# Plexus Messenger

**Planning for success in complex supply chains and projects in Aerospace and Defence**

Number 1
September 2011

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## Introducing Plexus Planning

Welcome to the first edition of the new, quarterly newsletter, from Plexus Planning. I hope you will find it interesting and informative.

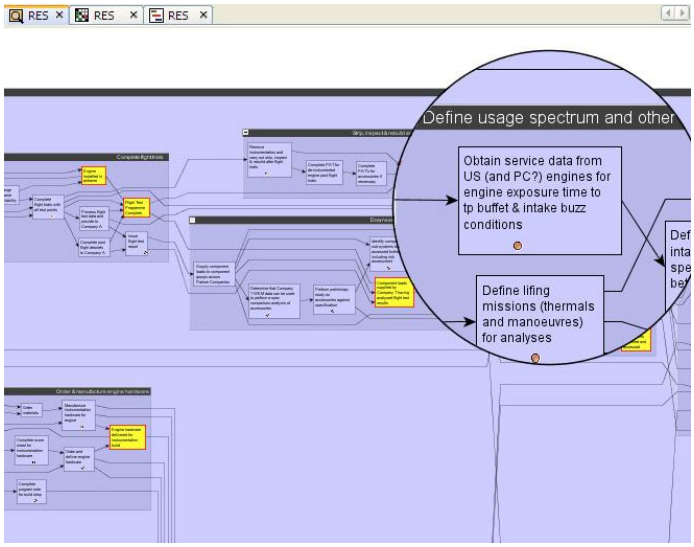
Plexus Planning Limited was formed in 2003 (under the name Acsian) with the specific objective of developing software solutions for the optimal planning and execution of large complex projects, which are typically characterised by being very late and suffering astronomical cost overruns.

The company was founded by Professor Jim Scanlan of Southampton University and Ian Poccachard of Rolls-Royce, who identified fundamental weaknesses in current process and program management tools, and utilized their combined years of experience in both industry and research to develop the concepts in Plexus™.

Based on these concepts, a team of industrial, academic and IT professionals have implemented the Plexus™ product set, which is an exciting breakthrough technology, offering a unique and easy to use solution to the problems of setting-up, and managing large projects and supply chains in aerospace and defence.

Plexus is now a generic tool and approach, that is designed to deal with large, complex networks of dependency, whose structure and associated data is not easy to piece together.

Plexus is an easy to use tool that provides an unparallelled visualisation of complete design and development networks and supply chains. It has been built using efficient simulation and multi-objective optimisation techniques that are specialised for such complex

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## What is Plexus used for?

Plexus is applicable wherever large complex networks of dependency arise in projects that are difficult to visualise. This happens across life-cycle stages, in various functions like Engineering and Operations; it can

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## Introducing Plexus Planning

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networks, and are exclusive to Plexus.

Plexus Planning has a team with extensive experience in the defence and aerospace industries, including programme management and systems development, and has used this expertise successfully in many large projects at several of the world's top aerospace and defence companies.

**Ian Poccachard - Chief Executive**

## What is Plexus user for?

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involve single products or apply across portfolios of products.

- **Product & Bid Management**.
    - Win bids. Understand the scope of the bid, supply chain preliminary design & analysis, supplier selection, optimise resources, costs, & timescales.
- **Engineering.**
    - Product development process modelling, program planning, and cross project dependency analysis. This can include hundreds of engineers and sub-contractors.
    - Deep dive and do what-if analysis for strategic Load-Capacity decision support and Benefit-Realization programs. Critical for optimising the budget, getting early indications of deviation, and to optimise use of resources for the business
- **Supply Chain**.
    - New Supply Chains - prepare contract execution, and create excellent supply chains from the start.
    - Improve & Manage Existing Supply Chains - reduce risk, improve affordability and improve responsiveness of existing original equipment and in-service-support supply chains.
    - Strategic Supply Analysis - Map, refine and secure global production systems, and key national industry bases

## Collaborative Modelling workshops

One of the strengths of Plexus is that it pulls together all of the knowledge related to a project into a single environment; adding the knowledge of key employees, contractors and developers, to ERP, PLM, BPM, BOM and other data.

