

Optimise

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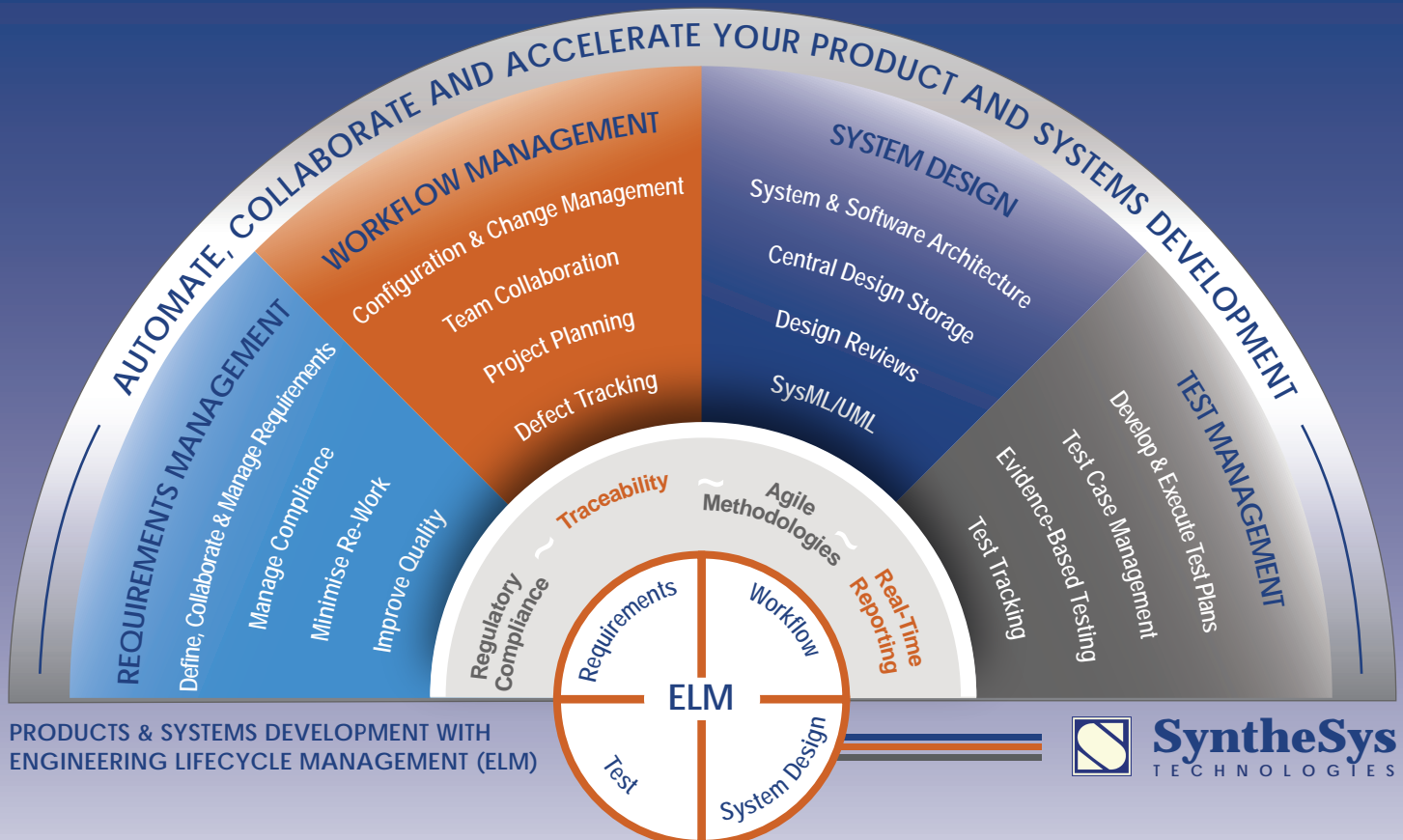
ISSUE 11
SUMMER 2023

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An Engineering Lifecycle Management (ELM) Special



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- IBM® Engineering Workflow Management Training Course
- IBM® Engineering Test Management Training Course

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Letter from the MD



Mark Williamson, Managing Director
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Transforming the Product Lifecycle through Digital Engineering

Welcome to the latest issue of OptimiseSE, the magazine dedicated to exploring the cutting edge of systems engineering. This latest issue is themed around Tool-Supported Systems Engineering, as facilitated by the IBM® Engineering Lifecycle Management (ELM) suite.

It's no coincidence that we publish this magazine in line with our IBM® ELM Future Forward User Day, which takes place on 15th June at the IBM® Innovation Centre in London.

