

Diploma Web Design and Development 28 March 2009

WDD3.3

Usability & Evaluation

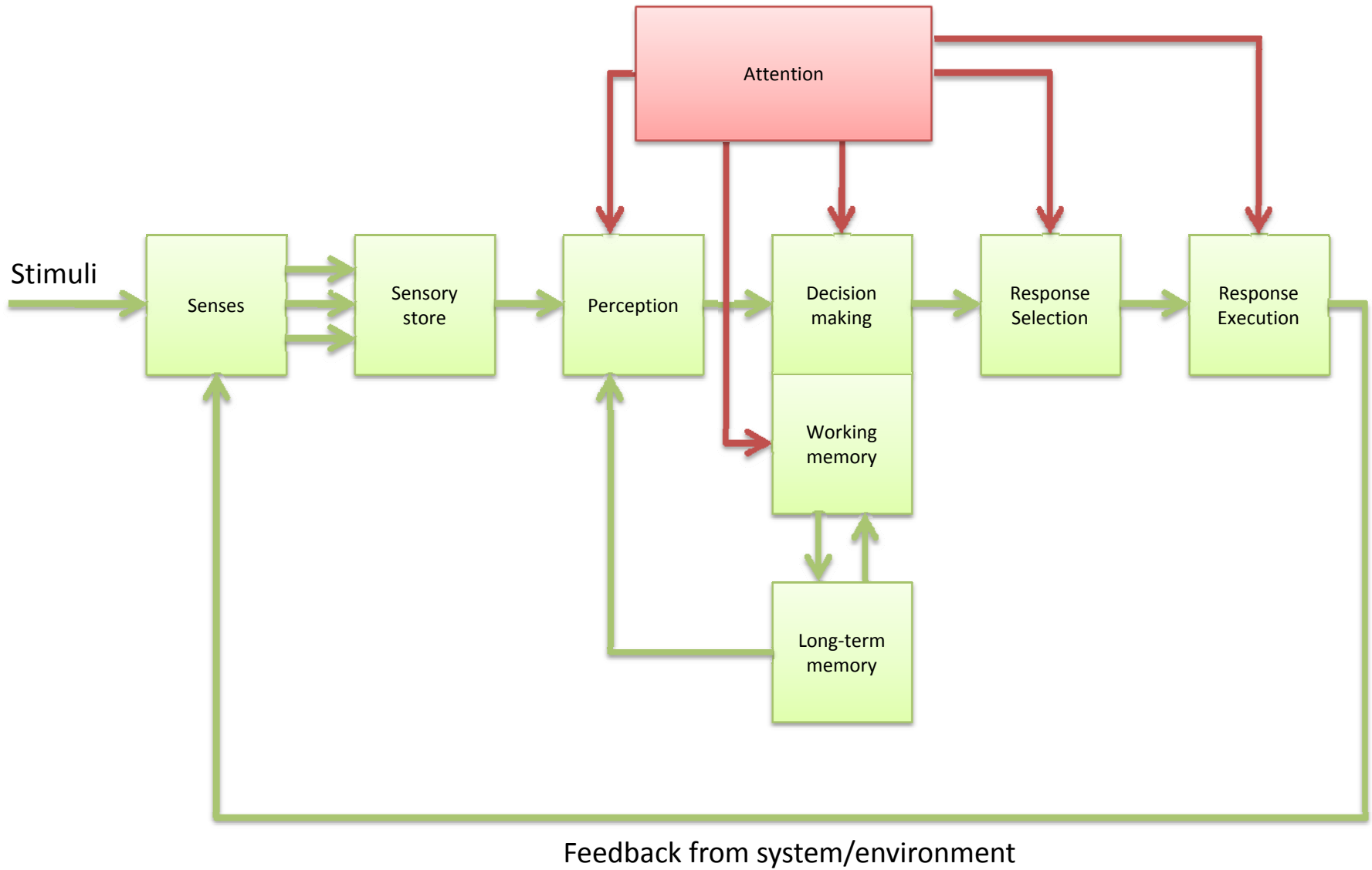
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Peter Otto, Principal User Experience Consultant, Flow Interactive, London

