Value management in construction

Case Studies
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Value Management (VM) is a well-established methodology for defining and maximising value for money. It can be applied to any type of project regardless of size or timeframe and at all stages throughout the life cycle of the project from inception to completion.

The Office of Government Commerce (OGC) has joined with APM Group Ltd and the Institute of Value Management to produce a series of case studies which demonstrate how applying VM to public sector construction projects can result in first-class, whole-life value-for-money programmes and projects that ultimately lead to better public services. OGC’s Achieving Excellence in Construction initiative (see Annex B) advocates the application of VM to construction projects.

The following case studies demonstrate the benefits VM has brought to seven central and local government construction projects. The case studies focus on the VM approach adopted on each project and detail the key success factors, achievements and lessons learned. Issues addressed include:

- leadership and decision-making
- effective team working
- performance improvement (pre and post construction)
- innovation
- defect reduction.

**Summary of the principal benefits realised through VM implementation**

**Case Studies**

1. Hextable Dance – achieving feasibility breakthrough
2. Open University – getting more for less and increasing user satisfaction
3. Kintry Housing Partnership – reducing cost and improving productivity
4. Home Happening – right first time!
5. NHS Teaching Hospital – the benefits of VM
6. Withington Community Hospital – building the team, meeting the budget
7. Bridging the Gap – adding value and reducing costs

**Principal benefits**

- Improved definition and articulation of value
- Clearer brief and improved decision-taking
- Enhanced value and benefits for end-users
- Reduced cost, improved affordability and value for money
- Improved productivity, efficiency, collaboration and trust
- Reduced waste and defects
- Earlier management involvement
- Benefits realised where previous methods failed
## 1. Hextable Dance – achieving feasibility breakthrough

### Case Study

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### Principal benefits

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A Value Management approach facilitated an innovative design solution that permitted the construction of a previously unaffordable project by reducing costs by £420,000.

Summary
This case study describes how the Hextable Dance project moved from being unaffordable to reality, through the effective application of VM techniques.

Hextable School, near Swanley, Kent has an enviable reputation as a centre of excellence for the performing arts. To build upon this, a project was initiated to construct a dance school of great aesthetic impact. The project was started 10 years ago but stalled because the design, although innovative, was expected to exceed the available construction budget of £2.1m by 20% (about £420,000).

To get the project back on track, the project team commissioned a VM study, involving all the key project stakeholders.

The project was completed in 2005. The new Dance Development Centre now provides previously unavailable performing arts facilities and related services in north-west Kent, enabling the education, creation and performance of dance to thrive. It comprises drama, production, recording studios and media room, and is available to professional and amateur dance organisations, as well as the local community.

The facility was largely funded by Kent County Council together with an award from Arts Council England, through the National Lottery.

Achievements and benefits
- The project’s functional requirements were reassessed. **Benefits:** Development of a new design that met the client’s requirements in full and achieved 20% construction cost savings, thus meeting budget requirements.
- Enhanced spatial links between Hextable Dance and existing school buildings. **Benefits:** Improved security, disabled access and landscaping.
- Involvement of all stakeholders in developing revised design principles. **Benefits:** Freeing up of constraints by enabling the stakeholder and end-user needs to predominate.

Principles and objectives
Hextable Dance was intended to:
- become a community resource available for use by local and regional arts organisations
- provide new creative opportunities for the performing arts in north-west Kent and beyond
- have high-quality internal finishes to complement the distinctive exterior
- provide excellent facilities in a professional setting
minimise operating costs
enable performing arts to thrive through the education, creation and performance of dance.

**Major issues**
There were a number of major issues facing the project team prior to the VM study:
- two earlier schemes had failed and the current proposal exceeded the budget by 20%
- due to the nature of the funding arrangements, finances were fixed and could not be increased
- the project team was unclear as to the precise nature of the client’s requirements.

**VM in action**
The introduction of VM to the project was originally envisaged as a value engineering exercise (a later stage in the VM process). However, as capital cost was a major concern, the VM team recommended re-evaluating the project to focus on function. The project team effectively took one step back to move two steps forward, to achieve maximum benefits by conducting the early stages of a VM study.

The VM stages are listed below. Each stage normally involves a period of preparation, one or more workshops and a report, which identifies actions to develop and implement. In this case, the project team combined the first two stages to fast-track towards a solution.

**Key VM Stages:**
- VM0 – Need Verification
- VM1 – Project Definition
- VM2 – Brief Development
- VM3 – Value Engineering
- VM4 – Handover Review
- VM5 – Post-occupancy Review
Successful initiatives

The key to starting a successful VM study (and a successful project) is to have a clear understanding of what value means to the client and to establish the objectives.

For Hextable Dance, this was all-important, as saving one-fifth of the construction cost within the constraints of an existing design was likely to be an unrealistic target. Therefore, it was advisable to take a step back from the existing design and to review the client brief, the required project benefits and important functions of the new building. With these principles established and agreed by the client, the project team could reach a common understanding for the scheme.

The discussions addressed and clarified many uncertainties, particularly in relation to client needs. This led to the identification of important functions – key value drivers – which ranged from delivery of the project to functions required of the completed building, including:

- keeping within funding requirements
- optimising the use of space
- complying with third-party constraints
- raising the profile of Hextable School
- delivering functionality to match the school’s curriculum requirements.

Further discussion and analysis of these value drivers enabled the project team to fulfil the clients actual requirements.

Being creative

With a clear understanding of the client’s needs, the team was able to view the project from a functional perspective and to identify opportunities for stretching the constraints of the existing design. This enabled the team to put forward innovative design solutions, without compromising the client’s requirements.

During this stage of the study, all suggestions were captured without discussion or evaluation. This stimulated creativity and removed inhibitions.
Selecting the best

Armed with the resulting creative ideas, the project team evaluated the merits of each and selected the best. This evaluation was based on criteria to ensure the selected ideas were consistent with the original project requirements.

The selected ideas were then developed into workable proposals for client presentation.

Decision building

The existing design for Hextable Dance was for a multi-level roof of great aesthetic impact, with a double-height ceiling in the main dance studio.

One of the most important new ideas was to lay the building over only one storey. This was radical, but exactly the kind of idea encouraged in the creative stages of VM. The innovative roof structure and double-height studio ceiling could be retained by moving upper level areas to the ground floor, removing stairs and corridor space, so improving the building’s efficiency.

The project team also developed ideas to give areas multiple functionality, thus increasing flexibility and allowing two dance studios to be combined into one. This resulted in a state-of-the-art performance space seating 100 spectators.

The architects, Lee Evans LLP, fully embraced the VM process and came up with a new design incorporating these concepts. The new design added extra value to the project by enhancing access between Hextable Dance and the existing school buildings whilst improving security, disabled access and landscaping.

Crucially, the new design met the budget with no loss of aesthetic quality or functionality.

Managing risks

Alongside VM, this project used risk management to maximise its chances of success. As a central part of the VM study, the team identified the potential risks facing the project. These included:

- difficulty in obtaining planning permission
- refusal of funding by Arts Council England
- vandalism to the finished building
- late changes to the design
- difficult access to the site.

