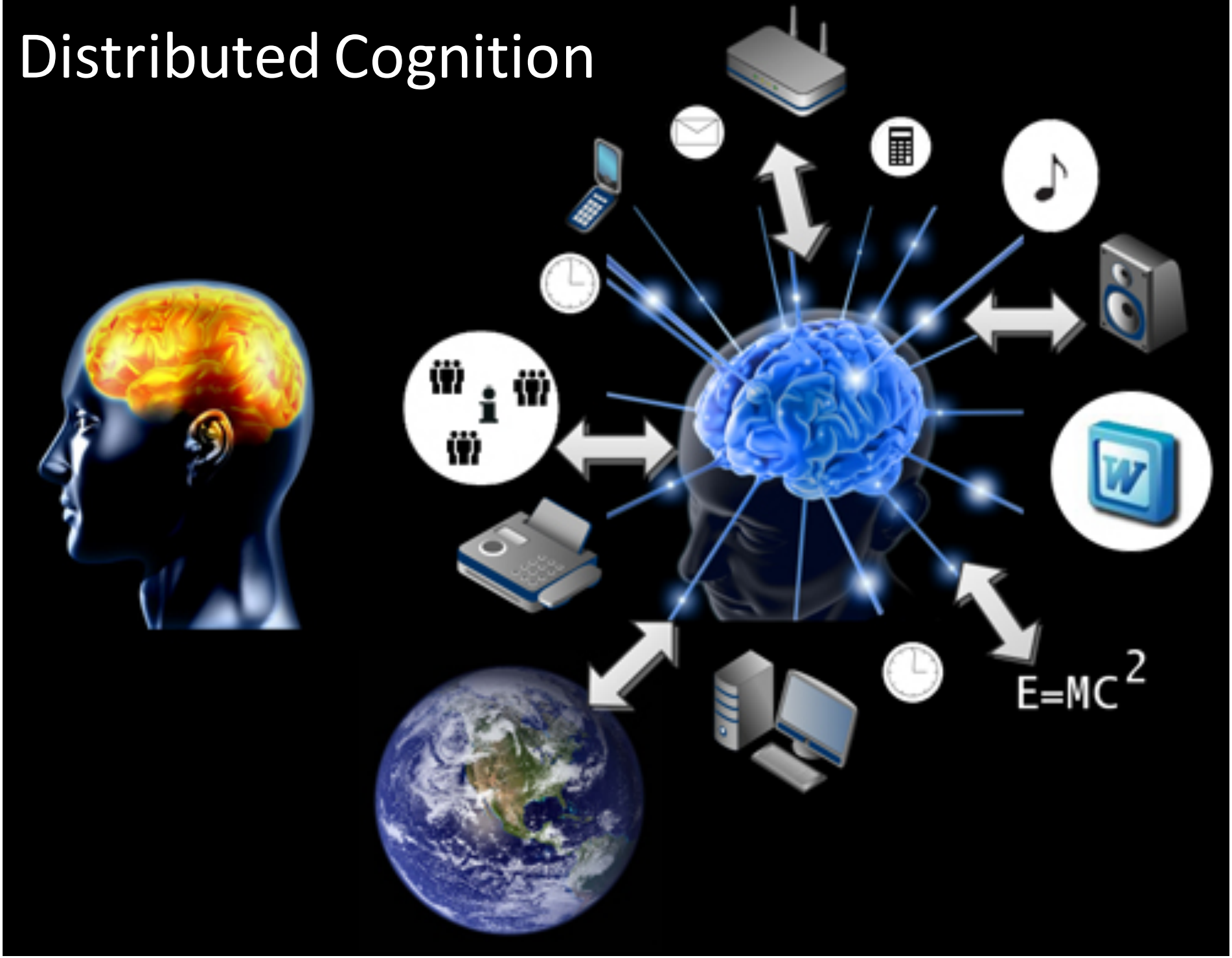
Distributed Cognition



What the?

