

The team behind Avanti helps Taylor Woodrow to achieve co-ordinated design and delivery on a major PFI project at St Helens and Knowsley Hospitals



Taylor Woodrow state: *"It is planned for the partners to share information and co-ordinate their designs using ICT enhanced collaborative working procedures. There will be co-ordination of the partners' design models at regular design review meetings, and data will be shared via the web-based extranet"*

Why Avanti?

Integrated working is in the Taylor Woodrow culture, at all levels and for all disciplines, and the company has supported developments in ICT collaborative working for many years. They know there are benefits but are also aware of the business process changes required to reap the benefits of change - to deliver the project with greater certainty and with reduced risk, on time and with better profit for all parties involved.

Taylor Woodrow was attracted to the Avanti approach by a combination of factors: the approach embraces three key aspects of successful collaboration within a project, namely process, people and technology. Taylor Woodrow were striving to implement procedures to integrate their project processes, encourage team members to work towards the delivery of the project as a whole, and enable their current technology to provide a better, more collaborative, working environment.

First steps.

To start things moving, the principles of, and business case for, adopting collaborative working approaches were discussed between consultants acting on behalf of the Avanti team, Taylor Woodrow, and their supply chain partners. Areas covered included:

- Previous projects the consultants had been exposed to, where the team members believed the adoption of collaborative working to have been beneficial.
- The areas of benefit that could be seen in the project by making important but achievable changes to the technology platforms and data standards proposed on the project.
- The practices and methods which would be required to support these changes and deliver the targeted benefits, based on the Avanti generic collaborative working toolkit.

St Helens and Knowsley Strategic Development Project (Hospitals) £305 million new development rationalises its current healthcare facilities at Whiston and St Helens.

Whiston will be redeveloped to provide 880 in-patient beds and a full range of clinical and non-clinical facilities; St. Helens will be redeveloped as a diagnostic and treatment centre together with provision of intermediate care beds.

Design and Construction will take place over a period of five years.

The project principals agreed that the team would engage in the delivery of a new project data standard and management procedure, and that this would be done with the assistance of consultants and be based on the Avanti 'Standard Methods and Procedure' document.

Workshops

To engage the key members of the team in the most appropriate way, a series of one-day workshops was run targeted at:

- Middle management – main contractor, design team leaders and key contractor design managers.
- Lead designers – architect, structural engineer, services engineer and services contractor.
- CAD managers within those same organisations.

Feedback from team members to Taylor Woodrow and the Avanti consultant following these workshops highlighted two concerns of the team regarding the adoption of the collaborative approaches that Avanti were advocating. Firstly, some of the workshop attendees considered that, as the project was already underway, a change of practice within the project could be too time-consuming and/or costly to implement. Secondly, it was felt that the project extranet would need to be reconfigured to deliver the necessary process management requirements and that this could lead to rework where documentation has already been uploaded.

This feedback represents key learning points for the team behind Avanti and for others looking to implement collaborative working: the chances of successful implementation are greatly hindered if the team has already put processes in place and started producing project information.

To address these concerns and perceptions, further discussions were held with the relevant team members to explore the change process in more detail so that they could better judge the associated time and cost. In total a further six focused meetings were held.

In parallel with these further discussions, Avanti's consultants undertook a review of the processes for sharing and utilising project data which the team already had in place. Effective processes such as these are considered by Avanti to be vitally important to the success of collaborative working within the project. In fact they are at the heart of one of the key principles which Avanti advocates, namely the Common Data Environment (CDE). It was felt that insufficient time had initially been devoted to developing workable and effective data sharing principles and procedures. Avanti's consultants felt that particular areas of risk related to the existing processes for:

- Achieving spatial co-ordination of design information; and
- The design sign-off (checking and approval) processes.

These concerns were understood by Taylor Woodrow and the team members. This, combined with the confidence the team had gained from detailed discussions around the change process, led them to commit further to adopting the approaches proposed by Avanti.

A further key learning point is that the effort and cost associated with adoption of collaborative working practices must be clearly explained to team members so that they can feel confident in their judgements about the perceived benefit against the likely investment.

Project achievements

Avanti consultants, working alongside Taylor Woodrow's own team, have assisted in the production and of project 'Standard Methods and Procedures', which are based on generic Avanti documentation – see www.avanti-construction.org. This document describes the agreed protocols for document naming, data file naming, and CAD layer naming. It also references the agreed design data origin, scale, orientation and so on, and procedures such as design checking. All of these were agreed upon through the intervention of Avanti consultants and are required to achieve effective data sharing through a Common Data Environment and ensure spatial co-ordination of the design.

