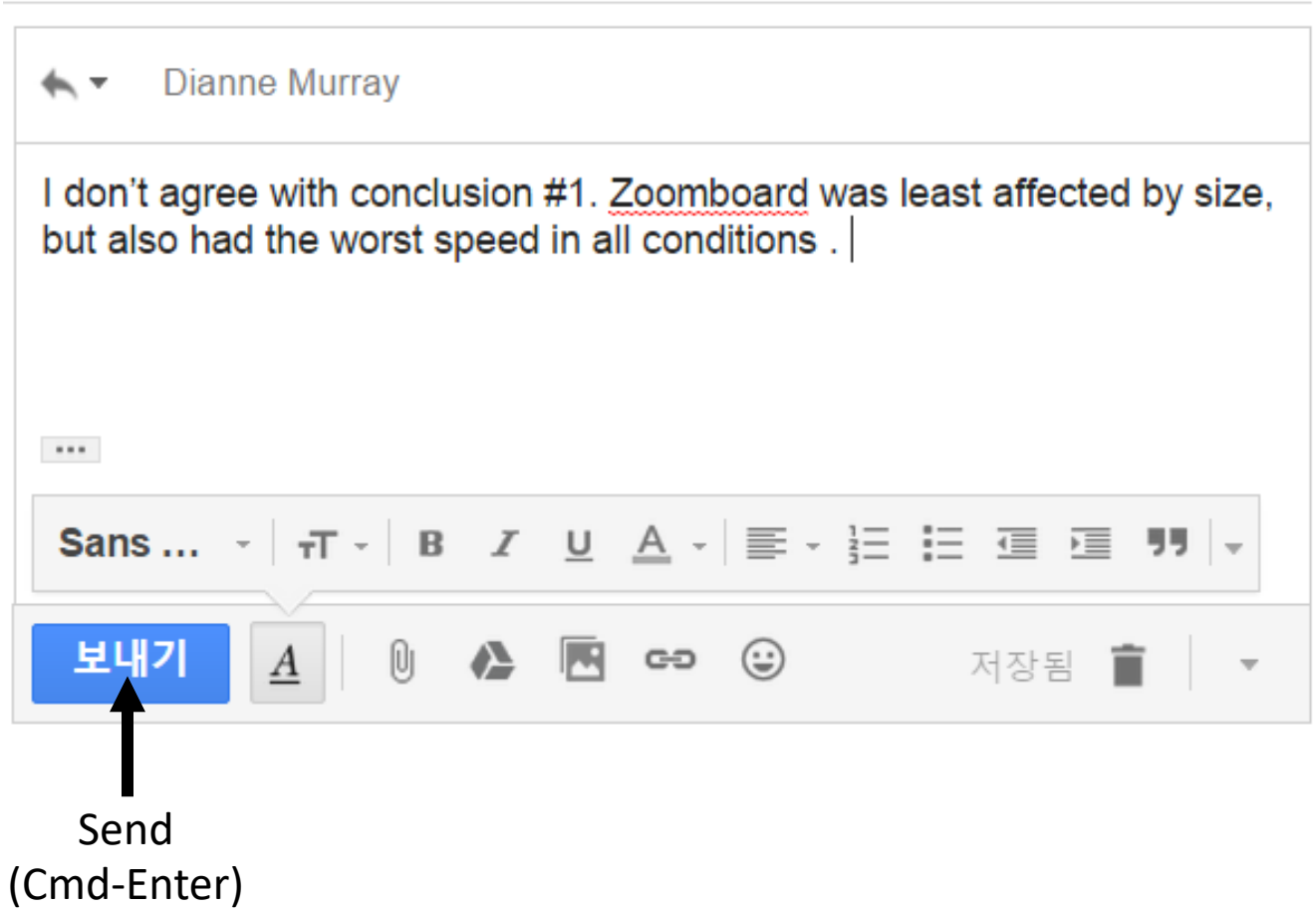
- Question:
  - “What kind of support does the system have for remembering how to do tasks, especially infrequent tasks?”

