

What is the basis for your guesses? Tell us! Sharing Expertise-Based Intuition

Frâncila Weidt Neiva and Marcos R.S. Borges
Universidade Federal do Rio de Janeiro
{fran.weidt, mborges}@ppgi.ufrj.br

Abstract. Expertise-based intuition plays a key role in decision making within organizations. This kind of intuition occurs when the decision maker has developed a rich knowledge from extensive experience. When an expert leaves, he also takes with him his intuition risking the ability of organizations to quickly and accurately make decisions. To support organization to face this issue, we are investigating how to transfer the expertise-based intuition from an expert to a collaborative team and how this transfer can be computationally supported. The research is being conducted following the design science methodological approach. The artifacts generated are a macro process to support sharing intuition and a model to support collaborative intuitive decision making. Our next step is to evolve the macro process detailing it in well-defined processes and highlight what are the collaborative activities and what are their features and requirements regarding the CSCW perspective.

Doctoral Research Overview

Experts made decisions strongly based in intuition (Klein, 2013). Expertise-based intuition is as a way in which experience is translated into action and plays a key role in decision making especially in complex environments where decisions often have to be made based on dynamic, incomplete and/or contradictory information (Klein, 2013). In these environments, a deliberative analysis is often impossible or inefficient, for example, due to time restrictions (Okoli and Watt, 2018). In contrast to deliberative analysis, intuition is based on the identification of subconscious patterns accessed very quickly by experts (Ross et al., 2004).

An organization should consider that experts eventually leave and take with them tacit knowledge. Part of this knowledge is the ability to apply the expert's intuition when make decisions . Considering that organizations should be prepared

to face these risks, it is important that not only technical capabilities be shared but also the capability of intuitive decision making.

Furthermore, considering that organizations are increasingly globalized and new business model are settling, for example, organizations as open platforms (e.g. uber, airbnb), collaborative teams gain strength in comparison with expert individuals who accumulate and keep knowledge to themselves. In this sense, the use of teams to collaboratively make decisions can bring advantages to organizations. In teams, the knowledge is not in the possession of only one individual, which reduces the risk of great loss of knowledge regarding the exit of one of the organization members. In addition, often collaborative teams outperform individuals in decision making, both in quality and in quantity. During decision making, collaborative teams can more easily parallelize tasks and take advantage of the redundancy of knowledge in the team and the enrichment provided by different views (Huang et al., 2014).

Our research question is: How to transfer the expertise-based intuition from an expert to a collaborative team and how this transfer can be computationally supported? In addressing this question, we expect to contribute to intuition, organizational learning and CSCW (practice-based perspective) research. Regarding intuition research we consider intuition as a mental faculty that allows us to learn from (i.e., to build tacit knowledge from) (van Riel and Horváth, 2014) and consequently to transfer it to somebody. Different from intuition studies that focus on decision making at the individual level, we focus on group intuition. In group intuition, the individual intuitions related to the same decision can be integrated into a collective solution (Akinici and Sadler-Smith, 2018). For example, imagine that an organization has to decide to close or not a certain deal. A team working in this organization composing by members with different perspectives should articulate the different intuitions about this deal and then, collaboratively made the decision. Regarding organizational learning research we are developing a process to support the sharing of expertise-based intuition among experts and teams. Regarding CSCW, we are focusing on developing a computational solution to support expertise sharing ('people-centric' view) and also aspects of knowledge sharing ('object-centric' view) (Ackerman et al., 2013). We understand that expertise-based intuition sharing is a new proposal both for intuition and organization learning fields and consequently constitutes a new opportunity of application, with new designs and challenges regarding CSCW viewpoint.

The methodological approach considered for the development of this research is the Design Science (DS). The DS methodology aims to produce knowledge about how to design (Dresh et al., 2015). The application of this methodology is not intended to seek optimal results, but rather results that satisfy the problem addressed in the research. Research based on DS proposes solutions to practical problems and also contributes to the improvement of theories.

In our research we expect the conduction of three cycles using DS. In each cycle is expected the generation of an artifact to address our research question and the evaluation of its applicability.

Cycle I provides the development of the general idea of how to share the expertise between an expert and a team. Our theory is that expertise-based intuition can be shared and as consequence the expertise is accelerated. To address the objectives of cycle I the artifacts produced are: a macro process based on models of intuition and knowledge sharing and an initial model to support the use of intuition in decision making considering collaborative teams. For cycle II it is expected to evolve the macro process detailing it in well-defined processes. During cycle II, the processes will be analyzed to highlight what are the collaborative activities and what are their features and requirements from the CSCW perspective. In cycle III it is expected to support the development of an expertise sharing system that considers the collaborative activities highlighted in the processes and its requirements according to CSCW perspective. In summary, after the definition of the collaborative activities, the relationship between these activities and the design of computer artifacts should be settle and then, we should define how to support the cooperative work regarding the complex system where decisions based in intuition are made.