Two areas of software implementation have been overseen in order to mitigate some of the concerns expressed by team members described above:

1. A software solution to deal with the updating of legacy data has been developed to align layer naming and file naming. This means that existing data and documentation, produced prior to the agreement of a common project standard, can be converted to be compliant with the new, agreed, naming conventions, thus avoiding the need for significant rework.
2. Taylor Woodrow, with the support of their extranet provider, specified the necessary adaptation to the extranet to ensure that the agreed methods and procedures could be supported. The aim here has been to provide a system that could collect, manage and disseminate data in a manner that:
 - a. Effectively presents data and information in the required formats using appropriate browsers;
 - b. Ensures compliance to agreed standards;
 - c. Reports on data and document delivery to aid design managers in the timely delivery to the construction schedule; and
 - d. Facilitates the design and sign-off processes.

Although the St Helens and Knowsley project it still in its design stages (the project had only just reached Financial Close at the time of this case study), there have been a number of observations in relation to the impact the adoption of the Avanti approach has made. These have been made by a specialist management consultancy brought in to make independent assessments of this and other projects. As well as these observations, there have been a number of other learning points for the project team and the team behind the Avanti approach.

Lessons learned

Within any project where change is required - either to improve embedded processes and procedures or to accommodate the requirements of other members of the delivery chain - there will inevitably be resistance until the benefits of the changes are universally understood and accepted. This is perfectly normal but must be allowed for. On a project of the scale of St Helens & Knowsley Hospitals it is clearly in Taylor Woodrow's interests to invest significant effort in attaining the benefits of collaborative working. This is particularly the case due to this being a PFI contract where Taylor Woodrow's interest is maintained well into the operation and maintenance of the building. However, as stated earlier, the effort and cost associated with adoption of collaborative working practices must be clearly explained to key team members so that they can feel confident in their judgements about the perceived benefit against the likely investment.

Taylor Woodrow's senior management are fully and firmly behind the implementation of collaborative working practices as advocated by Avanti. Some key lessons to achieving and maintaining this buy-in have been observed through this project. Most important among them is that confidence is provided by the fact that the processes advocated by Avanti are firmly based on existing best practice.

believed the Avanti approach would become normal practice within the company:

With the help of facilitated discussions around the project process and information management procedures, the design team were able to expose potential problems associated with some of the normal shortcuts that may be taken.

Taylor Woodrow's Director of Engineering has also stated that the structured Avanti process has helped everyone understand better their position in the total picture of the project, and their role in managing risk.

A number of lessons have been learned by Taylor Woodrow and the project team, and similarly a number of key observations have been made by Avanti consultants – more of which are listed on page 6. These are both positive and negative and include:

- The team have learnt that disciplined adherence to the collaborative processes they have agreed upon has the power to increase the quality of the data they exchange;
- The process assists in the achievement of spatial co-ordination i.e. 'fit first time' design information; it can provide a greater certainty of physical fit for off-site production and it will enable the delivery of co-ordinated and complete construction information in a timely fashion.
- Operation and maintenance information can be derived throughout the project process rather than purely through a dedicated process close to asset handover where timescales are normally such that production of accurate information is difficult to achieve.
- Rather than contradicting or replacing existing processes, Taylor Woodrow found that the standards and procedures, agreed with the help of Avanti consultants, were entirely compatible and complementary to other business processes which, in this case, include the Taylor Woodrow design management procedures.
- Failure to agree on a single, shared strategy for designating zones within the building causes problems when sharing information.
- Incomplete compliance to an agreed document naming convention causing problems for document controllers.
- There is a need to put in place an approvals process that is aligned within the project management documentation and the workings of the project extranet tool, otherwise the project is at risk of having an insufficient approvals audit trail.
- Where model files are updated but changes not highlighted (e.g. by using bubbling) this can causing delays for those that then have to review all models and manually 'spot' the changes.

