# Software Architecture and Design Thinking

116U01C701

Module 5

# Module 5 (07)

## 5. Refinement, Prototyping, Implementation:

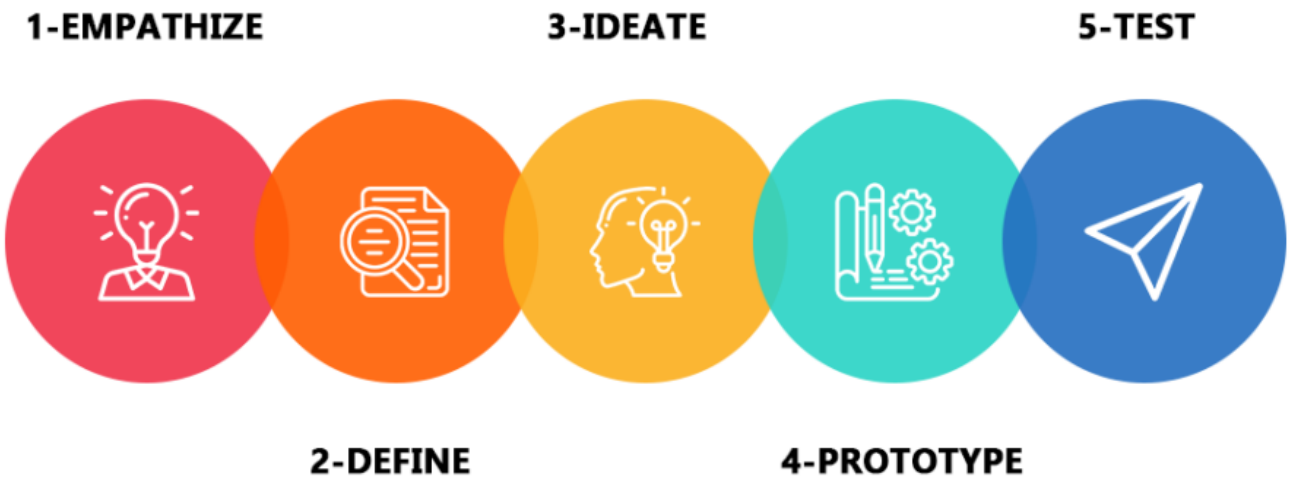
**5.1** Refinement : Thinking in images and signs,

Appropriation, Modification, Thinking in shapes and colours

**5.2** Prototyping : Developing designs, ‘Types’ of prototype, Vocabulary

**5.3** Implementation: Format, Materials, Finishing, Media, Scale, Series/Continuity

# *DESIGN THINKING* PROCESS




UNDERSTAND → EXPLORE → MATERIALIZE

# Refinement

- Refinement :
  - Thinking in images and signs
  - Appropriation
  - Modification
  - Thinking in shapes and colours

# Refinement

- Designing is an iterative process
- With every iteration; appearance, performance of the system may change
- Working up a design idea involves the continued refinement of the artwork and the message it communicates.
- Refinement sees small yet significant changes made to a design in order to enhance the idea and increase the effectiveness of its ability to communicate.

# Refinement

**Thinking in images**

- Images have the ability to convey an idea or a lot of information very quickly
- Images are such a prominent part of graphic design
- Images can have different cultural and social interpretations
- These can be shaped by the contexts within which they are used
- The cultural groups they are directed towards, the inclusion or exclusion of particular signs and symbols shared by a cultural group
- The use or absence of conditioning agents such as wit and humour and appropriation of historical meaning, are all factors that might influence the meaning drawn from an image.

# Refinement

**Thinking in signs**

- A sign is a powerful communication device: it can be easily recognized and can convey complex concepts in a simple fashion
- Images can contain different signs.
- Signs convey meaning through processes of semiotics, denotation and cognition.

