Human Computer Interaction - An Introduction

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Module 2:

Interactive System Design

Lecture 3:

GUI Design & Aesthetics

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GUI: Graphic User Interface

The interface through which a user operates a program or an application or an device

Consists of individual or group of ICONS, buttons, scroll bars, menus, widgets, boxes, status lamps, labels, instructions, visuals etc - arranged on the screen in a pattern that is visually pleasing as well as ergonomically useable.

Very important and critical component in facilitating user interaction with the software & hardware inside the device / product.

GUI determines the Usability Index of the product as a whole. Gives the product an identity, personality & character.
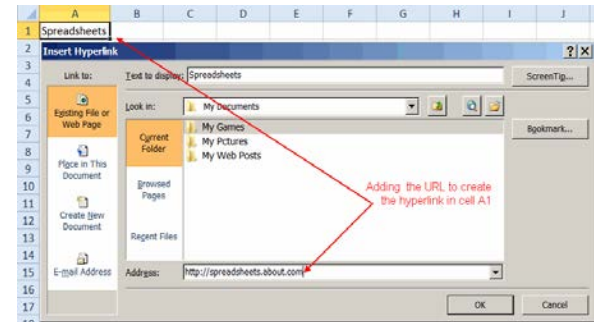
Requirements of a GUI

Should be

FUNCTIONAL:
Useable - Easy to operate ; locate what is required & where it is required on the screen; and do what is expected of it – without need for learning or training

AESTHETIC:
Pleasing to the eye ; Highest Visual Quality; Identifiable; Distinct ; Recognizable, Recallable

COMMUNICABLE:
Express what it represents; how it is to be operated; Unambiguous; Meaningful; Culturally & Contextually compatible

In GUI Design <u>Aesthetics</u> is about

Sensory + Empirical + Taste + Judgment

The Philosophical argument of aesthetics shown below is incorporated into Interfaces through Graphic designing
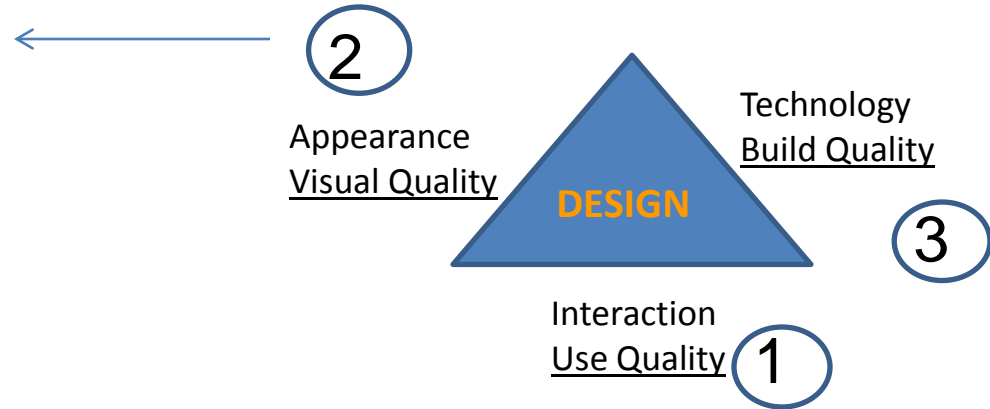
Simplicity + Infinity + Eternity + Serenity = Beauty

**Aesthetics is both Art as well as Mathematics.
It is both rational as well as emotional at the same time.**

Aesthetics is a medium for User Experience

Appearance
Visual Quality

Appearance
Visual Quality

DESIGN

Technology
Build Quality

Interaction
Use Quality

2

3

1

Aesthetics (Look & Feel) + Communication + Use ability

= Total UI Experience

Role of Aesthetics –
often misunderstood & underestimated

- Aesthetics is not mere beautification.
- It has as much to do with FUNCTION as with beauty

- Aesthetics is not the surface characteristics of a GUI It is not decoration. It is not cosmetic

- A 'good looking' GUI needs also   to function

                                   to communicate
                                   to express
                                   to instruct
                                   to perform

While the judgment of Aesthetics is subjective the construction / configuration is not.

