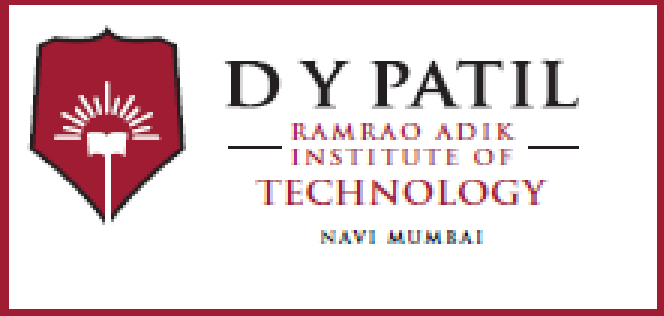

Subject Name: User Interaction Design

Unit No::01

Unit Name:Introduction to Interaction Design

Week number:1,2,3

Faculty Name : Mrs. Jyoti Joshi

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Unit No1 **Unit Name:**

Lecture1:Introdution

Introduction :
History of User Interface Designing

- A machine can be defined as anything that can reduce manual effort.

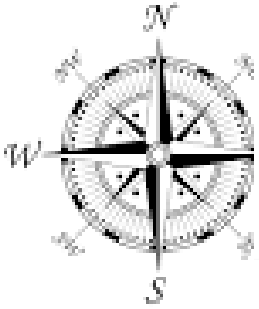
- **First Generation: Machines that Reduce Physical Labor** :
  - ✓ The earlier machine that can be thought of is the normal hand-axe.
  - ✓ The handle is the interface to access this tool. A long wooden piece that is rounded smoothly is used to ensure a good grip.
  - ✓ The crude hand-made axes of Stone-age gradually improved in aesthetics as well as purpose.

History of User Interface Designing

Second Generation: Machines that Displayed Output

- These machines calculate the speed of wind, temperature, time, etc. they showed humans some kind of readings.
- ***The presentation of data to the user can be called as its interface***. The units of measurements, the shape and size of pointers, color, scale, etc., made a difference to the ease of use of the machine.

Anemometer



Compass

Flask

Tailoring Tape

Thermometer

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History of User Interface Designing

Third Generation: Machines that provided Output with Feedback

- Feedback is an acknowledgement a user receives from the machine when his action is registered.
- Most of the home appliances come under this category.

Switch

Fan

Television

Mixer

History of User Interface Designing

- Machines with feedback.

  Microwave oven washing machine telephone

History of User Interface Designing

Fourth Generation: Machine with Computing Power

- The innovation of computers has motivated research in various fields.
- Earlier providing functionality itself was a challenge, and was a field of research. Today we have options, and we are free to discard the ones we are not comfortable with.
- ***For example, earlier people learnt DOS commands to work with computer but today no one put efforts to learn to use system. They just shift to a system which is easier to use.***
- Human Computer Interaction (HCI) is a field of research that emerged due to this competition. Here the focus is on easing the communication between the user and a computer.

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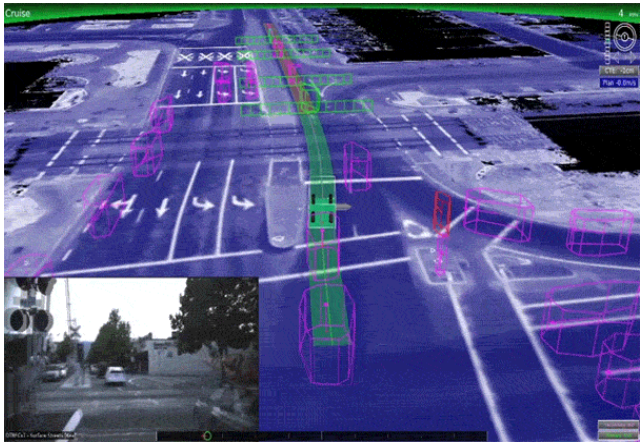
History of User Interface Designing

Fifth Generation: Intelligent Machines

- With artificial intelligence in boom, traditional input methods are providing to insufficient .
- We are making machines that can adapt to the humans by continuous learning. These systems require the freedom to learn from the environment.
- Here the user need not learn how to use the system . Instead these system learn how the user is going to operate the system.
- Example: self driving car detect and avoid obstacle.