# Refinement

**Thinking in signs**

- Semiotics:
  - Offers an explanation as to how people extract meaning from words, sounds and pictures.
  - Proposes that three ‘classifiers’ exist:
    - the sign: offers information by way of its content
    - the system :the scheme within which the sign operates
    - the context: the scheme within which the sign is placed


  - Many designs include symbolic references or signs that communicate multiple layers of information
- Denotation:
  - The literal and primary meaning of an image or graphic that means something as exactly as it appears to be

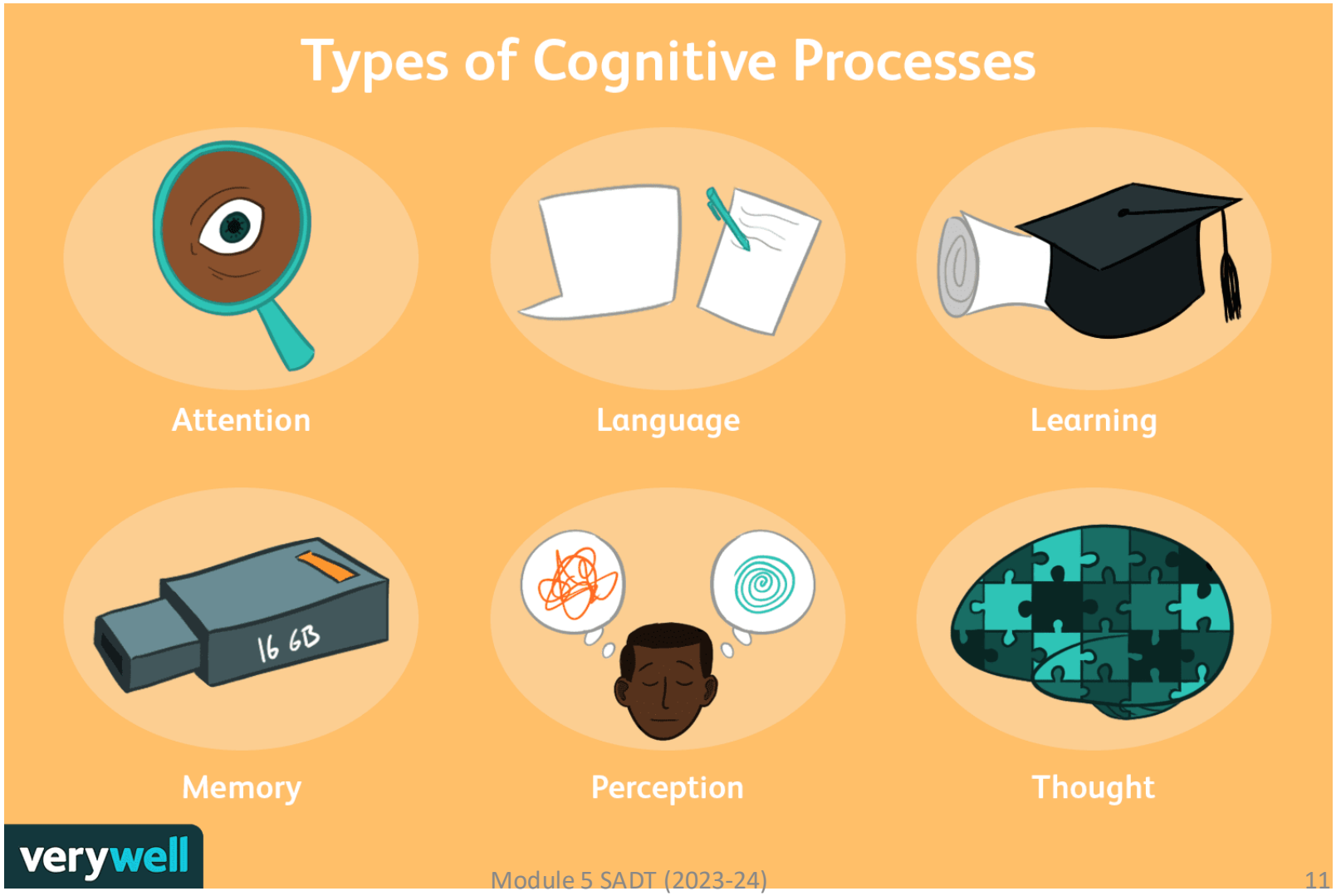
# Refinement

**Thinking in signs**

- Cognition:
  - Understanding, knowing or interpreting based on what has been perceived, learned or reasoned.
  - Interpretation of an image depends upon how it is presented.
  - Our denotative interpretation of an image changes as the presentation of the image alters
  - Such changes can be made by context, coloration, juxtaposition or in other ways

# Refinement

**Thinking in signs** Cognition:



# Refinement

**Thinking in signs**

- Commonly used to communicate short, important messages in a simple way
- Signs could be grouped into three categories:
  - **Icon:**
    - A graphic element that represents an object, person or something else.
    - Can be a photograph and it can be diagrammatic or illustrative
    - An effective diagrammatic or illustrative icon seeks to reduce the subject to simple and instantly recognizable characteristics

# Refinement

## Thinking in signs

- **Index:**
  - Sign is one where there is a direct link between the sign and the object

- **Symbol:**
  - Element that communicates a concept, idea or object, but without a logical meaning between them.
  - Letters are symbols that represent the sounds we use to form words.
  - Flags, for example, are symbols that represent different countries, geographic areas or organizations

# Refinement

**Using Symbols & Signs:**

- Symbols **communicate effectively** because they harness shared cultural norms, which may not migrate comfortably to being used as part of an identity, logotype or branding for a company or product
- Certain symbols are universal and may be ineffective in helping to create a visual identity for a particular entity or brand
- appropriation may fall victim to the overriding, more generally held interpretation of the symbol

# Refinement

## Appropriation

- A designer incorporates or annexes an element from another design in a piece of work
