How to Operationalize IEEE Standards

Using a Requirements Management Software Platform with templates derived from IEEE standards brings best practices to life.

Executive Summary

The over 3,800 IEEE standards contain many best practice approaches in terms of defining requirements for products or systems. Unfortunately, if you are dealing with many different standards, it can be difficult to operationalize in a PDF or HTML format. When integrated into a Requirements Management Software platform these best practices come to life. When using Requirements Management Software, you can document your specifications, collect feedback from stakeholders, plan your tasks, and track issues with your project. Once a single version of the agreed upon requirements are defined, teams can collaborate with full transparency and all changes can be traced. This systematic approach to managing your project or product requirements will exponentially improve the usability and value of IEEE standards and substantially improve project execution.

“IEEE standards integrated with Requirements Management Software bring best practices to life.”
Overview of IEEE Standards

An IEEE standard is a document authored under the IEEE-Standards Association Standards Development Process that set specifications and procedures based on current scientific consensus through an open process that brings diverse parts of industry together. There are more than 3,800 technical standards that IEEE publishes and makes available to its membership. These can be accessed via the “Standards” tab of the IEEE Xplore Digital Library.

These global standards cover a broad range of industries, including: power and energy, biomedical and health care, information technology, telecommunication, transportation, nanotechnology, information assurance, and many more. Some are available for free and others have modest fees to access the information.

Standards range from short papers to highly detailed 100-page documents. They cover a variety of topics of common interest. Many include templates or outlines of best practice approaches to understanding a technology or defining a process. These best practice guidelines which define procedures and requirements, are accepted as being the most effective approach.

Unfortunately, if you are dealing with many different standards, it can be difficult to operationalize in a PDF or HTML format. Ideally, best practice processes would come in the form of an interactive template integrated in a requirements management software platform, where a holistic approach can be used to address deficiencies in document-based approaches.

Top IEEE Standards for use with Requirements Management Software

<table>
<thead>
<tr>
<th>Standard Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>29148-2011</td>
<td>Systems and software engineering - Life cycle processes - Requirements engineering</td>
</tr>
<tr>
<td>23026-2015</td>
<td>ISO/IEC/IEEE International Standard - Systems and software engineering - Engineering and management of websites for systems, software, and services information</td>
</tr>
</tbody>
</table>

Overview of Requirements Management

What is Requirements Management?
Requirements Management is the process of documenting, analyzing, tracing, prioritizing and agreeing on requirements, controlling change and communicating to relevant stakeholders. It is a continuous process throughout a project and entails a considered, but active approach. A requirement is a capability to which a project outcome (product or service) should conform.

Spreadsheets and Words documents can be used for requirements management but when the number of specifications and stakeholders get large this becomes ineffective, as version control becomes problematic and labour intensive.

How Requirements Management is different from Project Management?
Essentially, Project Management is "how" you get something done while Requirement Management outlines "what" you get done. For instance, engineers commonly use the Agile methodology for projects. This approach defines a process of development methods in which solutions evolve through collaboration between self-organizing, cross-functional teams. It promotes adaptive planning, evolutionary development, early delivery, continuous improvement, and encourages rapid and flexible response to change. However, an Agile methodology by itself does not define the specifications that the final product or service must adhere to. This is where a requirements management process comes into play.

What is Requirements Management Software?
Requirements Management Software provides tools and services to aid with the definition and management of specifications of a product or service. It is a solution which automates the requirement management functions detailed above, also allowing stakeholders to collaborate and providing a single version of the agreed upon requirements; a single version of the truth.

Industry analysts report that poor requirements definition and management is a major cause of rework and friction between commercial and engineering teams, especially when developing highly complex or regulated products, systems or services, and has caused failures of billions of dollars in cost overruns.

Why organizations should consider using Requirements Management Software?