Risks were qualitatively assessed for likelihood of occurrence and potential impact. The project team appropriately managed and regularly reviewed these risks to ensure a successful project delivery.

Lessons learned

- Involving all key stakeholders in the VM study was very important when defining value. It allowed stakeholders to buy into the process and ensure their needs were met.
- The architects’ full support made the VM process much more effective. They were willing to take suggestions from the project team and quickly put forward relevant options.
- Willingness by the team to return to the client’s core requirements and to reassess the required functionality opened the project to increased creativity by removing unnecessary constraints – open mindsets really do make a difference!
Contacts

How does your project compare?
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Any feedback on this case study?
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This case study has been compiled using information supplied by members of the Institute of Value Management, www.ivm.org.uk

It also uses the OGC Achieving Excellence in Construction Procurement Guide 4 (AE4) – Risk and Value Management (order code: CP0064).

AE4 summarises the key principles of risk and VM in the context of construction projects and describes the practical steps that need to be taken over the project life cycle.

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Summary of changes

Original layout:
- two-storey building with associated corridor and stairs space
- multi-level roof structure created by the two storeys
- separate and distinct dance studios.

Revised layout:
- one-storey building with double-height dance show area
- two dance studios combined to give flexibility and state-of-the-art seating space for 100 spectators
- new building footprint
- first floor and stair space not required.

Benefits of revised layout:
- works better as a dance studio
- cost 20% less to build
- improved connectivity with the rest of the school
- enhanced security.
## 2. Open University – getting more for less and increasing user satisfaction

### Case Study

### Principal benefits

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Value management supported team-learning at the Open University library that resulted in a benefit-to-cost ratio greater than 10:1.

Summary
This case study describes how the Open University’s Estates Department delivered a £1.17m library project using the principles of partnering and VM. Cost savings of £1.3m were achieved at a VM study cost of £120,000 – a benefit-to-cost ratio of more than 10:1.

The partnership approach was adopted when earlier attempts to design, tender, procure and build the library using traditional procurement routes, failed to meet capital budget constraints and satisfy user requirements.

The design and construct partnership was appointed on best-value principles (not simply awarding on lowest price, but evaluating commitment to the client’s needs and budget). The project team comprised Malcolm Reading and Associates, Swanke Hayden Connell Architects, Buro Happold, Galliford Try and Davis Langdon, together with management and staff from the library, and Open University end-users.

From the outset the Open University’s commitment to a programme of VM and other full-team workshops, led to a successful project delivered on time and to budget, with high levels of client and user satisfaction, improving from 61% at the outset to 70% on completion. The project team enjoyed the experience and took satisfaction and pride in delivering an outstanding building.

Achievements and benefits
- Involvement of department heads and end-users. **Benefit:** Library usage is double the pre-project estimate.
- Excellent value for money. **Benefit:** Savings of £1.3m were achieved for a cost of £120,000 (the VM studies) – a payback of over £1.1m.
- Users’ needs were identified before value-adding proposals were generated. **Benefit:** The team evaluated the potential for value enhancement before spending time on the detailed development of proposals, which might have resulted in little improvement.
- All members were encouraged to attend meetings regardless of their position within the team. **Benefit:** Fuller briefings with input from end-users.
- Good team spirit. **Benefit:** Team members could raise controversial topics without fear.
- Joint solutions to problems encouraged. **Benefit:** Reduced delays and costs associated with time-consuming referrals to senior management.
- Development of trust within the team. **Benefit:** Reduced correspondence.

Principles and objectives
The Open University’s objectives were:
- A new library building which:
  - did not exceed the capped capital budget
  - would be ready for occupation by the stated moving-in date
  - met user requirements.
- The total and focused involvement of the wider client body, in particular users of the building and those responsible for its upkeep.
- A project team that would:
  - identify and enhance value
  - develop a common understanding of user needs
  - define common objectives.

Major issues
The proposed library site was constrained by existing buildings, car parking and natural features – including a large tree and a pond that was home to a colony of great crested newts.
The failure to gain approval for previous proposals had engendered doubts that a properly-functioning building could be delivered within budget, on time and also satisfy the aspirations of user groups, such as the management, library staff, library users and researchers.

**Successful initiatives**

**Core group**

A core group was established which:

- comprised a representative from each partnering organisation
- met monthly to maintain an overview of the process and to support decision-making
- would be the arbiter in the event of a major issue
- worked together in a structured programme of VM workshops and other full-team workshops
- aimed to add value by increasing client and user satisfaction
- aimed to reduce costs, waste and time spent on re-working and resolving confusions.

The team also focused on achieving satisfaction, enjoyment and pride in an exemplary building, adding value for all.

**Trust**

The increase in positive experiences, created by the successful series of VM workshops, significantly raised the level of trust within the team.

Regular performance assessment allowed the core group to identify unresolved issues and tensions. This information was fed into KPIs which then led to incentives and increased positive experiences for team members. There was an increase from 61% to 70% over a 19-month period for those KPIs related to the issue of trust.

When team morale weakened it was apparent in the team satisfaction KPIs. Consequently, the June workshop was limited to the morning, followed by a Thames cruise in the afternoon. In the context of a £17m project, this cost was minimal but it turned the morale and team-working around, as evidenced by the KPIs.

**Knowledge sharing**

One of the principles of VM is that added value is driven not only by workshops but also by the sharing of explicit and tacit knowledge throughout the project and then using that knowledge to benefit the project. Explicit knowledge may be shared at regular project design and site meetings, but tacit knowledge is rarely obtained in such an environment.

During review workshops, all team members benefited from communicating their views on project and team successes and opportunities. They observed how these might impact on the project, learning in cross-organisational groups how to use this information to benefit the scheme.

**Mitigating risk**

The University had previously endeavoured to procure the new library by traditional means. This did not yield proposals that could be delivered within time and budget constraints and to the satisfaction of the end-users.

The University Estates Department therefore adopted a project partnering procurement route to achieve their objectives. The VM programme was implemented to help reduce uncertainties.

**Reducing budget uncertainty**

As the project developed, it became clear that there was a potential mismatch between resources and expectations. This caused budgetary uncertainty. The programme of face-to-face full-team VM workshops brought these issues into the open, enabling the team to propose and develop creative solutions to the problems. Further workshops, during the design, development and procurement stages, provided more opportunities for both costs savings and enhancements to meet user needs.

The outcome of the workshops was a reduction in construction costs of 20% whilst retaining essential client and end-user functionality (e.g. future flexibility, 24-hour opening, changing technology and growth).

**Cost-effectiveness of VM process**

The overall cost of conducting the VM programme, including the salaries of those who attended and the
professional facilitation fees, was about £120,000. The realised cost savings were £1.3m, representing a payback of over 10:1.

**Early involvement of all parties**

Bringing the full team together early on enabled the client to take advantage of the knowledge of all professionals, including key specialist contractors.

Each workshop featured a team exercise to reinforce a learning point or introduce a process. These 15-minute activities also helped to breakdown barriers.

