# Asking the right questions, using the right tools

**Trish Melton** explains why engineers and scientists need good project management skills

Engineers need *good* project management. Everything we do is a project so we need the right tools to do the job right. Equally, organisations realise the impact that projects, and therefore project management, can have on their success. Previously, a project was one mechanism that organisations used to deliver benefits, but now organisations are increasingly being managed by project. Project management is therefore becoming a critical competency where the impact of delivering a project late, over budget and/or outside of scope/performance requirements can be catastrophic.

If we let our minds drift back to how project management was perceived some years ago we would think it's all about building 'big things' – whether the big thing was a new manufacturing facility, a research or technology centre or an IT system. We thought project management was a career choice and perhaps some of us chose not to do it.

Although there are many professional full-time project managers needed to deliver highly complex, business-critical projects there is equally a need now for everyone to consider what project management skills they need in order to maximise their delivery of value to our industry and to our economy.

## what is a project?

Good project management practice makes good business sense, so we need to start by understanding what a project is. A project is essentially any non-routine activity which, once completed, will be integrated into 'business as usual' (BAU) to enable some tangible business benefit to be delivered. It sounds simple – but then the next question is always what *isn't* a project? Answer: BAU.

Within this definition, most organisations have small, simple projects in progress most of the time, such as installing new equipment

| Parameters | Career project manager | Infrequent project manager |
|---|---|---|
| Job description | Project manager | Manager, scientist, engineer |
| Does project management how often? | Full-time – typically on a specific type of project (eg engineering, research, improvement, etc) | Part-time (as a part of role) Infrequently (when required to work 'off line' from BAU) |
| Capability needs | Structured, progressive development of knowledge, skills and behaviours requiring in-depth intermediate and advanced-level training supported by appropriate project experiences | Focussed and appropriate introduction to project management basics in terms of the knowledge, skills and behaviours but with a focus on basic tools and techniques |
| Career management needs | Mentoring support to ensure that capability targets are met Potential for project management accredited qualifications alongside engineering/science ones | Coaching support to ensure that guidance is available and help can be found during a project Improved understanding of the importance of project management within an organisational context |
| Aim | To deliver consistency and excellence in project management on all assigned projects as aligned to organisational needs | |

Table 1: Types of project manager

(whether in a production plant, a laboratory or any other part of the supply chain); improving a business process (eg paying invoices quicker or recruiting people more effectively); or doing anything new (eg moving office or selecting a new supplier).
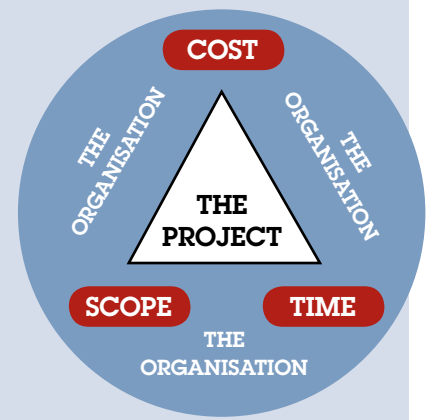
As the non-routine activities get larger, take longer, become more business critical and more complex, we recognise that they are indeed projects. It is the smaller projects which often suffer from a lack of a structured, data rationale project approach. More on this later.

So if we have a project then the next thing we need is a project manager, of which there are basically two types: a career project manager, or an infrequent project manager (see Table 1).

Traditionally, project managers have focussed on the project triangle with all tools, techniques and processes aligned to

## Figure 1: A project in an organisational context

The limited resources a business has available are used to deliver the most appropriate value for that organisation within its industry.

| Role component | What this means | Why we need this |
|---|---|---|
| Control manager | Being in control of the assigned project throughout all stages | We always need to be forecasting the project outcome and be adapting if we need to change it |
| Business manager | Continuous assessment that the project being delivered will enable the selected benefits to be realised | We need to constantly assess the value that a project can deliver to an organisation and adapt a project to a changing internal or external environment to match this |
| People manager | Ongoing management of all project stakeholders whether internal or external to the project team. Initially that means identifying them and then planning how to manage them | Relationship management is a critical aspect of managing project delivery: internal stakeholders are the project team and they need to know what to do, when and how; external stakeholders can impact or influence the direction of the project or be impacted by the outcome and they need to be appropriately engaged with the project |
| Technical manager | Recognising when you are the technical expert within a project as well as the project manager | In smaller projects you are often the selected project manager because of this expertise |

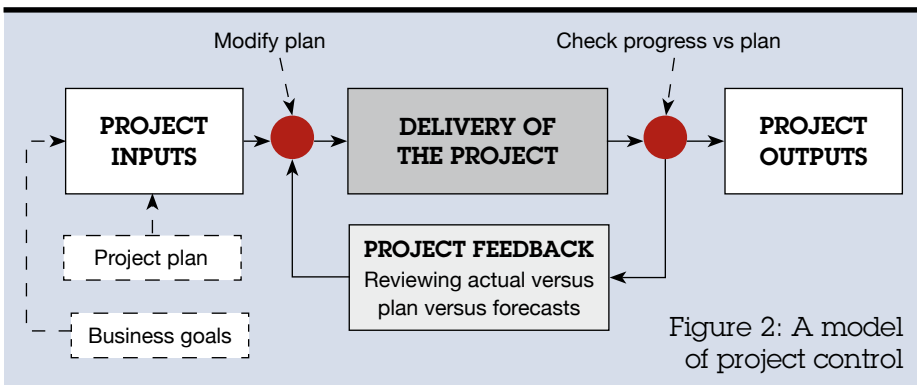Table 2: Facets of a good project manager



Figure 2: A model of project control

the delivery of the triangle (managing scope, cost and time). However in today's climate it is vital that any project is managed within its organisational context (see Figure 1) so that the limited resources a business has available are used to deliver the most appropriate value for that organisation within its industry.