There are elements & principles of good aesthetic configuration

ELEMENTS

Line, Shape, Space, Color, Form, Texture, Light

PRINCIPLES

Balance, Emphasis, Rhythm, Unity, Contrast, Movement

Principles of design in Visuals

Design is composed of manipulating the physical characteristics of size, shape, texture, proportion, scale, mass and color.

Order & composition is the arrangement and organization of elements in relation to each other.

Form follows function is a design approach wherein the form (overall layout / composition/geometric shape) of a GUI is determined by what function it does.

Ex: An arrow has a Form having a sharp angular face at one end expressing the function of pointing to a direction.

Composition

An orderly arrangement of elements using the principles of design
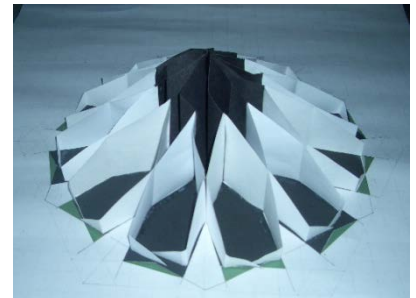
Principles of Design

Grammar of the visual language.
Rules for composing with the elements

- The Principles of Design can be thought of as what we do with the elements of design to express and communicate a predetermined message of Usability, Reliability, & Functionality in a harmonious fashion.

- **Balance**
- **Unity**
- **Proportion**
- **Harmony**
- **Direction**
- **Rhythm**
- **Symmetry**
- **Pattern**
- **Emphasis**
- **Contrast**
- **Movement**

Notice that many of the terms on the right figure
 are also used in Mathematics.
Design, therefore has both, Aesthetics and Mathematics, underlying it.

Rhythm & Movement

- **Movement** is the path the viewers eye takes through the artwork, often to focal areas. Animation is often used.

- **Rhythm** is created when one or more elements of design are used repeatedly to create a feeling of organized movement / direction.
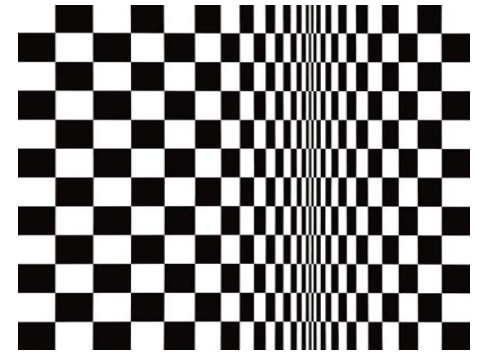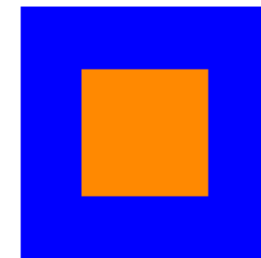
Emphasis

This is the part of the design that catches the viewer's attention. Usually the Designer will make <u>one area</u> stand out by using the elements of design in a contrasting way. There will be a play with different sizes, colors, textures, shapes etc.
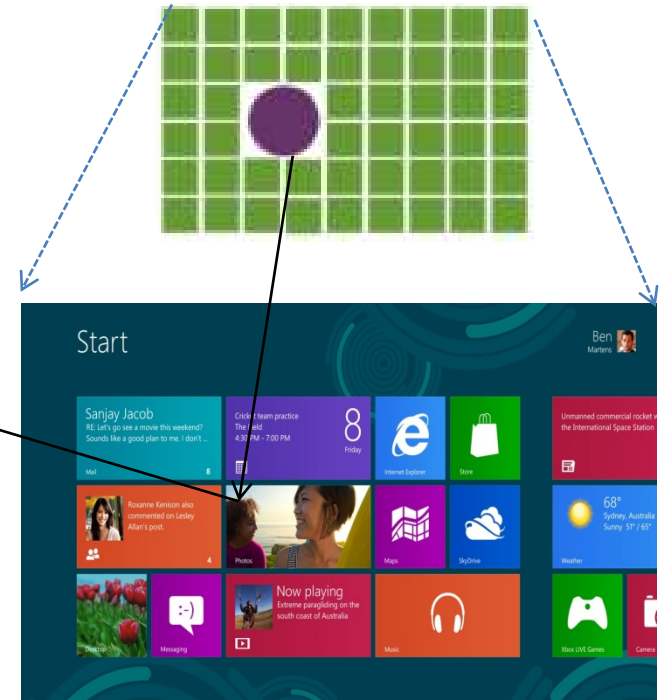
Contrast