The bottom line (so far)

The design team, including key suppliers, has taken up the challenge of the change process and is working with Taylor Woodrow to implement the required processes and procedures. However, the Avanti 'Standard Method and Protocol' has yet to be rolled out to the full supply chain, so there is another learning curve to go through. Nevertheless, Taylor Woodrow's Director of Engineering, Rennie Chadwick, told senior members of the Avanti team that he

- “The successful implementation of the Avanti procedure has given us confidence in applying the procedure on subsequent projects. This design procedure will become our company standard.” Rennie Chadwick, Design Management Director, Taylor Woodrow Construction

Feedback has also been positive from those involved operationally in the project:

- “Using the SMP and project extranet [in the way defined in the SMP] has significantly reduced the time to access design [information] ... and has improved design co-ordination.” Ian Cowland, CAD Manager, RW Gregory
- “Implementing the Avanti procedure has removed the team’s confusion in accessing design information ... and has resulted in the design team policing themselves.” Debra Brown, Project Extranet Administrator, Taylor Woodrow Construction

The team behind the Avanti approach recognise the need to back up mere feedback with robust evidence of impacts, both positive and negative, which has been researched and collated by an appointed management consultancy. The negative impact is a result of the investment that needs to be made in changing practices and adopting collaborative working. The St Helens and Knowsley project has been used (along with other projects) to assess the scale of this investment and also to measure the short-term benefits of collaborative working.

It has been observed that the chances of successful implementation are greatly hindered if the team has already put processes in place and started producing project information. On this project the effort required to rework information to comply with Avanti standard was calculated at 8-12 man-weeks. Of course this represents a significant investment.

However, information management processes were seen to be greatly improved. For example, the issuing of information was seen to be up to 85% quicker, and information could be found 60-80% more quickly. Also, a saving of 25% “and possibly a lot more” was seen in administering the document control process.

More significantly, where design information was issued in accordance with the Avanti standard it could be instantly re-used, whereas an effort of one man-month in each elapsed month was calculated as required to reformat drawings had they been exchanged in a non-reusable format (i.e. traditionally).

Finally, the issue of design co-ordination was explored with the project team. It was concluded that “several man-months” was to be saved in co-ordinating construction information because design could be co-ordinated in 15-25% of the time required if exchanged in the traditional non-re-usable manner.

Key Learning Outcomes

Lesson	Topic	Learning Point
People	Resistance to Change	<p>Watch for the excuse not to change - People are suspicious of change especially if it puts them outside of their comfort zone. They may use all sorts of reasons to justify their suspicion that do not necessarily relate to their discomfort; for example "We don't do it this way", or "It's too expensive / complicated".</p> <p>Communication is key - close communication and explanation of 'why' will help to clarify people's understanding of their impact on the next person in the chain (customer-supplier relationship) and contribute towards maximum ownership of the process. As a rule of thumb it is best to involve people who will be affected by the changes as much as possible - imposing change will create tension, resistance, resentment and in the worst of cases sabotage.</p> <p>People want to be seen to be flexible and helpful but underneath are still resistant to change. As Rennie Chadwick says: "Avanti must understand what people mean when they say 'Yes'"</p> <p>People today are no longer willing to take orders from those above that will impact them. They want to have a 'say' in what needs to change and (of equal if not more importance once a positive perception of the change is established) how that change will occur.</p> <p>If full commitment to the change is the desired outcome, involvement and collaboration in planning is required.</p> <p>Even with absolute commitment from top down, you cannot guarantee success.</p>
Process	Timing and definition of process	<p>Clear and mutually agreed objectives, standards and processes are fundamental to any complex process.</p> <p>Avanti principles must be adopted early. The Avanti approach was introduced to this project after the object information had already been created. There was inevitable resistance to changing already completed work, and a perception that Avanti was 'forcing' the design team to go down a certain route. Perception was that the process was over- bureaucratic.</p> <p>Despite difficulties, Avanti has "helped to take the blinkers off" in terms of better understanding of the design process and individuals understanding their roles better</p> <p>The procurement route matters: Taylor Woodrow were effectively both client and main contractor on this job. Furthermore their M&E team (critical to a hospital job) are part of a very solid supply chain partnership, the Strategic Alliance Partnership. Even so supply chain partners were asking for Taylor Woodrow to pay for the enhancements to their own processes to work within Avanti principles.</p>
Technology	2D vs 3D	<p>The Avanti principles can be perfectly well applied in 2D, although the Avanti team would argue full object modelling may yield better business benefits, this will not be the case if work has already started based on 2D.</p>
	Collaboration Extranets	<p>Extranet developers need to accommodate the Avanti approach within their products.</p>

About Avanti

Avanti is an approach to collaborative working on projects that enables construction partners to work together effectively. The principles of collaborative working the Avanti way are early access to all project information by all partners, early involvement of the supply chain, and sharing of project information, drawings and schedules, in an agreed and consistent manner. The Avanti approach is supported by handbooks, toolkits and on-site mentoring.

Avanti focuses on people and processes, mobilising existing enabling technologies. Team working and access to a common information model are at the heart of the Avanti approach to a project's whole life cycle.

Using the Avanti approach improves business performance by increasing quality of information and predictability of outcomes and by reducing risk and waste.

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