Working environment effects of agile-stage-gate in manufacturing SMEs

Kasper Edwards

DTU Management, Technical University of Denmark

THE WORK IN CONTEXT

Agile-stage-gate is a hybrid product development methodology which combines agile methods such as SCRUM with overall portfolio management from Stage-Gate®. Agile development methods are known from software development and have seen extensive use the past ten years. Agile methods are participatory and empowering as the development team with concrete technical knowledge and not a manager should make the technical decisions for the product. Agile organises work in specific ways and stipulates methods and artefacts to be used. Agile projects are typically organised as a series of sprints each with a specific focus and tasks to be completed. Agile projects are described as having a positive impact on working environment.

This paper describes a test of agile-stage-gate in three Danish SMEs and the impact on the working environment. It is hypothesised that use of agile-stage-gate will lead to an increase in wellbeing at work. Results show general but non-significant decline of the working environment possibly influenced by contextual factors.

This questions the assumed positive effect of agile development methods and highlights the importance of analysing the impact of contextual factors in intervention research.

KEYWORDS

Agile-stage-gate, SCRUM, wellbeing at work

A brief outline of the work carried out

Three Danish manufacturing companies about to start a development project were selected by consultants from the Confederation of Danish Industry. The companies received training in agile-stage-gate as well as onsite coaching from consultants. Each of the companies used agile-stage-gate in one development project for six months.

A pre- and post-intervention questionnaire was distributed to participants measuring select agile-stage-gate practices and select dimensions from the COPSOQ questionnaire (Pejtersen et al., 2009) were included: job satisfaction, employees keep information hidden, vertical trust, horizontal trust, predictability, justice and respect, role clarity and social community. agile-stage-gate practices were measured to ascertain if the companies were using the agile-stage-gate method and if it was different from their normal practice.

Findings/solutions (the outcome)

Agile-stage-gate practice increased significantly (see Figure 1), indicating that the agile-stage-gate development methodology was adopted in the test companies. Use of whiteboards to provide overviewss and visual aids have increased. Sprints are used and the core team is unchanged during a

period. Use of customer descriptions and lists of product features have also increased. However, co-location is unchanged.

*Figure 1: Agile-Stage-Gate has changed the development methodology in the test companies. **p<0.05, *p<0.1*

Agile-Stage-Gate practices, n=15
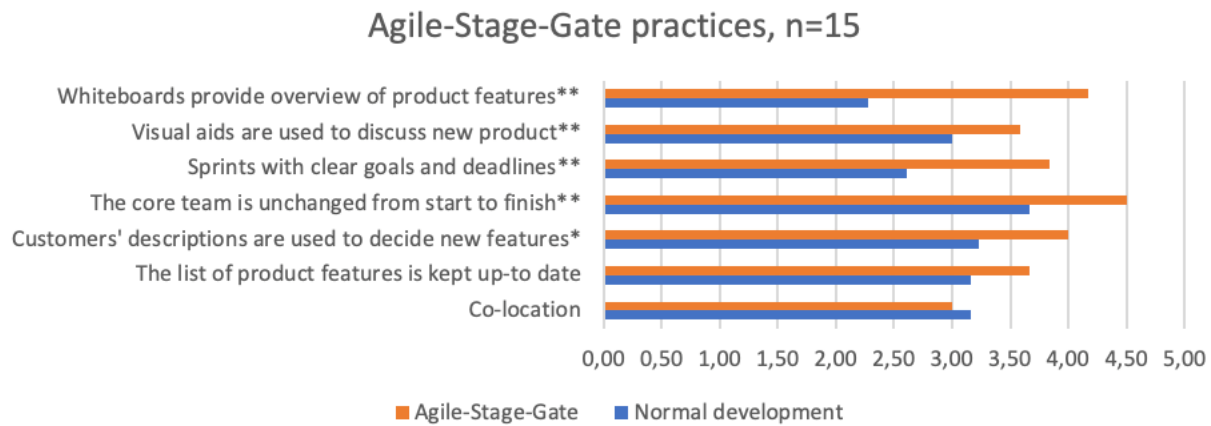
Working environment shows slight but insignificant decreases in social community, role clarity, justice and respect, vertical trust, job satisfaction and working environment in general. Employees significantly keep information hidden to a higher degree in the agile-stage-gate methodology. The only dimensions with a slight positive development are horizontal trust and predictability (see Figure 2)

*Figure 2: Using Agile-Stage-Gate shows a slight but mostly insignificant negative development in all working environment dimensions. *p<0.1*

Working Environment, n=15
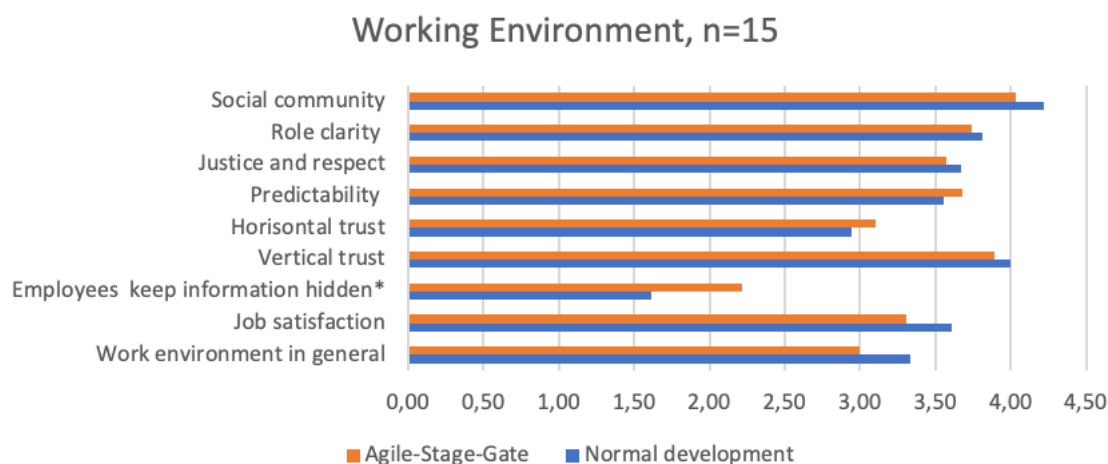
Impact

The analysis shows a general negative development in work environment although not significant. This contradicts the assumption that agile development methods result in an improved working environment. However, analysis of effect modifiers and confounders shows that the agile-stage-gate

method may not be fully responsible for the negative development. This study raises questions regarding the positive effect of agile-stage-gate and highlight the importance of analysing contextual impact in intervention research.