- Differences and Diversities.
- Highlighting similarities

High contrast   Low contrast

Unity

Unity is an overall "sameness" throughout a screen.. How harmoniously all the elements blend together.

Example: Windows 8 GUI

Balance

Visual balance. Are the various elements visually balanced in terms of their Size, shape, weight, and placement. Can the rhythmic order be visually discernable ?

Proportion

Size relationships found within an object or design. Also a comparison in terms of ratio of size, shape, etc with neighboring elements.
Example see proportions of various buttons within Windows 8 screen

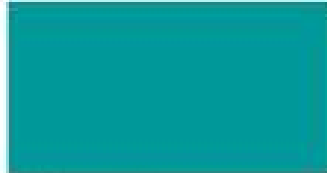1.618

1

The Golden Rectangle ratio
1: 1.618
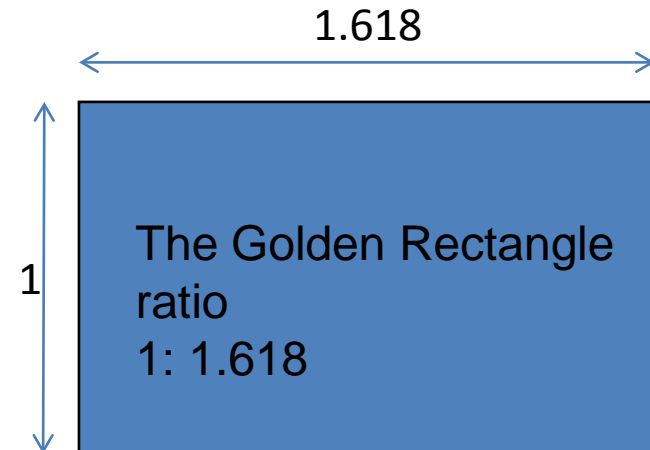
Proportion & Rule of thirds division of a screen

Proportion refers to the size relationship of visual elements to each other and to the whole picture. One of the reasons proportion is often considered important in composition is that viewers respond to it emotionally.
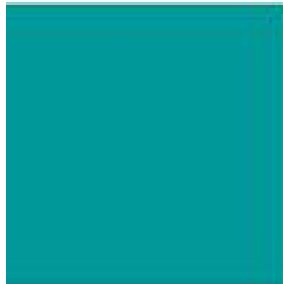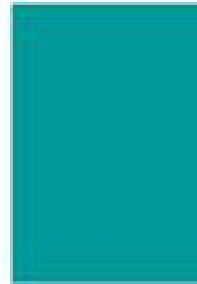
COLOUR

- Colour is a vast subject of both Physics and Fine Arts.
- Graphic Designers use metrics to specify colours.

**Hue:** refers to the names of the primary colours. (red, green and blue).

Value: lightness and darkness of the hue –

Shade: amount of white or black added.