The core group was positively committed to empowering team members to resolve issues before they became problems. This led to more timely issue resolution, maintenance of the project and a lower cost of resolving issues, as senior management had less input on minor matters.

**Continuous improvement**

Continuous improvement was a target for the library project. But it did not stop there. The information and knowledge generated from the workshops has been used to improve subsequent schemes for the Open University. All the data leading up to the team’s decisions was listed in detail within the workshop reports. This formed an audit trail of objective decision-making and also provided an information base to guide users, specifiers, designers and constructors involved in future Open University projects.

**Lessons learned**

- The success of the VM workshop programme has led the client to adopt the same approach on subsequent projects.
- The process allowed the client to feel part of the project and also involved the end-users, enabling both client and user needs to be met in a resourceful and value-adding manner.
- The workshops helped the team to push the boundaries of cost, time and quality. Normally, one would expect a gain in one of these criteria at the expense of the other two, but in this project the team achieved better-than-expected performance in all three criteria.

**Contacts**

How does your project measure up?

For support, please contact Mike Rhodes, Head of Projects, Estates Division, The Open University:

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Any feedback on this case study?

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AE4 summarises the key principles of risk and VM in the context of construction projects and describes the practical steps that need to be taken over the project life cycle.

**Summary of changes**

**Before:**  
The procurement route was traditional.

**After:**  
The revised procurement route involved partnering with regular VM reviews.

**Benefits:**

- increasing collaboration as the project progressed
- clients’ and end users’ expectations met in full
- costs reduced by 20% to remain within capped budget
- effective VM reduced uncertainty of unproven procurement route to acceptable levels.
3. Kintry Housing Partnership – reducing cost and improving productivity

Case Study

Principal benefits

| Improved definition and articulation of value | ● |
| Clearer brief and improved decision-taking | ● |
| Enhanced value and benefits for end-users | ● |
| Reduced cost, improved affordability and value for money | ● |
| Improved productivity, efficiency, collaboration and trust | ● |
| Reduced waste and defects | ● |
| Earlier management involvement | ● |
| Benefits realised where previous methods failed | ● |
Value management has improved partnering performance delivering a 7% cash saving and increased profits in the supply chain.

**Summary**

This case study illustrates how VM was used during one phase of a major housing project to improve partnering performance which resulted in a 7% saving of £500,000.

The Kintry Housing Partnership project was launched in 2000 to deliver 400 new homes for rent or sale. The project was part of the regeneration strategy for the Craigmillar area of Edinburgh and was funded by Communities Scotland. It was unusual for two reasons:

- Castle Rock Edinvar acted as the client, on behalf of itself and three other housing associations (Canmore, Edinvar and Link)
- the project was taken forward in full consultation with the local community.

One of the phases in the project was for the construction of 114 houses. A tender was negotiated and agreed at £7.5m, which was in line with pricing levels on earlier phases. However, Kintry and Communities Scotland wanted to ensure this contract benefited from learning through partnership working, rather than just market pricing.

A structured framework of VM was introduced to stimulate improvement. The resulting step-change in performance enabled Communities Scotland to confirm an extension to the housing programme.

**Achievements and benefits**

- Applying VM processes within an existing project team. **Benefits:** By improving partnering performance, savings were made without adversely affecting suppliers’ profits.

- Identifying and implementing many small improvements. **Benefits:** The cumulative effect of these made a significant contribution to the 7% cost saving.

- Exploring alternative ways of working. **Benefits:** Working in partnership and collaborating in advance with local utility providers, reduced management time and costs.

- Applying imaginative design to car parking spaces. **Benefits:** This encouraged community ownership of the local environment at no extra cost.

- Encouraging each building trade contractor to improve design features for the residents. **Benefits:** Simpler designs and standardisation made homes easier to build whilst reduced waste and costs contributed to the 7% saving.

- Encouraging collaboration. **Benefits:** Improvement opportunities were identified through the building trades co-operating with the contractor and other professionals (e.g. the architect and the building inspector).

- Applying principles from ‘lean manufacturing’ (cutting out waste) to reduce cost and improve productivity. **Benefits:** Reduced costs, time and reworking, enhanced profits and lowered costs for all parties.

- Strong leadership from client and contractor senior management. **Benefits:** Team commitment improved and time spent on day-to-day problems was significantly reduced.
Principles and objectives
The project team had a desire to introduce further innovation in order to stimulate improved performance.

Major issues
The tendered price, based upon previous phases, was higher than desired and if accepted, would have put future phases of the housing programme at risk.

The challenge was to improve on the tendered price by incorporating learning from earlier phases, without jeopardising supply chain profits.

Successful initiatives
VM workshops were set up with the initial aim of improving working relationships on site, reducing defects at handover and improving value in design.

The combination of VM, in-house design, function cost analysis and lean thinking, proved to be powerful and resulted in more benefits than expected.

Focused studies
Four working groups, selected from management and frontline operational workers, were formed to address the four core elements of the project – substructures, superstructures, defects and supply chain.

Two of the studies focused on the physical elements – substructure and superstructure – and the other two on the process elements – handover (customer and supplier interaction) and waste reduction (eliminating defects and inefficiencies).

The VM process was completed in less than one month, allowing for an early flow of benefits.

Imaginative design
The superstructure working group found that by working closely together within the collaborative, facilitated, value engineering environment of a workshop, contractors were empowered to improve design features and reduce ongoing maintenance. At the same time, they created a simpler design that was easier to build, with less waste in materials and less need for reworking. As a result, performance improved and costs were reduced.

One workshop group took an imaginative approach to the design of private space. It reduced space on the public road by moving boundary fences to create private areas for driveway car parking. This led to a relatively car-free environment on the estate’s roads, which encouraged a sense of community ownership of the space and a renewal of the local environment at no extra cost.
As an example of innovative thinking, the electrical wiring was re-routed and standardised, thus reducing the length of wiring loom and fitting costs. This enabled an extra fire alarm to be installed, providing protection over and above normal building standards, whilst saving costs.

**Focus on detail**

The houses were designed as timber-frame structures with imaginative use of colour, light and space to create a pleasing living environment.

Within the overall design, the VM studies looked at how value improvements could be made on individual components. Each contractor looked at how their contribution could add value or reduce costs. Their efforts resulted in a simplified layout which produced savings of more than £300,000.

Furthermore, improving choices for timber joists and room dimensions removed unnecessary design components and created volume discounts for materials, contributing a further saving of £93,000.

**Improvements**

- Fewer corners and joints. This meant:
  - less plumbing work
  - fewer electrical fittings
  - fewer timber-frame components
  - easier, quicker and less costly erection
  - savings in materials and labour
  - reduced waste.
- A simplified bin store. A delineated area, screened by a wooden fence was used instead of a brick structure.
- Timber floor joist sizes were selected to optimise the cost of materials and fitting.
- The design was refined and standardised to suit a modular template, with fewer separate timber components. The modular size was chosen to facilitate easy handling and machine arrangements within a factory.
Partnership ethos
Because the studies were professionally facilitated, team members were able to take a full operational role in the team. This avoided the pitfalls of traditional, adversarial, cost-cutting meetings.