- often very direct, enabling a viewer to readily understand the intended message
- The capacity for people to recognize appropriations makes it a very effective way to communicate
- Key forms of appropriation:
  - **Imitation**
  - **Adaptation**
  - **Parody**
  - **Paradox**
  - **Distortion**
  - **Homage**

# Refinement

## Appropriation

- **Key forms of appropriation:**
  - **Imitation**
  - The copy, reproduction or adaptation of an existing design or image for use in a new design.
  - Provides a short cut to producing an effective design as the design decisions will already have been taken, tried and tested.
  - **Adaptation**
  - Modifying an original design to suit another purpose
  - It allows a new design to benefit from original design elements although the content, the message or the medium may be different.

# Refinement

## Appropriation

- **Key forms of appropriation:**
  - **Parody**
  - A design that mocks an original work through the use of humor or satire
  - The use of humor often changes or subverts the original meaning.
  - **Paradox**
  - An idea or statement that includes conflicting ideas;
  - Often inject humor or force the viewer to question what they see

# Refinement

## Appropriation

- **Key forms of appropriation:**
  - **Distortion**
  - An optical phenomenon or deformation of a shape or object.
  - Visual distortion sees the designer change the appearance of an object to make it less recognizable or even to form a different object from it.
  - **Homage**
  - Designers can express their honor or respect for a particular work, artist or genre by incorporating it into, or using it as the basis for, their own work.

# Refinement

## Modification

- Modification is a key design aspect that transforms text and images in a way that instills them with meaning
- **Types of modifications:**
  - **Intervention:**
    - By intervening in an image a design can modify its meaning, stress or significance, or change its focus entirely
  - **Omission:**
    - when something has been left out or forgotten.
    - Used to channel the viewer's focus to the omitted element, or draw attention to the context within which the omission occurred.

# Refinement

## Modification

- **Types of modifications:**
  - **Opposition:**
    - When two or more ideas compete, conflict or resist each other, opposition occurs.
    - Opposition is a form of juxtaposition whereby elements are positioned to create an antagonistic relationship between them due to their inherent contrasts
    - Effective opposition relies on recognizable cultural or societal norms.

