

Understanding agile development in terms of distributed cognition

Distributed cognition (Hutchins 1995) is an approach that treats collaborative work as one cognitive system in terms of individuals, artefacts and internal (i.e. cognitive) and external representations. It's been used in the context of ship navigation and aircraft piloting, for example. Potentially, distributed cognition is a powerful tool for analysing collaborative work with the aim of identifying breakdowns and answering 'what if' questions. But it hasn't been applied to teamwork settings – and XP, if it's nothing else, is a teamwork setting *par excellence*. Recently, Ann Blandford and colleagues at University College London's Interaction Centre have developed a promising methodology and representational system called Distributed Cognition for Teamwork (DiCoT for short) to support the distributed cognition analysis of small teams.

We wanted to use the DiCoT approach on an XP team – to understand more about how an XP team can be usefully thought of as a single distributed cognitive system. However, Blandford's DiCoT approach had been developed and articulated in terms of its application to an emergency medical dispatch systems, rather than as a more general approach. The promise was there – and we had a suitable XP team who were willing to be the subject of the study – but it just wasn't clear how we needed to carry out the detailed application for its use with XP teams. We needed a short injection of expert consultancy from a member of Blandford's team – and the Agile Alliance generously provided the funds for this.

'Our' mature XP team was based in London, and were involved in developing and maintaining travel information webpages and travel alerts for a variety of customers. There were 23 developers in the team, who worked closely with a project manager and two business development staff. We spent time studying them: we took extensive field notes, photographs, and copies of work artefacts. We attended meetings, shadowed members of the team, and just chatted to them, as the opportunity arose. We analysed our data according to the DiCoT approach.

Was it successful? Yes! The DiCoT approach used three main themes: the physical theme; the artefact theme and the information flow theme. So, we were able to bring out the crucial role of the physical layout in XP; the way story cards and information radiators mediate, create scaffolding and co-ordinate resources; and the flow of information in the life history of a story card. You can find out more in the two papers that were made possible by this funding. They are:

Sharp, H., and Robinson, H.M. 2006. A distributed cognition account of mature XP teams. Proceedings of the Seventh International Conference on Extreme Programming and Agile Processes in Software Engineering (XP2006), Oulu, June 17-22. Springer-Verlag, 1-10.

Sharp, H., Robinson, H.M., Segal, J., and Furniss, D. 2006. The role of story cards and the Wall in XP teams: a distributed cognition perspective. Proc. Agile 2006, Minneapolis, Minnesota, 23-28 July, 2006. IEEE Computer Society Press, 65-75.

What next? The funding has allowed us to carry out a 'proof of concept' – to show the utility of the DiCoT approach in understanding Agile teamwork. We'll expand and develop this work, hopefully with a successful bid to one of the UK research councils so that we have the wherewithal for some in-depth studies.

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