IE 403/476
Human-Computer Interaction
Week 3-Lec2

Recap

- Cognitive Model
- Gulf of execution and Gulf of evaluation
- 7 stages of actions By Norman
- Mental Vs Conceptual Model

Conceptual Models

- Need to first think about how the system will appear to users (i.e. how they will understand it)

- A high level description of
  - the proposed system with a set of integrated ideas and concepts about
    - what it should do
    - behave
    - look like
    - that will be understandable by the users in the manner intended

Understanding a Conceptual Model

- How will the user think about the system? Possibly based on:
  - Data or objects
  - Types of operations (activities) done
  - Metaphors (real world analogies/similarities)
- What kind of interface metaphor, if any, will be appropriate?
- What kinds of interaction modes and styles to use?

Fig 1. Word processor Vs a typewriter

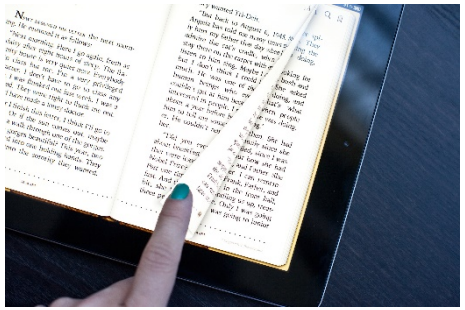

Fig 2. iBooks flipping pages similar to physical books

A desktop Conceptual Model

- Interface metaphor
- Items on a desk – Desktop
  - Files, notepad,
- Trash can below the table –
  - Recycle bin (windows)
  - Trash Can in Mac Easier metaphor
- Files in folders with labels

Developing a CM

A CM is developed from three perspectives

- Interaction mode
- Interface metaphor
- Interface Paradigms

Interaction Modes

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>ping ics.uci.edu
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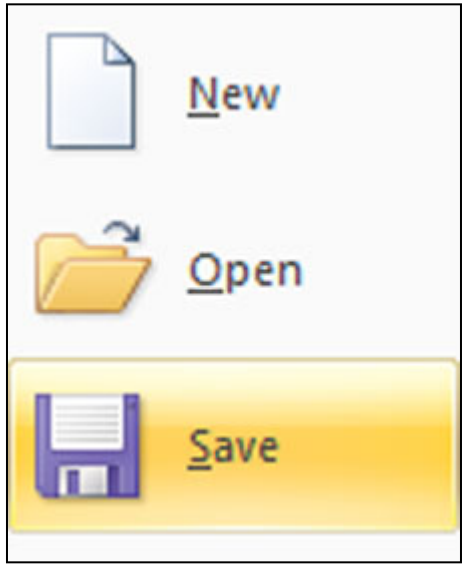
- Activity-based
  - Instructing
  - Conversing
  - Manipulating & Navigating
  - Exploring & Browsing



- Users instruct the system and tell it what to do e.g. tell the time, print a file, save a file
- Implementations: typing, pressing buttons, etc.
- Quick and efficient interaction

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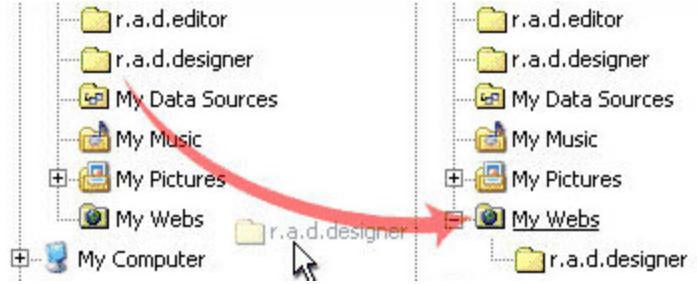