An important part of a Plexus implementation is to run a series of Collaborative Modelling workshops. These are an excellent vehicle for getting participants to interact who would not normally do so, and to understand the dependencies that exist between them. These dependencies are otherwise often missed, leading to unnecessary rework, risk and other implications. The information gathered from the workshops is added to the Plexus modelling database, resulting in a more detailed and accurate set of base data of interactions and dependencies.

The Collaborative Modelling workshops, may be run, or facilitated by, Plexus, and are the best way to set-up Plexus for an initial deployment, since they generate momentum and understanding and deliver on the job training to participants even as they do real-work.

Some of the benefits from the workshops, stated by one Plexus user, are shown below:

- Ability to staff design teams rationally to accomplish their defined goals
- Ability to sequence design activities to achieve the required schedule

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# Collaborative Modelling workshops

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- Ability to quantify the design tool and process change impacts to the design schedule, costs, and risks
- Ability to predict and track risk reduction throughout the process
- Ability directly to generate Gantt charts and other management views from the model
- A great training tool for developing engineers and programme managers

# Plexus in the Supply Chain

Plexus provides a complete solution to the issues of designing, implementing, managing and improving complex supply chains.

Right from the beginning, at the bid stage, Plexus provides the tools that help you design the most effective supply chain that is optimised to produce a winning bid according to a wide variety of criteria.

The same tools enable you to design, manage and improve the supply chain throughout the complete product life-cycle from development, to manufacturing, delivery , commissioning and maintenance.

## *Design of New Supply Chains*

In the supply chains for complex engineering projects, it is typical for 75% of the deliverables to come from sub-contractors or partners, each of whom manages their own share of the project risk, but generally each party does not communicate enough about supply chain risks. This makes it impossible, easily, to identify all the potential weak links and opportunities for improvement.

Plexus is the solution. It helps integrate the diverse perspectives of engineering, commercial, purchase, manufacturing, logistics and other factors across the whole supply chain.

### *Systematic Definition of what must be sourced*

Plexus starts by building up a systematic list of what must be sourced, which acts as the route map to get information from RFI/RFP, data and to evaluate alternative suppliers and strategies. Plexus may be used for own manufactured or OEM parts & subassemblies and for services and support infrastructure. Activities may take place in multiple countries and locations and often include the country of the customer.

### *Central Model to structure Sourcing Options*

Plexus is a centrally maintained supply chain model that, eliminates the unstructured mass of separate spreadsheets previously used, and pulls everything together in a single model that supports multiple tiers of information and allows drill down to the detailed value streams, project plans, processes to evaluate alternatives, risk and opportunities.

The model is created by starting from your corporate supply chain data such as: approved & potential suppliers; internal work centres;

*"Plexus provides a complete solution to the issues of designing, implementing, managing and improving complex supply chains. "*