Intensity: the purity or saturation of the colour

Monochromatic : use of one colour where only the value of the colour changes

Analogous colours: colours that are adjacent to each other on the colour wheel, e.g. yellow and green are analogous.
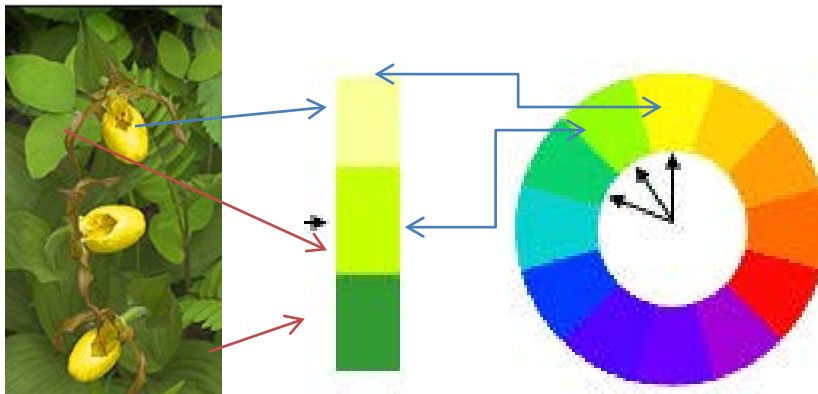
Limitations of Technology

The Visible spectrum consists of billions of colours, a computer monitor can display millions, a high quality printer is only capable of producing thousands, and older computer systems may be limited to 216 cross-platform colours.

The Psychology of Colours

WARM colours include: yellows, red and orange we associate these with blood, sun and fire.

The Psychology of Colours

COOL colours include: violet, blue and green because of our association with sky, water.
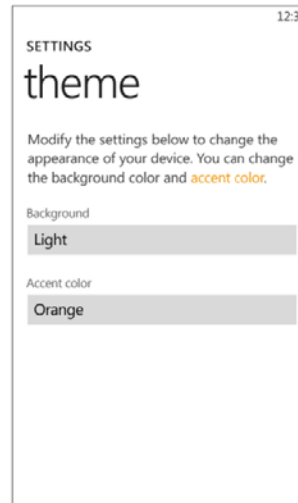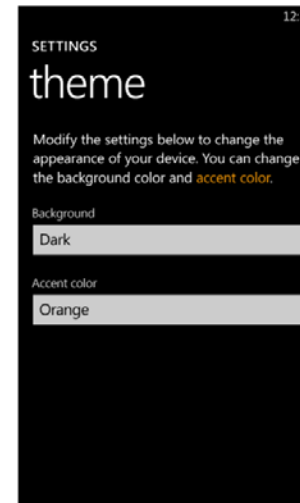
Colour Theme

Choices of colour given to the User. Simple Pick & Chose does not confuse the user with 100s of colours to chose from.

A set of colours are carefully decided upon by a designer which form a 'theme' .

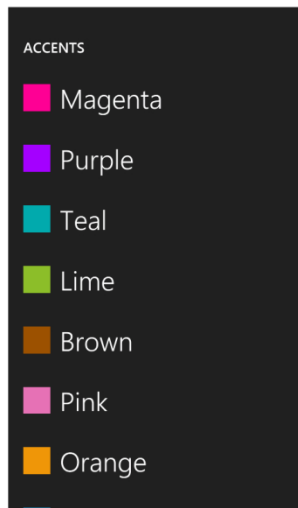All screens will have visual elements from the theme.

12:38

SETTINGS
theme

Modify the settings below to change the appearance of your device. You can change the background color and accent color.

Background
Light

Accent color
Orange

THEME SETTINGS
Shown in light theme

12:38

SETTINGS
theme

Modify the settings below to change the appearance of your device. You can change the background color and accent color.

Background
Dark

Accent color
Orange

THEME SETTINGS
Shown in dark theme

ACCENTS

Magenta

Purple

Teal

Lime

Brown

Pink

Orange

ACCENT COLOR PICKER
Shown in light theme

ACCENTS

Magenta

Purple

Teal

Lime

Brown

Pink

Orange

ACCENT COLOR PICKER
Shown in dark theme

| E51400 | 339933 | 1BA1E2 | F09609 | 8CBF26 | 00ABA9 | FF0097 | E671B8 | 996600 | A200FF |

Graphic Design Principles: Example: mobile screen

The Clustering Principle:

Organizing the screen into visually separate blocks of similar controls, preferably with a title for each block. Modern WIMP (Windows-Icons-Menus-Pointer) systems are a natural expression of the Clustering Principle