Safety

- Protecting the users from dangerous errors, for example losing all the user's data or protecting the user's confidential information.
- Also refers to how users recover from errors.

- Question:
  - "What kind of errors can users make and how can they recover from the mistake?"

* Exit vs Send (e-mail)



User Experience Goals

User Experience

- How a product **behaves** and is used by people in the real world.

- “all aspects of the end-user’s interaction with the company, its services, and its products”
  - Nielson and Norman (2014)

- One cannot design a user experience, but only design *for* user experience.
  - It’s subjective!

User Experience Goals

- Satisfying
- Aesthetically pleasing
- Enjoyable
- Engaging
- Supportive of creativity
- Pleasurable
- Rewarding
- Exciting
- Fun
- Entertaining
- Provocative
- Helpful
- Surprising
- Motivating
- Enhancing sociability
- Emotionally fulfilling
- Challenging
- Boring
- Annoying
- Frustrating
- Cutesy

User Experience Goals

- **Subjective qualities** and concerned with how a system feels to a user.
- **Terms to convey a person's feelings, emotions**, etc., in the description of the interaction

- **How to assess** whether the goals are achieved?

How to assess user experience?

- Virtual sales agent
  - How long do users interact with the virtual sales agent?
  - What is the user's immediate response to the agent's appearance? Is it one of mockery, dismay, or enjoyment?
  - Do they smile, laugh, or scoff?

Design Principles

Design Principles

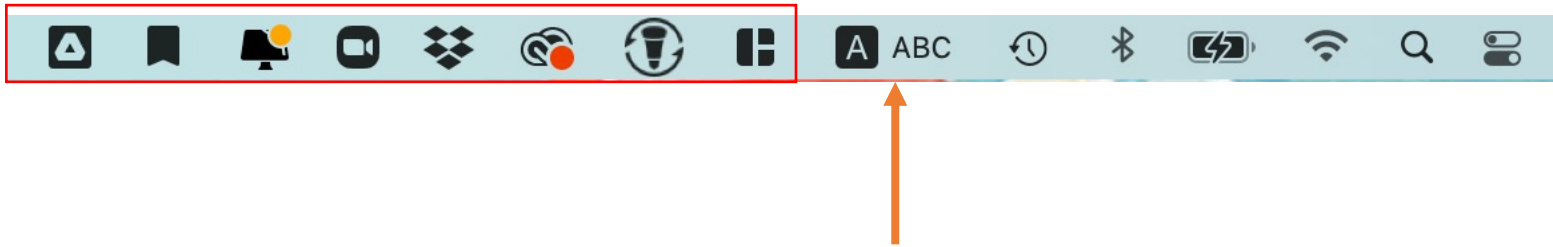
- Generalizable abstractions for thinking about different aspects of design
- The do’s and don’ts of interaction design
  - What to provide and what not to provide at the interface
- Derived from a mix of theory-based knowledge, experience and common-sense