# Refinement

## Modification

- **Types of modifications:**
  - **Two-in-ones**
    - Graphic devices can communicate two messages at the same time within the context established by the design.
    - This can be achieved by making subtle variations to easily recognizable objects.
    - Their success depends upon the viewer's ability to recognize and interpret the contextual references, which means two-in-ones can be created to resonate with very specific target audiences.


# Refinement

## Thinking in shapes

- Design elements such as text blocks form approximate shapes on a page.
- Thinking in shapes helps the designer to address general spatial relationships between the elements.
- **Concerns related to shapes:**
  - **Harmony**
  - **Balance**
  - **Shape alliteration**
  - **Drama**

# Refinement

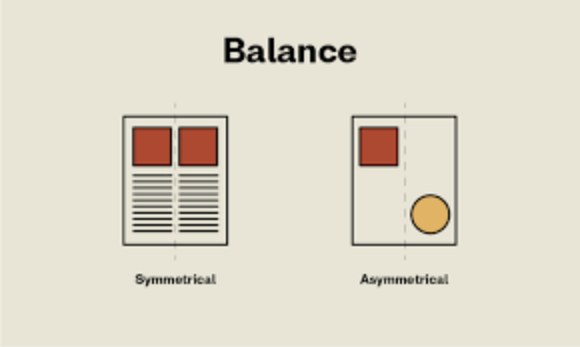
## Thinking in shapes

- **Concerns related to shapes:**
  - **Harmony:**
    - An agreement in feeling between the different elements of a design to such an extent that they support one another to produce an effective and coherent visual statement.
    - Can be achieved on different levels within a design, such as typographic selections that complement each other, color schemes that are sympathetic and do not clash, and images that communicate the required message well.
    - Varied design elements can harmonize with each other and the entire design can harmonize with what it was created to represent, whether this be a company, product, service or institution.
    - Pleasing to the eye and is an indicator of good design. As such, it often goes unnoticed, as pointed out in the axiom, ‘good design is never recognized, only bad design’

# Refinement

## Thinking in shapes

- **Concerns related to shapes:**
  - **Balance:**
    - A state of equilibrium in which no single part has a greater weight or presence than another, producing a soothing, peaceful and non-dramatic result.
    - Visual balance is achieved through the considered positioning of page elements; an even interaction of text, images and white space. In this context, each element can be thought of as a shape that needs to be positioned in harmony with the other shapes within the design.



# Refinement

## Thinking in shapes

- **Concerns related to shapes:**
  - **Shape Alliteration:**
    - Similar shapes can be grouped together to create larger elements.
    - This will help to balance out a page, especially if other large shapes are used in the design

# Refinement

## Thinking in shapes

- **Concerns related to shapes:**
  - **Drama:**
    - The use of more dynamic, angular shapes to add drama and interest to a design

**Dynamic shapes**
Wassily Kandinsky believed the yellow triangle to be an active and dynamic form and the blue circle to be cold and passive.

# Refinement

## Thinking in Colours

- Colour is a powerful communication tool because it can grab the attention and make things stand out and look more attractive.
- The subtle and sparing use of colour can elevate a design and can apply emphasis just where it is needed to increase the effectiveness of a piece of communication

# Refinement

## Thinking in Colours

- Compatible colour selections
- Monochrome: any single colour.
- Complementary or contrasting: colours that face each other.
- Split complementary colours: two colours adjacent to the complement of the principal colour.
- Mutual complements: a triad of equidistant colours and the complementary colour of one of them.
- Analogous colours: two colours on either side of a chosen colour (any three consecutive colour segments).
- Triad colours: any three equidistant colours.
- Near complement: the colour adjacent to the complement of the principal colour.
- Double complements: two adjacent colours and their two complements

# Prototyping

- Design is a creative discipline that can generate many solutions to a particular problem or brief.
- Does not stop once a workable idea has been generated.
- An idea or concept needs to be worked up or rendered, so that it can be developed and advanced towards a final result.