In the superstructure group, seven different building trades co-operated with the main contractor’s management team (and other professionals), achieving a real partnership ethos. This enabled the team to generate over 94 ideas for improvement.

Cost savings
The £500,000 saving was achieved on 114 new homes – an impressive £4,000 per house. Aggregating such savings across such a large regeneration programme, enables more homes to be built.

The savings were achieved without reducing the profits of local firms undertaking the work, hence providing additional benefits to the local community.

Reducing waste
The waste reduction group examined generic areas of reducing waste, including cost savings that could be passed on to the client. The group identified 148 areas of potential waste, of which the use of inappropriate working processes was, by far, the most significant.

Examples of improved working processes included advance works with utility providers. This led to greater certainty of outcomes and reduced the cost of management time incurred by both the contractor and client in liaison and co-ordination activities.

Another area of improvement was in the handover between contractors. The changes implemented allowed smoother transitions with fewer defects.

Importantly, the building trades also saved their own time, wasted fewer materials and needed less reworking. These improvements in efficiency improved their profit margins.

Other examples of improved efficiency and waste reduction were:
- Unnecessary fittings were eliminated, purely cosmetic treatments were removed to give residents more personal choice and to reduce unnecessary cost to the housing association.
- Experience from previous developments showed that some decorative features – such as mirror doors – were typically removed and replaced by residents when they moved in.
- Better quality paint materials were selected to reduce cost of application.

Leadership
The senior leadership input, at chief executive and managing director level, enabled the project team to have the confidence to develop project-specific working procedures. This allowed people to spend more productive time on delivering the new homes for the community because it reduced the number of day-to-day problems, which cost time and money to resolve.

Lessons learned
- The personal involvement of key business leaders at the initial stage and their presence at the start and end of the workshops, was highly beneficial. It established a clear imperative for performance improvement and empowered each group to make recommendations that could be directly implemented.
- VM provided structure for the team to collaborate and gain the benefits of partnering.
- The VM programme was designed and delivered in less than one month. This meant that the flow of benefits began almost immediately.
- The construction process became more efficient through redesigning the way in which the different building trades handed over work to each other and the way the contractors handed over completed homes to the client and the community. This speeded up progress and reduced defects in the new homes.
Summary of changes

Before:
Traditional contracting with each firm looking after its own interests.

After:
Collaboration between all members of the delivery team and the client through a series of VM workshops.

Benefits:
- 7% cost reduction
- trade contractors’ profits maintained or increased
- more efficient working and reduced waste.

Contacts

How does your project measure up?
For support, please contact David Brotherston, Kintry Housing Partnership, Castle Rock Edinvar Housing Association:

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- w: www.placesforpeople.co.uk/castlerockedinvar/

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AE4 summarises the key principles of risk and VM in the context of construction projects and describes the practical steps that need to be taken over the project life cycle.
4. Home Happening – right first time!

Case Study

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**Principal benefits**

- Improved definition and articulation of value
- Clearer brief and improved decision-taking
- Enhanced value and benefits for end-users
- Reduced cost, improved affordability and value for money
- Improved productivity, efficiency, collaboration and trust
- Reduced waste and defects
- Earlier management involvement
- Benefits realised where previous methods failed
Value management methods reinforced partnering performance to double productivity and reduce defects by 10% and costs by £1.75m.

Summary
This case study illustrates how applying VM methods from the outset on a project can stimulate a dramatic improvement in production efficiency and free-up cash savings for reinvestment, without compromising profit margins for the supply chain.

At £144m, Home Happening is Scotland’s largest council housing improvement programme. The five-year housing renewal programme will improve 25,000 homes and build community spirit across South Lanarkshire.

A forward-looking procurement strategy brought together partnership working and VM practices, which ensured that client and user requirements were addressed right from the start. The contract was awarded in 2004 and continuing VM workshops have helped deliver sustained, improved operational efficiency and value-for-money designs that are fit for purpose.

Home Happening is now transforming homes across South Lanarkshire by providing:
- new kitchens and bathrooms
- rewiring
- external fabric renewal
- environmental improvements
- other projects, such as lift replacement in high-rise towers.

Achievements and Benefits
- A Partnering Charter was developed. **Benefits:** Linking all parties through a quality system allowed them to exchange information and work together as a partnership whilst shortening communication channels between the client and supply chain.
- A move from traditional confrontational procurement to collaboration. **Benefits:** Better decision-making, involving all parties.
- Improved supply chain performance. **Benefits:** Supply chain delivery has improved from being within the top 25% to the top 10%, assessed against industry standard KPIs.
- Increased productivity. **Benefits:** Production more than doubled, from fewer than 50 homes a week to 100.
- Decisions based on value. **Benefits:** Opportunities for savings of £9.75m over the life of the programme have been identified, of which £1.75m has been realised to date. Quality has improved by about 10%.
- Combining VM with other collaborative strategies. **Benefits:** All parties worked together to resolve issues using value as the key decision criterion.
- A ‘right first time’ policy was adopted. **Benefit:** Service satisfaction has risen from between 90% and 95% to a consistent 98%.
Principles and objectives

The Home Happening partnership comprises South Lanarkshire Council, CCG Ltd, Symphony Plc, Jewson and Graham and Michael Graham Consultancy. The aim is to improve homes and communities across South Lanarkshire so that they meet or exceed Scottish Housing Quality Standards.

It was vital to set the pace and culture for the project at the outset to achieve the desired higher levels of productivity and quality. A traditionally confrontational approach would not have helped, so a new strategy was adopted whereby VM was employed alongside other collaborative initiatives to stimulate people to work together in innovative ways.

Major issues

Previous housing improvement projects had been procured traditionally and suffered from:
- confrontational attitudes
- poor quality
- low productivity.

The challenge was to achieve end-user satisfaction whilst still meeting budget and programme commitments.

Successful initiatives

Home Happening is being delivered by an integrated team of public and private sector partners. The focus for the first year was to establish a good project team and efficient working processes.

Right first time

VM principles emphasise the need to strive for the highest levels of customer satisfaction. Every small defect, delay or weakness in communication has an adverse effect on service satisfaction.

For Home Happening, a ‘right first time’ policy delivered improved process reliability and significant reductions in defects. Supply chain delivery for the project has often been rated ‘perfect’ and the reliability of delivery is consistently within the top 10% of national performance, according to industry standard KPIs. This has released resources to be spent on customer care, service delivery and achieving production targets.

Specific performance improvement targets were agreed against KPIs.
Targets
- Resident (public) satisfaction
- Client satisfaction
- Lower capital and whole-life costs
- Reduced design, supply and construction time
- Fewer defects and ultimately, zero defects
- Improved safety
- More predictable design cost
- Higher productivity
- Improved sustainability.

Right First Time Drives Satisfaction

The Home Happening workshops developed new ways of working which speeded up decision-making. Deployment of the workforce was balanced against the skills required, waiting time between tasks was reduced and the need for rework was almost eliminated. Particular attention was given to detailed planning at survey stage and to personal customer liaison, so that delays and disruption during the works process were eliminated wherever possible.

