Lecture 3 & 4

Goals & Evolution of Human-Computer Interaction

Kashif Sajjad Bhatti
Assistant Professor
IIU, Islamabad

Life Imitates Art

- 1 in every 4 computers has been physically attacked by its owner - Novatech (British PC Manufacturer)
- Almost ⅓ of people have physically attacked a computer – National Opinion Poll/Symantec
- 67% experienced frustration, exasperation and anger – National Opinion Poll/Symantec
- 70% swore at their machines – National Opinion Poll/Symantec

Success Criteria in the New Economy

- Business success is all about managing relationships
  - Companies doing business on the Web are focusing on how to retain and extend relationships with customers

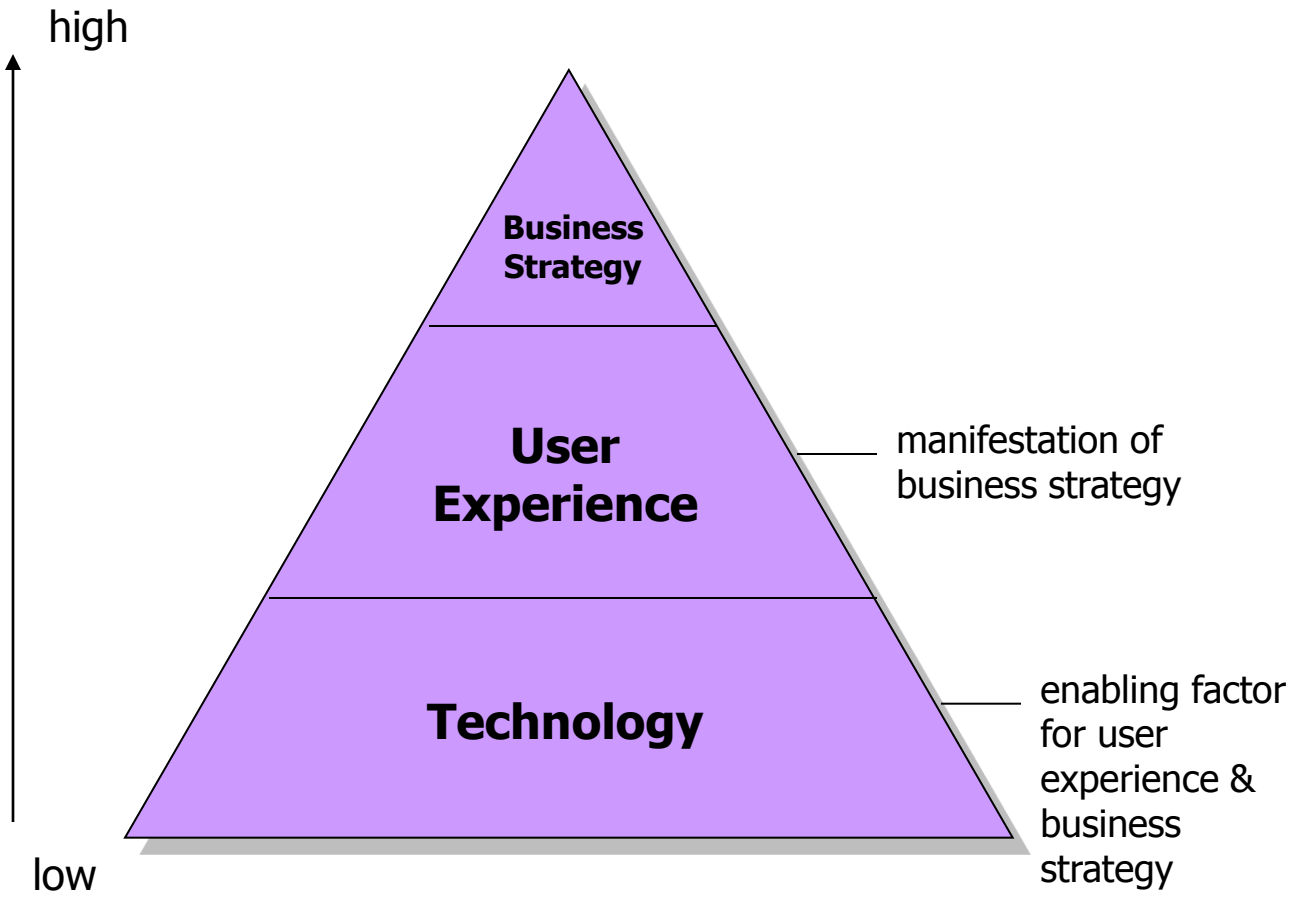
Success Criteria in the New Economy

- Success depends upon the ability of a business to effectively and efficiently meet customer needs and goals

Business Success $\propto$ User Experience

Success Criteria in the New Economy

Factors providing competitive advantage



Common Problems in the New Economy

- Scenario: A web site that is
  - Aesthetically beautiful
  - Technically perfect
  - Wonderful content
  - But users can’t find information!