http://www.youtube.com/watch?v=2Z_TheGgFWI

Distributed Cognition

- Main reference: Hutchin's paper on Distributed Cognition (in the wild), see GitHub
- For a brief summary see: http://en.wikipedia.org/wiki/Distributed_cognition
- http://etec.ctlt.ubc.ca/510wiki/Distributed_Cognition

Distributed Cognition Theory

- Seeks to describe the organization of cognitive systems
- Unit of analysis is not the individual but the socio technical system
- Considers a broader class of cognitive events (not just within a head)

  e.g. memory involves manipulation of objects and external representations

Brings together two things

1. Cognitive Anthropology which is concerned to the real world settings and the role that artifacts play during work practice
2. Cognitive Psychology which concerns to the study of the individual in a technological environment

Cognition in the wild

- Cognitive processes may be distributed across members of a social group
- Cognitive processes may involve coordination between internal and external (material or environmental) structure
- Process may be distributed through time – with products of earlier events transforming nature of later events

Social organization as a form of cognitive architecture

- How are the cognitive processes of an individual distributed across a group of individuals?
- How are the cognitive properties of individual minds affected by participation in group activities?
- How does the social organization influence the flow of information?

Embodied Cognition

Minds are not passive representational engines..

Organization of the mind is an emergent property of interaction among internal and external resources

Culture and cognition

- Culture shapes cognitive processes that are distributed over agents, artifacts and environments

- The environment as a reservoir of resources for learning, problem solving and reasoning…

- Culture provides us with intellectual tools, but culture may also blind us…

How to study distributed cognition?

- Ethnography – not just of minds but also of artifacts and social processes – event centered, to develop a theory
  - Requires domain expertise and knowledge of the structure to study events
- Followed by experiments (to refine the theory)
- Back to more studies "in the wild"