# Prototyping

- Prototyping provides an **opportunity to test** a design idea in various ways to see if it functions in practice and to get a better understanding of how it works as a piece of visual communication

# Prototyping

- **Developing designs:**
  - The ideation stage will have generated various possible solutions to the brief.
  - Design ideas need to be further developed to have a more precise handle on the message that is to be communicated
  - Design and communication strategies need to be thought out and developed to maintain a consistent and coherent line of thought that is repeated and reinforced through all communications
  - A prototype can also present design ideas to other people, such as the client, so that the concepts involved can be readily understood

# Prototyping

- **Developing designs:**
  - **Design legs**
    - A design cannot be finite and stationary: it needs to be able to change, adapt, work in different ways and in different settings.
    - A design needs to ‘have legs’ so that it can go a greater distance than was originally intended.
    - A graphic designer needs to think about this during the design process so that a design idea can evolve.

# Prototyping

- **Developing designs:**
  - **Adaptability**:
    - An adaptable design is one that can be comfortably transferred across different formats, sizes and distribution channels.
    - a design must be scalable: it must continue to communicate effectively, even if its scale is increased or decreased dramatically

# Prototyping

- **Developing designs:**
  - **Stories:**
    - A final design should be the starting point for many possible future manifestations and uses and so a designer needs to ask whether a design has a narrative that can be expanded, extended or broadened.
    - A design that does will be easier to adapt in the future to fill a new market segment or reflect changing tastes

# Prototyping

- **Developing designs:**
  - **Flexibility:**
    - Should sustain broad appeal across different applications to reach the same target audience in different environments, or that can be used in different settings to reach different target audiences.
    - Instilling flexibility in a design can be achieved by steering clear of controversial concepts and avoiding the use of elements that may date rapidly

# Prototyping

- **Types of Prototype:**
  - ‘A designer can prototype a job in different ways to test or check different design ideas
  - **Sketching**
  - **Model**
  - **Maquette**
  - **Printer’s dummy**
  - **Scale**

# Prototyping

- **Types of Prototype:**
  - **Sketching**
    - Enables a designer to rough out a basic visual idea and the positional aspects of the different design elements.
    - A rapid and cost effective means of resolving general design issues for a given job.
  - **Model:**
    - A replica of a design that allows people to see in three dimensions
    - A model can have varying degrees of functionality, ranging from simply being a replica of the final shape, to having working components.
    - Models test, respectively, the visual aspects and the functional aspects.
  - **Maquette:**
    - A three-dimensional scale replica of a design that allows people to get an overview of it in relation to its setting or location.
    - A maquette brings design drawings to life and is often used in architecture to give an idea of what a building will look like within the context of its location

# Prototyping

- **Types of Prototype:**
  - **Printer's dummy:**
    - A printer's dummy is a full-scale mock up of a book, produced using the specified stocks and materials.
    - This tests how well materials work together and gives an indication of the tactile elements of the physical product.
  - **Scale**
    - All prototype methods use scale as an integral part of the testing approach.
    - Maquettes typically use scale to reduce a large design into something that is simpler to digest; models can be actual scale, reduced scale or even enlarged scale in order to give a reliable representation of the design
    - A printer's dummy is produced full scale; and poster ideas may also be prototyped at full scale to see if they communicate well at a distance

# Vocabulary

- An important part of design development is establishing the design vocabulary that will enable a piece to communicate effectively.
- Design vocabulary refers to the ways in which the elements and styles within a design communicate.

**Eclecticism**

The incorporation of elements from different sources allows a designer to express a diverse array of ideas. In this way, many ideas can be communicated to the viewer: the various sources of inspiration for a piece of work.