If you are reading this magazine at the event, I'd like to thank you, not only for your time today, but for your commitment and investment in the IBM® ELM tools. If you are a SyntheSys client, we also extend our thanks for your valued business.

In this issue, we have a range of articles that explore different aspects of ELM. From discussions on the Engineering Workflow Management to an ELM solution tour, we hope that this issue will provide you with a wealth of information and insights.

We are passionate about supporting the advancement of systems engineering. We believe that by sharing knowledge and insights, we can help drive innovation and create a better future for everyone.

As always, we welcome your feedback and suggestions for future issues. We hope you enjoy this edition of OptimiseSE and look forward to continuing to bring you the latest news and insights in the field of systems engineering and optimisation.

Very best regards,

Mark Williamson, Managing Director
SyntheSys Technologies

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To subscribe go to:
www.optimiseSE.co.uk

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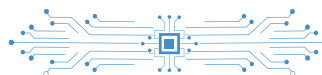
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Welcoming the Community to our
IBM® Engineering Lifecycle Management
Future Forward Day

15.06.23 | IBM® Innovation Centre | London



Big Announcement from IBM® and Siemens

IBM® and Siemens Collaborate to Accelerate Sustainable Product Development and Operations

The two companies are developing a new systems engineering and asset management combined software solution to support traceability and sustainable product development – linking domains including mechanical, electronics, electrical and software engineering.

IBM® and Siemens Digital Industries Software today announced they are expanding their long-term partnership by collaborating to develop a combined software solution integrating their respective offerings for systems engineering, service lifecycle management and asset management.

The goal is to help organisations speed innovation and time to market which can lead to improved quality and lowered costs.

The new combined SysML v1 standards-based suite of integrated engineering software is expected to support traceability and sustainable product development using a digital thread that links mechanical, electronics, electrical engineering and software design and implementation.

To read the full press release, visit:
<https://ibm.co/42qjamq>

SyntheSys News

Sharing a Wealth of Experience to Encourage Young People Towards a Career in STEM Fields

SyntheSys is proud to announce that its Managing Director, John Hartas, has been enrolled as a STEM Ambassador.

STEM Ambassadors are volunteers from a range of Science, Technology, Engineering, and Mathematics (STEM) careers who are dedicated to inspiring young people to pursue careers in these fields. The STEM Ambassador programme is run by STEM Learning, a non-profit organisation that promotes STEM education and careers across the UK.

As a STEM Ambassador, John will have the opportunity to share his expertise and experience with young people in schools and other educational settings. He will be able to inspire and motivate students to consider pursuing careers in STEM fields, which are critical to the future of the United Kingdom (UK) economy.

"I am delighted to have been established as a STEM Ambassador and to have the opportunity to inspire young people to pursue careers in STEM." said John. "At SyntheSys, we have a long history of supporting STEM education and careers and we are committed to investing in the next generation of STEM professionals. I look forward to sharing my passion for these fields with students across the UK."

To hear more about the STEM Ambassador programme, visit:
<https://www.stem.org.uk/stem-ambassadors>

For more information on SyntheSys, its products and services, and its commitment to STEM education and careers, please visit:
<https://www.synthesys.co.uk/index.html>

SyntheSys Technologies Maintains IBM® Sales and Technical Partner Proficiencies



SyntheSys Technologies is proud to announce that several of its staff members have earned technical and sales proficiencies from IBM®.

The IBM® partner proficiencies cover a wide range of technical topics of which members of our Customer Engagement Team demonstrated a deep understanding of these technologies and their practical applications.

"We are thrilled to see our staff members achieve these important proficiency badges from IBM®." said Mark Williamson, Managing Director of SyntheSys Technologies. "It's a testament to

their dedication to professional development and their commitment to providing our clients with the best possible service and solutions."

In addition to the technical proficiency badges, several SyntheSys staff members have also earned sales proficiency badges from IBM®. These badges demonstrate their proficiency in understanding customer needs and identifying solutions that meet those needs.

"We are proud of our staff members for achieving these sales proficiency badges from IBM®." commented Mark. "These badges recognise their ability to understand our clients' businesses and provide them with the solutions they need to succeed."

SyntheSys has a long-standing relationship with IBM®, and these proficiency badges demonstrate the company's continued commitment to delivering cutting-edge solutions to its clients.

IBM® Engineering Workflow Management

Plan, Integrate and Collaborate Across the Entire Project Lifecycle

Introduction

IBM® Engineering Lifecycle Management (ELM) Suite provides end-to-end traceability throughout the Engineering Lifecycle.

It can help streamline the engineering lifecycle by providing teams with a collaborative platform to manage requirements, test effort, engineering change and risk management activities as well as day to day tasks, all on the same platform.

