Welcome to the HCI Course
CS5015

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WhatsApp – **I am Void** ; My **TA is mutable** type in all modes !

✓What is HCI? – **Human Computer Interaction** ; other famous acronyms such as **MMI** – Man Machine Interface ; **HMI** – Human Machine Interface; **CHI** – Computer Human Interface; **IxD** - Interaction Design

✓Infact there is a famous ACM SIGCHI conference…

✓We will stick to the common term of HCI

- HCI is the Study of Usability and Its Practice
- – Understanding or creating software and other technology that people will want to use, will be able to use and will find effective when used.
- In essenence HCI focusses on Usability concepts and methods to encourage it, achieve it and measure it.
- Also viewed as Design of Interface ranging from
- **Unimodality v/s multimodality ;**
- **Intelligent Adaptive v/s Command / Action based ones**
- **Active v/s passive interfaces**

- ✓ Key aspects of HCI are Functionality and Usability
- ✓ Functionality – Set of actions or services that a system provides to its users.
- ✓ Value of functionality is visible only when it becomes possible to be efficiently utilized by the USER
- ✓ Usability of a System with certain functionality is the range and degree by which the system can be used efficiently and adequately to accomplish certain goals for certain users.
- ✓ Effectiveness of the system – balance between functionality and usability
- ✓ Similar trade off as with Efficacy v/s Efficiency for Robustness

- ✓ HCI is an emerging (or shud we say emerged!) trend in Computer Engineering
- ✓ Computer Engineers – analyse and design and evaluate computer systems – both Hardware and Software
- ✓ ACM mandate of COE is skillsets for Efficent Hardware and Software Interaction
- ✓ HCI focuses on the Design Issues related to Software Manufacturing or Development
- ✓ HCI – also defined as the **Study of How People Interact with Computers** and to what extent **computers are or are not developed** for successful interaction with human beings.

- ✓ HCI comprises of THREE Parts –
- ✓ **USER, COMPUTER and INTERFACE**
- ✓ **USER:** Individual or Group of Users working
- ✓ Issues such as – Appreciation of People's sensory system to relay information
- ✓ Differing conceptions or mental models of interaction by different users
- ✓ Role of Cultural or National Differences in Interaction
- ✓ **COMPUTER –** Desktop to Large Scale Systems – In a design task of Website Creation – Website is the COMPUTER
- ✓ **Smart Phones, VCR's etc. are all computers!**
- ✓ **INTERFACE:** balance between what is **ideal and what is feasible** for USERS

- **Goals of HCI** – Produce **Usable, Safe and Functional Systems**
- Put **people first is the mantra of HCI**
- **HCI –** understands factors that determine how people use technology
- **Large Focus –** create efficient, effective and safe interaction
- Users needs, capabilities and preferences for various tasks – should drive the System Designers
- People shud not be forced to change the way that they use a system in order to fit in with it! As opposed to
- System should be designed to match their requirements

- Usability – one of the key concepts in HCI – focus in on creating systems that are easy to learn and use.
- **Usability is Characterized by 5 E's;**
- Easy to Learn
- Easy to remeber how to use.
- Effective to Use
- Efficient to Use
- Enjoyable to Use
- Why is USABILITY so Important
- Modern system have least regard for this measure!

- How many times have **V come across glass doors with a handle** that does not indicate the opening mode ! (design term is **AFFORDANCE**….what operations does a feature allow!)
- Push AND Pull Stickers are not SIGNS of a GOOD Design!
- Design of the Handle should indicate the affordance!
- Photocopiers – XEROX machines – two buttons with ! And C.
- C is treated by modern day users as COPY ! But in the Photocopier the ! Is the copier operation and C is for Cancel
- Not to entirely blame given the C for Cancel model from Calculators usage!!

Our Famous Punching Bag – Usability Issues

Jacob Nielsen – Father of Usabilithy Engineering

Nielsen Norman Group (nng) – their famous organization

Norman – famous author of Design of Everyday Things

Nielsen's Summary of Windows 8

- Hidden features, - Shutdown was a real treasure hunt!
- reduced discoverability,
- cognitive overhead from dual environments,
- reduced power from a single-window UI
- low information density. Too bad.

