



Company Background

Racal Acoustics is a manufacturer of specialist acoustic ancillary equipment, mainly for the military and emergency services markets. Established in the early 1950's, they also manufacture for the commercial markets, mainly dealing with the aviation sector.

The company has facilities in the UK and USA. Their products are sold worldwide, and see service in conditions ranging from the arctic to the Sahara to equatorial rainforests, and are deployed in the air, on land, and on the sea.

Manufacturing Documentation in Recent Times

Over the last ten years, Manufacturing Instructions (MIs) had been generated electronically using desktop publishing software, with line drawings and pictures inserted as PCX or Jpeg files. Master PageMaker files were held on a secure server and PDF copies were freely available for viewing or printout at most computer terminals throughout the company.

Due to the labour intensive nature of the system, the number of stages involved, the past uncontrolled growth in style and content of the MIs, and the lack of adherence to any cohesive structure or template for document generation, the previous system became inefficient and unwieldy.

Summary of the Current Situation

There are currently thirteen main families of equipment in production, and within each family, there are a number of variants – anywhere from 10 to 150. Racal provide a range of unique products, and because they have to interface with many different systems, each interface has to be tailored mechanically and electrically to suit each customer's needs.

This situation has a major impact on the generation and control of MIs:

- Over 570 product variants (each averaging 23 operations) to be documented.
- 13,100 MI pages to be written, and updated throughout the average ten year product life.
- Estimated time to generate and maintain production documentation for the 570 variants is likely to be in excess of eight man years of work (390 working weeks), over a ten year product life.



Racal Acoustics

Case study

Racal Acoustics was struggling with the maintenance of over 13,100 pages of Manufacturing Instructions, and coping with the manufacturing problems that errors and omissions created.

“A saving of almost three man-years of labour”

They turned to VisualFactory to solve this large and growing problem. NoMuda introduced lean thinking into the documentation generation and together with VisualFactory brought massive savings to Racal Acoustics; a 90% reduction in instruction pages (over 10,000 physical pages) leading to a combined benefit of over five man years of labour. Racal Acoustics now enjoy far greater documentation flexibility whilst maintaining rigid rules of authorisation and validation.



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The Problem

Although all MIs were written within a standard document template, there was still no unified approach for writing the content of the MI within a particular product family. This led to assembly variations for similar processes within the same family. It also meant that within a single product range, between 60% to 85% of each MI may be identical, (although not necessarily presented in a consistent order, from MI to MI). Other issues to be considered regarding the previous system include:



- The response time for MI update or correction was in the order of weeks.
- The number of different software packages used in the preparation, publishing, and administration of the MIs.
- The increased learning time required by assembly operators, because of the inconsistencies in presentation of MIs.

Benefits from the Introduction of VisualFactory

The adoption of VisualFactory would only provide the fullest benefit to Racal Acoustics if the philosophy of writing MIs was revised. NoMuda's experience with implementing mass customisation helped in developing a new, leaner approach.

- For each of the thirteen main product families, a master set of assembly operations was generated. Each set of assembly operations would then cover all the assembly processes required to build any one of the product variants.
- By using this technique, it is estimated that the number of MI pages required to be stored will fall from 13,100 pages, down to a total of 1,200 pages. This represents a saving of over 90%.
- The equivalent estimated time to generate and maintain production documentation for the 570 variants is likely to fall to around 5.1 man years of work (250 working weeks), over a ten year product life. This represents a saving of almost three man-years of labour.

The response time for MI update or correction using VisualFactory will be minimal as a single operation is used repeatedly. Each operation is called up wherever needed so there is no chance of any variant being missed out during an update.

There are further factors to be considered when estimating the total impact of introducing the VisualFactory system:

Significant improvements in the configuration and issue control of manufacturing instructions - VisualFactory keeps track of the issue number of individual tasks within an operation, and each route (which has a number of operations within it), has a version number, as well as the drawing issue number. This allows the tracking of any change in assembly procedure, down to operation level, and allows the exact point of embodiment of any change to be identified.

- A 90% reduction in the volume of data required to be stored on network servers.
- A 90% reduction in the number of MI pages to be maintained and updated.



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The Future

It is the intention of Racal Acoustics to move towards a paperless factory. Each production bench will have a flat screen monitor linked to a network PC, and each operator will be able to call up every relevant production document, including manufacturing instructions, assembly drawings, machinery operation handbooks, health and safety data sheets, all at the click of a hyperlink. VisualFactory will become the first and possibly only point of contact for the operator with all other Racal systems.

Summary

The adoption of VisualFactory for the creation of Manufacturing Instructions was a decision driven by a number of considerations – listed below are some of the more important:

- To provide a more manageable and flexible solution to the generation and maintenance of manufacturing instructions.
- To reduce the labour costs involved with MI generation and maintenance.
- To be able to respond more rapidly to the changing requirements of a Lean Manufacturing system.
- To increase the quality and consistency of the production documentation available.
- To reduce the learning curve associated with the introduction of a new product variant.

The investment in the software will be matched by a larger investment in time to implement the system, but the potential returns far outweigh the costs. VisualFactory.NET is versatile and adaptable enough to grow with the business, and is seen as a valuable asset in the move towards a lean, paperless and more environmentally aware manufacturing facility.



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