



TechExcel DevSuite

Specification-driven Development

A detailed look at specification-driven development (SpecDD). Specification-driven development is a robust and scalable agile-derivative.

Summary

TechExcel DevSuite is built with the best-practice that specifications – from ideas, to formal specifications, to competitive information to issue resolution and customer insight - is central to any product development initiative. By eliminating the silos of data that exist between different teams and in different locales, specification-driven development helps enterprises dramatically transform their development processes, increasing both the efficiency and overall quality of their end products. The framework helps teams communicate better and reduce their development cycle times, allowing the right products for the right markets to be developed in the shortest possible time.



Introduction

Agile development is sparking the interest of everyone: From small development teams to multi-national corporations. It is one of the hottest trends in software development. The ideas of iterative development of applications, evolving requirements, better channels of communication, and projects finishing on time prove to be instantly popular with the development community. This popularity was born out of the failures of previous large projects: it is very easy to read the headlines of millions of dollars in overruns.

A fundamental flaw in these projects was the belief that the specifications (the to-be delivered functionality of the application) set at the beginning of the effort were the same set of features to be delivered at the end. Hundreds of hours were spent in the design and development cycles for these specs. At the end of the road, though, customers too often found that they hadn't completely represented their needs with the specifications.

Agile development methodologies came about to promote evolutionary changes within software engineering. There are some basic agile principles which are followed:

- Customers list and prioritize their requirements.
- Development teams deliver increments of the software to meet these requirements.
- Customers can then add, remove, or re-prioritize their requirements based on the delivery of the software.
- At the end of each iteration, which is usually in less than a month, both the customer and the developer can evaluate the project and start a new cycle if needed.

This dramatically shortens the time required for the project, since functionality designs are loose. Developers are free to implement their understanding of the requirements, and the customer is free to request that the functionality is changed to better suite their needs.

However, this more open development environment also introduces risks to the project.

Risks of undisciplined Agile development

The lack of formal design processes, one of the key benefits of agile methods, means that it is hard to get meaningful metrics for implementation teams. This lack of measurement is compounded by the global nature of modern teams, who have geographic, language, and cultural barriers. These barriers can lead to longer projects if programmers are disconnected from the business logic of the application and do not correctly implement customer requirements. The constant communication that is required to keep the pace of agile projects is also more difficult to maintain for these dispersed teams. The entire evolutionary development model can quickly breakdown into chaos.

Balancing Agile with business needs: SpecDD

In order to mitigate these risks, a design process needs to be added on top of the development process. This conceptual framework allows customers, product managers, and implementation teams to interact in a measurable way. Instead of implementation occurring isolated from customers and designers, specification-driven development (SpecDD) provides the needed process, without adding overhead to the project timeline.

SpecDD states:

- Business logic always dictates the correct way for software to function.
- Requirements must be formally understood and translated into specifications.
- These specifications, along with their related requirements and other collateral (called knowledge) form a "conceptual product."



- The conceptual product guides engineering and QA testing.
- A conceptual product, as the complete blueprint of an application, should be compared to the implemented product.
- Any deviations between the implemented and conceptual products must be corrected, since the conceptual product is an accurate representation of the application.

Benefits of SpecDD

The conceptual framework provided by SpecDD provides immediate benefits. First, it enables distributed development teams to interact with product managers and design teams. A core team can take a customer's requirements and reinterpret them into developer-friendly language as a specification. Developers only need to worry about implementing the specification. If the customer's requirements change, this can trigger a change to the specification. However, unlike our previous example where this could dramatically alter the course of the project, the impact of a change can be measured. Since the specification works as a parent item to all development tasks, project managers, product managers, and customers are always aware of the potential impact these changes can have.

Change Management

SpecDD also makes it possible to quantify these changes. For changes to specifications or requirements that the implementation team is currently working on, an approval process can be used to analyze the change request. This analysis can look at each specification's linked development tasks or test plans and flag items that are related to outdated specs and requirements. This allows for a living, parallel design process to take place even during development – providing a great degree of agility while still maintaining a consistent vision for the application. Change requests in SpecDD can be used to perform cost and impact analysis.

Traceability

From a specification, all relevant data should be communicated. This information includes related requirements, development work items, QA test plans, and customer support issues. Viewing all these elements together gives a full matrix of traceability for each specification. This empowers decision makers by presenting all relevant information from a single view point.

Scalability and Collaboration through Specifications

The specification also provides a way for product managers to collaborate with developers. Each specification can allow team members to voice their opinion of the specification through a voting concept. The votes for a particular specification's ease of implementation can be compared to its' cost and revenue estimates. This allows product managers to forecast the success of a specification, and alter it if needed. Specifications can also be broken into multiple pieces and assigned to different teams if needed.

Specification-driven Success

Specifications create a way for designers to communicate a customer's intentions to developers. The framework enables agile development by introducing process and traceability to changes in requirements. This in turn allows the developers to respond quickly to design changes and deliver better increments of the software. The project moves forward at all times, even while exact details of specifications are evolving.



SpecDD maintains the efficiency of agile development, while also maintaining the quality and vision of the business behind the project. It also provides a way for businesses to adopt a scalable agile process without adding additional risk to their process.



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