The result was that production levels more than doubled, from fewer than 50 homes completed per week to a record of more than 120 and the annual production level was the highest for Scotland in 2005.

One key management decision was to introduce dedicated frontline customer liaison officers by redeploying administrative officers. This boosted motivation, improved customer understanding, strengthened the capacity to manage a growing workload and eliminated unnecessary back-office activity. The focus was placed on management effort and partnership.

The impact across the supply chain was substantial as knowledge and learning flowed between the public and private sector partners. This good start to the programme established a sound base for further improvements such as increased productivity and improved cost efficiency, quality and service for each year over the life cycle of the partnership.

Collaboration
Independent facilitation has been a key factor in making the collaborative approach work. The early VM workshops frequently proved to be the first time that people had sat down together as a team to plan the programme and tackle cultural issues.

The structured VM approach enabled the whole team to focus on delivering value for the end-user. The client has played a full role in the team, avoiding the pitfalls of adversarial ‘cost-cutting’ or ‘scope-changing’ meetings between the client and contractor.

Step-changes in production
VM experience shows that improvement comes from many small steps at operational level. This is encouraged by customer satisfaction and management initiatives. All the small steps are kick-started at formal workshops.

The result was production levels more than doubled, from fewer than 50 homes completed per week to a record of more than 120 and the annual production level was the highest for Scotland in 2005.

One key management decision was to introduce dedicated frontline customer liaison officers by redeploying administrative officers. This boosted motivation, improved customer understanding, strengthened the capacity to manage a growing workload and eliminated unnecessary back-office activity. The focus was placed on management effort and partnership.

The impact across the supply chain was substantial as knowledge and learning flowed between the public and private sector partners. This good start to the programme established a sound base for further improvements such as increased productivity and improved cost efficiency, quality and service for each year over the life cycle of the partnership.
Cost reduction
During the second year, the team was able to concentrate on improving value for money. Efficiency gains of £9.75m over the life of the programme were identified, of which £1.75m could be captured immediately. Achieving the balance of £8m identified savings has set the agenda for the future.

Tracking improvements
The management team also met between workshops to discuss actual and potential improvements. These meetings ensured an up-to-date record of improvements.

After the first year the management team conducted a further formal VM study to “celebrate” improvements achieved, to set an agenda for cost-efficiency savings and to explore ways of improving value for money.

Lessons learned
- Independent objective facilitation enabled the team to maintain progress and adopt new approaches.
- VM has resulted in more effective working, significantly improved customer satisfaction (by 10%) and reduced costs.
- Martin Dorby, Head of Project Services at South Lanarkshire Council, summed up: “We’ve learned a lot. Our board meetings have moved from heated debate to an informed, controlled environment, where hard decisions are made to add value. Our successes have given us confidence and the live feedback on customer satisfaction spurs us on. Early involvement of staff has changed the culture and given people ownership.”
Contacts
How does your project measure up?
For support, contact Mark Whittet, South Lanarkshire Council:
  t: 01698 455065
  e: mark.whittet@southlanarkshire.gov.uk
  w: www.southlanarkshire.gov.uk

Any Feedback on this Case Study?
Please contact the OGC Service Desk:
  t: 0845 000 4999
  e: servicedesk@ogc.gsi.gov.uk

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AE4 summarises the key principles of risk and VM in the context of construction projects and describes the practical steps that need to be taken over the project life cycle.

Summary of changes
Before:
Little buy-in to partnering and low productivity.

After:
Widespread commitment to collaboration and contributions to VM programme.

Benefits:
- productivity doubled
- defects reduced by 10%
- costs reduced
- supply chain delivery improved to the top 10% in Scotland.
5. NHS Teaching Hospital – the benefits of Value Management

Case Study

Principal benefits

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Value Management closed the affordability gap for two major projects at the University Hospital of North Staffordshire NHS Trust.

**Summary**

This case study shows how the University Hospital of North Staffordshire NHS Trust (UHNST) used the lessons learned by the Project Director on previous VM exercises to deliver significant benefits on two major construction projects.

UHNST is a large Acute Trust with an annual operating budget of over £290m. It serves almost 500,000 people and employs over 7,400 staff. It has an annual capital budget of up to £25m. Two of its major construction projects were:

1. An Integrated Clinical Education Centre (ICEC).  
   The VM study helped build a common understanding of the Project Brief. The team achieved savings of about £4m on this £13m project.

2. A £350m PFI scheme to modernise the acute hospital and the associated North Stoke Community Hospital.
   The VM workshop achieved annual savings of £4.5m on the £52m annual Unitary Payment.

**Achievements and Benefits**

**ICEC project**

- Bringing key contributors together in independently-facilitated workshops.  
  **Benefits:** Mutual learning and creation of trust between all parties, reducing confrontation and building team spirit.

- Applying a carefully planned structure to the workshops.  
  **Benefits:** Helping individuals to understand underlying issues and differing priorities enabled them to reach agreement on issues where differences existed.

**PFI project**

- Building a clear understanding of the project imperatives and the factors that drive value.  
  **Benefits:** Generating ideas that added value or reduced costs without compromising essential performance or quality. This led to a reduction of £4.5m in the annual Unitary Payment, equating to over 10% a year or £135m over 30 years.

- Involvement of the contractor consortium (Equion) in the Fit for the Future project workshops.  
  **Benefits:** Active collaboration between the contractor’s and the Trust’s teams – in particular the architects and service engineers – developed imaginative proposals which saved time and money.
Principles and objectives

ICEC project
The purpose of this project was to provide a 6,000m² ICEC which would:

- be available to both UHNST and Keele University staff and students
- integrate the Nurse Education Centre and the Undergraduate Medical School
- accommodate the needs of post-graduate students
- include £1.3m of hospital accommodation.

The ICEC VM study had two objectives:

- to bring the team together to align the priorities of UHNST and Keele University.
- to eliminate the £4.3m affordability gap, without adversely affecting the requirements of the agreed Project Brief.

PFI project
The purpose of the PFI project (between UHNST and the Special Purpose Vehicle (SPV) Equion, led by Laing O’Rourke) was to provide:

- affordable acute hospital and services co-located to support the agreed model of care
- a Diagnostic and Treatment Centre giving fast-track access to one-stop diagnosis and treatment of 80% of all planned procedures
- efficient use of resources (e.g. acute inpatient stay within top 25% of equivalent providers in UK)
- an appropriate environment to promote the patients’ well-being
- dedicated children’s services in line with the National Service Framework
- facilities to support anticipated development of clinical networks in acute care
- support of education for staff, undergraduates and post-graduates
- flexibility to accommodate healthcare changes and growth over the next 30 years
- the development of the Community Hospital at North Stoke.

The aim of the VM studies for the PFI scheme was to reduce the annual Unitary Payment to a figure that:

- was affordable within the Business Case
- did not compromise the quality requirements of a major acute hospital
- achieved acceptable risk-sharing with the contractors.