**Trompe l'oeil**

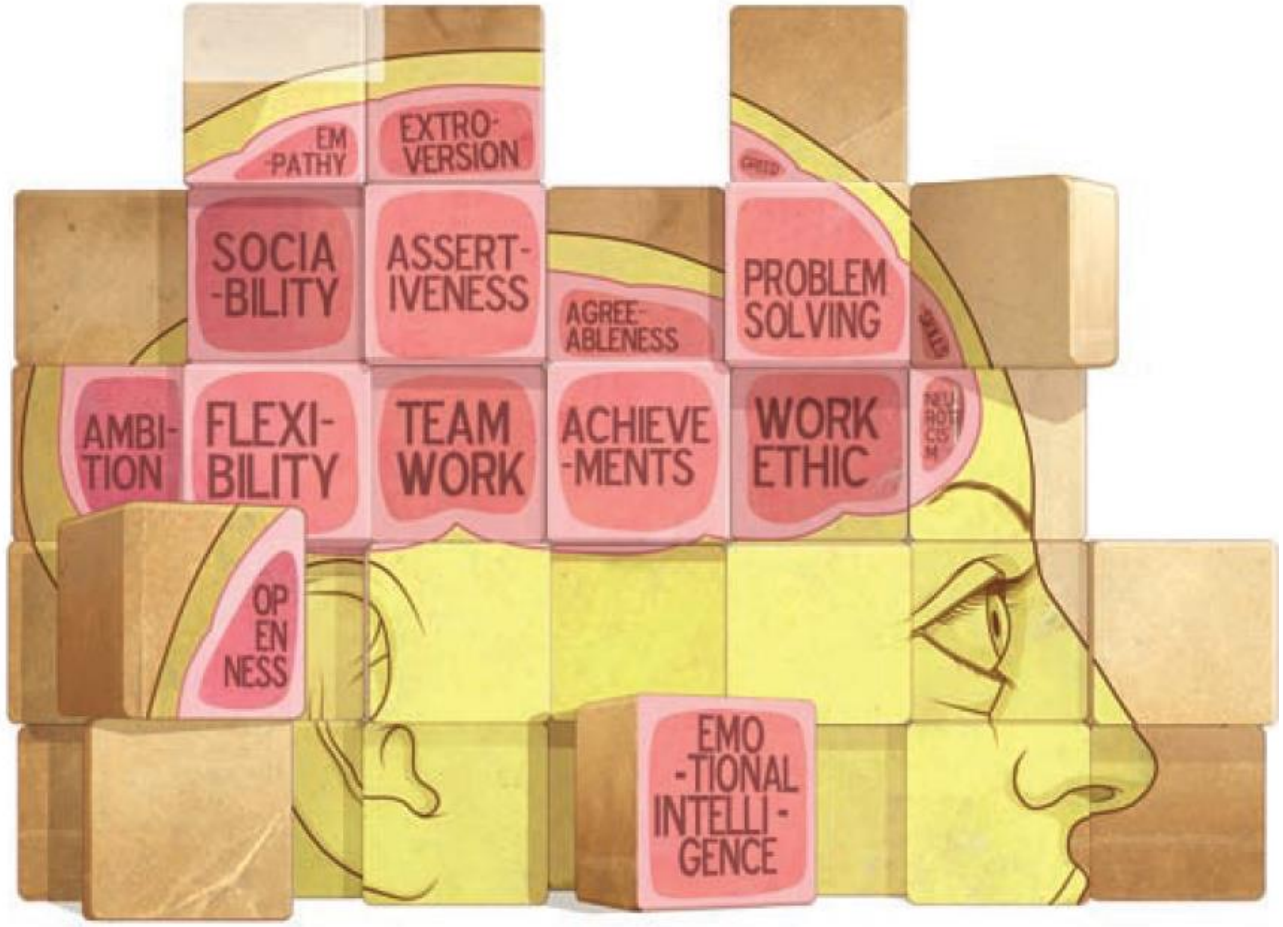
Trompe l'oeil is an image technique that tricks the eye into seeing something that is not there. Designs can be made to imitate reality through their scale and composition so that from a distance one could be fooled into thinking that an image is real.