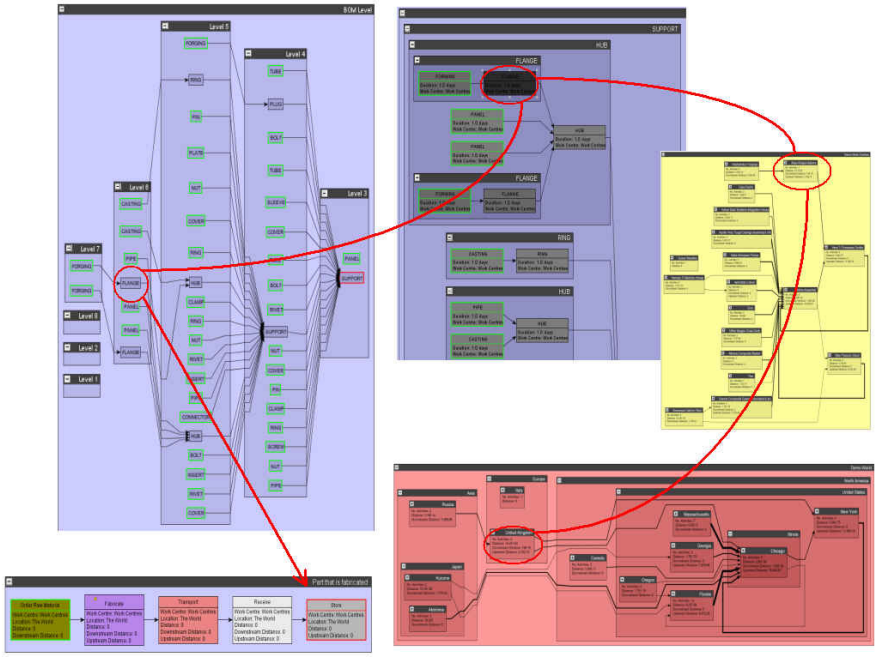

Figure: Multiple views enable easy supply chain visualisation

lists of commodity & material groups, together with work in progress definitions from the BOM and then used to create standard networks for the supply chain

### *Easily Characterise and review Alternate Strategies*

The power of Plexus is how it allows you to visualise and analyse the whole supply chain

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## Plexus in the Supply Chain

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value stream, however complex. Plexus clearly shows: the number of hand-offs; various cost elements; cumulative mileage; lead-time; ROM inventory for given production rates; visualised geographical flow; risk ( supplier maturity on each alternate path); single points of failure; currency exposure, and much more.

Many processes are automated, so that to change a vendor or other user defined attribute of the supply chain, the model is updated in real-time with, for example: locations; mileage; costs; work in progress; risk.

## Plexus in Detail - Visualisation

One of the unique strengths of Plexus is the world-beating visualization of complex dependency networks, allowing you to understand models with hundreds of thousands of elements with ease.

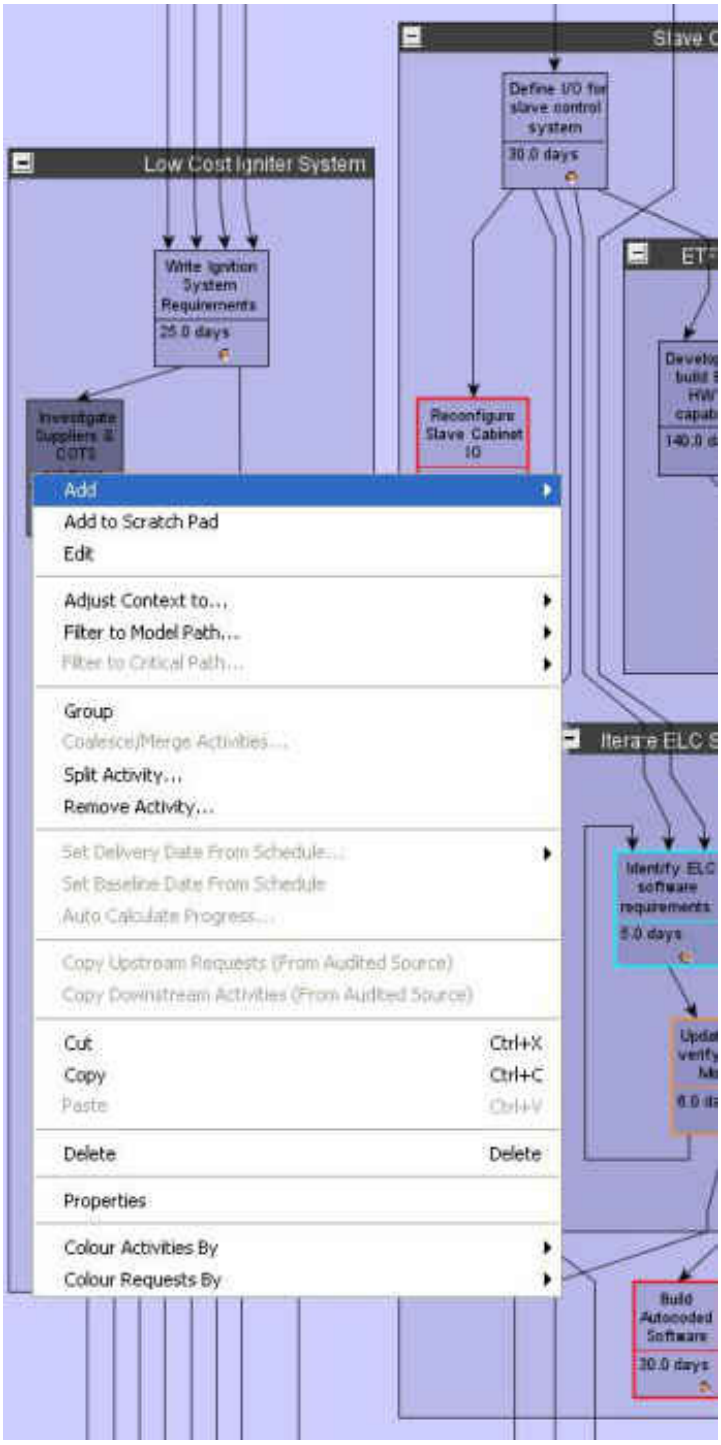
The diagram shows an example network, grouped in one of an arbitrary number of hierarchies that can be defined and used in Plexus.