Major issues
Both projects were experiencing difficulties. They had escalated in terms of cost following contractor selection, albeit for very different reasons.

On the ICEC project, UHNST and Keele University had differing priorities, which were reflected in the project brief. A second major issue was that cost estimates exceeded the available budget.
The 2004 figures on the PFI project estimated an annual Unitary Payment of £57.9m a year – £4.5m over budget. The first VM study successfully addressed this issue but by 2005 there were still difficulties in achieving financial close. A further affordability gap had opened up due to changing circumstances including Health Service funding rules.

**Successful initiatives**

The primary objective of the VM studies was to help both project teams develop affordable schemes.

**ICEC project**

**Reconciling different objectives**

Bringing together the requirements of two institutions in one facility exposed gaps in expectations. Consultation with the key stakeholders identified a host of issues that needed resolution if the integrated facility was to be a success. A workshop, involving all the stakeholders, was held to identify those issues where there was unanimous agreement and those where there was significant disagreement.

To help overcome the areas of disagreement and to achieve consensus, key areas of reconciliation were identified. They included:

- operational and management strategy of the centre (including who would control it)
- access and infrastructure
- accommodation needs.

**Design clarification**

The studies resulted in improved understanding of client requirements by the design team. The team was able to redesign the building to provide the agreed accommodation and promote more effective sharing of space. This reduced the overall size of the building and saved a total of £4.3m.

**PFI project**

**Closing the affordability gap**

The first study in 2004 resulted in savings of £4.5m on the annual Unitary Payment. The principal areas of savings included:

- reduction in excessive circulation and waiting areas
- redesign of key operational areas to improve the way in which they worked
- removing uncertainty in the provision of key items of equipment.

This closed the affordability gap and enabled the project to proceed until 2005 when further savings were required.

**Risk allocation**

In 2006, in order for the project to proceed, it was necessary to find additional savings in the Unitary Payment. The team identified a potential £8m a year of additional savings. Part of this was achieved by re-allocating parts of the PFI back to the UHNST which had the effect of re-allocating the risks across the project, thus reducing the amount payable to Equion.
The principal items transferred were the Community Hospital in North Stoke, selected soft services and inflation risk above RPI.

Improved layout
The balance of the £8m came from changes in design. Equion’s architects produced imaginative ideas for improved layouts that reduced the area of building needed. Service engineers were innovative in suggesting better ways of delivering services. The value of their involvement and commitment was a major positive factor in the study.

Lessons learned
The positive outcomes of the VM workshops included:
- creation of a team spirit between all parties
- clear communication of project objectives as well as the changes to be made
- the achievement of significant savings with better design solutions.

ICEC project
VM provided an excellent forum for reconciling differing stakeholder priorities. The resulting common brief allowed for the effective sharing of space between different activities taking place at different times of the day, thus reducing the size of the building that was needed.

PFI project
The VM study allowed the team to agree many recommendations for reducing the Unitary Payment. Further reductions were identified through the re-allocation of risk from the SPV to the Trust.
AE4 summarises the key principles of risk and VM in the context of construction projects and describes the practical steps that need to be taken over the project life cycle.

### Summary of changes

**ICEC project:**
Increased efficiency in the use of space through sharing and rationalising of accommodation needs, leading to a reduction in the size of the building.

**PFI project:**
Simplification of design, improvements in key operational areas and re-allocation of risk between the Trust and the contractor.

**ICEC Benefits:**
33% reduction in construction cost.

**PFI Benefits:**
Significant reductions in the annual Unitary Payment by the Trust.

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**Contacts**

How does your project measure up?

For support, contact Andrew Underwood, Project Executive Director:

Fit for the Future Project Office
Royal Infirmary, Princes Road, Hartshill
Stoke-on-Trent, ST4 7LN

- **t:** 01782 554860
- **e:** Andrew.underwood@uhns.nhs.uk
- **w:** www.uhns.nhs.uk

Any Feedback on this Case Study?

Please contact the OGC Service Desk:

- **t:** 0845 000 4999
- **e:** servicedesk@ogc.gsi.gov.uk

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6. Withington Community Hospital
– building the team, meeting the budget

Case Study

Principal benefits

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Value Management provided much-needed structure to cutting-edge healthcare provision under ProCure21 procedures.

**Summary**

This case study describes how VM methodology facilitated the successful delivery of a project using an innovative procurement approach.

Withington Community Hospital is an early example of the NHS initiative to provide ambulatory diagnostics and treatment within the community. The hospital offers a “one-stop shop” solution, in line with the NHS Plan to relieve pressure on acute hospital services.

ProCure21, which had been recently launched, was adopted after traditional procurement failed to come up with a solution within the budget of £20m. The project team – South Manchester Primary Care Trust (the client) and Interserve Health – were not familiar with the form of the hospital or ProCure21. Therefore VM was introduced to provide much-needed structure at an optimal time in the early project stages, whilst key decisions were being made.

**Achievements and Benefits**

- **VM workshops were held.** Benefits: The total integrated project team was brought together for the first time facilitating the building of the team into a working unit.

- **Agreeing the project mission statement.** Benefits: This provided the basis for developing a common understanding of the client’s requirements.

- **The identification and presentation of the client’s values to the project team ensured a common understanding of the comparative importance of specific values.** Benefits: These were captured in a table showing performance attributes (or value drivers) and their relative importance to the client.

- **Improved understanding of the client’s requirements enabled the team to develop cost controlling measures.** Benefits: The out-turn cost was £19.5m – within the £20m budget.

- **An integrated team was built into a working unit.** Benefits: Improved relationships and collaboration throughout the project.
Principles and objectives

Interserve Health had used VM on many previous projects and had confidence in the techniques used and the benefits it brought. They commissioned two studies. The first was to help in the building of an integrated project team, develop a clear project mission statement and ensure a clear understanding of the functions of the project and client values. The second study was commissioned to improve value for money and bring costs in line with the £20m budget.

The Project Mission Statement was agreed as: “To improve the health of the community by focusing and enhancing local health services by meeting the NHS Plan through developing Community Hospital and Diagnostic Treatment Centre (DTC) facilities.”

The Value Drivers

- Capital costs to be contained within the £20m budget
- Operating costs to be minimised
- Delivery on time
- Minimised environmental impact
- Flexibility of operations
- Patient comfort
- Service to the local community.

Of these, the last three were deemed to be the most important.

Major issues

Originally this project was to be procured using the traditional route of full design followed by fixed-price competitive tender for construction. This stalled when predicted costs considerably
exceeded the £20m budget. The NHS had recently launched their ProCure21 method of procurement, embodying current procurement best practice. The method encouraged close collaboration throughout the project team. The client therefore decided to adopt this approach.

The second novel feature of the project was the type of hospital to be procured. Withington Community Hospital was an early example of the new NHS initiative to provide ambulatory diagnostics and treatment within the community with the aim of largely removing outpatients from acute hospitals.

The client team for this project was in unfamiliar territory with regard to both the form of the hospital and the new procurement system, ProCure21.