Evolution of HCI 'interfaces

- **50s** - Interface at the hardware level for engineers - switch panels
- **60-70s** - interface at the programming level - COBOL, FORTRAN
- **70-90s** - Interface at the terminal level - command languages
- **80s** - Interface at the interaction dialogue level - GUIs, multimedia
- **90s** - Interface at the work setting - networked systems, groupware
- **00s** - Interface becomes pervasive
  - RF tags, Bluetooth technology, mobile devices, consumer electronics, interactive screens, embedded technology

From HCI to Interaction Design

- **Human-computer interaction (HCI)** is:

  "concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them" (ACM SIGCHI, 1992, p.6)

- **Interaction design (ID)** is:
  "the design of spaces for human communication and interaction"
  - Winograd (1997)

- Increasingly, more application areas, more technologies and more issues to consider when designing 'interfaces'

History of User Interface Designing

- ***Natural language processing*** is an upcoming field that allows humans to freely talk to the computer in their own language, and the computer will interpret it correctly

- For such system keyboard, mouse or even a touch screen restrict the learning of the machine .

Thank You

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Lecture No: 2
Good Design and Poor Design

Example of bad and good design

- Elevator controls and labels on the bottom row all look the same, so it is easy to push a label by mistake instead of a control button

- People do not make same mistake for the labels and buttons on the top row. Why not?

From: www.baddesigns.com

Good Design and Poor Design

Why is this vending machine so bad?

- Need to push button first to activate reader
- Normally insert bill first before making selection
- Contravenes well known convention

What to design

- Need to take into account:
  - Who the users are
  - What activities are being carried out
  - Where the interaction is taking place

- Need to optimise the interactions users have with a product
  - Such that they match the users activities and needs

What to design?

- Need to take into account:
  - Who the users are
  - What activities are being carried out
  - Where the interaction is taking place

- Need to optimise the interactions users have with a product
  - Such that they match the users activities and needs

Understanding users' needs

- Need to take into account what people are good and bad at
- Consider what might help people in the way they currently do things
- Listen to what people want and get them involved
- Use tried and tested user-based methods

Activity

- How does making a call differ when using a:
  - Cell phone
  - Public phone box?
- Consider the kinds of user, type of activity and context of use

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Unit No: 1

Unit Name: Introduction

Lecture 3-From HCI to Interaction Design

From HCI to Interaction Design

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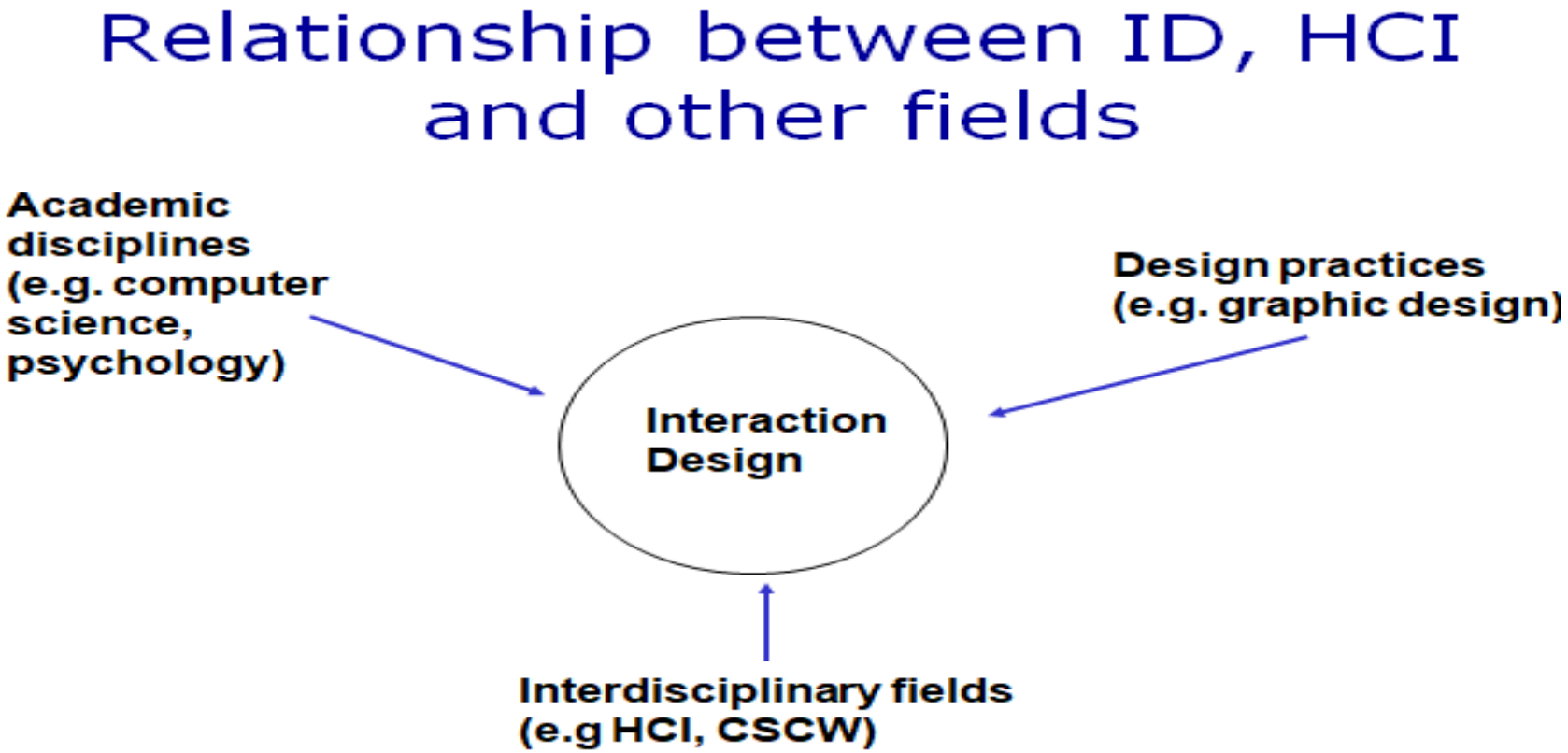
InterRelationship between ID, HCI and other fields