To discuss (small groups): The integrated research activity map

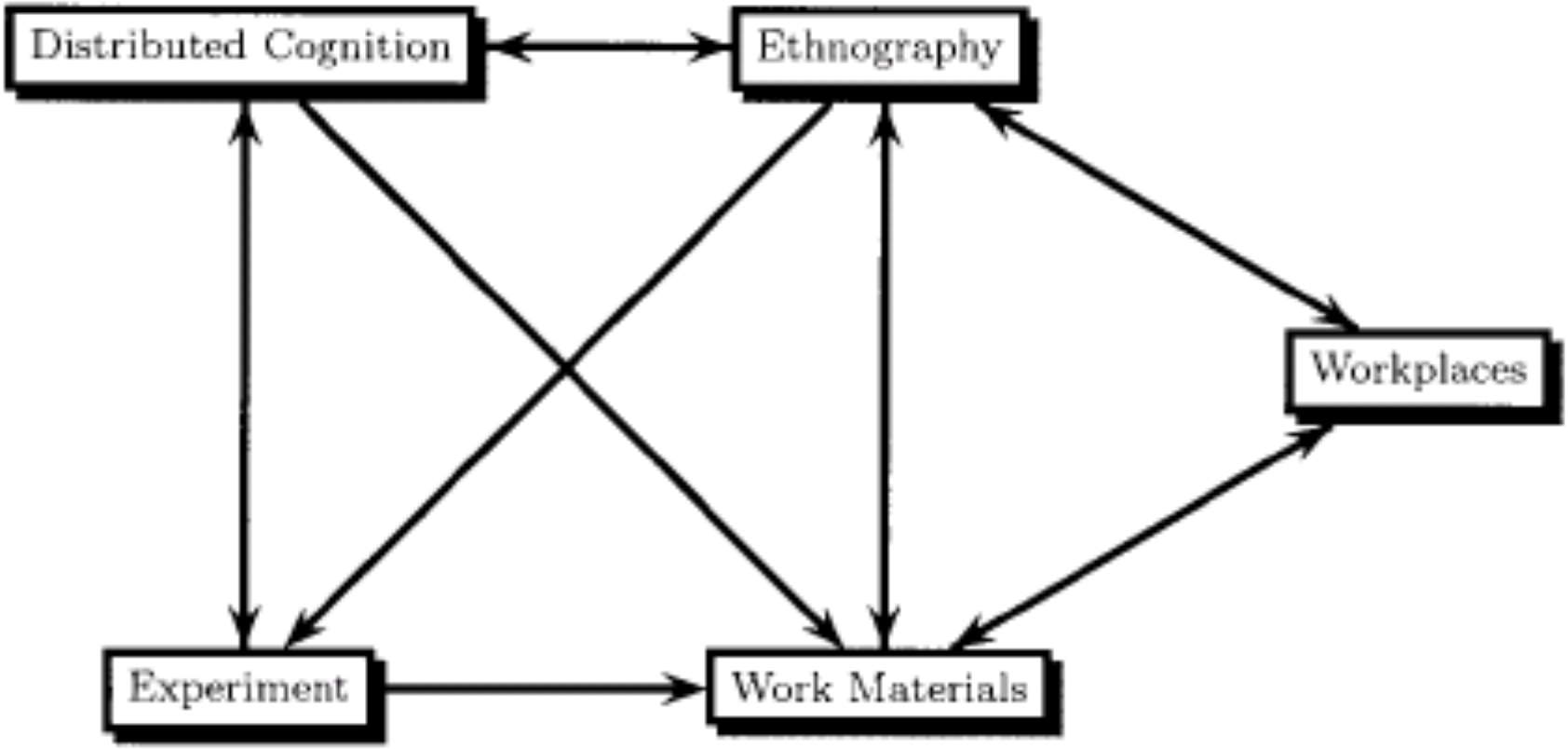


Fig. 1. Integrated research activity map.

Principles of distributed cognition theory

- People establish and coordinate different types of structure in their environment
- It takes effort to maintain coordination
- People off-load cognitive effort to the environment whenever practical
- There are improved dynamics of cognitive load-balancing available in social organization
- Studies reveal uses of representations that were not anticipated

Representations

- Direct manipulation and immediacy
- Representations and the things they represent – not the same thing but that is useful!

- How to design representations to facilitate flexible use?
- How to design representations that are more active and help decide what to do next?
- How to use representations to help us have a better understanding of what is going on?

Discussion..

- Why is ethnography the best way to discover how cognition is distributed?

- What role can experiments play?

Diary study…

- As a technique to study distributed cognition in terms of learning in a course
- Why might it not be the best technique?
- Is there a better approach?

Some more points for discussion

- What unexpected ways do you offload cognition to artifacts (e.g. pilots use of weather radar to remind about refueling)?
- Can you think of digital artifacts you have used that provide information about their history of use? (e.g. in email)
- What strategies do you use with digital representations of real objects to help you organize our work?
- How has the cloud enhanced our distributed cognition processes?