**Successful initiatives**

**Clarifying the project objectives**

The first challenge was to build a common understanding of the objectives for the hospital. This was achieved by careful analysis of the functions of the hospital and resulted in an agreed Project Mission Statement supported by eight value drivers. These clearly articulated the project’s functional and performance requirements.

**Understanding project issues**

The team identified, categorised and ranked all the stakeholder issues such as client organisation, location, community finance, time, legal etc. It quickly became apparent that time was a significant problem, so the team developed a high-level programme to build a better understanding of key target dates.

**Use of space**

The first VM workshop:

- confirmed accommodation requirements in terms of size and adjacency of spaces
- helped distinguish between essential and desirable items

- allowed instant feedback on the design and construction implications of certain requirements
- provided information for the architect who used an adjacency matrix, coupled with feedback on space planning in the design of the community hospital.

The review of accommodation requirements and adjacencies highlighted key issues. For example, the planned drug rehabilitation unit had no adjacency requirement (i.e. it did not need to be located in the hospital) and was subsequently omitted from this project to be constructed elsewhere.

**Improving value for money**

Once designs had been developed, a second workshop concentrated on value for money and keeping costs within the (now confirmed) £20m capital budget. The team explored innovative ways to meet the project functions by conducting a brainstorming session which generated 76 ideas covering technical and organisational functions.
These ideas were evaluated against the Value Drivers, so that the most promising could be developed for implementing the final designs.

Selected ideas:
- Shared reception and waiting areas – reducing the size of the building
- More efficient construction methods – reducing construction time
- Improved management procedures – reducing decision-making time.

The benefits of these changes ensured that the project was completed on time and within the £20m budget.

**Lessons learned**
- VM is an effective way to determine and articulate client objectives on a complex project, thereby facilitating development of a robust design brief reflecting the client’s requirements.
- Development of a robust brief using VM, results in a scheme that meets client expectations.
- Fine-tuning of developed designs using VM techniques provides a way to ensure that projects can be delivered to clients’ expectations on time, within budget, whilst delivering the functionality required.

Mike Green, Chair of the South Manchester PCT Board and member of the Save Withington Hospital campaign, said:

“The Save Withington Hospital campaign succeeded. The new community hospital is a direct response to the wishes of South Manchester residents for a first-class health facility in their area, meeting their needs. The hospital will provide quicker access, more capacity, high quality and more satisfaction for patients and staff.”
Contacts:
The following website gives general information with regard to the Withington Community Hospital:
http://www.southmanchesterpct.nhs.uk/treatment-and-care/withington_diagnostic.htm

For specific information on the VM studies contact
Andrew Jowett, National Operations Manager, Interserve Health:
  t: 0121 344 4888
  e: Andrew.Jowett@interserveprojects.com
  w: http://www.interserveplc.co.uk/projectservices/building/regional+building/nhs+procure+21.htm

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AE4 summarises the key principles of risk and VM in the context of construction projects and describes the practical steps that need to be taken over the project life.

Summary of changes
Before:
The project lacked procurement structure.

After:
VM used to reduce uncertainty and provide structure to the procurement.

Benefits:
- defined a clear mission statement and key value drivers
- improved relationships and collaboration
- improved use of space
- project delivered within budget.
7. Bridging the Gap
– adding value and reducing costs

Case Studies

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Principal benefits

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| Improved productivity, efficiency, collaboration and trust |
| Reduced waste and defects |
| Earlier management involvement |
| Benefits realised where previous methods failed |
Value Management was used on the project to replace Antler’s Bridge in California, which saved £7m and improved performance by 19%.

Summary
This case study shows how VM can enable a broader assessment of value for money than that based on cost alone. It also demonstrates the benefits that flow from automatic inclusion of VM on major projects.

In 2004 the California Department of Transportation (Caltrans) began a project to replace the Antler’s Bridge Crossing, across the Sacramento River arm of Lake Shasta, with a new £58m structure. The United States Federal Highway Administration requires VM studies for all projects exceeding $25m (£13.8m). Furthermore, Caltrans requires the assessment of non-monetary benefits on all VM studies. This is currently not the case in the UK.

VM studies were undertaken – four at concept design stage and four at preliminary engineering stage. These resulted in cost savings of £7m and improvements in traffic operations, constructability and environmental impacts.

Achievements and Benefits

- Involvement of the whole project team in a formal, facilitated VM workshop. **Benefits:** Contributions from all stakeholders in the generation of proposals to improve the project.
- Identification of non-monetary benefits. **Benefits:** A 19% increase in project performance.
- Revised structural design reducing need for imported fill. **Benefits:** Constructability improved by 28%.
- Further away from nesting eagles. No need to fill large ravine on the south side. **Benefits:** Impact on the natural environment improved by 50%.
- Further away from an existing boat ramp. **Benefits:** Impact on local community improved by 40%.
- Poor geometry of existing bridge improved to avoid curves of less than 300m radius and gradients exceeding 6%. **Benefits:** Traffic operations improved by 20% including safety improvements due to improved road alignment.
- Generating an improved alternative bridge design. **Benefits:** Construction costs reduced by nearly 12%.
- Improvements in value for money. **Benefits:** Improving performance by 19% and reducing costs by £7m increased value for money by a total of 36%.

Principles and objectives
The project goals were to:

- provide a new bridge with a minimum 100-year life expectancy
- correct poor geometry at the approaches to the bridge
- accommodate up to 10m of future increases in the water levels of Lake Shasta
- minimise the impacts of the new structure on the natural environment and also on the recreational activities in the area.

The objectives for the VM study were to:

- develop solutions to address difficult transportation issues, such as construction sequencing and the best way to manage traffic dislocation and re-routing during the construction phase
- reduce the project’s initial costs and life cycle costs
- improve project performance and quality.
The project stakeholders included Caltrans, the US Forest Service, the Californian Department of Fish and Wildlife, Local Community Recreational Interests (marinas and resorts), the Union Pacific Railroad and the US Bureau of Reclamation.

**Major issues**
The existing bridge had been constructed with road curvatures and gradients that were unacceptable for modern traffic. The new bridge had to conform to modern requirements, in which approach curves must not be tighter than 300m in radius and gradients must not exceed 6% to prevent speeding. Disruption to the natural environment, as well as the local natural recreational activities on Lake Shasta, was a major challenge:

- the proposed design required a new 90m-long viaduct on the southern approach, which added significantly to the volume of imported fill that would be needed.
- a pair of nesting eagles had been spotted nearby, because they are a protected species measures were needed to avoid disturbing them.

**Successful initiatives**
The collaborative efforts of those present at the VM study resulted in the following improvements.

**Operations**
The project had two design options to deal with the problem of speeding and safety – a baseline and an alternative. The original bridge had encouraged speeding due to a steep gradient and tight curve. The alternative option was chosen because it provided for a larger radius curve which improved the geometry of the whole bridge and road safety.