Computer Supported Cooperative Work(CSCW)

Relationship between ID, HCI and other fields

- **Academic disciplines contributing to ID:**
  - Psychology
  - Social Sciences
  - Computing Sciences
  - Engineering
  - Ergonomics
  - Informatics

Relationship between ID, HCI and other fields

- Interdisciplinary fields that ‘do’ interaction design:
  - HCI
  - Human Factors
  - Cognitive Engineering
  - Cognitive Ergonomics
  - Computer Supported Co-operative Work
  - Information Systems

Relationship between ID, HCI and other fields

- **Design practices contributing to ID:**
  - Graphic design
  - Product design
  - Artist-design
  - Industrial design
  - Film industry

What is Interaction Design

- **Interaction design, often abbreviated as IxD, is "the practice of designing interactive digital products, environments, systems, and services.**

- Beyond the digital aspect, interaction design is also useful when creating physical (non-digital) products, exploring how a user might interact with it. Common topics of interaction design include design, human–computer interaction, and software development

- Interaction design synthesizes and imagines things as they could be. This element of interaction design is what characterizes IxD as a design field as opposed to a science or engineering field

- The term *interaction design* was coined by Bill Moggridge and Bill Verplank in the mid-1980s.

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Lecture 4– Methodologies for Interaction design

Methodologies for Interaction design

- **Goal-oriented design:** Goal-oriented design (or Goal-Directed design) "is concerned with satisfying the needs and desires of the users of a product or service

- **Usability:** Usability answers the question "can someone use this interface?". usability is the quality attribute that describes how usable the interface is.

- **Personas:** Personas are archetypes that describe the various goals and observed behaviour patterns among users.

  A persona encapsulates critical behavioural data in a way that both designers and stakeholders can understand, remember, and relate to. Personas use storytelling to engage users' social and emotional aspects, which helps designers to either visualize the best product behaviour or see why the recommended design is successful.

Methodologies for Interaction design

- **Cognitive dimensions:** The cognitive dimensions framework provides a vocabulary to evaluate and modify design solutions. Cognitive dimensions offer a lightweight approach to analysis of a design quality, rather than an in-depth, detailed description. They provide a common vocabulary for discussing notation, user interface or programming language design.

- **Affective interaction design:**Designers must be aware of elements that influence user emotional responses. For instance, products must convey positive emotions while avoiding negative ones.Other important aspects include motivational, learning, creative, social and persuasive influences. One method that can help convey such aspects is for example, the use of dynamic icons, animations and sound to help communicate, creating a sense of interactivity. Interface aspects such as fonts, color palettes and graphical layouts can influence acceptance. Studies showed that affective aspects can affect perceptions of usability

Lecture 5– Process of Interaction Design

Process of Interaction Design:

Step1:know your user

Step2:Understand business Fuctions

Step3:Understand principle of good screen design

Step4:Develop system menu and navigation schemes

Step5:select proper kind of windows

Step6:Select proper Device based controls

Process of Interaction Design:

Step7:Choose proper screen based controls

Step8:write clear text and messages

Step9:Provide effective feedback and Guidence and assistance

Step10:Provide effective Internationalization and Accessibility

Step11:Create meaningful Graphics,Icons,and Images.

Step12:Choose the proper colour

Step13:Organise and Layout Windows and Pages

Step14:Test test and retest and deliver.