The engineering lifecycle involves several stages and can be a complex and time-consuming process, with several interdependent stages that require careful coordination and management. The delivery of complex products and services requires an integrated solution that allows teams to break through departmental silos and take products from concept to market quickly and cost effectively.

In this article we will take a look at how IBM® Engineering Workflow Manager (EWM) gives engineering teams the capability to plan, manage and deliver throughout the whole project lifecycle.

7 Ps - Perfect Planning Prevents Problems, Poor Performance and Products!

How do we use EWM to effectively plan development effort and provide a collaborative environment for the whole project team to work from concept through to delivery to market or project completion? We start by creating a Lifecycle Project.

What is a Lifecycle Project? Good Question!
A lifecycle project is a project that includes a project area for all 3 of the ELM Core Applications:

- EWM - Engineering Workflow Management
- DOORS® Next - Requirements Management
- ETM - Engineering Test Management

Regardless of how your engineering teams prefer to work, be that SAFe, Agile or a more traditional waterfall approach, EWM provides 'out-of-the-box' templates to meet their needs and allows project leaders to define a project framework that works for the whole team.

Once our lifecycle project has been created within ELM, the process is pretty much automated, the only input required by project administrators is to provide a name and select a main template and the process template

for each application, the options are provided as part of the process. The 'type set' and artifact structures created will depend on the process templates selected at this stage.

Note: after the project is created, artifacts and attributes can be added or modified by the project administrators.

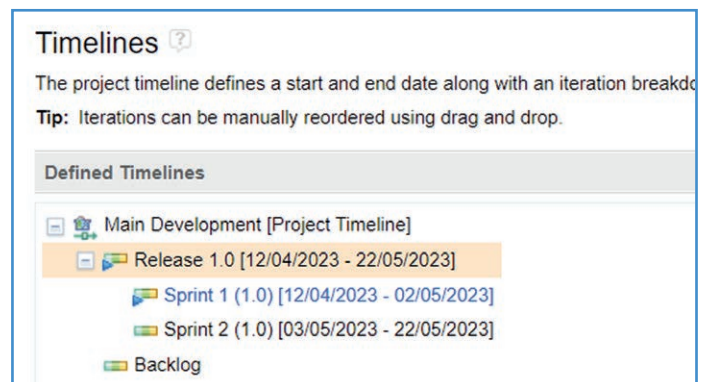
Once the Project has been set up, project admins can manage the project by clicking the link in the settings menu.



The management page is split into three screen areas, a navigation pane on the left gives access to settings for configuring roles and permissions, work items (artifacts within the EWM application), workflow settings, planning etc. The centre section shows the content for the setting selected and right area shows the team area hierarchy.

Timelines

Timelines provide the visual outline of the projected start and end dates, and all the bits in between (or iterations).



The Main Development timeline can be edited to suit the project, and you can also define scheduled work days, and the start and end time for each day. The project is currently broken down into Iterations for Release 1.0 and Backlog. Iterations can be added and defined allowing a very granular view of the plan.

The Team - Adding Members & Creating Team Areas

The next step is to add members to the project. Once all the project members are added, you have the option to create Team Areas. Team areas allow work items to be allocated to specific groups of users, as well as providing a team-centric view via the Teams dashboard (more on that later).

Note: Access to team areas and work items can be locked down to specific project members if required. Teams can be further broken down in to sub teams.



Each team and sub team will have their own team dashboard, providing a more team-focused view of project progress.

Categories

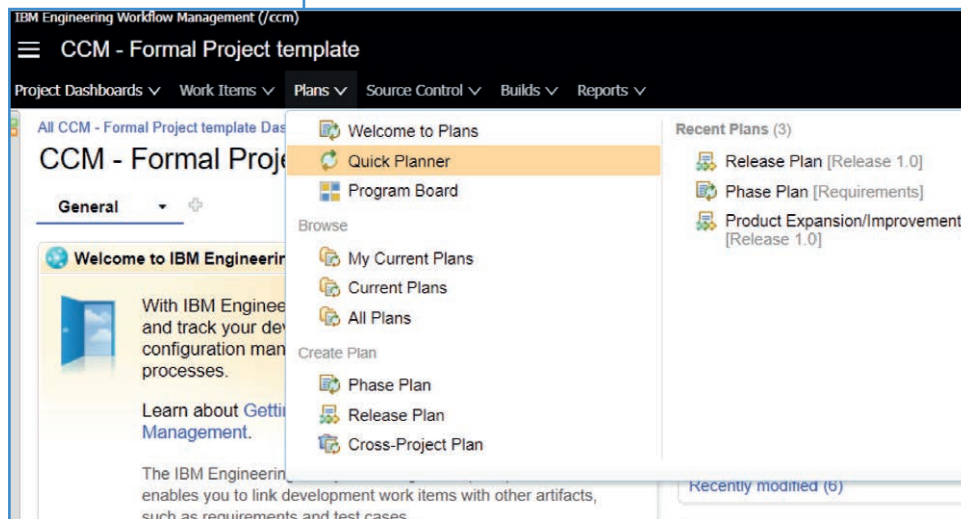
Categories allow work items to be grouped together for reporting and management purposes. Categories should be associated with specific teams; this allows work items to be assigned to the correct team when created, categories can also be further divided into subcategories.