Psychological basis of usability

We need to design for limited cognitive hardware





Feedback from system/environment

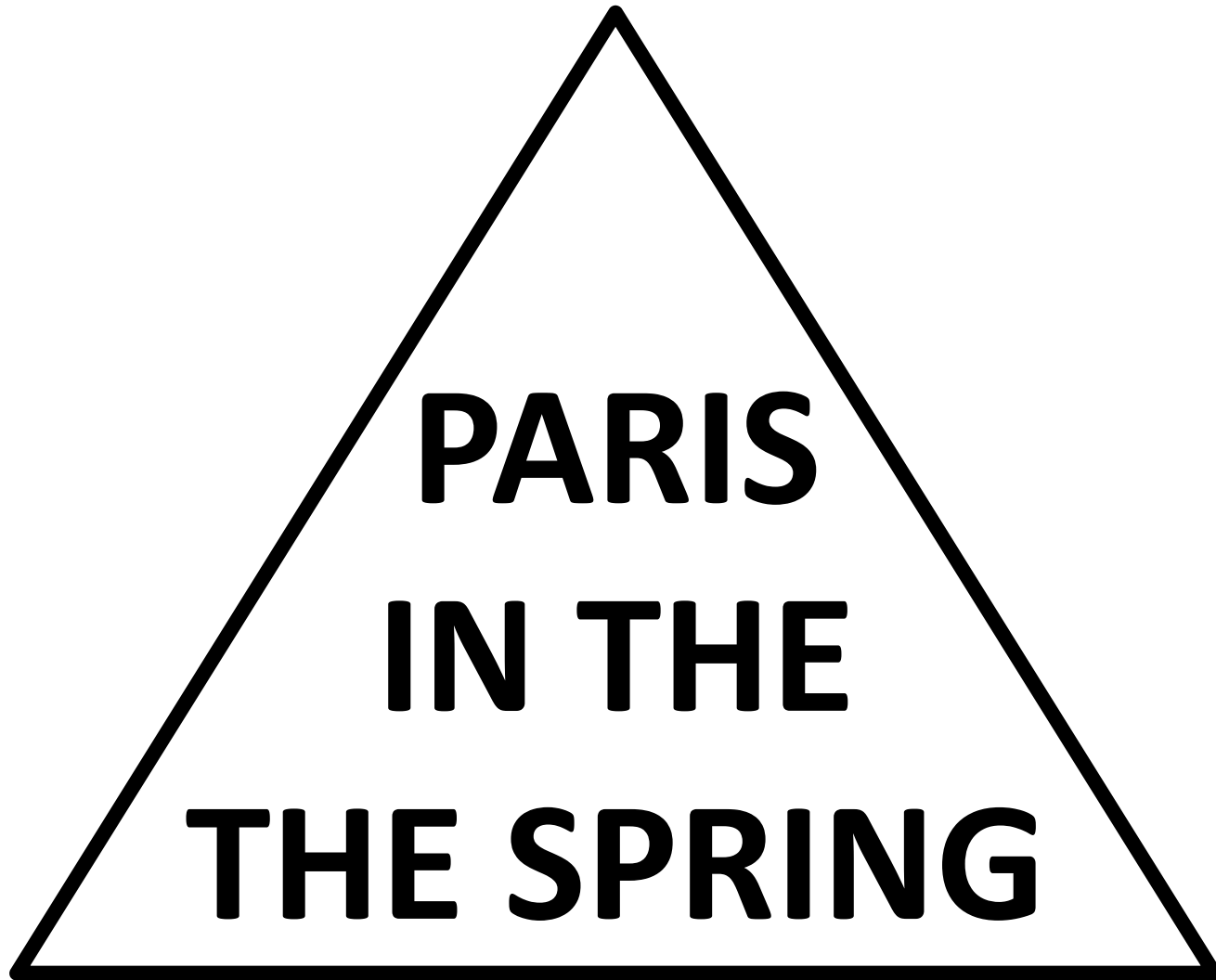
Sensation & Perception

Sensation: Stimuli impinge on the senses and give rise to neural events.