Cluster 1

Grid lines

Cluster 2

Information on a screen which is not catagorised into some order (right hand screen in the above figure) can be confusing. GRIDS are therefore used to not only to align & please aesthetically but also catagorise UI elements according to functions .
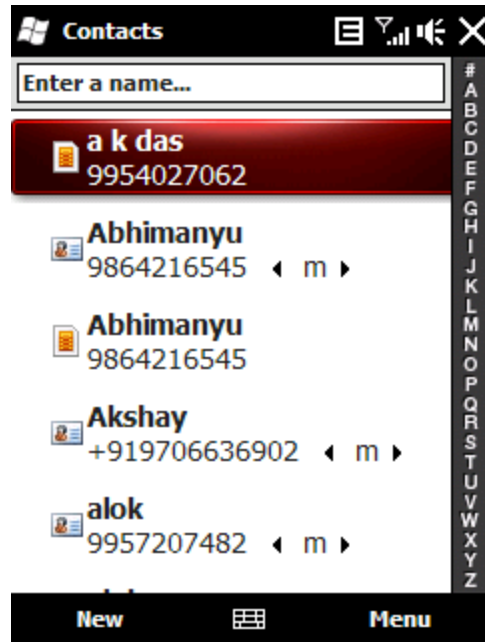
Type size and font, for example: the Reduced Clutter Principle would suggest that one or two type styles are sufficient.
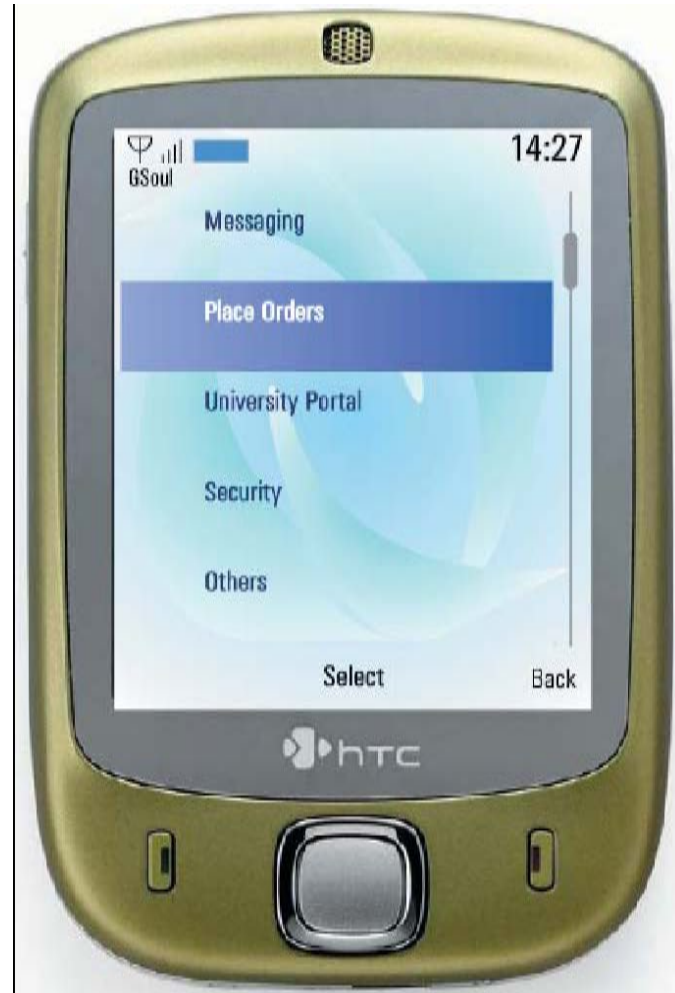
Poor Font readability

Avoid fancy fonts totally

Safe Fonts

- Arial, Helvetica, sans-serif
- Courier New, Courier, mono
- Verdana, Arial, Helvetica, sans-serif
- Geneva, Arial, Helvetica, sans-serif

Regional Fonts still have unresolved problems when used in low resolution & small displays screens.