Findability

- Users can only find information 42% of the time

– Jared Spool

Findability

- 62% of web shoppers give up looking for the item they want to buy online

– Zona Research

Findability

- 50% of the potential sales from a site are lost because people cannot find the item they are looking for

– Forrester Research

The Result

- 40% of the users who do not return to a site do so because their first visit resulted in a negative experience

– Forrester Research

Software Maintenance Costs

- 80% of software lifecycle costs occur after the product is released, in the maintenance phase - of that work, 80 % is due to unmet or unforeseen user requirements; only 20 % is due to bugs or reliability problems.

- IEEE Software

Project Cost Estimation

- Around 63% of software projects exceed their cost estimates. The top four reasons for this are:
    - Frequent requests for changes from users
    - Overlooked tasks
    - Users' lack of understanding of their own requirements
    - Insufficient user-analyst communication and understanding

- Communications of the ACM

Return on Investment (ROI)

	Scenario A	Scenario B
Revenue Potential	$100m	$100m
User Experience	Good	Bad
Sales Lost	0%	50%
Revenue Lost	$0m	$50m
Actual Revenue	**$100m**	**$50m**

m - millions

The End of Business As Usual

- Business success is directly related to the customer experience
- BOO.com, a $204m startup fails

– BBC News

- Poor commercial web sites will kill 80% of Fortune 500 companies within a decade

- Jakob Nielsen

Engineers Belief

Engineers believe that since they made it, can use it, everyone can use it

“If WE can use it, YOU can use it. If you can’t, YOU must be STUPID”

“Users are stupid” – anonymous

“Users are dummies” – anonymous

HCI – A Definition

"Human-Computer Interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them"

-ACM/IEEE

Human-Computer Interaction

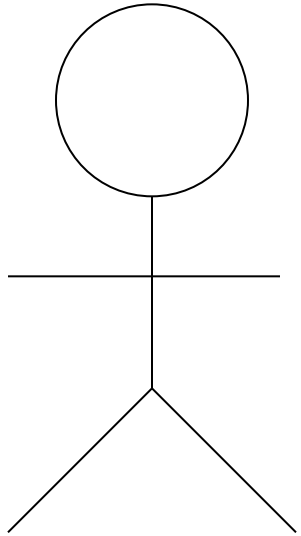
Usability

User Experience

Interface

Computer

Interaction



Human

The Shopping Analogy

- Types of experiences
  - Good or Bad

- Every user is unique
  - Experiences are unique

User Experience – A Definition

- The user experience is the holistic combination of everything that the user
  - Sees
  - Touches
  - Feels
  - Interacts with

Good and Bad Experiences

Good experience

Satisfaction
Happiness
Elation

Bad experience

Frustration
Resentment
Anger

Usability - Abstract-level Constituents

Ease of Use
(Could I use it?)

+

Usefulness
(Would I use it?)