Interface design goals:

- Reduce visual work
- Reduce Intellectual work
- Reduce memory work
- Reduce motor work
- Minimize any burden or instruction imposed by technology

What is involved in the process of interaction design

- Identify needs and establish requirements
- Develop alternative designs
- Build interactive prototypes that can be communicated and assessed
- Evaluate what is being built throughout the process

Lecture 6–Visually Pleasing Composition

Importance of good design:

- Good design makes a product useful
- Good design in innovative
- Makes product understandable
- Good design is aesthetic
- Good design makes product easy to transport store and maintain
- Good design is long lasting
- Good design is less design
- Its through down to the last detail.

Principles of good design:

- Asthetically Pleasing
- Clarity
- Compatibility-------user,task,job,product
- Comprehensibility
- Consistensy
- Control
- Directness----reduce mental load
- Efficiency----transistion through different cntrols should flow easily amd freely
- Responsiveness
- Simplycity
- Transparency---user should be focused on task and not mechanics of interface
- Trade-off---user requirment is important over technical requirment.

Visually Pleasing Composition:

- Balance
- Symmetry
- Regularity
- Predictability
- Sequentiality
- Economy

Visually Pleasing Composition:

- Simplicity
- Amount of Information----proper amount, all necessary information, screen density
- Grouping----proximity,closure,similarity.
  ----based on whitespace using boarders using background
- Unity---similar size shape colors for related info
- Proportions—

  square----------1:1

  square root of two------ 1:1.14,

  golden rectangle----------1:1.618

  Square root of three-----1:1.732

  Double square----------1:2

Poor design:

- Design lacks contrast
- Non responsive design
- No feedback
- Poor information architect
- Inconsistent style.

User Experience:

- Useful
- Useable
- Desirable
- Findable
- Accessible
- Credible—user should trust information task and controls on interface

Lecture 7–User Experience Process

User Experience:

- Useful
- Useable
- Desirable
- Findable
- Accessible
- Credible—user should trust informatio and belive what u tell

User Experience Process:

- Understand
- Research
- Sketch
- Design
- Implement
- Evaluate

User Experience Process:

- Understand---

Understand requirement create user personas define use cases

stake holders to understand –1 Design team
2 Business Manager
3 Product Manager

Activities:

-meet talk observe and understand user in environment
-Analyze requirments to understand and clarify them
-Define user Personas and use cases

Outcomes-

-User Personas
-User stories
-Usecases User flows

User Experience Process:

- Research---

  Design team does research work to explore how outer world is working on such features.

  Understand Market competion

  Learn about domain

  Get inspirations and ideas from your competitors

  stake holders

  Design team

  Activities:

  -study competitors approches

  -Research on sililar features in the world

  -Analysis latest UI/UX trends

  -Keep track on our own ux Guidelines

  Outcomes-

  -A bunch of ideas and materials on which you can build your actual design work

User Experience Process:

- Sketch
  -Make a useable design to achieve end user satisfaction
  -Testing and evaluation of wireframes is part of this stage
  -Draw and draft and then redraw and redraft.
  -using paper sketches white board flows and wireframes to share ideas with stackholders.

  Stake holders –Design team
  -Product Managers
  -Technical Mangers

  Acivities:
  -Generate ideas and work on basics of sketches
  -Brainstorming sessions with stackeholders to get their feedback from technical perspective
  -Redraw sketches and retest them with stake holders.

  Outcomes:
  Sketches
  wireframes,Mockups
  userflow

User Experience Process:

- **Design**

  -Finalized layouts and flow of inerface is done now finalize on graphics

  -turn wireframes mockups to grat looking imags with theme and styles applied to them

  -

  Stake holders –Design team

  -Product Managers

  -Business Mangers

  -Technical Experts

  Acivities:

  -Design ui images

  -Design final theme guidelines required for implementaion

  -Design icons to display on screens

  Outcomes:

  Design images

  Details of design like colour theme styles guidelenes

  Icons

User Experience Process:

- **Implement**

  Development tems builds backend fuctionality first and connects it with Ui whenthey get design artifacts -

  Stake holders –Design team

  -Development team

  Acivities:

  -Implement back end fuctionality and front interface

  Outcomes:

  Developed UI with complete fuctionality and experience following the design theme and style

User Experience Process:

- **Evaluate**

  when product features are implemented the end product is evaluated based on few factors

  Whether system is usable
  is it easy to use for end users
  is it flexible and easy to change
  does it provide desired solutions to users problems

  Stake holders –Design team
  -Product maneger

  Acivities:
  -Go through the flow and feel the experience
  -Perform a comparision of implementation and defined inerface

  Outcomes:
  user feedback
  UI audit reports
  Ares marked were improvement is required

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