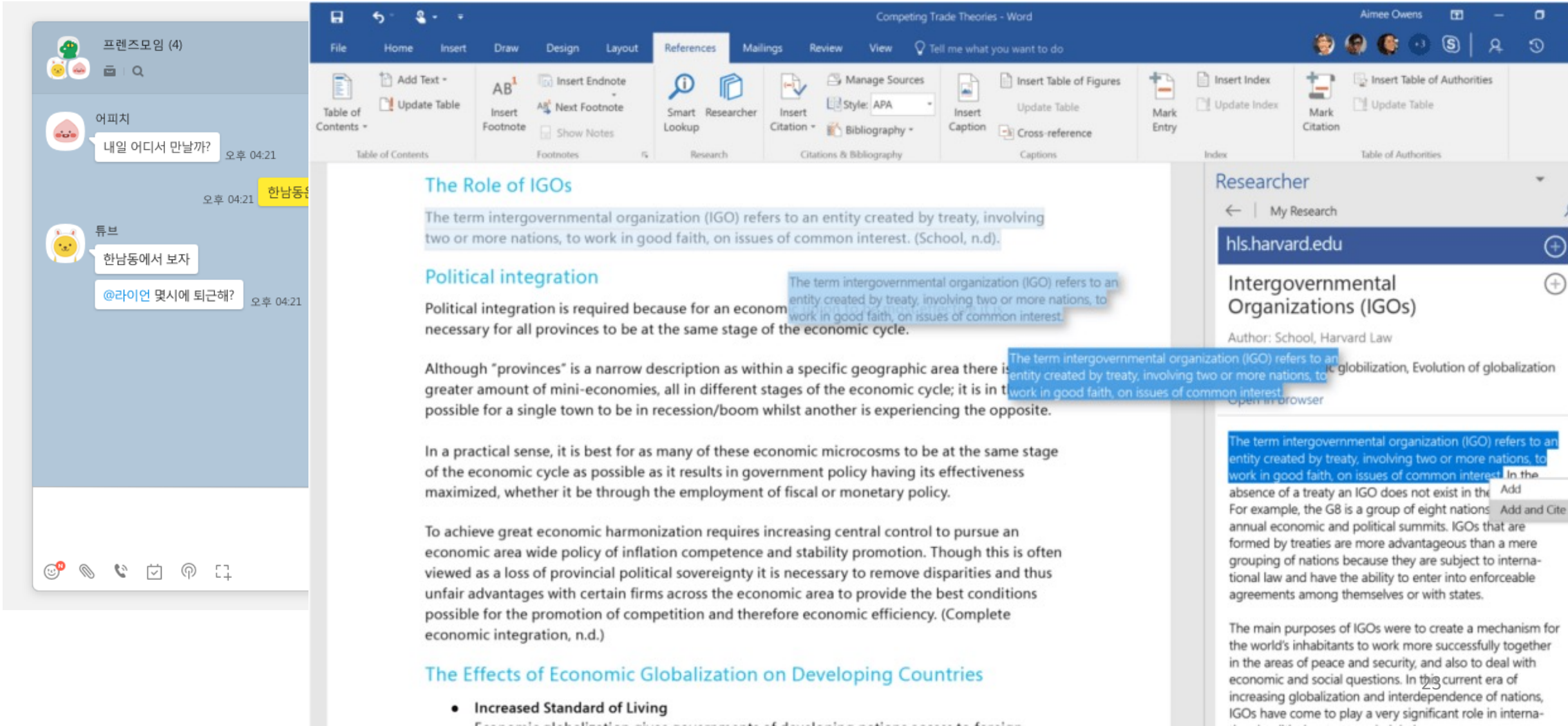
5 Design principles

- **Visibility**
- **Feedback**
- **Constraints**
- **Consistency**
- **Affordance**

- Explained in <The Design of Everyday Things> by D. Norman.