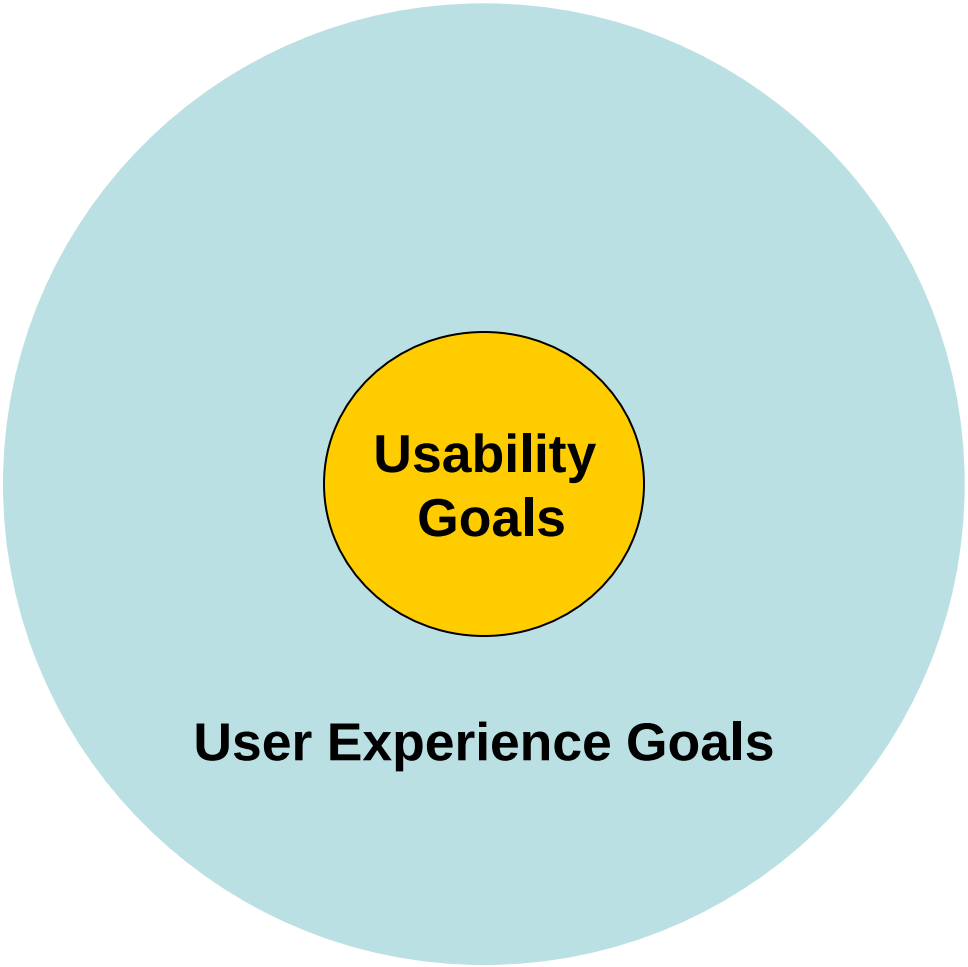
Usability

- Ensuring that interactive products are easy to learn, effective to user and enjoyable from the user’s perspective

Perspective ?

- People perceive the same item in different ways
- What do you see in the Image ?

Usability & User Experience



Usability Goals

- Effectiveness
- Efficiency
- Safety
- Utility
- Learnability
- Memorablity

Effectiveness

- How good the system is at doing what it is supposed to do

- Are these systems really effective ? Think again !!
  - Main goal of HCI is to evaluate things from the User's perspective

Efficient

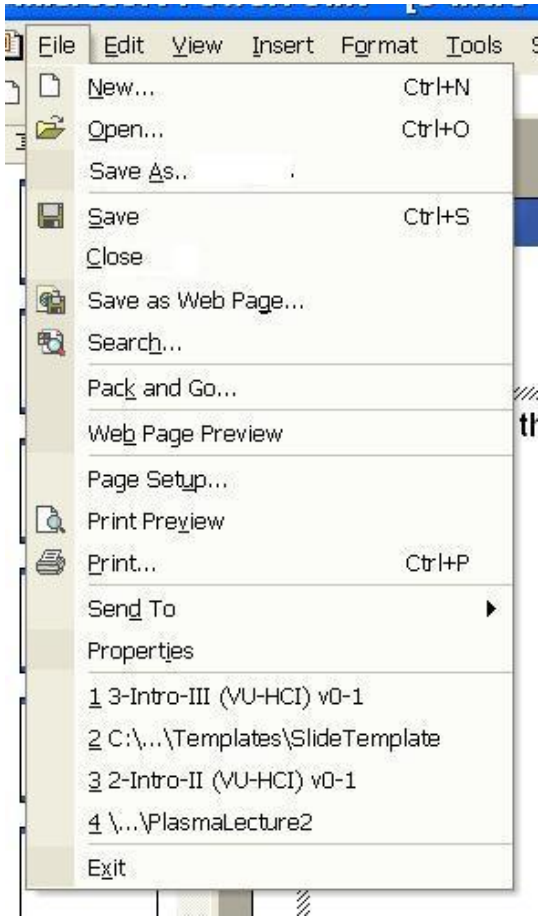
- The way system supports its users in carrying out their tasks

- Does the product help users sustain a high level of productivity?