ಜನನೀ ಜನ್ಮಭೂಮಿಶ್ಚ ಸ್ವರ್ಗಾದಪಿ ಗರೀಯಸೀ

जननी जन्मभूमिश्च स्वर्गादपि गरीयसी

ஜநநீ ஜந்மபூ்மிஶ்ச ஸ்வர்காதபி கரீயஸீ
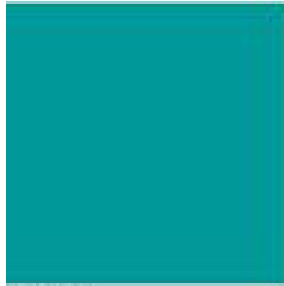
Weight of font matters

 BOLD – some times , results in poor smudged readability on mobile screens - even on AMOLED

ಜನನೀ ಜನ್ಮಭೂಮಿಶ್ಚ ಸ್ವರ್ಗಾದಪಿ ಗರೀಯಸೀ

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ஜநநீ ஜந்மபூ்மிஶ்ச ஸ்வர்காதபி கரீயஸீ

 జనని జన్మభూమిశ్చ స్వర్గాదపి గరీయసీ

ಜನನೀ ಜನ್ಮಭೂಮಿಶ್ಚ ಸ್ವರ್ಗಾದಪಿ ಗರೀಯಸೀ

ജനനീ ജന്മഭൂമിശ്ച സ്വർഗാദപി ഗരീയസീ

Screen resolution & aesthetics

Aspect Ratios

Square

Horizontal

Vertical

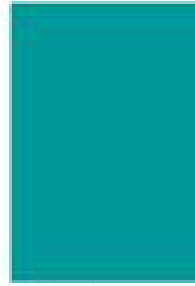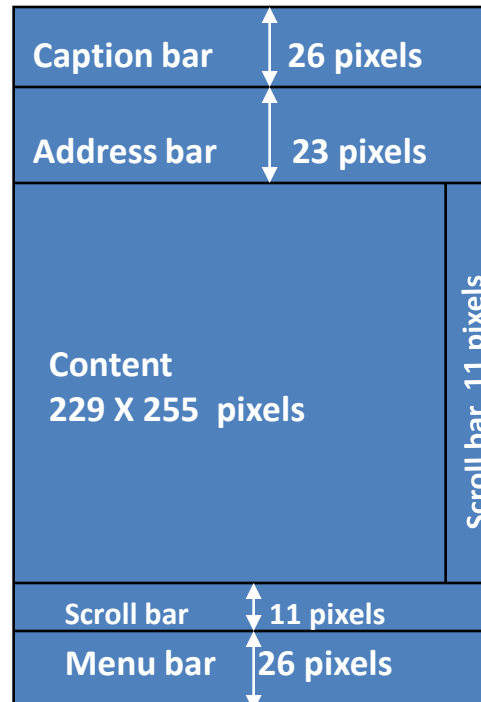| Caption bar | 26 pixels |
Address bar	23 pixels
Content 229 X 255 pixels	Scroll bar 11 pixels
Scroll bar	11 pixels
Menu bar	26 pixels

25 to 30% of the area is taken by buttons, etc. Therefore only about 229 X 255 is effectively available from a 320 X240 display.

Some unsatisfactory GUIs.

Too many similar elements.
No colour contrast.
Monochrome colour scheme
is visually too heavy. No
differentiation . No identity.
Functional confusion. Poor
communication.
Difficult to use. Error prone.
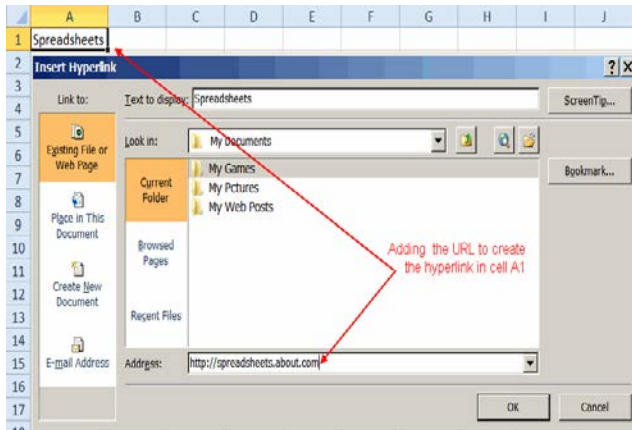
No colour contrast.
Too many data fields
undistinguishable.
Use of same colour
(orange) to for two
different tasks.

