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Cognitive Human-Computer Interaction

Attila Márton Putnoki[1], Dóra Mattyasovszky-Philipp[1], Bálint Molnár[1]
[1] Faculty of Informatics/ Eötvös Loránd University
Pázmány Péter 1/C, 1117, Budapest, Hungary
faf2j3@inf.elte.hu ; mattyasovszky@inf.elte.hu; molnarba@inf.elte.hu

Extended Abstract

We consider human cognition as the most elevated way during problem-solving. In informatics as science currently, Cognitive Information Systems (CISs) are considered the most elevated and the speediest systems that can handle complex problems.

What exactly makes CIS the best solution for complex problem-solving? The algorithms themselves can handle various problems providing the best outputs, however, there are cases where there are good solutions, however, we miss the lack of the taste of the success behind. The added value can be easily filtered from the Human-Human Interaction (HHI); however, this is hard to find via Human-Computer Interaction (HCI). Based on our opinion this is the resonance, that ensures an additional value via the interaction. There is a need to find a clear definition and metrics, and a way of measurement to find the proper information to ensure higher added value provider hyper-personalized CIS for management decision and support [4][5]. The objective is to improve the services provided by CIS utilizing the info-communication, that ensure the smooth cognitive-communication flow and the interaction between Human and Computer as between the Carbon and Silicon agent. The objective includes and focuses on human Decision-Making (DM) within the business environment; therefore, it has serious and multiple impacts on the enterprises especially on the management level. These impacts including market, financial, capability, and other elements, or management decisions, are fundamental considering the future in the current economic environment. The market competition is extremely strong, the decision must be made in an extremely short time, the quality of the decision the impact inducted must be focused and flexible, quickly adaptable, and adjustable in the case if there is a need [1]-[3]. These decisions made might determine the short-term future and the long-term viability, the survival, and the success of enterprises. The information elaboration on both sides should contain an added value to ensure the improvement on the decision level, where a special tool and process is needed. In addition to the corporate environment, cognitive info-communication also plays an important role in a multimedia environment. In real-time, it is necessary to generate personalized content with the Silicon agent that fits within the bubble of the Cognitive agent and provides a personalized presentation.

The info-communication is the tool, that supports the transfer of the value add between agents, that improve the cognitive functions [6]. The cognitive resonance provides the value add, that supports the quickly adaptable and flexible answer to the Carbon agents. The flexibility and adaptability are essential elements of the interaction on both sides, which are both embodied in the realization of cognitive resonance and the output as well as a value add. Meanwhile the info-communication function as a process as well, during the interaction. Both sides receive inputs and the outputs, iteration by iteration contain the given value add ensured by the cognitive resonance, that has been processed and transferred via info-communication, which in this way becomes a cognitive info-communication. We aim to model and demonstrate the cognitive resonance to be able to show the direction of the possible development and the gaps including the potential for the developer community. Based on our view to improve the cognitive elements and impacts, both the architectural and the software development including the integration part must be considered to result in a highly cognitive information system for management support.

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