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The Bit Expansion.

Origin of Augmentation Operations
in Mixed Realities.

INTRODUCTION

In the context of the Mixed Realities (MR) paradigm (half atoms, half bits), mixture is related to augmentation operations that bring new dimensions into our experience, a whole that cannot be thought of as a purely physical or purely virtual environment.

Is it possible to conceive augmentation as arising only from the mixture between the physical and the virtual? Or are other factors necessary for augmentation to happen and for experience to be perceived as a unified whole?

DEVELOPMENT

The Metaphor of the World as a Palette

The virtual rests on a numerical materiality characterized by abstraction and intangibility. The metaphor, with its capacity to establish analogies, i.e. to transfer a literal meaning to a figurative one by means of a tacit comparison, acts as a bridge to give substance to the intangible, making abstract realities concrete. Given the heterogeneity of the elements involved in augmented experience (atoms and bits), the metaphor acts as a common substance that merges and dissolves ontological differences. It favors a symbiosis between symbolic production and reality, facilitating the dissolution of the limits between these two instances.

The Metaphorical Interface as a Bridge for Acting in the World

The interface, the space where three heterogeneous elements converge (a person, an action and a device), allows the user to act upon the mixed environment. The greater the analogy between the interface design and

the grammar of the possible actions related to a specific phenomenon, the greater the possibility of fusion and the consequent perception of a real phenomenon with new properties.

The metaphor is the figure that favors fusion by transferring the logic of acting upon the everyday world semantizing devices and the behavior that these make possible (actions) in the constructed environment.



Fig. 1: Schema about the role of the metaphor in mixed environments.
Photo: Andrea Sosa & Laura Maiori 2009.

Immersion or the Illusion of Being inside a World

Immersion as an experience takes place when the impossibility to distinguish real and symbolic space, the behavior that is analogical to the laws of the physical world, and the environment transparency tend to make users feel they are within a modeled world.

Representation limits, scale modeling, sensory stimulation, interactivity levels and behavioral scopes are key dimensions for the construction of an immersion effect.

Augmentation Theory

In order to understand augmentation operations, we need to systematically relate the four variables mentioned before: matter, metaphor, interface, immersion.

For augmentation to take place, we must enter the illusion of a unified space with new properties (immersion level). The immersion effect is brought about by a precise articulation between (mixed) matter and interface (with its three components). Precision derives from the metaphorical approach, particularly from the degrees of analogy the metaphor absorbs from real, everyday life, and its subsequent transference to all levels of the work. The greater the level of semantization in the articulation of matter and interface, the greater the possibility that the appliance will become transparent and, therefore, that augmentation will take place.

CONCLUSION

In the definition of MR, special emphasis is placed on the degree of presence of the real and the virtual. From our perspective, the augmentation operation goes beyond a simple addition and exceeds the level of gradualness. Even though mixture is a fundamental operation, augmentation takes place

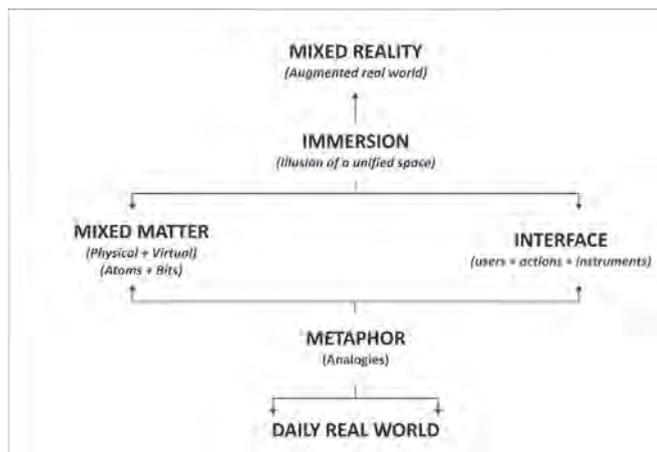


Fig. 1: Schema representing a proposed theory about the links between metaphor, matter, interface, immersion and mixed realities augmentation development.
Photo: Andrea Sosa & Laura Maiori 2009.

with the combination of other factors of articulation: the interface as a bridge between two worlds, the metaphor as a link between the concrete and the abstract, and immersion as the illusion of being within a unified environment. All levels must be present and interrelated for augmentation to happen. Without atoms and bits, mixed reality is not possible. In the same way, without metaphorical mediation to merge different components, the mere articulation of physical and virtual instances does not seem to guarantee the emergence of augmentation and the perception of a unified space.
(Full version of this paper: <http://www.scribd.com/lauramaiori>)

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