Icon to depict '
security' has two
humans . Not
representational &
meaningful.
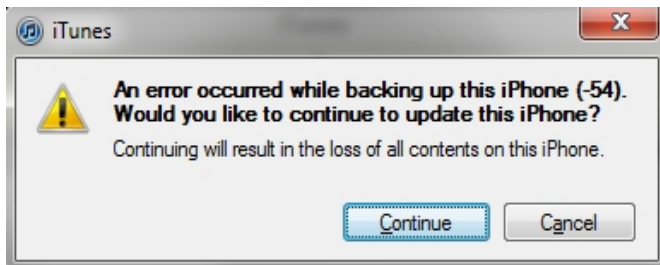
Confused verbal statement label.
The two buttons offer a dead end. By
executing the action the user is not
visually informed as to what to do.

Case Study 1 : Windows GUI

Aesthetic and minimalist design:

The system is not cluttered with excessive use of icons and buttons. Tabs are used to separate different functionalities. A simple rectangle composition arrangement is used to model information.

Recognition rather than recall: The use of colour schemes and icons act to denote functionalities . Example ' Head Phone icon". This design feature promotes recognition of rather than recall of system functionalities

Case Study 2 :   Icon Design

Two simple icons communicating an activity in progress.

Both the icons are graphically simple, do the function of informing the status & are not complicated to understand.
They use gradient in colorus (monochrome) to depict time progress through animation. The circular form express the abstract concept of time.

The state of 'please wait' is expressed in a pleasant peaceful unhurried manner.

In terms of construction, the icons do not take expensive screen real estate; need very less computing memory; are amiable to both pixel as well as vector graphics.

The icon has achieved this by employing aesthetic principles in their form, colour, shape, configuration, motion & composition – all of them put together holistically resulting in a simple 'design'.
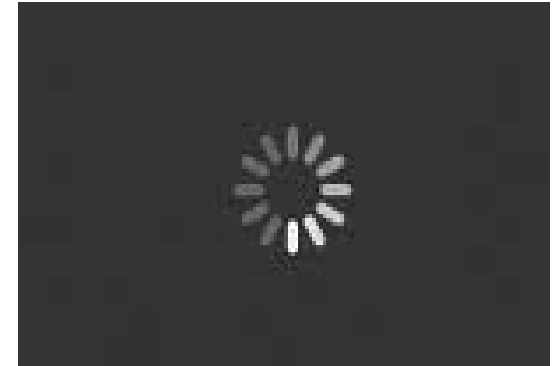
Graphic Design – Website Layout

HCI-Designers besides being Engineers are Artists in the sense that they have to become sensitive to the visual language and master the use of visual elements in accordance to Principles

Too much of order. Not Interesting

Rhythmic spacing. Different shapes create interesting lay out.

Graphic Design Case Study 3

A case study of a website's visual quality

The principles of Cognitive Science – Gestalt laws govern aesthetics.