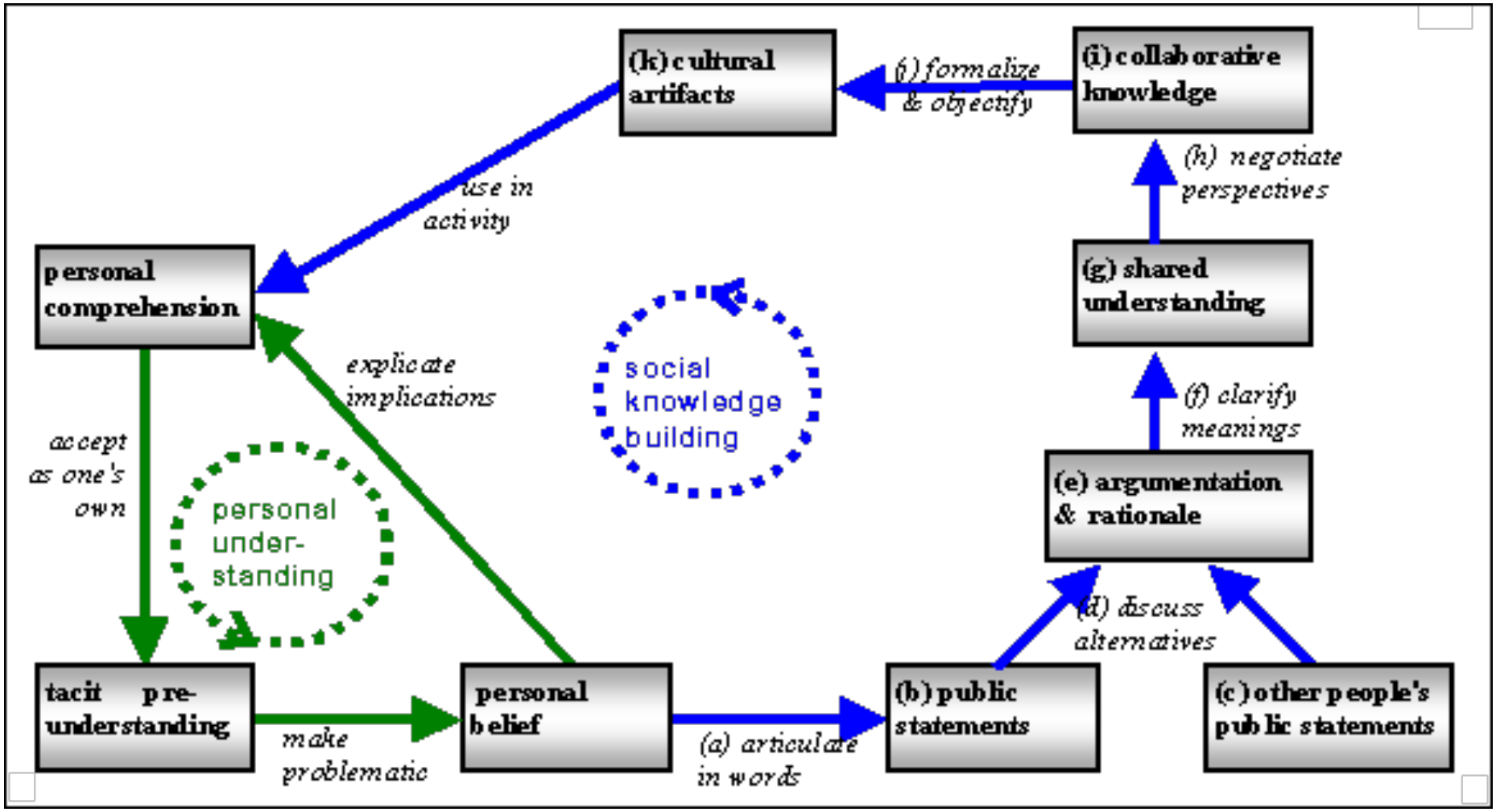
Discussion points from Blogs

- What about impact of Big Data on distributed cognition?
- Concerns such as security, reliability, privacy

From one blog post…

“From the article, we understood that any introduction of human-friendly system into real world, depends on iterative series of social interaction of internal and external cognitive processes .

This can be explained through an example: the typewriter discovered with the aim of communicating their ideas. With the course of time, humans felt the need of modification, correction, saving for future use of their write-ups which led to the invention of computerized systems such as word document, notepad etc. To make it distributively used , the network based tools came into picture like Sharepoint, GoogleDocs etc.”



https://cscwuvic2015.wordpress.com/2015/09/15/cscw-distributed-cognition-and-global-collaboration/

From your blog posts…

"I think that in order to build a truly effective computer-supported environment, it must offer the opportunity for its users to become emotionally attached to it."

How does Slack use "personality"?