Fig 1. Navigate folders/files similar to real world set up

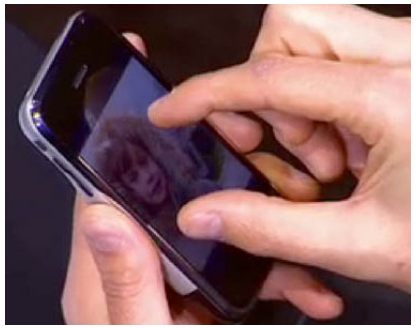

Fig 2. Direct Manipulation: Drag, zoom, pinch etc

Fig 3. Game interface with user experience similar to actual scenario

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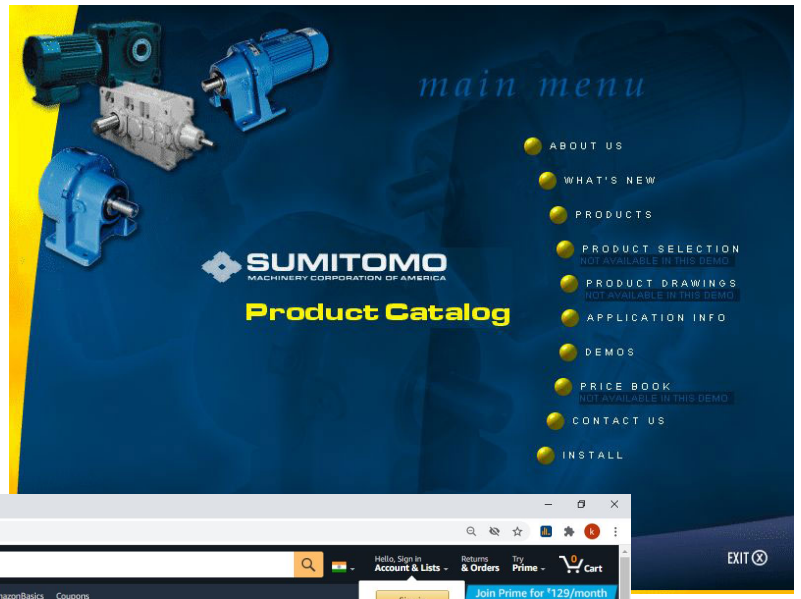
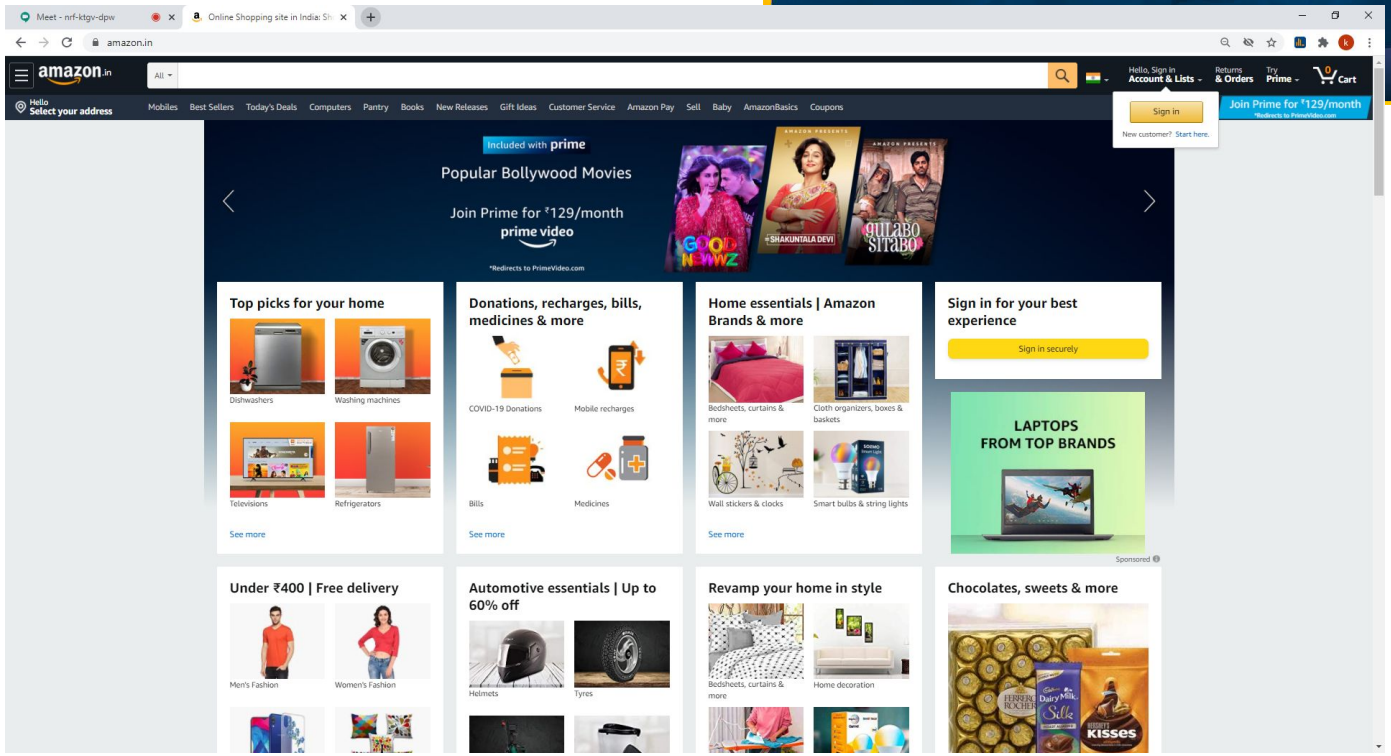




