ICIS 2022 TREOs   TREO Papers

12-12-2022

Automation, Augmentation, and Activation Process: A Process behind the Emergence of Successful ML-based Business Solutions

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A Process behind the Emergence of Successful ML-based Business Solutions

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The present wave of machine learning (ML) advancements allows organizations to leverage ML-based solutions to address business problems in a more integrated fashion. Despite their immense potential, the implementation and operationalization of these solutions have proven to be challenging for organizations. In response to these challenges organizations take different approaches to designing and managing ML-based solutions by adopting machine learning operations (MLOps) frameworks and related technologies (e.g., AWS SageMaker). However, MLOps like its genesis, DevOps, remains insufficient in its ability to account for the organizational challenges of ML-based solution appropriation. Given this context, the aim of the present TREO talk is to share preliminary results from a study investigating the process behind the emergence of successful ML-based business solutions. We conducted an in-depth qualitative study of the ML-based solution lifecycle in the context of large organizations through a case study of Finland's Artificial Intelligence Accelerator (FAIA) members and follow-up semi-structured interviews with experts from multiple international organizations outside FAIA.

The results suggested that ML-based solutions emerge from the interactions of three subordinate cycles: *ML Organization Cycle, ML Technology Cycle,* and *ML User Cycle*. These cycles represented changes taking place over time in i) organizational subsystems responsible for ML development, ii) technological artifacts, and iii) human agents interacting with these artifacts, respectively. Our analysis revealed that successful emergence of ML-based solutions consistently manifested three types of interactions at the interfaces between the subordinate cycles. We theorized these interactions as *Automation, Augmentation,* and *Activation.* Automation represented the interaction between ML Organization and ML Technology cycles. It involved the encapsulation of a specific task execution ability into a technological artifact. Augmentation, taking place at the intersection of ML Technology and ML User cycles, represented the embedding of that new artifacts into work practices, thus establishing new affordances. Finally, activation resided at the overlap between ML User and ML Organization cycles. It stood for either proactive engagement of users/employees with, for example, data science teams to tackle existing problems or their continuous feedback on the new artifact.

Our findings extend the emerging IS conversation on managing artificial intelligence (AI) by showing that ML-based solutions do not emerge through temporal or spatial balancing of automation and augmentation. Instead, they require simultaneously these two types of interactions and, activation of ML Users–ML Organization link. Our work contributes to literature by clarifying the undertheorized meaning of automation and augmentation in AI context. Our results have direct practical implications for managing AI in organizations.