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Airbus: Major projects call for special planning methods



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Where aircraft electrics and electronics are involved, nothing can be left to chance. All components must be triple-redundant – resulting in three-fold system complexity. Add to this the gigantic dimensions of the Airbus A380, and it is obvious why conventional project management methods soon come up against their limits. For this reason, two years ago Airbus took the decision to opt for the collaborative project management methodology implemented in Actano's software suite RPlan.

Founded more than 35 years ago, Airbus is now a successful globally operating company with a workforce of more than 20,000 in Germany alone and around 53,000 employees worldwide. Sales of 20.2 billion euros were generated in 2004. The major project, on which the world in general and competitors in particular are casting a keen eye, is the A380 wide-bodied superjumbo. New dimensions in aerospace are not easy to explore using conventional development methods. Much had to be redesigned in order to build the A380 – for example, new tools had to be introduced. And this applied, also and in particular, to the methods used to manage the schedules of countless individual subprojects.

Peter Waetjen is the Airbus Concurrent Engineering (ACE) site manager in Hamburg, Germany. Over the past few years, he has been responsible for the optimization of processes and tool deployment

in the A380 development project. And here he has successfully broken new ground. "Our Airbus specialists have long experience and are well trained in matters of project management. Projects of the present kind cannot be managed without now widely accepted scheduling, capacity and cost management tools. However, as the magnitude of our products has increased, so has the complexity of the components – to such an extent that past management methods are simply not up to the job."

Nothing under the same roof

It's not just a matter of coordinating the work of several thousand engineers and technicians from hundreds of disciplines in a single project at Airbus. There are also thousands of other project participants at sites throughout the world and these do not include external partners spread across all continents.

The growth in project scope has been accompanied by a hitherto unprecedented increase in the mutual dependencies between the individual projects and work steps. For example, the development units concerned with electrics and electronics define new functions which must be provided by specific components. Complete systems comprising circuits, connectors and cabling are fully described before their – in most cases, virtual components – are built. When cable looms – with at least triple redundancy – are fitted, connectors are attached, and circuit diagrams have been translated into hardware, some of the many components are from Germany, France and Spain, others from China and Taiwan, and yet others from the USA and Canada. Thousands and thousands of single wires are routed through hundreds of cable looms. Components of various origins come together at every meter and must be securely attached to each other or reliably isolated from each other.

Much of the success of the A380 depends on the perfect fit of thousands of individually shaped parts that perform their desired functions. None of the geographically dispersed project teams can complete their work without variously influencing the work of other teams and/or without being equally reliant on the results produced by them.



Complexity under control:
Routing cables in the
Airbus

Major projects like the
A380 are barely manage-
able using conventional
methods



Product data management systems are naturally in use at Airbus to control the individual aircraft programs. However, the functionality they provide has not proved suitable for the detailed scheduling and efficient control of projects such as the A380 project. Normal projects with a limited number of tasks handled by small teams are able to make do with standard planning tools. As of a certain project size, it is essential to use special tools designed with highly complex projects in mind. At Airbus, this project size was reached some years ago in the electrics and electronics sector.

Wanted: A tool for handling major projects with strict time constraints

"Like our colleagues in the automotive industry, with whom we regularly exchange views and information, we constantly endeavor to adapt our processes to meet growing challenges and to deploy the best available information technology tools." says Peter Waetjen, "But time and time again, we found that our in-house software platforms were not able to deliver the goods." This was also true in terms of project scheduling. Airbus therefore opted for a system supplied by Actano. This Munich-based company not only employs a host of consultants to service

process management projects in the automotive and aerospace industries but, building on its own process know-how, has also developed a software tool called RPlan which has emerged as a de facto standard in these industries.

In contrast to all other commercially available programs, RPlan is based on a "collaborative project management" methodology. Schedules are not automatically updated – or, in other words, recomputed – by algorithms; instead, project members are required to talk to each other when schedules threaten to clash. The principle is as follows. All schedules of all disciplines, divisions and project teams are interlinked in a single database. Anyone with responsibility and write permission for a schedule can link their schedule to other schedules and display certain tasks by "taking out a subscription" or – and this function is perhaps even more important – by making their own work depend on work done by others by creating what are known as "Synchrolinks". RPlan manages interlinked schedules invisibly to users and that was the first major benefit noted by Airbus. All schedules are kept up-to-date centrally and contribute to an overall planning picture which covers many individual aspects but which is much more detailed than the picture provided by conventional milestone planning.

Greater transparency and effective communication

Those responsible are given a full picture of the situation as described at the beginning of the project and of the current status of the overall project and its constituent parts. This enables project teams to be controlled directly and proactively instead of calling meetings to discuss possible solutions to conflicts that have already arisen. The second tangible benefit is the fact that RPlan not only detects conflicts in schedules when they are adjusted but also draws the attention of those concerned to the conflict instead of adjusting the entire schedule in a way that never reflects reality. This ensures that only those persons with the necessary expertise are called upon to achieve a joint solution to the problem in hand. Often, project members must learn how to communicate with each other. They belong to different disciplines and have their own individual and departmental interests that sometimes run counter to each other. The RPlan software promotes communication between project members, firstly because schedules can be viewed at any time via a Web browser (RPlan is fully programmed in Java) and secondly because it immediately informs those involved of potential problems and requires them to take action.



AIRBUS A380-800



“Project management naturally keeps a very close watch on compliance with project goals,” says Peter Waetjen. “This puts due pressure on all involved to keep their schedules up-to-date. But, in terms of acceptance of the new project management method, it is of almost equal importance that increased emphasis is placed on the direct responsibility of individuals and subteams, and that the system not only documents dependencies between project members but also goes some way towards synchronizing their activities.” For example, colleagues were initially skeptical during trials at Airbus until they noted how useful RPlan is. They now recognize that projects of this magnitude would be inconceivable otherwise.

Collyborative project management

For Peter Waetjen, the introduction of collaborative project management was like “breaking out of chains”. One immediate benefit was that all project dependencies had to be analyzed down to the last detail prior to program implementation, simply because RPlan scheduling is controlled by

means of workflows. The system focuses not on individual conflicts in a specific project but on the requisite workflow and the unavoidable dependencies between project members. Without a prior project description, it is just impossible to control projects of this size.

A further benefit for the specialists at Airbus are the excellent reporting features offered by the RPlan project management software. Easily customized reports reveal at a glance where difficulties can be expected and who should talk to whom to make an appropriate decision. Although suppliers and external partners play a major role in Airbus projects, the Cross Company Planning (CCP) module of RPlan is not yet in use. This module allows schedules to be kept up-to-date, even beyond company boundaries.

To quote Peter Waetjen again, “Currently, our projects are concerned with prototypes, and constant modifications to plans are an inevitable part of our everyday work. However, if our outline planning really functions as it should, we are on the path to success. We have already taken the first step.”

Ulrich Sender, Munich