Interface Metaphors

- Conceptual model similar to some aspects of a physical entity
- Need to be evaluated
  - Structure
  - Relevance
  - Representation
  - Clarity
  - Extensibility

Interface Paradigms

- Desktop
- Ubiquitous
- Pervasive
- Wearable
- …

- Consider user tasks & environmental requirements

What should a CM consist of ?

Object/Action relationships

- Metaphors or analogies
- the (user-level) concepts to be created and manipulated
- the relationships between concepts,
  - Attributes has-a
  - Specialisations is-a
  - Containment contains
- the mappings between concepts and task domain

- Functions performed and by whom
  - Task allocation
  - Relationship between functions
    - Relative position
    - Sequential
    - Parallel
  - Importance
    - How frequent?
  - How data is captured, transformed and output?

Example 1: Online Library

- Metaphors Physical card catalogue
- Concepts Item, book, periodical, issue, DVD, shelf- mark, user account,
- object relationships a book is a type of item; periodicals contain issues
- Mappings item corresponds to a physical object; shelf-mark to its physical location
- functions issue item, return item, search item
- Function relationships issue before return for same item; for different items, in parallel
- Data new items added by typing data

Example 2: Bank transactions

- Objects customer, checking account, savings accnt, cheque
- Actions withdraw, deposit, open/close, viewing, transfer
- NO click button, load database, create record etc., these are a) how the action would be enabled (UI part) or no reqd for customer to know DB, record etc.,
- May be create template, command / action sequence
- Attributes Properties
  - what will a cheque have: number, date, balance, interest rate, date opened etc., No: transaction memory size,

Understand
- Problem space
- Task domains
- Create story like Scenarios

Mental models

- Users “see” the system through mental models
- Users “rely” on mental models during usage
- Reason about a sys
  - Interact with
  - Infer how it works
  - Figure out how to correct when things do wrong

Why are mental models important?

2016, Chrysler automobiles recalled over 100K vehicles

- Gear shows P, R, N, D/S
- Shift through the gear options
- But returns to center position?
- What is the problem ?

People were getting out of their cars thinking the gear was in Park mode
But it wasn't, so the car drove off without them!!!

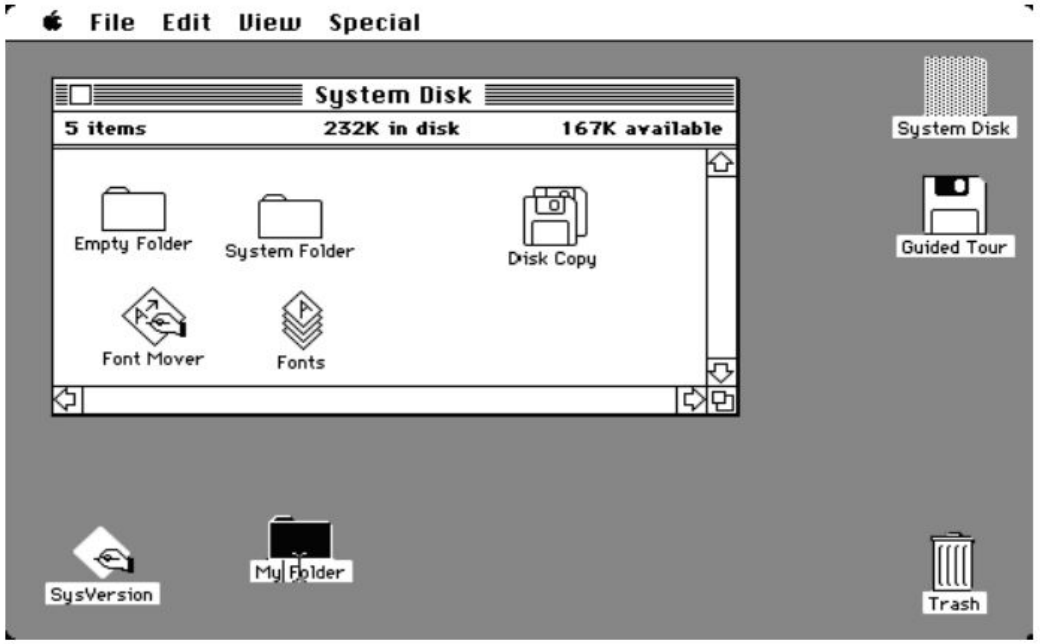
Classic Design Flaw

Designing something that people don't understand or making some thing which is totally NEW & Expecting USERS to figure out
User's mental model is not the same as what was designed

https://www.carcomplaints.com/news/2017/lawsuit-chrysler-gear-shift-confusing.shtml