Visibility

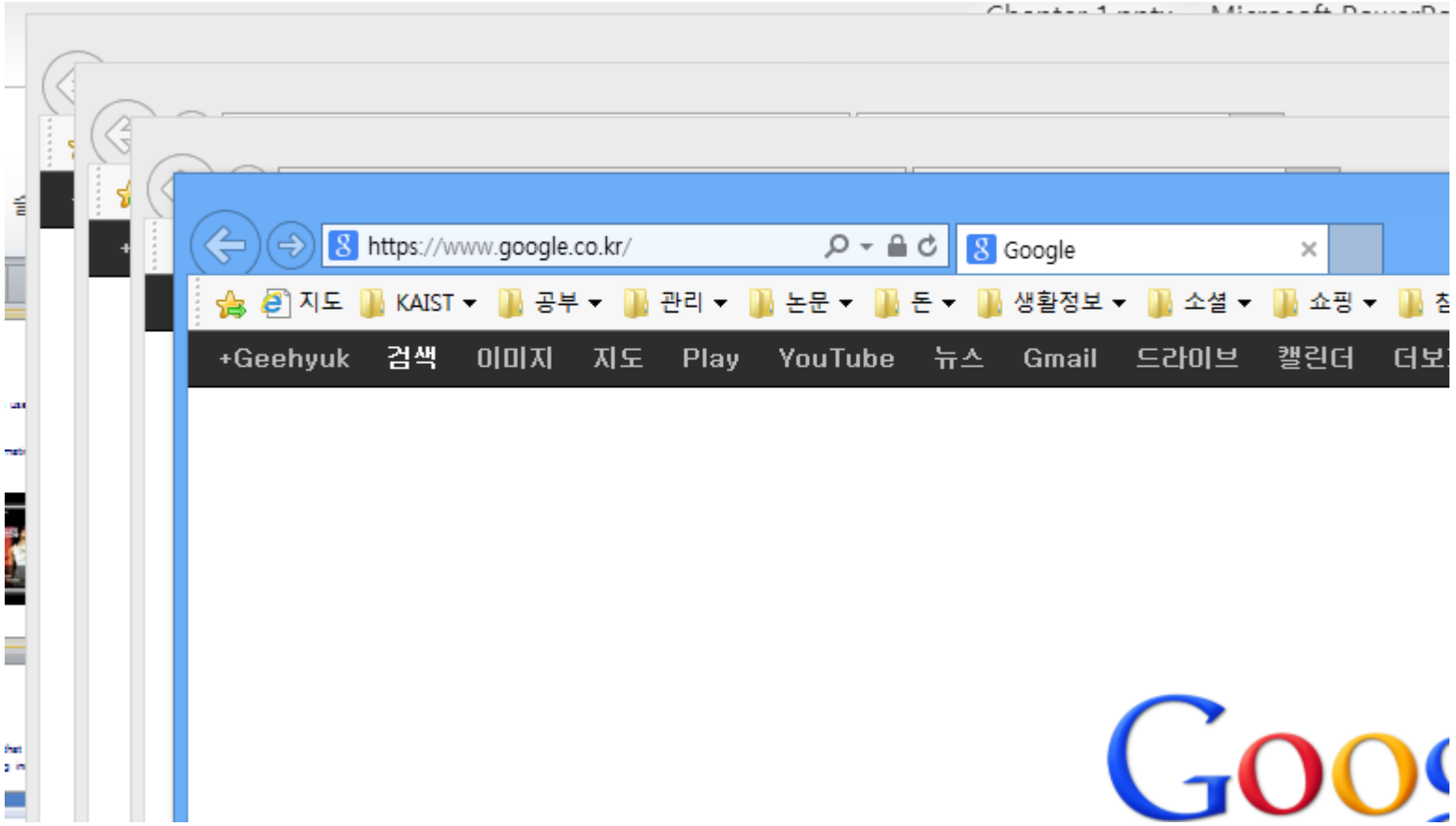

ABC


프렌즈모임 (4)
어피치
내일 어디서 만날까?
오후 04:21
오후 04:21
튜브
한남동에서 보자
@라이언 몇시에 퇴근해?
오후 04:21
Competing Trade Theories - Word
Aimee Owens
File
Home
Insert
Draw
Design
Layout
References
Mailings
Review
View
Tell me what you want to do
Table of Contents
Add Text
Update Table
Insert Footnote
Insert Endnote
Next Footnote
Show Notes
Smart Lookup
Researcher
Insert Citation
Manage Sources
Style: APA
Bibliography
Insert Caption
Insert Table of Figures
Update Table
Cross-reference
Mark Entry
Insert Index
Update Index
Mark Citation
Insert Table of Authorities
Update Table
Table of Contents
Footnotes
Research
Citations & Bibliography
Captions
Index
Table of Authorities
The Role of IGOs
The term intergovernmental organization (IGO) refers to an entity created by treaty, involving two or more nations, to work in good faith, on issues of common interest. (School, n.d).
Political integration
Political integration is required because for an econom
necessary for all provinces to be at the same stage of the economic cycle.
Although "provinces" is a narrow description as within a specific geographic area there i
greater amount of mini-economies, all in different stages of the economic cycle; it is in t
possible for a single town to be in recession/boom whilst another is experiencing the opposite.
In a practical sense, it is best for as many of these economic microcosms to be at the same stage of the economic cycle as possible as it results in government policy having its effectiveness maximized, whether it be through the employment of fiscal or monetary policy.
To achieve great economic harmonization requires increasing central control to pursue an economic area wide policy of inflation competence and stability promotion. Though this is often viewed as a loss of provincial political sovereignty it is necessary to remove disparities and thus unfair advantages with certain firms across the economic area to provide the best conditions possible for the promotion of competition and therefore economic efficiency. (Complete economic integration, n.d.)