In contrast with BPM tools, Plexus uses simple boxes and arrows to allow users to input their knowledge with minimal training.

In contrast with Project Management tools Plexus emphasizes the network view as a powerful antidote to poor planning behaviours encouraged by Gantt-dominated project tools.

Color codes show some important, automatic activity classifications.

Plexus provides constant feedback and guidance to the user, and performs real-time model health checks. This is another way in which Plexus transparently improves planning and modeling behaviors




*"world-beating visualization of complex dependency networks"*

## Plexus at 13TH INTERNATIONAL DSM CONFERENCE

MIT, Cambridge, Massachusetts, USA, September 14 - 15, 2011

Plexus was selected to present a paper at the DSM Conference in September 2011.

Titled, "SHIP DESIGN PROCESS MODELING: CAPTURING A HIGHLY COMPLEX PROCESS" the paper was presented jointly with users from the US Navy.

This is a case study highlighting the experiences of the US Navy in using Plexus Planning to model the ship design process. The paper describes the Plexus user interface for modeling dependency, which has "proved more intuitive to ship design practitioners" than DSM. The robust model framework includes semantic rules and conventions that proved helpful in the capture of knowledge from the diverse perspectives of many subject matter experts.

Dependency and Structure Modelling (DSM) techniques support the management of complexity by focusing attention on the elements of a complex system and how they are related to each other.

*"US Navy experiences in using Plexus Planning to model the ship design process."*

## Focus on: Ian Poccachard – Chief Executive

Ian co-founded Plexus Planning Limited with James Scanlan in 2004 after recognising the need for a better way of planning for large scale engineering projects. He has an extensive background in engineering, gained over some 19 years of academic study and industry experience.

Ian was awarded a Masters in Aeronautical Engineering from Imperial College London in 1996, and then became a Chartered Mechanical Engineer through the Institute of Mechanical Engineers (IMechE). He acquired specialist skills whilst integrating and developing engineering information systems in Defence and Aerospace for Rolls-Royce.

## Contact Us

**Head Office**

University Gate East
Park Row
Clifton
Bristol
BS1 5UB
United Kingdom

telephone: +44 (0)845 643 9640

fax: +44 (0)845 643 9641

Email: info@plexusplanning.com

**Visit our website for more information**

**www.plexusplanning.com**

## Feedback:

Please send any comments or suggestions to: ian.poccachard@plexusplanning.com