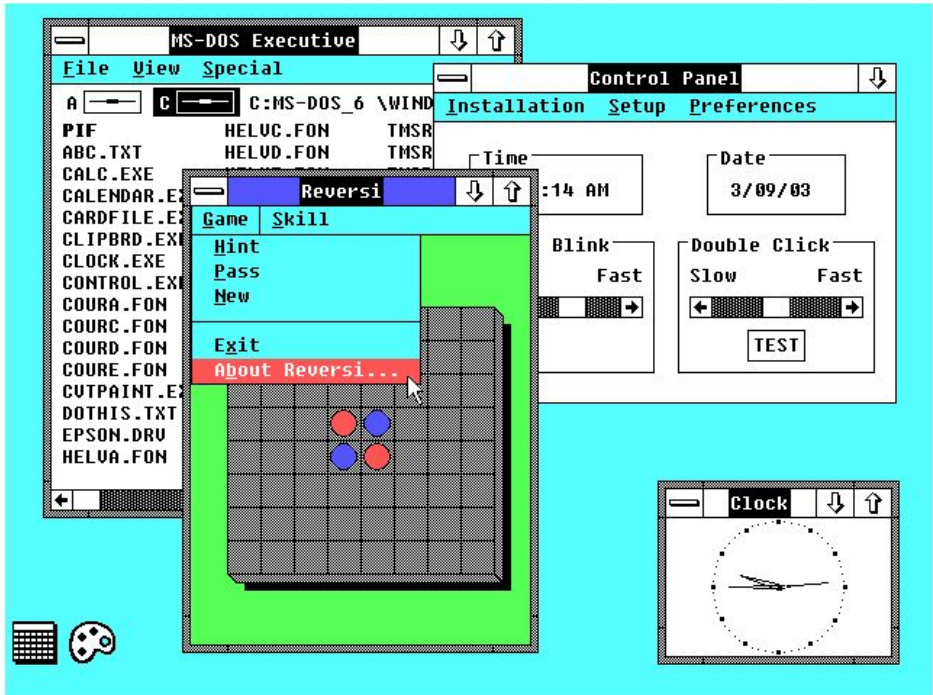
Evolution of OS interface design - Examples

Mac OS


File Edit View Special
System Disk
5 items
232K in disk
167K available
Empty Folder
System Folder
Disk Copy
Font Mover
Fonts
System Disk
Guided Tour
SysVersion
My Folder
Trash