Actions	Categories	Associated Project/Team Area	Restrict Category Visi
	▼ Unassigned <Root Category>	CCM - Formal Project template [Project Area]	<input type="checkbox"/>
	▶ Mechanical Team	Mechanical Team	<input type="checkbox"/>
	▶ Product Development	Product Development Team	<input type="checkbox"/>
	▶ Software Team	CCM - Formal Project template [Project Area] [inherited]	<input type="checkbox"/>

Planning the Work Effort

We can now start the work of planning the effort that will take place during the project.

We start by creating a plan.

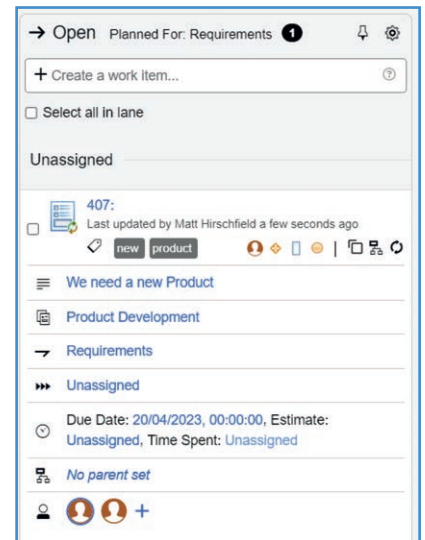


From the Plans menu, we have options to create Phase, Release and Cross-Project Plans, as well as using the Quick Planner and Program Board.

The latter two options offer a quick wizard interface for creating plans and working with work items.

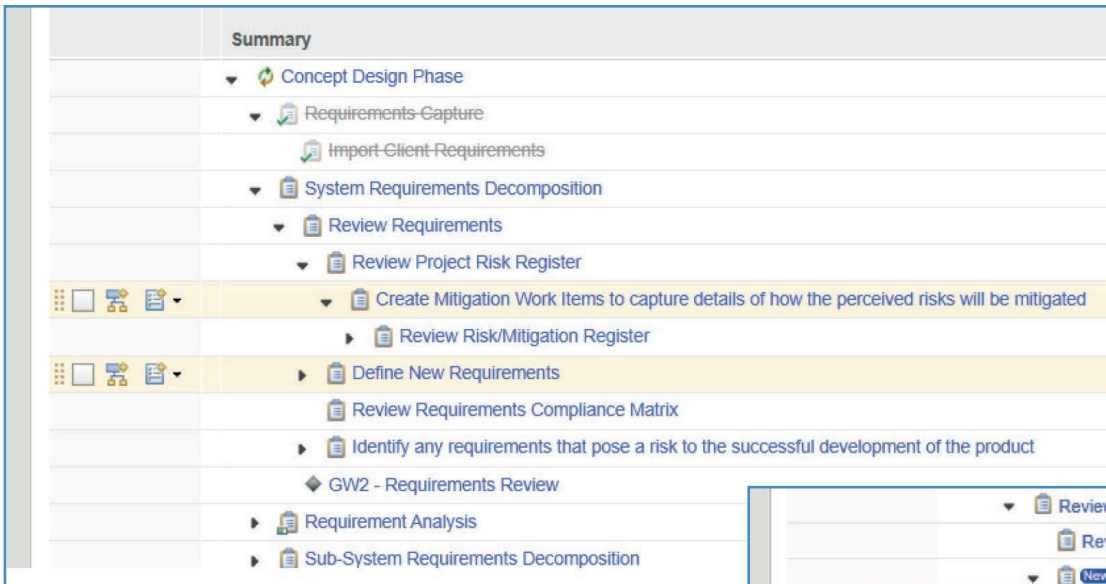
Program boards give a view of work items from a team and iteration aspect.

Quick plans offer a simple and quickly configurable view of the work effort in a swim lane format.