Safety

- Protecting the user from dangerous conditions and undesirable situation
  - Which of the Cases we discussed earlier you think was the most unsafe ?
    - Plane

Safety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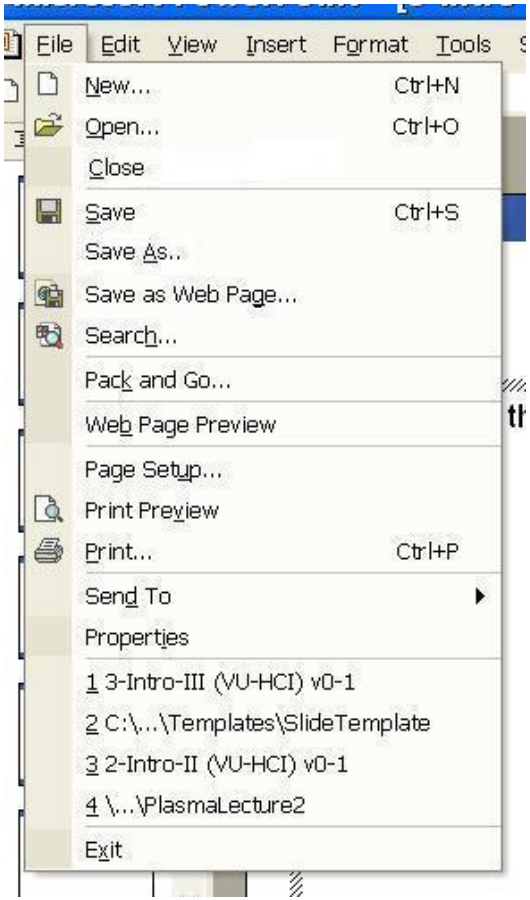
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Utility

- System providing the right kind of functionality so that the user can do what they want