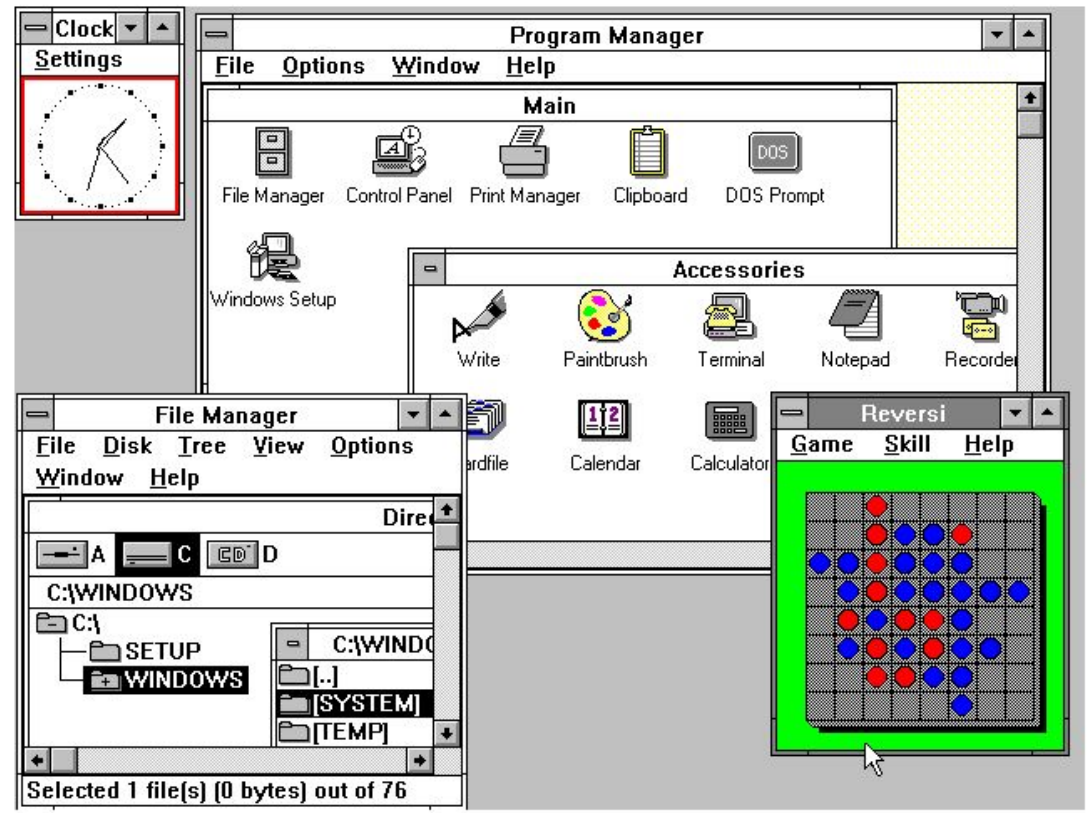

Mac OS X

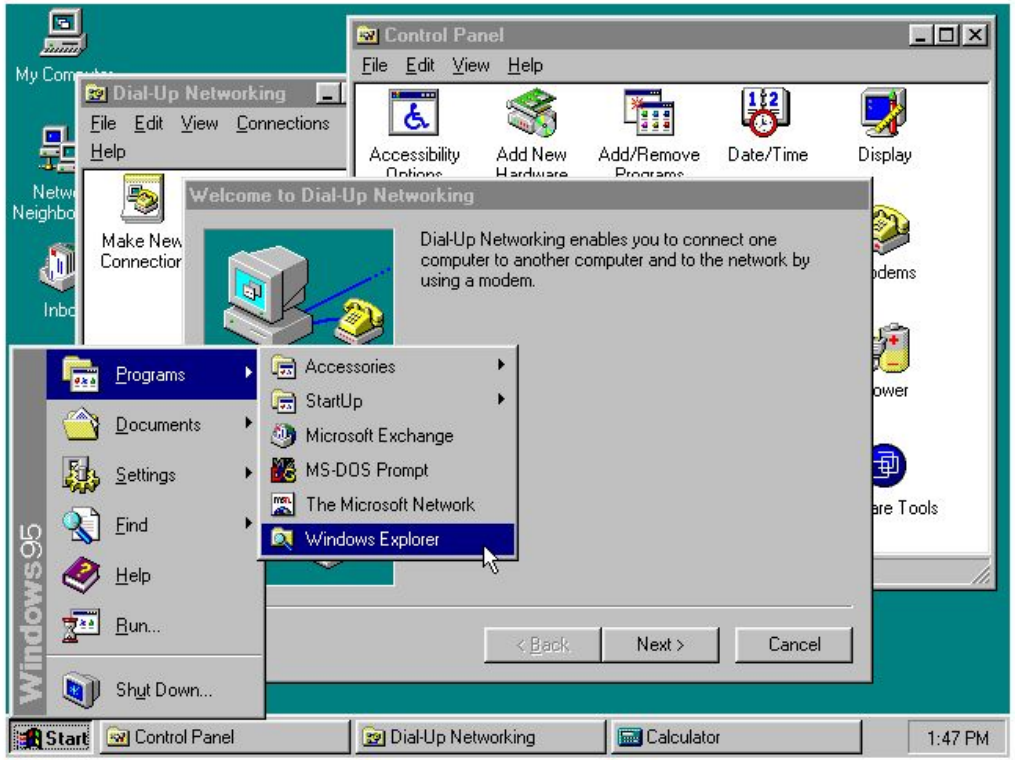
Windows



Win 1.0

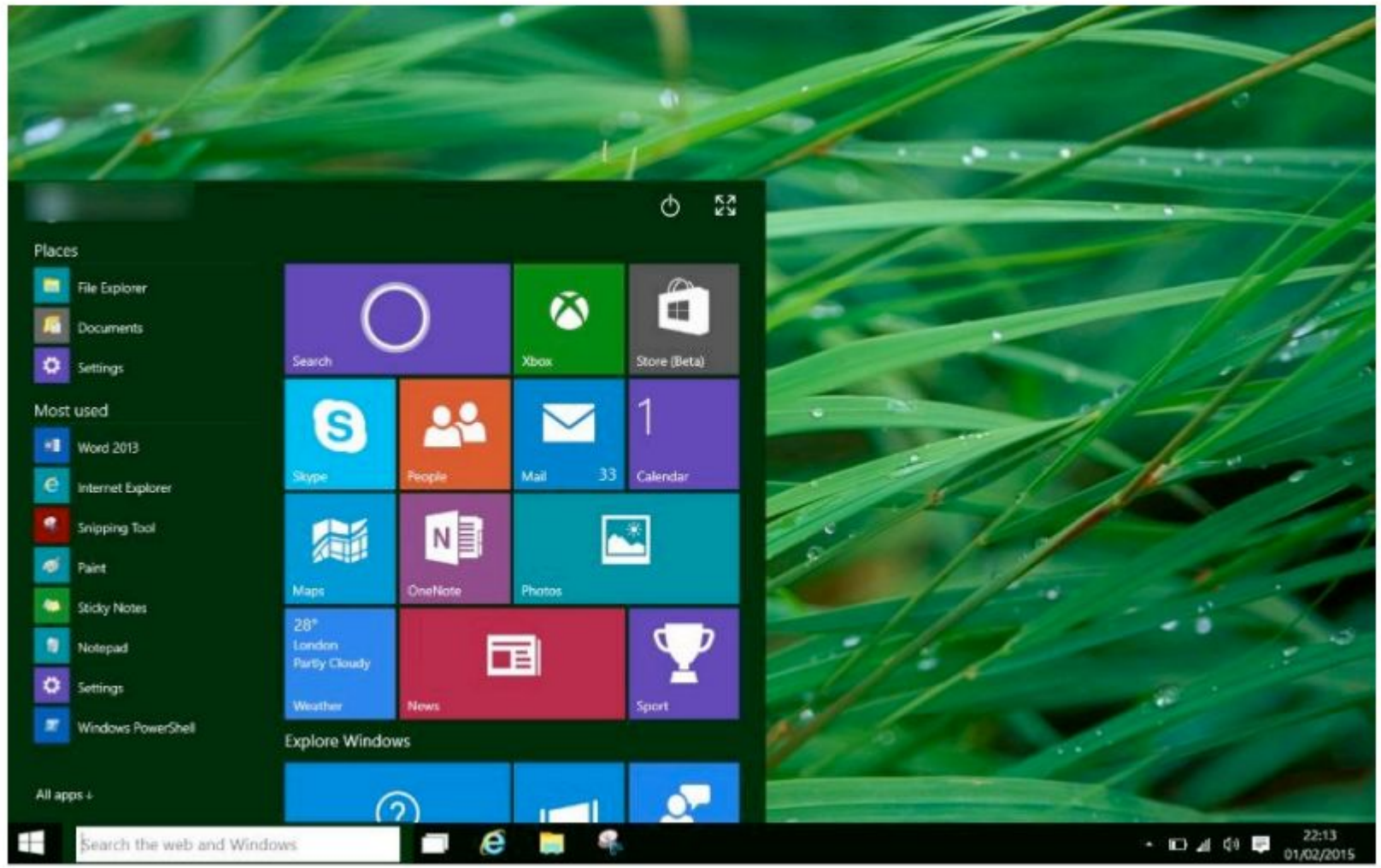
Win 3.0





Win 95

Win Vista


Places
File Explorer
Documents
Settings
Most used
Word 2013
Internet Explorer
Snipping Tool
Paint
Sticky Notes
Notepad
Settings
Windows PowerShell
All apps
Search
Xbox
Store (Beta)
Skype
People
Mail 33
1
Calendar
Maps
OneNote
Photos
28°
London
Partly Cloudy
Weather
News
Sport
Explore Windows
Search the web and Windows
22:13
01/02/2015

Win 10

Assignment 3

- Write down your own mental model of how a cash machine (ATM) works
- Answer the following:
  - What happens to prevent you taking out more than the limit by using several machines in turn?
  - What information is on the card itself, and how is it used?
  - Why are there pauses between steps, and why are they duration they are?
  - What happens to the card while in the machine?
  - Do you count the money? Why or why not?
- Now ask two other people the same questions and compare your mental models.