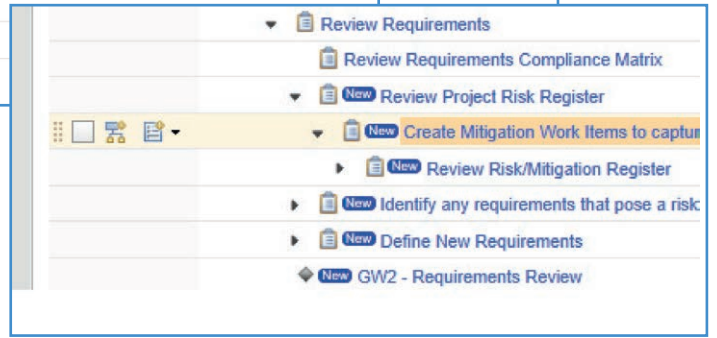
Work items can be created, opened or edited and moved between lanes directly on the board, this can be used by individual users or as part of a review meeting. Work items can be created and managed from Plan views.

The view on the next page is of a work breakdown structure, showing the hierarchy of work items. These views can be configured to show different sets of attributes and even configured to show coloured flags based on attribute conditions.



A work breakdown structure, showing the hierarchy of work items

Showing coloured flag based on attribute conditions



Work Items

When planning a project, we identify what is needed to complete the project. In EWM work items, such as task, defect, change request, and risk, assumptions are used to capture project activities. New work item types can be created, and existing work items can be customised to suit the needs of the project from the Manage this Project page. Each work item type can be configured to follow a specific workflow that take the user through the process of completing the work.

A workflow is the series of defined states/transitions that the work item passes through from start to completion.

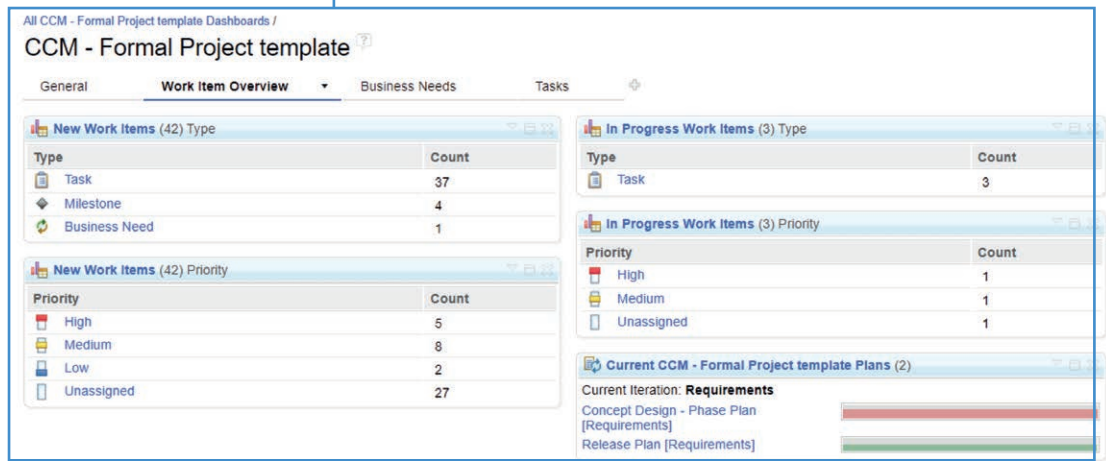
Transitions							
From	To	New	In Progress	Completed	Closed	Reopened	Triaged
New	New	<None>	Start Working	Complete	None	None	Triage
In Progress	In Progress	Stop Working	<None>	Complete	None	None	None
Completed	Completed	None	None	<None>	None	Close	None
Closed	Closed	None	None	None	None	Reopen	None
Reopened	Reopened	None	Start Working	Complete	None	<None>	Triage
Triaged	Triaged	Untriage	Start Working	Complete	None	None	<None>

By mapping out the process we can identify states and transitions that make up the workflow; dashboards can be configured to report on the live status of work items.

