A Ten Point Guide for Managing Requirements for the Internet of Things (IoT)

Getting Started with IoT

The Internet of Things (IoT) offers many exciting opportunities for product innovation, new business models, and expanding revenue streams. Companies looking to take advantage of these opportunities should start with a strategic approach to requirements management that will transform products into connected systems. This may require new approaches to requirements management. While managing requirements for today's complex products is already a challenging task, IoT introduces new levels of complexity. Older approaches to requirements management that may have worked in the past, will not be sophisticated enough to handle the complexity of a connected IoT enabled product. To help companies think through the various impacts of IoT on requirements, Tech-Clarity offers the following ten tips:

Consider Ecosystems

Think of a product as an ecosystem of connected systems and define the boundaries of the system. Consider the ecosystem requirements needed to deliver the desired services. Implement plans for managing requirements of systems and products you do not own.

Include Interfaces

Define requirements for how the different "things" of the system will communicate. Consider industry standards to support interoperability within the ecosystem and expand the network of potential partners who can deliver extended services.

Identify Instrumentation

Take advantage of opportunities to provide closed loop product feedback. This includes service information to predict maintenance needs or operational information engineers can use to improve future products. Define what information should be captured and the required data sensors needed to capture the right data.

Facilitate Collaboration

Involve input from customers, product managers, engineering, and test to properly define requirements. Include new groups that have not been a part of traditional product development such as IT who can help with IoT requirements like cloud technology and connectivity.

Manage Change

Identify the impact of changes, before implementing them. Interdependencies in complex systems mean that poorly managed changes risk introducing new problems. Plus, product requirements have become more fluid and cannot all be defined upfront. Implement Agile processes to support this needed flexibility. Plan for future software updates for products 'in-operation' to meet ongoing customer expectations for new features and functions.

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Create Single Source of Truth

Improve accessibility by centralizing requirements. Manage complex systems more easily and reduce communication challenges with requirements in one place. Evaluate and implement changes more easily by eliminating the need to search multiple locations.

Enable Traceability

Link requirements, work items, architecture and design items, and test plans so that the relationships across interdependencies are understood. Ensure requirements are traceable across the lifecycle to manage progression and understand status. Use traceability to conduct a change impact analysis to identify all impacts.

Encourage Strategic Reuse

Save time and improve quality by taking advantage of existing requirements and the associated deliverables. IoT systems are too complex to start from scratch every time so use previously validated work when possible. Share the same requirements across multiple places so that changes to those requirements will propagate to each instance. Reuse requirements in different configurations to support Product Line Engineering.

Support Compliance

Manage and prove compliance with reporting tools that identify the status of compliance throughout complex systems. Include audit trails so that there is a record of who has done what.

Ensure Security

Take the needed steps to incorporate modern security protocols to protect against security vulnerabilities created by connectivity. Rigorously test for potential security issues.

Key Takeaways

IoT introduces new levels of product complexity. To be successful, companies need new ways to manage this complexity. Getting it right starts with the requirements. IoT creates new considerations for defining and managing requirements. Connected products are too complex to risk teams working with outdated requirements. Development efforts require a higher level of rigor, starting with requirements. At the same time processes must be agile so that problems are found early. With sophisticated approaches to requirements management, teams will have an advantage when developing IoT enabled products.

About Tech-Clarity

Tech-Clarity is an independent research firm that specializes in analyzing the true business value of software technology and services.

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