The Effects of Economic Globalization on Developing Countries
Increased Standard of Living
Researcher
My Research
hls.harvard.edu
Intergovernmental Organizations (IGOs)
Author: School, Harvard Law
globilization, Evolution of globalization
Open in browser
The term intergovernmental organization (IGO) refers to an entity created by treaty, involving two or more nations, to work in good faith, on issues of common interest. In the
absence of a treaty an IGO does not exist in the
For example, the G8 is a group of eight nations
annual economic and political summits. IGOs that are formed by treaties are more advantageous than a mere grouping of nations because they are subject to international law and have the ability to enter into enforceable agreements among themselves or with states.
The main purposes of IGOs were to create a mechanism for the world's inhabitants to work more successfully together in the areas of peace and security, and also to deal with economic and social questions. In this current era of increasing globalization and interdependence of nations, IGOs have come to play a very significant role in interna-
Add
Add and Cite

Feedback

- Sending information back to the user about what has been done
- Includes sound, highlighting, animation and combinations of these

With slow feedback..



Constraints

- Restricting the possible actions that can be performed
- Helps prevent user from selecting incorrect options

* Physical constraints

- Refer to the way physical objects restrict the movement of things

* Natural mapping
= Constraining using common sense

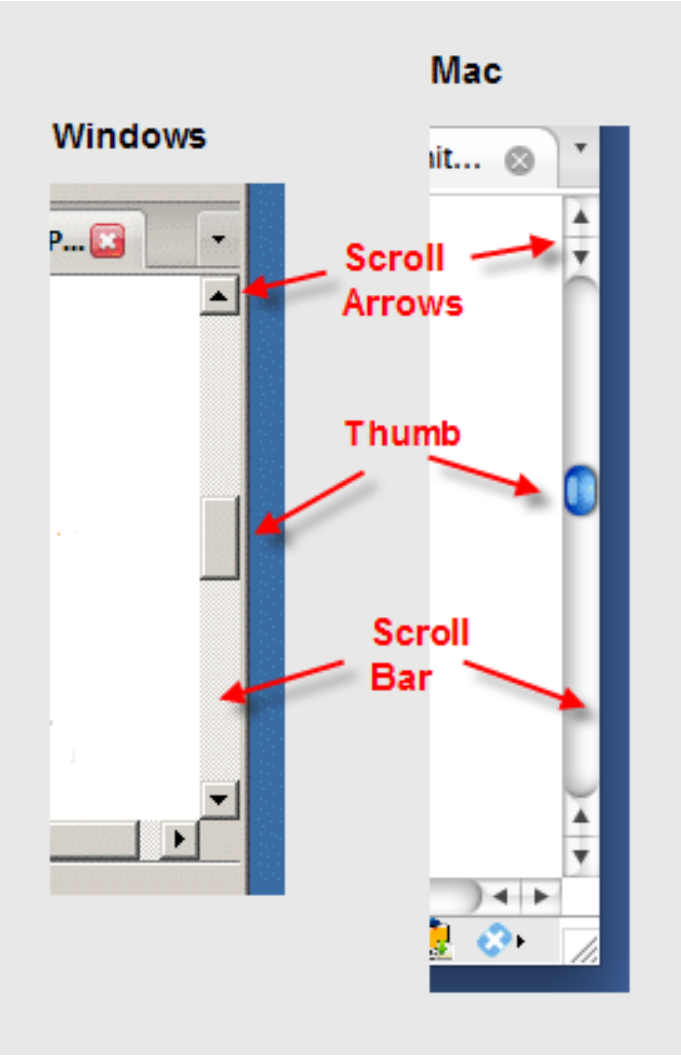
- You do not have to create constraints.
- Our thinking is in fact very constrained (by common sense)