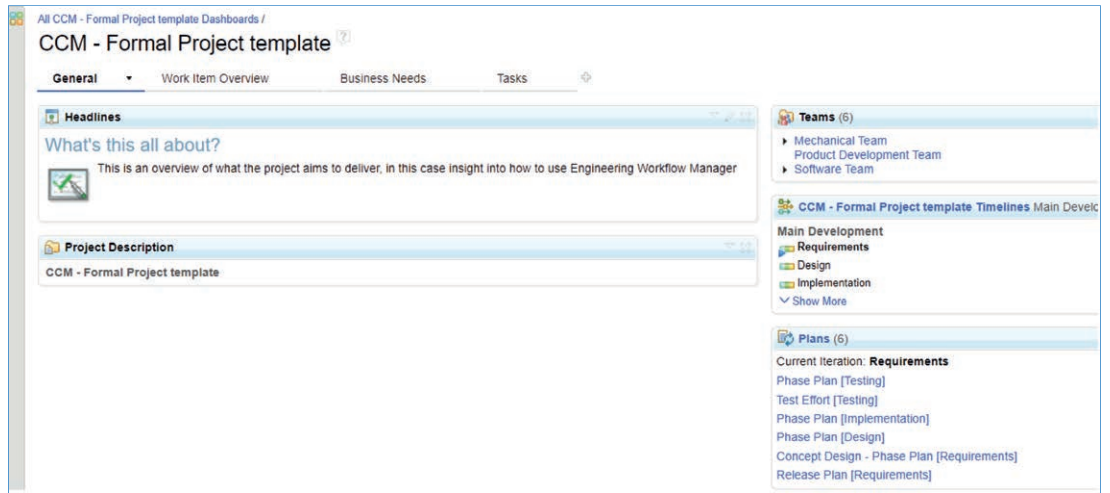
Dashboards

Dashboards can show as much or as little information as you wish; best practice is to keep the dashboards clean and simple.

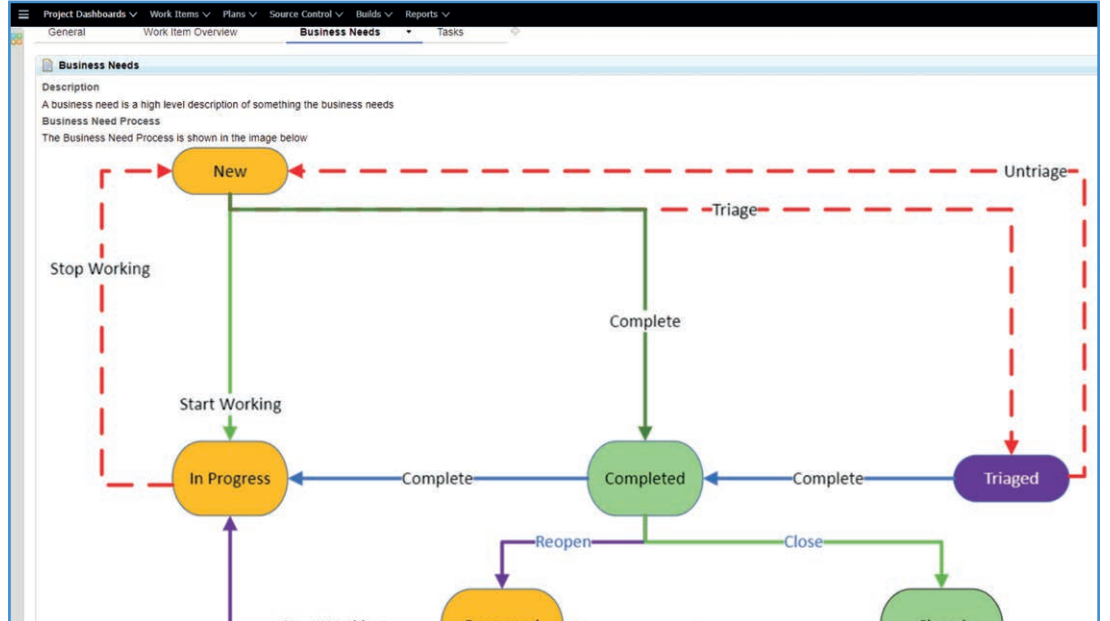
Key Performance Indicators (KPIs) should be defined early in the project, these KPIs then define the information to be shown on each dashboard.



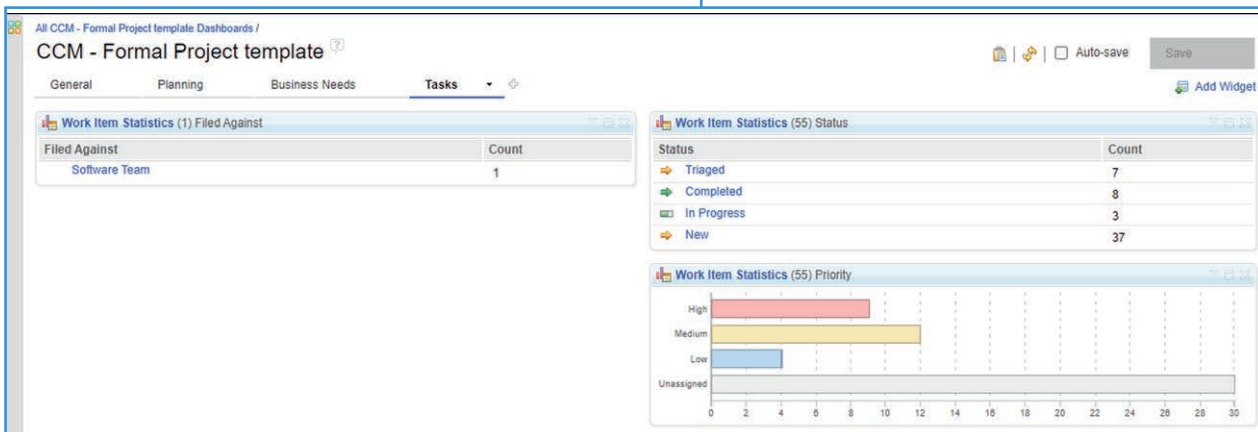
A simple general Project tab showing project information top left, then the right section provides some overviews of project teams, timelines, plans and the current iteration. Additional tabs can be added to drill down into more detail for specific work items or overview.