Our work to date is an approach (Neiva and Borges, 2017) that consists of splitting the expert's knowledge and transferring it to a team parallelizing part of the process, thus potentially saving time. This approach was the result of our initial investigation considering the expertise sharing field. We realized that existing techniques to replace and/or train a new expert are not fast enough, especially for those organizations operating in critical areas.

Given that experts apply intuition to multiple actions, a central issue in the approach presented in (Neiva and Borges, 2017) and (Neiva et al., 2017) concerns the development of a similar intuition by the team. In this way, the team should work collaboratively and intuitively to obtain results analogous to those of the individual expert when acting within the organization. In this way, representing the cycle I in the application of the DSR methodology in our research, our paper (Neiva et al., 2018) presents a macro process to support the development of intuition in collaborative teams and a model to support collaborative intuitive decision making. The macro process was built from the combination of the knowledge transfer/creation model proposed by (Nonaka and Takeuchi, 1995) and the conceptualization of intuition as a mental faculty (van Riel and Horváth, 2014). The model, called Collaborative Recognition-Primed Decision Making, was built as an adaptation of the model presented in (Ross et al., 2004) for work explicitly with teams making collaborative decisions. The artifacts generated in cycle I was evaluated through a proof of concept (Neiva et al., 2018).

In a briefly overview of the macro process, tables with decision requirements are inputs into the first stage of the transfer process, which is Socialization. In Socialization a (sub-) process is followed that promotes the discovery of patterns. During Externalization, the patterns identified and discussed with the team are documented and stored forming the initial subsidies for the construction of a collective mental scheme. In the Combination stage, the team works in conjunction with the expert on the construction of decisions based on intuition. At this point, the expert individual is "part of the team". The team organizes the

intuitive decision-making guided by the Collaborative Recognition-Primed Decision Making model. The constant feedback from the expert supports the update of patterns used as triggers for intuition. In Internalization stage, the team internalizes the established patterns by being exposed to the accomplishment of environmental tasks. In this stage, the expert is no longer a "part of the team", he/she tries not to intervene during the decision making, conducting a discussion session only after the decision is made. After the completion of a first round of the process, a new one may begin by considering a new level as a starting point.

Our next step is to evolve each activity in the macro process detailing it in sub processes as defined in our cycle II. In these sub processes the collaborative activities should be highlighted to plan the computer support solution. At the end of cycle II we will continue to the activities defined in cycle III.

References

- Ackerman, M. S., Dachtera, J., Pipek, V., & Wulf, V. (2013). Sharing knowledge and expertise: The CSCW view of knowledge management. *Computer Supported Cooperative Work (CSCW)*, vol. 22, no. 4-6, pp. 531-573.
- Akinci, C., & Sadler-Smith, E. (2018). Collective Intuition: Implications for Improved Decision Making and Organizational Learning. *British Journal of Management*.
- Dresch, A., Lacerda, D. P., & Júnior, J. A. V. A. (2015). *Design science research: método de pesquisa para avanço da ciência e tecnologia*. Bookman Editora.
- Huang, H. C., Davy, F. L., Shih, H. Y., & Fan, C. J. (2014). Accelerating Knowledge Adoption: Information Systems Change Management. *Approaches and Processes for Managing the Economics of Information Systems*, vol. 253.
- Klein, G. (2013). *Seeing what others don't: The remarkable ways we gain insights*. Public Affairs..
- Neiva, F. W., França, J. B., Dias, A. F., & Borges, M. R. (2018). *Agnosco: Transferring Intuition from Individuals to Collaborative Teams*. In press: *Computer Supported Cooperative Work in Design (CSCWD)*.
- Neiva, F.W. and Borges, M.R. (2017), April. Split expertise transfer: An innovative collaborative approach to support accelerated expertise transfer. *Computer Supported Cooperative Work in Design (CSCWD), 2017 IEEE 21st International Conference on*, pp. 48-53.
- Neiva, F. W., França, J. B., Dias, A. F., & Borges, M. R. (2017, October). An innovative approach to accelerate expertise transfer in organizations. In *Systems, Man, and Cybernetics (SMC), 2017 IEEE International Conference on*, pp. 1770-1775.
- Nonaka, I., & Takeuchi, H. (1995). The knowledge-creating company: How Japanese companies create the dynamics of innovation. *Oxford university press*.
- Okoli, J., & Watt, J. (2018). Crisis decision-making: the overlap between intuitive and analytical strategies. *Management Decision*.
- Ross, K. G., Klein, G. A., Thunholm, P., Schmitt, J. F., & Baxter, H. C. (2004). *The recognition-primed decision model*. ARMY COMBINED ARMS CENTER FORT LEAVENWORTH KS MILITARY REVIEW.
- van Riel, A. C., & Horváth, C. (2014). Conceptualizing intuition as a mental faculty: Toward a 'critique of intuitive reason' and a process model of intuition. *Handbook of research methods on intuition*, pp. 42- 67.