Consistency

- Design interfaces to have similar operations and use similar elements for similar tasks
  - e.g., Always use ctrl key plus first initial of the command for an operation – ctrl+C, ctrl+S, ctrl+O
- Main benefit is consistent interfaces are easier to learn and use (**simpler rules**)
- Difficult to be consistent when a design becomes complex.
  - e.g. short-cut keys for save, spelling, select, style?

* Number keypads - inconsistency

* Scroll – inconsistency



Affordances: to give a clue

- **An attribute of an object that allows people to know what to do with it.**
  - Button invites pushing
  - Door handle prompts pulling
  - Chair invites sitting

- How about the virtual objects on the screen?
  - Scrollbars afford moving up and down
  - Icons afford clicking on
  - Hyperlinks afford clicking on

* Physical Affordance

- What actions do the following physical objects invite?

https://vimeo.com/145211058

inFORM: Dynamic Physical Affordances and Constraints through Shape and Object Actuation

Sean Follmer* **Daniel Leithinger*** **Alex Olwal** **Akimitsu Hogge** **Hiroshi Ishii**
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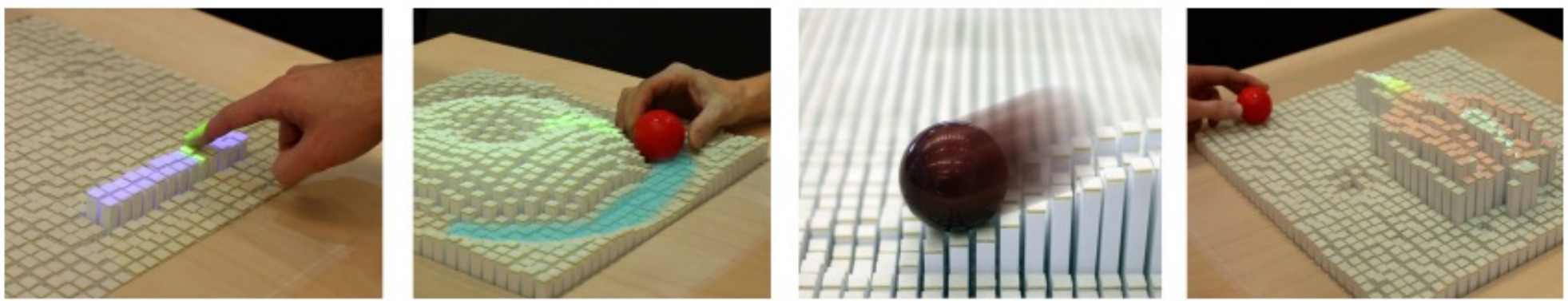

Figure 1: inFORM enables new interaction techniques for shape-changing UIs. *Left to right:* On-demand UI elements through *Dynamic Affordances*; Guiding interaction with *Dynamic Constraints*; Object actuation; Physical rendering of content and UI.

Now you are familiar with

- Usability goals
  - Effectiveness, efficiency, utility, learnability, memorability, safety
- User experience goals
- Design principles
  - Visiblity, feedback, contraints, consistency, affordance

First (out of about 10) Quiz on Thursday!

- On Interaction Design (This slide)
- Open book, but no chatting or discussion
- One question, multiple choice
- 3 min, starting at the beginning of the class (10:32-10:35)
- Answer will be open at the end of the class