Process Descriptions capture information about the processes, business rules, anything that can help the users to understand their role in the project. Rather than writing separate process documentation, the information is held within the tool. As an example, we have a flow diagram that details the process of completing a business need work item.



On the Tasks tab - widgets showing information about team ownership, priority and status.



Team specific dashboards can be quickly configured to focus on the team and individual user if required.

We recommend carefully planning out KPIs and keeping dashboards light and insightful to ensure the right amount of information is shown.

In Summary

EWM includes comprehensive project management capabilities that can help you and your team to manage development effort across the engineering lifecycle. Our aim is to delve deeper into EWM capabilities in future issues of OptimiSE.

SyntheSys offers flexible licences, training and configuration support services to help you and your team to get the most from EWM. If you would like to speak to us about how we can support you with a specific EWM use case or get you up and running with EWM, contact us at: cet@synthesys.co.uk.



IBM® Engineering Lifecycle Management (ELM) Solution Tour

To cope with rising product complexity and significant amounts of data, modern engineering teams must improve existing methods of working whilst embracing new processes and technologies to maintain a competitive edge.

Competitive pressures to bring products to market faster, slash development costs, maintain quality standards and counter competitor innovations are forcing organisations to change fundamentally the way their engineering teams work. Customer and market demands are driving the need for companies to overhaul their old methods for newer, more agile processes that optimise the entire engineering lifecycle. We partner with IBM® to supply best-in-class engineering development tools to give our customers access to robust and powerful functions which automate, accelerate, improve and adapt engineering programmes

Requirements Management: Fundamental to Successful Collaborative Engineering

Requirements Management can be defined as the subset of systems engineering concerned with discovering, developing, tracing, analysing, qualifying, communicating, planning, monitoring and controlling requirements that define the system at successive levels of abstraction.

Stakeholder requirements drive the quality of your end product. In the growing face of complexity, systems engineers are faced with the challenge of managing an increasing number of requirements as an essential component of engineering development. Developing and maintaining good requirements management practices is no mean feat but it controls projects, mitigates risk and reduces cost.

Getting stakeholders to articulate their needs can be a difficult and lengthy process. Half the time – even more if the buyer isn't the same person as the one with the technical need – they don't even know what they want themselves. No process can pull information out of the void when it doesn't exist, but systems engineering takes a robust and scientific approach to requirements management that clearly and specifically identifies ambiguities and gaps in stated stakeholder needs. The best way to get a straight answer is to ask a straight question, and the

systems engineering process is very good at generating straight questions. Working with vague or incomplete requirements doesn't just lead to a risk of building the wrong product, it can also risk building the right product badly. Effective projects run individual management tasks rigorously and efficiently, and the ability to follow a rigorous process is severely hindered by a lack of robust inputs. Problems that arise in this way only multiply over time, as knock-on effects are generated and start introducing chaos of their own.

IBM® DOORS® Family is a Requirements Management application which provides an effective way to manage requirements, improves efficiency and enhances overall project output. The tool automates the requirements management process and enables your teams to concentrate on building the right product, not spending time on manual tasks and rework. This scalable solution provides functionality which allows teams to communicate, document, collaborate and verify stakeholder requirements whilst handling real-time version control and change management.

Design Management: Clarity Through Models, Prototypes and Simulation

Model-Based Systems Engineering (MBSE) has long been recognised as an effective method of mitigating risk, reducing costs and increasing agility and as products become more interconnected and software intensive, more organisations are waking up to the benefits. Prototyping and modelling your system design provides a reliable and seamless way of understanding the architecture and behaviour of your products and services which enables you to adapt to changing market and customer requirements whilst improving your overall productivity. The early validation of requirements is critical to the overall effectiveness of your system design. The rising complexity in industries such as Aerospace, Rail and Defence is evolving the types of challenges seen by engineers. These challenges are causing many organisations to integrate new systems and software engineering solutions which automate MBSE whilst also providing tools which give end-to-end management of the engineering lifecycle.