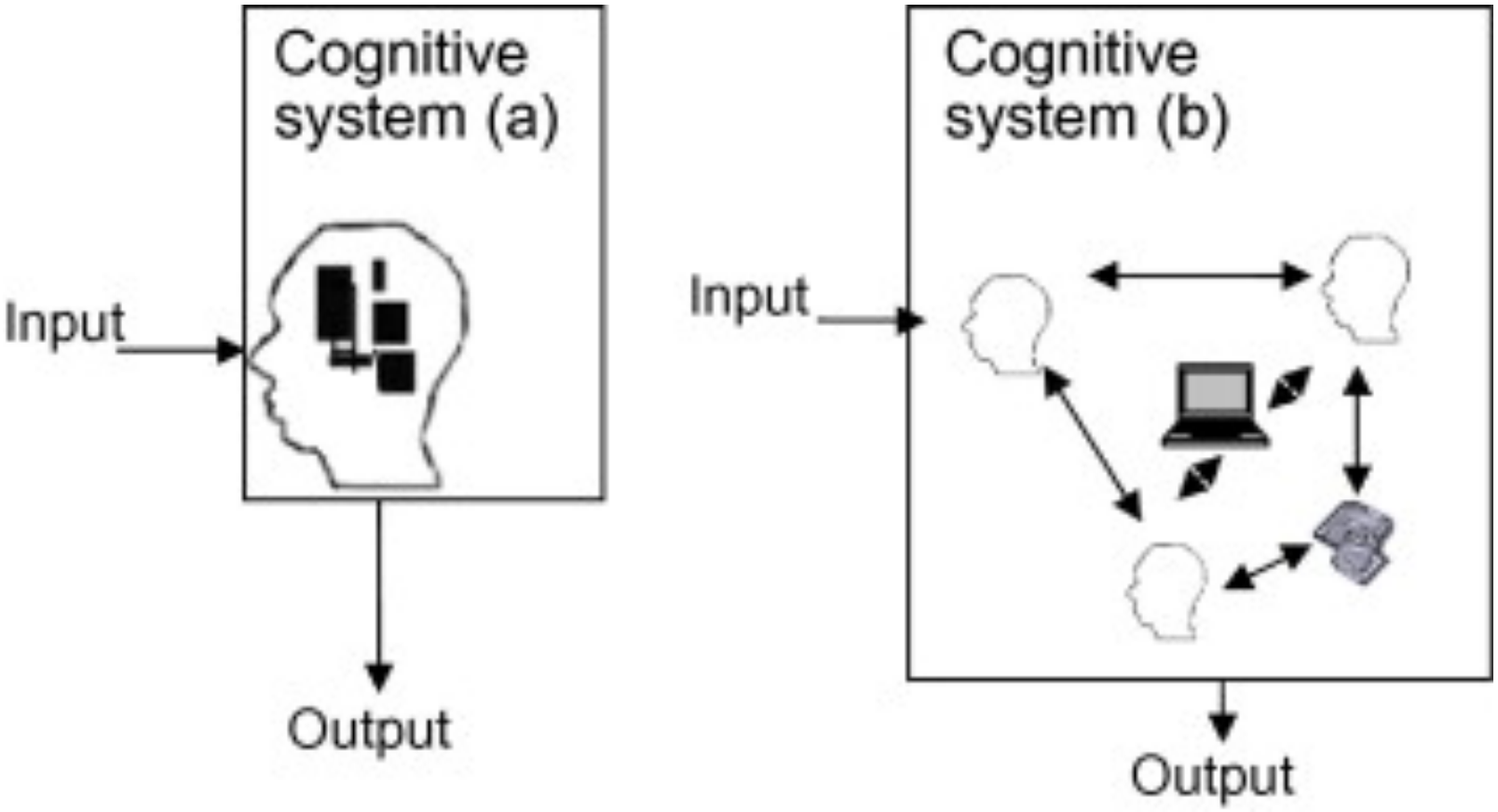
From your blog posts…

"Death of the Author" is a concept that exists in art criticism circles which posits that what was meant by the artist who created a piece of art and what that work meant to the viewer are equally important. This thought can also be applied to interface design, and in fact I would go so far as to say that what users do with a software interface is more important than what the designer intended when creating it.

From your blog posts…

"A common method of invoking mental shorthand is skeuomorphism, where an interface is designed with elements that are no longer necessary to its function in order to draw symbolic or functional parallels to a predecessor. Skeuomorphism can be a powerful tool for the creation of intuitive interfaces, but it must be employed carefully for best effect, often it can be used as a crutch rather than a tool when designers fail to understand what makes the interface valuable to a user and copy the interface wholesale from older examples."

A more intuitive view?



http://etec.ctlt.ubc.ca/510wiki/Wikis:_A_Theoretical_Perspective