Our Famous Punching Bag – Usability Issues

- ✓ smothers usability with big colorful tiles while hiding needed features.
- ✓ new design optimized for touchscreen
- ✓ **Double Desktop = Cognitive Overhead**
- ✓ **product's very name has become a misnomer.**
- ✓ **no longer supports multiple windows** on the screen
- ✓ can't view several windows simultaneously, they must keep information from one window in short-term memory while they activate another window
- ✓ **short-term memory is notoriously weak**

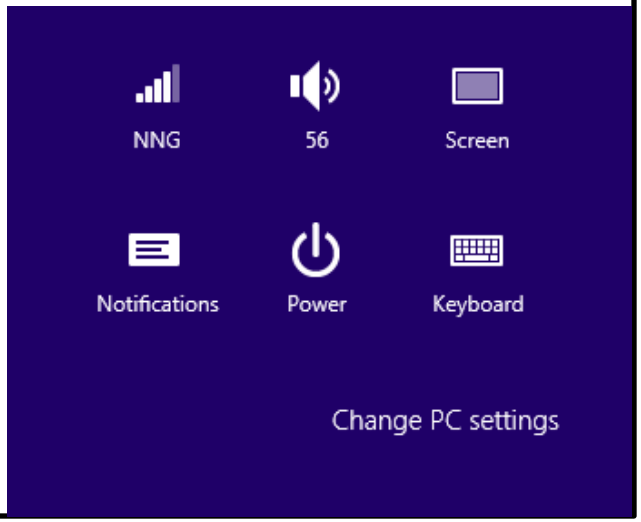
Our Famous Punching Bag – Usability Issues

- **Flat Style Reduces Discoverability**

Where can you click? Everything looks flat, and in fact "Change PC settings" looks more like the label for the icon group than a clickable command.

- **Low Information Density**
- Amount of Info projected on a window is drastically reduced.
- **Overly Live Tiles Backfire**

✓ Misuse for all apps results in apps being not recognised!



MORE ON USABILITY

Some of the key factors affecting Usability are

- Format of Input
- Feedback
- Visibility
- Affordance – added by Donal Norman/
- **Affordance** of an object **--**sort of operations/manipulations that can be done on or to it.
- Examples such as A door affords opening
- **Visibility** – mapping between control and its effect. Eg. Cars have good designed controls – steering wheel has only one functionality – **good feedback – easy to understand**
- **Really bad ones follow…….**

MORE ON USABILITY

- Mobile Phones and VCR's score poor on visibility front
- There is little visual mapping between control and user goals
- Also controls have multiple functions…
- Who can miss out the **Set Top Box Remotes!!**
- **Elders have simply lost the charm of watching TV**…
- And to make things worse…..multiple designs with functionalities being supported not in a consistent manner**…**
- One more interesting case – How many of us read the **product manuals** given with products such as phones, washing machines, etc.
- Golden Theory in Design –**Blame the Design, Not the User**

- **It is the Duty of Machines and Those Who Design them to Understand People –Don Norman**
- **Bad UX and UI Makes Users Blame Themselves**
- User hate uncertainty, and do anything to escape it, as quickly as possible— even if it means lying to themselves.
- Design isn't about pushing pixels. It's about advocacy.
- it's not about the user understanding technology, but about the technology (and those who create it) understanding them
- **Design is a CONFIDENCE GAME**
- Plenty of Success and Failure Stories! – what better example than Google Search Engine for Usability . Many who visit sites via google even when they know the exact url! That sums up Google's Popularity and Usability

Disciplines Contributing to HCI

- Computer Science – technology, software design, UIMS,etc.
- Cognitive Psychology – information processing capabilities, limitations, etc.
- Social Psychology – Social + Organizational structure
- Ergonomic and Human Factors – Hardware Design, Display Readability, etc.
- Linguistics – Natural Language Processing
- Artificial Intelligence – intelligent Software
- Engineering & Design – Graphic Design, etc.
- ……

Some of the Issues / Factors in HCI