**Construction Impacts**
Structural improvements were made to the design of the bridge to reduce maintenance. The hard shoulders were widened so that an additional lane could be accommodated in the future without further bridge widening. Realignment avoided the need for a viaduct on the southern approach, thus removing the need for large fills and retaining walls on the south tie-in of the bridge. Cut material from the south side of the bridge was used for any necessary fills on the northern end (hence lessening the need for imports).

**Environmental – recreational**
This alternative bridge alignment not only provided a more forgiving curve but also placed the structure further away from the existing Antler’s boat ramp. This significantly reduced the bridge’s impact on this important recreational facility.

**Environmental – natural**
The US Forest Service offered support for the alternative bridge structure because the alignment was further away from the nesting eagles. It also avoided filling in a deep drainage ravine on the south side.
Cost
The revised design saved £7m in construction costs, principally by shortening the length of the bridge by about 90m and eliminating the need for a viaduct or embankment on the southern approach.

Performance and value improvement
The VM process included methods to identify, weigh and assess performance against a number of non-monetary attributes. These included traffic operations, construction timescale, maintainability, constructability and environmental impacts.

Assessment of the revised design (following VM) against the original showed a 19% overall performance improvement. This was achieved at a reduction in cost of £7m or 11.8%.

Value (for money) may be represented by the expression:

\[ \text{Value} = \text{benefits} + \text{investment}. \]

In this case the improvement in value was

\[ 1.19 \div (1 - 0.118) = 1.35, \text{ or } 35\%. \]

Lessons learned
- VM has enabled non-monetary benefits to be identified, assessed and realised. This is particularly useful for public projects of a high-profile nature that usually have numerous intangible benefits.
- The ability to objectively assess non-monetary benefits enabled the project team to include environmental improvements, such as reduced impact on nesting eagles, alongside other benefits such as improved safety.
- The inclusion of a system such as that demonstrated in this case study, on all significant public projects would enable a broader assessment of value for money than that based on cost alone (see Getting Value for Money from Construction through Design. How Auditors Can Help NAO, CABI & OGC, 2004).

Contacts
How does your project measure up?
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Any Feedback on this Case Study?
Please contact the OGC Service Desk:
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This case study has been compiled using information supplied by members of the Institute of Value Management, www.ivm.org.uk

It also uses the OGC Achieving Excellence in Construction Procurement Guide 4 (AE4) – Risk and Value Management (order code: CP0064).

AE4 summarises the key principles of risk and VM in the context of construction projects and describes the practical steps that need to be taken over the project life cycle.

Summary of changes
Before:
Straight replacement bridge linked to existing highway by tight curves.

After:
Following VM a revised design was adopted giving a better road alignment.

Benefits:
- nearly 12% reduced construction cost
- improved safety through better alignment and grade
- reduced environmental impact
- less intrusion on local recreational facilities
- overall improved performance of 19%
- overall improved value of 35%.
## Annex A: Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Affordability</td>
<td>Ability to pay for a project (cash flow as well as quantum).</td>
</tr>
<tr>
<td>Achieving Excellence</td>
<td>Achieving Excellence promotes the use of risk management and VM as core tools, which are key to the successful delivery of construction projects.</td>
</tr>
<tr>
<td>Case Studies</td>
<td>Examples of the application of a process.</td>
</tr>
<tr>
<td>Cash Flow</td>
<td>The sum of income less costs over a given period.</td>
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<tr>
<td>Embedding</td>
<td>Consolidating concepts and skills in an organisation.</td>
</tr>
<tr>
<td>Function</td>
<td>What someone or something does. A function may be physical (turn handle) or intangible (enhance appearance). It is normally expressed by an active verb and a measurable noun.</td>
</tr>
<tr>
<td>Function Analysis</td>
<td>Method of analysing the functions of the constituent parts of a project or a product. A core technique in VM is changing the focus from what things are to what they do.</td>
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<tr>
<td>Key Performance Indicators (KPIs)</td>
<td>A set of metrics to assess performance against key outcomes or activities in the Construction Industry.</td>
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<td>Stakeholders</td>
<td>Individuals or organisations with an interest in the conduct or outcome of a project.</td>
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<td>Value</td>
<td>Assessment of the benefits brought about by a project in relation to the resources needed to implement it.</td>
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<tr>
<td>Value and Risk Management</td>
<td>Activities to improve value and reduce uncertainty.</td>
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<tr>
<td>Value for Money</td>
<td>The optimum balance between the benefits expected of a project and the resources expended in its delivery.</td>
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<tr>
<td>Value driver</td>
<td>A functional attribute that is necessary to fully deliver the expected benefits from a project (equivalent to a Primary Function).</td>
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<tr>
<td>Value Index</td>
<td>Dimensionless measurement of value for a project, not confined to cost and time but utilising all the Value drivers.</td>
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<tr>
<td>Value Management</td>
<td>An umbrella term used to embrace all activities and techniques used in the effort to deliver better value for the client, commonly abbreviated to VM.</td>
</tr>
<tr>
<td>Value Management Stages</td>
<td>Different types of VM study (see below) related to the stage in a project’s life cycle.</td>
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<tr>
<td>Value Management Study</td>
<td>A process involving the gathering and analysis of information (preparation), one or more workshops to process information, a report summarising the outcomes and including an implementation plan, all consistent with best VM practice, designed to add value to a project or part of a project.</td>
</tr>
<tr>
<td>Value Metrics</td>
<td>Use of the Value Index to measure improvements in value before and after a VM study.</td>
</tr>
<tr>
<td>Workshop</td>
<td>A formal facilitated event, involving multiple stakeholders and disciplines, taking participants through a structured process to a prescribed outcome.</td>
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</tbody>
</table>
Introduction
Through the Achieving Excellence in Construction (AEC) initiative, central government departments and other public sector organisations commit to maximise, by continuous improvement, the efficiency, effectiveness and value for money of their procurement of new works, maintenance and refurbishment.

The AEC initiative was introduced in March 1999 by the Chief Secretary to the Treasury to improve the performance of government as a client of the construction industry.

The AEC was launched as a three-year initiative and its key aspects include:
- partnering
- the development of long-term relationships
- the reduction of financial and decision-making approval chains
- improved skills development and empowerment
- the adoption of performance measurement indicators
- the use of tools for value and risk management and whole-life costing.

The AEC procurement guidance is contained within a set of 11 guides and two high-level guides. It builds on departments’ recent experience, supports future strategy and aligns with the OGC Gateway™ process.

Procurement Guide Number 4: Risk and Value Management
This guide promotes the use of risk management and VM as essential tools for the successful delivery of construction projects. VM helps the client to identify the best ways of meeting business need. Risk management is used to manage the risks associated with the solution that offers best whole-life value to the business. Risk management should not be seen as a barrier to innovation; the most successful projects have well-understood and effectively-managed risks.

Principles of risk and VM
Risk and VM are interrelated tasks that should be carried out in parallel. In practice, VM exercises are carried out first on a project, to determine exactly what constitutes value to the client. A preferred option (or options) is identified, together with the risks that are likely to occur if that option was implemented. The integrated project team repeats the parallel exercise of defining value and associated risks until they arrive at the optimal balance of risk and value.

Further information
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Value management in construction

Case Studies