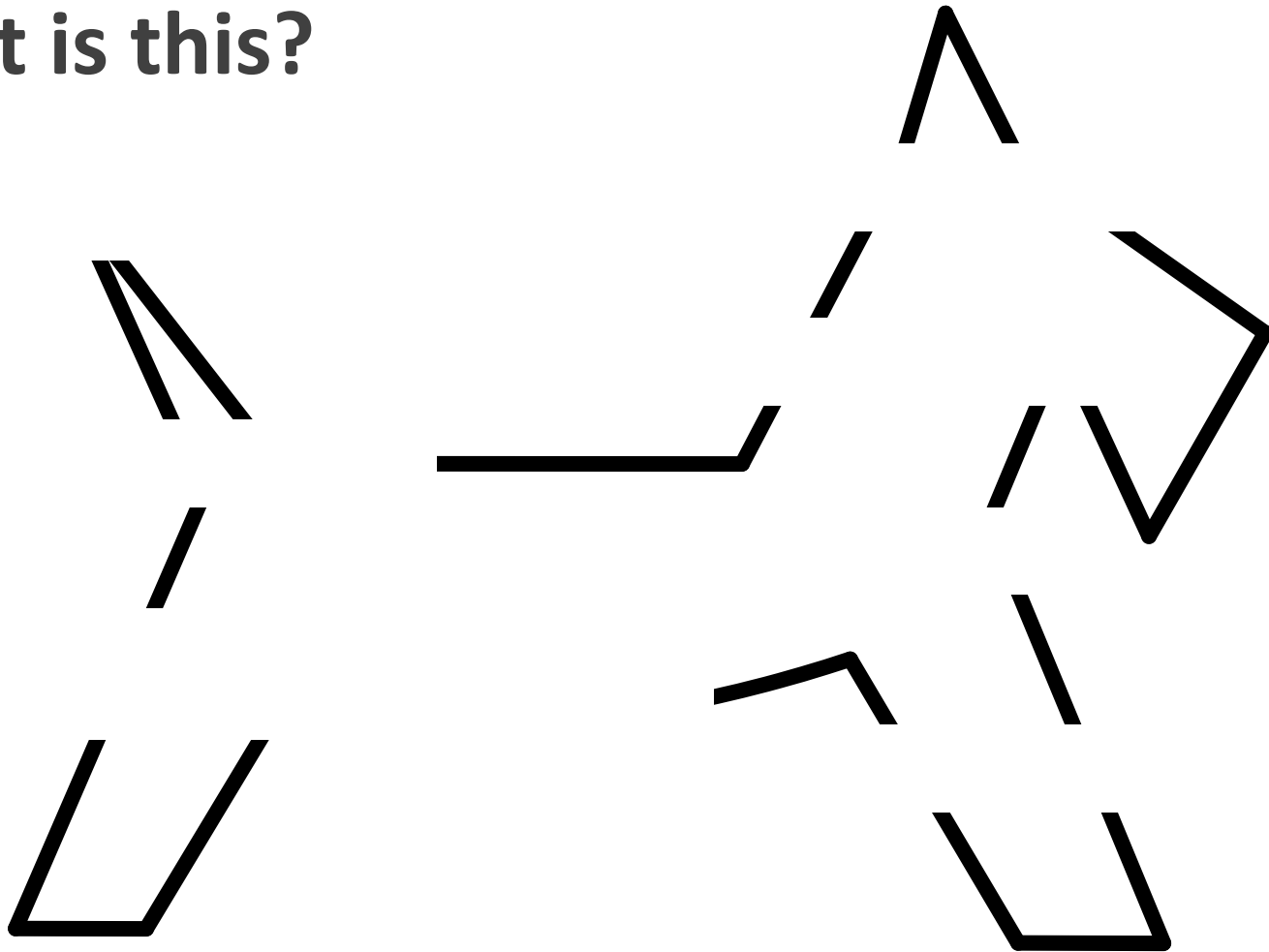
- **Sensory memory** holds stimulus for a very brief period of time.

Perception: Giving meaning to the event that produced the sensation.

- **Automatic, rapid and requires little attention** unlike cognitive processes that start when perceived information is processed.
- **Bottom-up processing** is driven by incoming data/stimuli
- **Top-down processing** is driven by prior knowledge



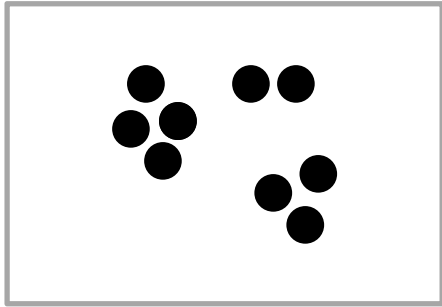
What is this?



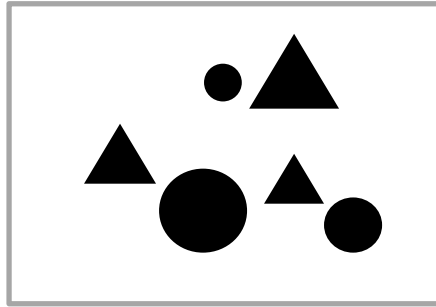
What does this say?