Aesthetics
Ordered Grid -
Rows and Columns
Good composition –
Position with respect to area
Visual Balance –
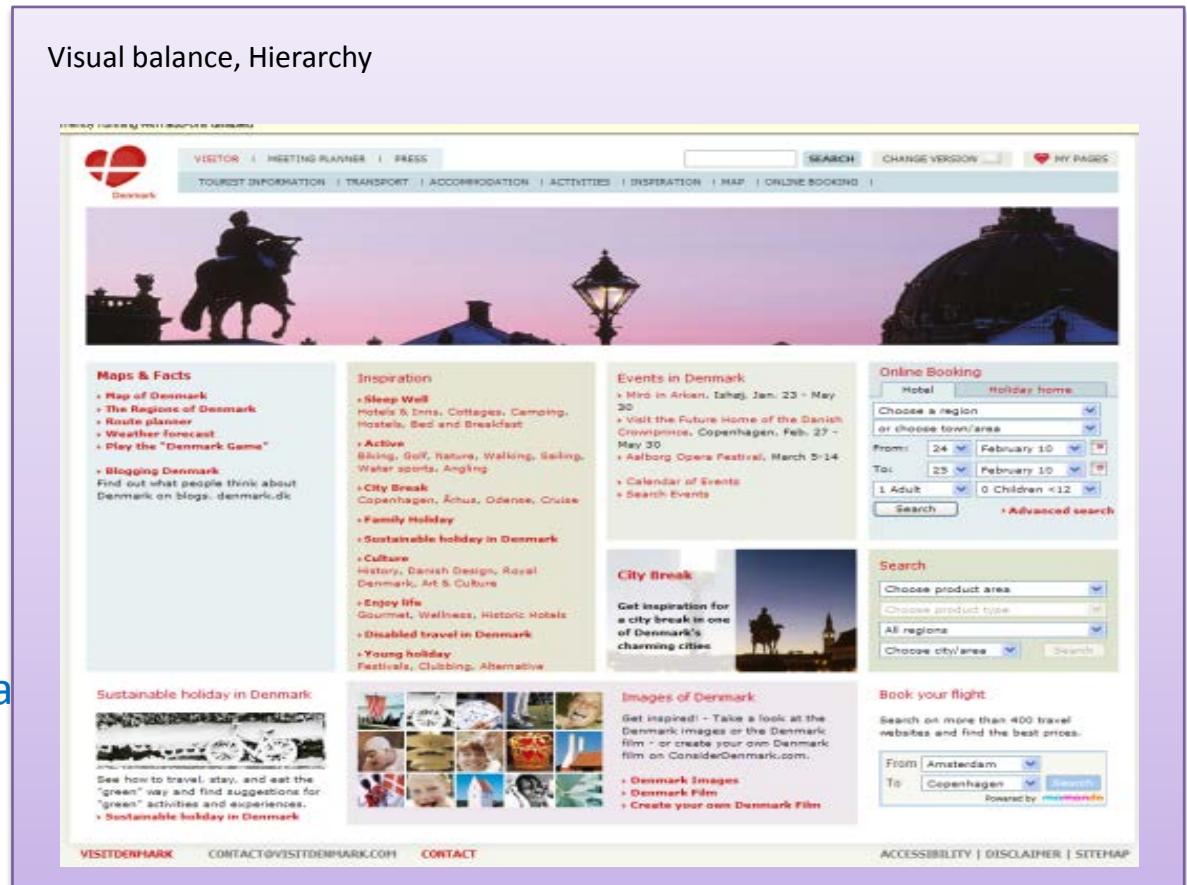Symmetry / Asymmetry
Low visual noise –
No clutter or crowding
Color & Graphics –
Simple plain light reflective /absorbing colors with no fancy labels.

Visual balance, Hierarchy

The U I -interface of a product is not a canvas for art nor a surface for advertising.

- Aesthetics is a specilised discipline.
- It has as much science & technology in it as much as Art.
- It is qualitative as well as quantitative judgment.

- Creative Designers are best equipped to decide on aesthetics as they are trained professionally.

Assignment 1

From any computer or mobile screen pick one GUI which you do not like & one more GUI which you like.

Analyze their constituting graphic / visual elements by applying principles of aesthetics and find out if you can attribute any aesthetic reasons for your 'like' & 'dislike'. Keep functional & usability aspects out of the judgment for the time being.

Assignment 2

Sketch as many alternatives as you can visualise for the two icons that depict activity progress happening in the background .

Conduct a quick survey from amongst your friends as to which of the icon concepts, you have come up with, are 'liked' by them.
You can ask them to rate each design for 10 points and empirically find out the one that is most likely to be accepted in terms of aesthetics & function representation.

You can also ask them to point out one visual element from your design that if changed will improve your design.

?