

Agile safety – how to transform safety assurance

Introducing agile concepts in safety and risk-related areas

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Traditionally many business processes are carried out in a linear, step-by-step manner where one step needs to be completed before the next is undertaken. This is especially true whenever safety is involved, because safety assurance processes tend to place a strong emphasis on documentation and sequential progress through stage gates. While such an approach is effective for providing assurance, sequential decision-making is often slow and inflexible. Moreover, such approaches can lead to a culture of overemphasis on “following the process” and “meeting requirements and targets” to progress through each stage gate. Adhering to the process can become a goal in itself rather than a means to achieving the business aims, for example developing a robust, reliable and safe product, providing an efficient and effective customer service or managing the organization’s risk exposure.

Therefore, organizations are increasingly looking to use new – agile – business processes to reduce time-to-market and improve the way they manage their business, develop products and serve customers. The agile process is a concept that first arose in software development, where it was used to allow development of systems based on rapid development cycles, and it is now being adopted in other areas where businesses seek to respond quickly to change. It involves principles such as flexibility, dynamic teamwork and networking.

The challenge

For organizations moving to agile processes there can be significant challenges to overcome. Existing regulations and standards in many industries make it difficult for the orga-

Many companies are moving towards agile concepts as a way to improve efficiency, effectiveness and responsiveness to change. However, this can present difficulties in safety and risk-related areas. In this article the authors discuss developments in the way agile concepts are being used in challenging fields through the use of such techniques as safety envelopes, operational modeling and incremental/pilot implementation.

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nization to adopt agile concepts, especially in the case of high-reliability systems, or where safety or security is affected. Indeed in some cases the use of a linear, gate-driven and highly documented process is explicitly prescribed. Despite these challenges, a number of organizations are exploring how to adopt agile concepts for these types of regulated situations.

To be successful and overcome the sometimes fierce resistance from proponents of the traditional approach, companies will need to be able to demonstrate that adopting agile processes delivers results that are at least as good as those achieved by applying the existing linear processes.

The way forward

One current concept that is showing some initial success is to define a clear “safety envelope” and focus on working within this envelope. The idea of the safety envelope is to define the boundary of what should be achieved, instead of creating a long list of all the things that must not be done. The safety envelope says what to achieve, in a positive sense, to demonstrate safety at all times during change. For example, in a recent highways project that was using new innovative technology and operating regimes, a clear safety envelope was defined in terms of an agreed global safety level that allowed room for maneuver as options were explored, developed and tested. The project needed to show that it always stayed within the agreed safety envelope as design and development work progressed. New concepts and trials could be implemented as long as the overall result could be shown to be within the envelope.

Another concept being explored is to develop and implement different options in partly parallel incremental steps.

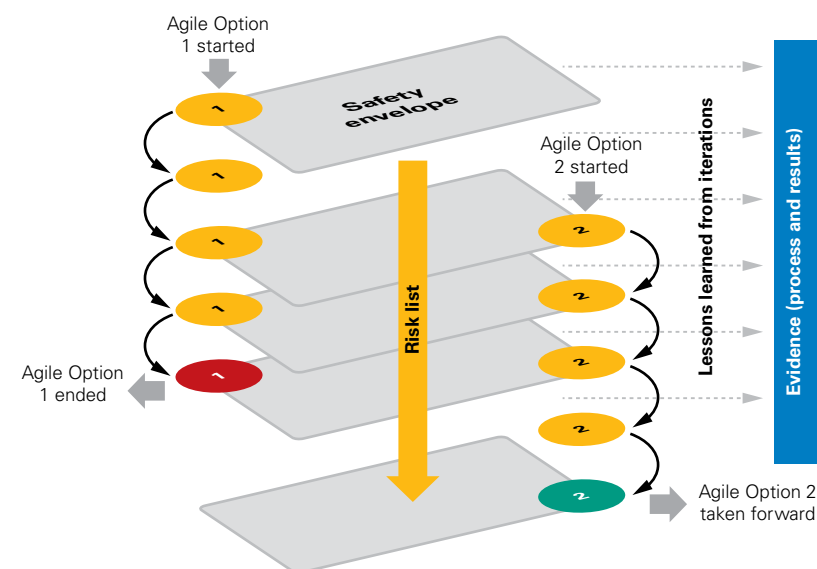


Table 1
The process in the safety envelope
Source: Arthur D. Little analysis

As each implementation cycle is carried out, multiple options may be implemented at the same time as long as the overall safety envelope is respected. Feedback is collected on the effects of the change and the lessons learned from each implementation cycle are used to inform future development and implementation cycles. Relevant evidence is collected from each cycle and fed back into future cycles to enable evidence-based decisions to be taken. Using this approach, organizations can agree and adjust the envelope with relevant stakeholders. They can then demonstrate through evidence that all changes stay within the defined and agreed envelope and that, hopefully, the overall result is actually improved as lessons are learned. This is shown in the Table 1 above, as multiple options are explored within the envelope, with lessons learned and evidence collected from each cycle. Activities such as hazard management are carried out and form part of the process of improving the overall result.

This approach can be supported by modeling to assess the evidence-based impact of the changes before they are implemented.



Picture by Adie Bush / Cultura / gettyimages

Not just theory

The use of agile approaches in safety-critical applications is more than just theory. For example, a metro railway system is currently exploring how to manage change through the use of operational envelopes and model-based environments. The model-based environment would enable it to test changes to operations within the model, using agile principles. Multiple changes to operations could therefore be tested using agile development principles before the changes are tried on the railway.

An international manufacturing company recently adopted agile concepts when looking into ways of strengthening risk management processes for its product development projects. The standard procedures for updating the risk management guidelines and tools would have taken around 18 months. However, the company was keen to improve risk management on critical projects that were currently underway. The company first piloted some new ideas on two existing projects, each at a different stage of the product development lifecycle. Further ideas that were thought to be useful were then rolled out on around 20 projects. Not all ideas were

rolled out to each of the 20 projects, but only those ideas that were relevant to each project. Based on the lessons learned, the company's project risk management guidelines and tools were updated and made available to all of the company's development projects. Not only were the new and improved guidelines and tools available around nine months after the start of the first pilot project (i.e. in half the time of the standard updating procedure) but the changes incorporated had also already been trialed and tested in real projects, making their wider adoption more likely and successful. Simultaneously a cadre of experienced enthusiasts is now available to advocate the wider uptake of these approaches across the company.

Insights for the executive

Organizations are increasingly moving to agile business processes as a means of improving efficiency, effectiveness and responsiveness to change. However, in certain safety or risk-related areas existing regulations and standards make this difficult. Some leading companies are currently exploring ways of adopting agile concepts for these areas and thinking through how this can be done. Promising approaches for further exploration include the use of safety envelopes, operational modeling and incremental/pilot implementation. To be successful in the long run, companies will need to demonstrate to stakeholders that the results achieved with agile processes are at least as good as those using traditional approaches, if not better. There is still some way to go before stakeholders can be convinced, but the early signs are promising.



Picture by Adie Bush / Cultura / plainpicture

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