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When is Agile Execution not the best answer for a given effort/project?

The conditions under which we, as part of a professional team, need to use an agile method over, for example, a waterfall method are very clear, and we can find them on blog posts, tech talks or any modern project management book. The industry is pushing more and more towards the adaptation of the current methods towards agile-based ones, especially in the technology industry, where every project seems to adhere to the agile conditions (Serrador et al., 2015) (Thesing et al., 2021) (Siqueira, 2017). However, when have we heard of unsuccessful agile projects? Doesn't it sound suspicious? In the following essay a few published unsuccessful – or closely controlled - agile development projects are discussed, to hopefully arrive to more practical conditions where it might seem that agile suits our project, when in reality, it doesn't.

The agile methods have been a significant contribution from the software engineering industry and have been praised due to its similarity with the changing market conditions and the rate of innovation in new technologies (Thesing et al., 2021) (Siqueira, 2017). Nevertheless, companies should always analyze their circumstances before adopting a new methodology, since "few organizations are technically able to adopt agile development approaches successfully over a short period of time" (Siqueira, 2017), according to Brazilian researchers published by renowned house Springer. This statement comes after an outstanding investigation where a nonparametric statistical method was applied to analyze the performance of two teams developing *ten different software projects* with an agile methodology and then with a waterfall-based method, giving polarizing results. One cannot help but think: when is my project/company suited to fall in the success of agile methodologies?

The study by Springer gives an overview of the pros and cons of agile methodologies, especially when compared to waterfall development, since the company that performed the study had the chance to implement ten different real-world projects with their employees. The results of the study were both good and bad news: the teams using *agile development took 7.3% more time* to complete the project than those using waterfall development, but the latter development produced close *to five times more defects* in the outcome (Siqueira, 2017). From this study we can gather a few conclusions: agile is suited for efforts where the outcome is key to market acceptance, and not when the amount of time it takes for the completion of the project is key. This may explain why waterfall methodologies work especially for well-established products or a predictable market (Thesing et al., 2021), because this implies that the product or result's ground is not extremely sensitive to defects, and this is achieved in markets that have already been explored and educated to accept said product. New horizons for innovative products seem to be quite sensitive to defects in usability, aesthetics or simply errors (Thesing et al., 2021), making defects a delicate issue worth experimenting with, ability that the agile methodologies seem to provide, but with the trade-off of extra-time.

The International Journey of Project Management published a large-scale study on more than a thousand agile projects assessed (Serrador et al., 2015), with different

metrics: business efficiency factor, stakeholder success factor, and many others. The overall results determine that the greater the agile approach, the higher the reported project success. But if we dissect what 'success' means, we find that it is formed with the cumulative sum of all the metrics used: some of these metrics might be extremely beneficial for agile, while some others are not, but in the end, the cumulative sum disguises these components. The study has an important insight, since it shows that indeed, the more agile efforts, the greater stakeholder satisfaction there will be. However, as we mentioned, success is not only stakeholder satisfaction; it also takes on account business efficiency. This metric alone showed that, no matter the level of agile effort, *the business efficiency index did not change*, and even increased the more traditional planning components the approach had (Serrador et al., 2015). This may be explained due to the very nature of traditional planning: it develops the project based on a formal plan, with little to no changes based on external inputs. This entails the construction of a business case aligned to the market, but more remarkably, aligned to the business needs and objectives. The result of a strategy that follows said case without any significant change is then the strict attachment to business efficiency.

Following the line of metrics inside agile methodologies, there is a case studied by Utrecht University (Cheng et al., 2009), where KPI's (Key Performance Indices) were introduced as part of the daily scrum meeting ritual. This was done due to the inefficiency that the software was generating in terms of bugs, and the company management was the only department that had knowledge on these quality indices, leaving the rest of the organization unaware of the software quality at each iteration. The solution was to set several KPI's as part of the sprint planning and daily scrum meetings, as well as planning the test plans explicitly before even the development started. Marketing, sales and training were also decided to plan before development. The inclusion of KPI's in the agile rituals and additional planning were two components that the agile methodologies did not contain but seemed necessary for the "successful development and selling of software for several decades", according to the study (Cheng et al., 2009). Here we see that agile methods prove to be incomplete when the software product is intended to be sold not only in the present market, but in *long term conditions*. This is telling us that agile approaches will not be enough for the successful development of products that want to be sold for a large amount of time, due to the lack of detailed quantitative performance analysis and planning.

Throughout this brief review of some cases where agile approaches had to be intervened or completely ditched, we came to a few conclusions about the practical conditions were agile might not be the answer. One of them is when a project has tight schedule and due dates, since agile proves to take 7% more time to complete if compared to a waterfall approach (Siqueira, 2017). Another condition would be a strict business efficiency required: while agile guarantees greater stakeholder satisfaction, the index of business efficiency tends to fall (Serrador et al., 2015) due to the over-concentration on external satisfaction, often leaving internal metrics aside. The last key condition would be when a project has the purpose of a long-term success, since agile seems to appeal to a short-term market due to its lack of planning regarding quantitative quality metrics. Nevertheless, as most of the studies

showed, by adding the missing qualities to the agile approach, the project turns out successful, becoming one of many mixtures of agile and traditional used nowadays.

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