THE CAT

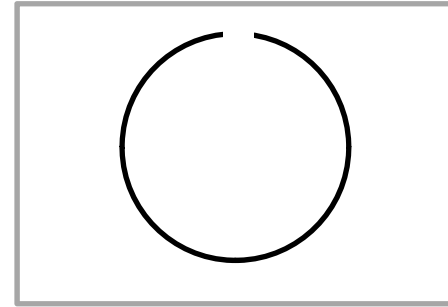
Gestalt principles



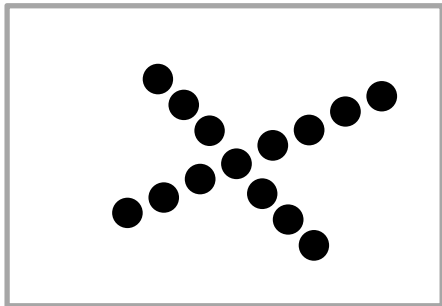
Proximity



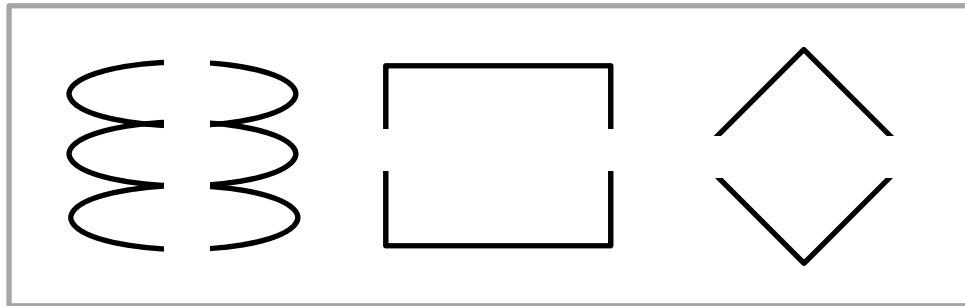
Similarity



Closure



Continuity



Symmetry

It's important to be aware of these principles and to consider them in your design!

Design implications

- **Structure:** Help users understand what belongs together by chunking similar and separating different items; create a good.
- **Consistency:** Help users apply previously acquired knowledge from LTM. (consistency within the UI and consistency with the world)
- **Visibility** and **affordance:** Show all required information and use controls that are self-explanatory.
- **Feedback:** Communicate the consequence of an action

Prominence indicates importance

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Big things are perceived more important

T H A N S M A L L O N E S

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Proximity-compatibility principle

Things that are near each other are presumed to be similar

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Things that are separated are presumed to be different

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Difference can also be indicated using visual contrast i.e. colour, size, style

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Headings summarise adjacent content

Painfully obvious isn't it?

But for it to work, headings must be instantly recognised as headings.

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Lack of distinction or visual clutter undermines their function

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Try to remember this:

K F J A S A N I B F O T N A S P U

Now this:

KFJ ASAN IBF OTNA SPU CKF

Now this:

JFK NASA FBI NATO UPS KFC

Memory

Short term (working) memory

- Size **7 ± 2 chunks** (Miller, 1956), consists of:
- **An auditory component** [the phonological loop]
- **A visual component** [the visio-spatial sketchpad]
- Each has its own store & its own rehearsal mechanism

Long term memory

- Thought to be organised on the basis of **meaning and semantics**
- **Schemas**: Organised knowledge structure to reflect knowledge, experience, expectations. Unconscious routines for commonly performed actions
- **Activated schemas** stand ready to execute on cues from the environment

Design implications

- **Visibility:** Minimise what users need to remember (“the knowledge in their head”) and show all required information on the page (“the knowledge in the world”)
- **Consistency:** use a language and imagery that conforms to user expectations and previously acquired knowledge; allowing users to connect existing knowledge with new one.
- **Simplicity:** avoid information overload.
- **Concrete things are easier to remember** than abstract ones.
- **Examples and mnemonic devices** help us remembering things: see [Dyson website](#)

Attention

Selective Attention

- Attention can be selective (e.g. listening to a particular instrument in an orchestra)

Divided Attention

- **Criteria:** Task difficulty, Task similarity & Practice
- Practice leads to processes becoming automatic
- Differentiate between **controlled and automatic processes**
- **Controlled:** Limited capacity, require attention, flexible
- **Automatic:** No capacity limitation, require no attention, difficult to modify

Check this: Card trick

Design implications

- We have **limited attentional resources** at our disposal. Use visibility, affordance, structure, feedback and consistency to help users shift attention between different tasks and aspects of the page and alert them of changes.
- **Simplicity:** Don't present too many things at once.
- **Tolerance:** Help users recover from slips of their attention and help avoid errors.

In Summary

The human information processing system can be seen as:

- **A general purpose pattern recogniser**
- **With limited information processing capacity**
- **Using heuristics** (rules of thumbs) to simplify the information processing load
- **Acting as a satisficer** rather than an optimiser

Reason (1990)

In Summary

- We make **predictions based on previous experience**, or, in other words, **we see what we expect to see**.
- We use Gestalt principles to interpret what we see, and therefore **it is easier for us to perceive a structured layout**.
- We have limited working memory, therefore **it's easier to recognise than recall** for us.
- We use **habits to help us reduce mental effort**, which means that on the web, we often do things in automatic mode rather than consciously paying attention.
- With our limited **attentional** resources we can only give real **attention to one thing at a time**.

In Summary

Design principles to apply:

- **Visibility** of information and controls
- **Affordance** and correct **mapping** of controls
- **Feedback** from the system
- **Structure** of the design
- **Consistency** with user expectations and the world
- **Simplicity** of the design
- **Tolerance** of the system to errors