1. No traceability between requirement statements, explicit or implicit needs and the product or service attributes
2. Lack of good collaboration across diverse stake holder groups to adequately control and baseline requirements
3. No visibility into the details of testing and how testing coverage relates back to the product or service attributes
4. No central database for requirements for product or service baselines including incremental change control
5. Not able to manage changes to requirements baselines and not able to determine versions versus variants of baselines
6. No multi-user access allowing simultaneous, geographically dispersed collaboration
IEEE develops and makes available to its members standards, which often include best practices. If you are dealing with many different standards, it can be difficult to operationalize in a PDF or HTML format. It is possible to convert these best practices into a format that can be imported into a Requirements Management Software platform.

Taking a static PDF and making it part of an industrial strength software tool can exponentially improve the usability and value of IEEE standards and provide traceability between the end product or service and the IEEE standard.

Instead of having standards printed out and tacked to a wall in your office, or worse, unused a binder on a shelf, IEEE templates that are integrated with a Requirements Management Software platform can bring these best practices to life, in a user friendly environment.

Why Successful Teams Do Requirements Management?
- Collaborate Better
- Risk Control
- Delivery Speed
- Complexity Management

www.requirementone.com
RequirementONE is the most proactive Requirements Management Software vendor in terms of creating and making importable templates available that integrate IEEE standards as part of their software platform. The screenshot below demonstrates a template from the Systems and Software Engineering -- Life Cycle Processes --Requirements Engineering standard (SO/IEC/IEEE 29148:2011) that has been incorporated into RequirementONE.

SO/IEC/IEEE 29148:2011 contains provisions for the processes and products related to the engineering of requirements for systems and software products and services throughout the life cycle. It defines the construct of a good requirement, provides attributes and characteristics of requirements, and discusses the iterative and recursive application of requirements processes throughout their life cycle. It is a very popular standard and has been downloaded 4,500 times since 2012.

There are several different templates derived from this standard:

- **Stakeholder requirements specification template** - describes the organization’s motivation for why the system is being developed or changed, defines processes and policies/rules under which the system is used and documents the top level requirements.

- **System requirements specification template** - identifies the technical specifications for the selected system of interest and usability for the envisaged human-system interaction. It defines the high-level system requirements from the domain perspective.

- **Software requirements specification** - is a specification for a particular software product, program, or set of programs that performs certain functions in a specific environment.

- **Project plan template** - provides the total picture for the different activities and milestones for the project and it relates closely to the requirement specification that may contain essentially all the functionality of the project or it may be part of a larger system.

- **Stakeholder questionnaire template** – can be used internally, at workshops, on an Intranet or can be sent out via email to elicit requirements and feedback using a structured set of questions to classify, prioritize and validate the suggestions submitted.

RequirementONE users can quickly and easily select these templates from the Project Store on the platform’s main menu and have it as part of their RequirementONE solution. The benefit is that you avoid recreating the wheel, saving time as there is no need to cut and paste the standard into RequirementONE or deciding how it should be best structured. Just select it and it is ready to use. Once purchased, a template can be tailored and populated for any specific project need.

**Conclusion**

You and your team will achieve greater value from the IEEE standards when they are integrated into a Requirements Management Software platform, as this approach is a very time-efficient and cost-effective way to operationalize best practices. Companies that deploy this solution indicate that they achieve productivity improvements from 30-200%.

Although penetration of Requirements Management Software is currently low, and limited off-the-shelf standards templates are available, early adopters will see huge benefits, especially when compared to document based approaches.

### Value from Requirements Management Software

- Streamlined processes
- Decreased risk of errors
- Higher quality outcomes
- Faster time to market

**About Us**

RequirementONE is a pioneer in freeing up content that is locked in documents, spreadsheets or binders on the shelf, and transforming them into structured actionable information. Our cloud-based platform is highly configurable, allowing for the accelerated delivery of solutions for compliance, business software implementation and product development. The unique Solution Store centralizes your internal best practices, and provides templates from industry experts. RequirementONE leads the way to more effective collaboration and reduced risk with consistent and rapid deployment of your projects.