Learnability

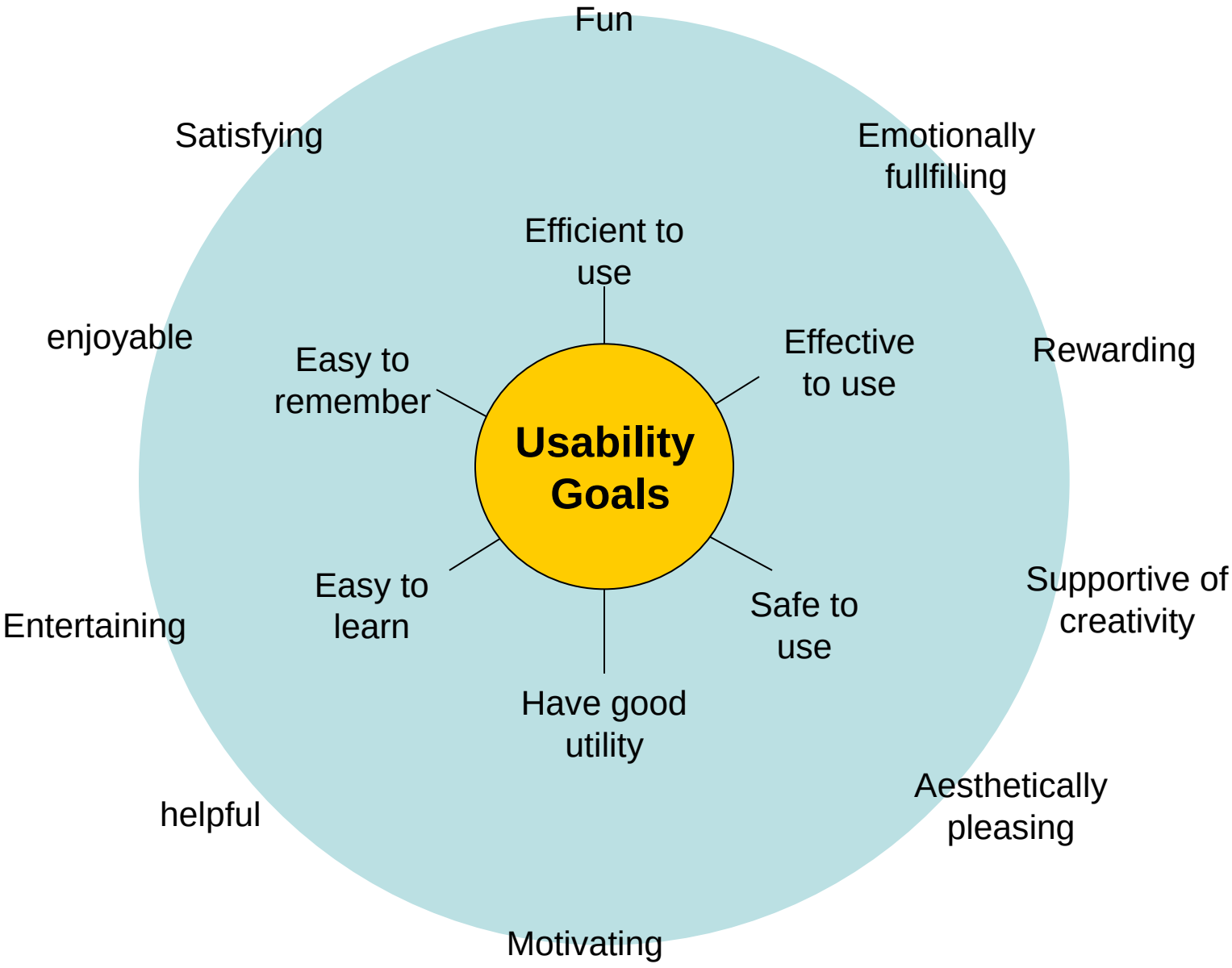
- How easy a system is to learn to user

Memorability

- How easy the system is to remember once learnt
- Riding a bicycle

User Experience Goals

- Satisfying
- Enjoyable
- Fun
- Entertaining
- Helpful
- Motivating
- Aesthetically Pleasing
- Supportive to Creativity
- Rewarding
- Emotionally Fullfilling


Fun
Satisfying
Emotionally fullfilling
Efficient to use
enjoyable
Easy to remember
Effective to use
Rewarding
Usability Goals
Easy to learn
Safe to use
Supportive of creativity
Entertaining
Have good utility
Aesthetically pleasing
helpful
Motivating

Today's Revelation

"Don't Make me THINK, is the key to a usable product"

Usability and Quality

- What is Quality?
  - You like a product
  - Does not break down

- More about Quality later

Software Quality – A Definition

- The extent to which a software product exhibits these characteristics
  - Functionality
  - Reliability
  - **Usability**
  - Efficiency
  - Maintainability
  - Portability

Evolution and History of HCI

Groundwork for HCI: 1960s – Early 1970s

- “Man-machine Symbiosis" (Licklider, 1960)
  - Symbiotic relationship
  - Computers would contribute in creative process

- “Augmentation of human intellect” (Engelbart, 1963)

- SketchPad system at MIT (Sutherland, 1963)
  - Ideas for displaying, manipulate, copy pictures
  - Use of input devices

Groundwork for HCI: 1960s – Early 1970s

- Parallel developments
  - Interactive graphic interfaces
  - Interactive text processing systems
  - Line and display editors
  - WYSIWYG editors
  - Computer graphics (CAD/CAM)

Difference in Approach: Late 1970s and 1980s

- US
  - How computers enrich lives
  - Facilitating problem-solving and creativity
  - Empirical evaluation
  - Psychology of programming

- Europe
  - Theories of HCI
  - Methods of design
  - Formalize usability

Early Days of HCI

- Early days of computing computers were used and operated by Engineers / Technical Staff only

- 1970's: technology explosion
  - Notion of **user-interface** arises, a.k.a. **Man-Machine Interface** (MMI)
  - User-interface became a concern for system designers and researchers

- Growing realization
  - Success depended on improving physical aspect of UI
  - 'user friendly' was often just lip service and making UI aesthetically pleasing

Role of Academic Researchers

- Academic researchers were more interested in how computers enriched human life

- They investigated
  - ‘people’ side of interaction
  - Limitations and capabilities of humans

- Other issues found
  - Training issues
  - Working practices
  - Management and organizational issues

‘Birth of HCI’

- ‘HCI’ term adopted in mid-1980s

- Another HCI definition
  - A set of processes, dialogues, and actions through which a human user employs and interacts with a computer.

Landmark Systems in Evolution

- Three systems were landmarks in evolution
  - Dynabook
  - The Star
  - Apple Lisa

- Unifying theme in these systems
  - Easy-to-use for all
  - Visual spatial-interface

Dynabook – 1970s

- Brainchild of Alan Key and his Associates in Xerox's Palo Alto Research Center (PARC), California

- Intention
  - Develop highly-responsive book-sized PC
    - Colour display
    - Radio link to a world wide computer network
  - Could function as
    - Secretary
    - Mailbox
    - Reference Library
    - Telephone Center
    - Amusement Center

The Star

- Same team of Dynabook
- Desktop Sized Personal Workstation
- Intended for Individual Use
- First Time a Mouse was Used
- Xerox as slow to capitalize on its invention

Apple Lisa – Early 1980s

- Apple exploited this discovery (Star)
- Lisa developed
- Macintosh developed
  - Smaller, cheaper and more powerful version than Lisa
- The concept of GUI

What We Learnt Today …

- Goals of HCI
  - Usability
  - User Experience

- History and Evolution of HCI

Next Lecture

- Quality and Usability
- Discipline of HCI