Model-Based Systems Engineering gives clarity of information whilst reducing costs.

IBM® Engineering Systems Design Rhapsody® and associated tools provides proven functionality for modelling and design management. The tools automate the way in which you check for consistency and offers continuous validation through models and prototypes. The suite of tools offers development, design and test environments for software and systems engineers and teams.

Workflow Management : Collaborating Teams, Managing Projects

Managing tasks, project status and plans is a critical component to any engineering development. Teams must adopt a flexible and adaptable approach in order to achieve faster release cycles.

IBM® Engineering Workflow Management facilitates individuals and teams to collaborate to build better software and systems by aligning development environments. The tool provides an all-in-one common platform where users can manage workspaces and software version control more effectively whilst facilitating development support. Available in the cloud or on premise, IBM® Engineering Workflow Management unifies work teams to allow them to work faster and smarter, on the right task, by linking plans with software development. Project reporting is simplified and automated to provide a 'single source of truth' throughout internal and external environments.

Test Management: Integrated and Continuous Testing

Testing, in an engineering context goes hand in hand with quality management, but a high-quality output is only one of the benefits of adopting robust and effective testing regimes and tools. In addition to maintaining the quality of your products and services, testing helps engineering teams meet project deliverables and go-to-market faster. But as technology advances, so does a testing requirement which relies more heavily on testing processes which are integrated at each element of the engineering lifecycle. Traditionally, testing is seen as one of the last steps in the engineering development process and therefore is often under scrutiny when budgets and schedules are tight. In recent years, it has become more widely explored and accepted that this view of testing no longer presents a competitive position, and that testing as early and as often in the development process as is possible, reduces cost, increases quality and accelerates time to market.

To achieve quality driven software and systems, development teams need to collaborate, share information and adopt a level of automation throughout the software and systems development process.

IBM® Engineering Test Management is an end-to-end test and quality management tool which provides test planning and asset management functionality across the entire engineering lifecycle. IBM® Engineering Test Management offers test planning, test construction and test artifact management functions, which helps quality assurance teams collaborate, automate and govern more effectively. The tool automates collaboration and information exchanges across engineering development teams to allow them to deliver superior quality on time, every time. The robust reporting features provide real-time data to inform release decisions and mitigate risk.

Lifecycle Optimization: Manage Documents, Extract Data, Optimize Development

Creating, publishing and connecting high-quality engineering documentation can be a challenge. Engineering teams need easy access to documentation which relates to the overarching engineering development process, and perhaps more critically, to each other. Organisations need a seamless and elegant way to trace documents, track data and mitigate risk. Adaptability is key and development engineers need methods for creating a variety of different output formats taken from multiple different sources.

IBM® Engineering Lifecycle Optimization - Publishing offers powerful, automated documentation generation functionality which helps organisations generate documents for inhouse review purposes, contractual obligation, or compliance with standards. The tool automates document generation and report production across your deployed Jazz™ and other engineering tools, and enables engineering teams to produce quality reports and requirements traceability matrices in user-friendly formats such as PDF, HTML, Word, Excel and XSL. Data can be extracted from various sources to automate manual processes and reduce errors, whilst the ready-to-use templates and drag and drop features will improve your overall project delivery. Document styles are flexible and support hyperlinks which provide unique navigation between documents.

As an IBM® Gold Business Partner, we offer licence sales, software installation, training and support services.

Gold
Business
Partner



To talk to us about the IBM® ELM toolset, contact our Customer Engagement Team by emailing: cet@synthesys.co.uk



IBM® Engineering Lifecycle Management Health Check Service

During a thorough review and check-up, our consultants will review your technical and operational environment, the tools and applications you currently have implemented, and associated mechanisms. We will evaluate and identify any issues with performance, outstanding tickets, operational usage and technical constraints. We are experienced in reviewing the development processes and associated application configuration deployment, so as to promote continuous improvement of your implementation.

After analysis and consultation with your team, we will provide a comprehensive formal report with recommendations for proactive tool and application management, which will allow you to release maximum benefit from your IBM® software investment.

What you can expect:

- Full review of your current IBM® Engineering Lifecycle Management (ELM) implementation;
- Experienced guidance from our best-in-class application consultant (remote or on site);
- Formal report containing recommendations and solutions for success.

If you are currently utilising IBM® ELM tools and would like to discuss the potential that lies in upskilling your team, please contact us by emailing: cet@synthesys.co.uk or telephone: +44(0)1947 821464.