**Abstraction**

Abstraction seeks to remove elements or details of something in order to reduce it to a group of its essential characteristics. The concise way that abstract designs communicate key information may mean they are very efficient.

**Noise**

Noise refers to elements within a design that serve no purpose, such as random lines, dots or odd patterns.


EM
-PATHY
EXTRO-
VERSION
SOCIA
-BILITY
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IVENESS
AGREE-
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# Implementation

- This is the stage when the design job is realised, completed and handed over to the client.
- Implementation is the end of the design process and involves physically putting into effect many of the design decisions previously taken, such as those regarding format, scale, media and use of materials.
- This section is not intended as a guide to production, rather it will provide an overview of the design thinking behind the physical aspects of design that are put into effect during its physical production.
- Implementation must ensure that the design the client signed off is produced as expected and with no surprises.

# Implementation

- It is important to remember that this stage sees the design team hand over the design to other practitioners such as printers, book-binders and programmers.
- It is paramount that the design team effectively communicate the design thinking to the protagonists of such trades so that the expected results can be achieved.
- The design details put into effect during the implementation stage will have arisen during the definition stage, will have been defined and refined during the ideation stage, and possibly trialed and clarified at the prototyping stage.
- As a design passes through the design process, aspects relating to its implementation may have been modified and refined, perhaps due to changes in budget or time scales, format or print run

- **Format**
- Format selection is the first aspect of the implementation stage.
- **Materials**
- The second decision in implementation thinking is to consider the materials that will be used for the production. A wide range of materials and substrates are available that will hold a printed, stamped, engraved, carved, etched, cut or painted image.

- **Finishing**
- The materials used to produce a design
- can be finished in a number of different
- ways, and this is the third element of
- implementation thinking.

| Print finishing techniques | |
|---|---|
| Binding | A process to gather and securely hold the pages of a printed work to form a publication. |
| Debossing | Stamping a design into a substrate to produce an indented surface. |
| Deckle edge | The ragged edge of the paper as it comes from the papermaking machine. |
| Die cutting | Use of a steel die to decoratively cut away stock. |
| Endpapers | Pages that secure a text block to the cover boards of a case binding. |
| Foil blocking | Applying a coloured foil to a substrate via a heated die. |
| Folding | Turning a printed sheet into a more compact form or signature by parallel and vertical folds. |

| | |
|---|---|
| Fore-edge printing | Printing on the fore edge of a publication. |
| Embossing | Stamping a design into a substrate to produce a raised surface. |
| Perforation | An area of a substrate weakened with a die cut so it can be detached, or for decorative effect. |
| Screen printing | A printing method where ink is passed through a screen carrying a design on to a substrate. |
| Thermography | Raised lettering produced by fusing thermographic powder to a substrate in an oven. |
| Throw outs | A sheet of paper folded and bound into a publication that opens out to a much larger dimension. |
| Tipping-in | An insert in a book or magazine that is glued along the binding edge. |
| Varnishing | A colourless substrate coating to protect and enhance visual appearance. |

- **Media**
- The type of media used to distribute a design will have been identified earlier in the design process but media choice may present different considerations during design implementation.
- **Scale**
- Implementation thinking also needs to consider scale: challenging preconceived ideas about size can produce a striking solution. Does a book design have to be a certain size, for example?

- **Series/Continuity**
- The design team needs to consider whether a job is a stand-alone piece or part of a series. Design is seldom undertaken in isolation and a design concept is often rolled out through different media and different items within the same media group.
- **Glossary**
- An understanding of the terms employed in design thinking can help in the articulation of creative ideas. It will reduce misunderstandings between designers, clients and other professionals while commissioning and developing projects.
- Ex: **Research-** Dedicate sufficient time to research a brief thoroughly. The quality of the research and the understanding obtained from it facilitates the generation of workable design solutions.

# Implementation

- With reference to Software:
  - Translation of Static and Dynamic models into code
  - Creating Database as per the schema finalised
  - Storing the components at the respective locations