Therefore today's project managers need to work within this organisational context whatever type of project manager they are. The overall aim is the same as are the four components to their role (see Table 2):

Whatever the project, the one thing a good project manager has to remember is that it's not about knowing the answers to all the questions but being able to ask the right questions. And it's not just about being a 'control freak' it's so much more. It's about understanding what control means (see Figure 2).

A good project manager will always have the answer to one key question: what's the likely project outcome? Being 'in control' is all

about the management of uncertainty against the vision of project success and being able to interpret the current project status against a forecast and make appropriate changes to increase the chances of success. Control is *not* about resisting change or blindly maintaining your original cost, scope and time objectives. This level of risk management is fundamental to both project and business success.

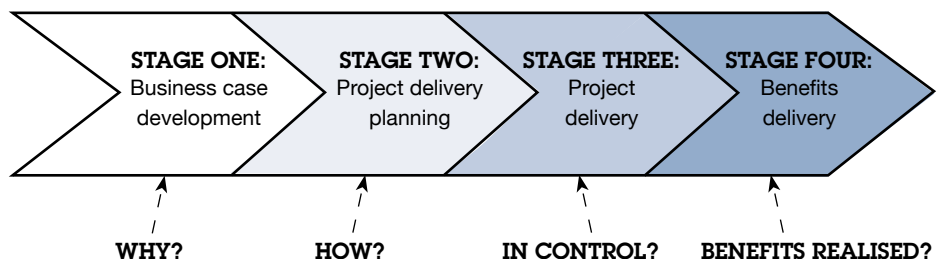Stop for a moment. Think. Have you ever delivered a project? Did you do a design

project as a part of your degree? A research project as a part of your PhD? Or deliver a new 'thing' in your job that relied on you to meet an agreed goal so that the business got some benefit? The chances are that you've already done a project. Whether you've used good project management practices may be another question.

So how do we gauge the level of expertise we need as an engineer, scientist and/ or businessman as opposed to those who choose to follow a project management career path? Over many years I had to develop some basic skills as I was increasingly working with those who had very little project management capability (see Figure 3), but who were expected to deliver projects infrequently.

Figure 3: Defining project management capability

CAPABILITY =
COMPETENCY +
PERFORMANCE (CURRENT & PAST)

COMPETENCY =
KNOWLEDGE +
SKILLS + BEHAVIOURS

In order to develop a basic capability in those I was working with I had to support them in developing: a basic knowledge of project management; a basic project management toolkit; and their role profile so that they could perform on assigned projects within their organisational culture.

This led me to develop many of the concepts and tools within the first of my project management books (*PM toolkit: the basics for project success*). The book aimed to highlight the simplicity of a project. After all, every project goes through the same four basic stages in its lifetime regardless of size, type, or style of delivery (see Figure 4).

Each stage asks a value-added question and one which I've found *must* be asked and answered in the positive before moving on to the next stage:
• Stage 1 – do we know *why* we are doing this project?
• Stage 2 – do we know *how* we are going to



Figure 4: Four value-added stages to a project

## Case 1: a product without a market

A small research-based organisation was developing a new product when it trialled the use of the basic toolkit as a way of integrating project management into its very 'technical' ways of working. Very quickly, using the 'Why?' checklist, the small project team established that the basis for the project was flawed. Although it had technically established that it could make the new product, it had not challenged whether it should. Some basic market research identified that the additional product specification was not required by its customers. As a consequence the project was stopped and the investment (resources, funds, assets) redirected to other areas of the business.

## Case 2: The last-minute design project

In working with chemical engineering lecturers, the concepts of *PM toolkit* have helped them give early structure to students commencing design and research projects where otherwise, they may have been started as late as possible.

While students are very adept at technical creativity and problem solving few, if any, see themselves this early in their career as business managers. The toolkit provides them with decision-rationalising mechanisms.

Students have used the 'How?' checklist to structure their planning, ensuring that they can actually complete tasks in the allocated time and then subsequently used the 'In control?' checklist to ensure that tasks are progressing to plan with risk assessment.

deliver this project?
- Stage 3 – are we *in control* of delivery?
- Stage 4 – Have the *benefits* been *realised* from the delivery of the project?

Projects generally fail due to a lack of understanding of the critical nature of all four stages. Typically, inexperienced project managers are given a project to deliver and therefore start delivery – missing out on development of a robust business case and then a delivery plan. More projects tend to miss out the final checking of whether the business case was actually fully and sustainably delivered and most go through an element of firefighting in delivery.

So over many years I've had feedback from engineers and scientists that just having this basic project lifecycle structure has made a difference. For some it has enabled the wrong project to be stopped, for others it changed project direction to better address an issue or allowed them to develop a plan where previously none would have existed. For most it has pushed them to check on whether the project outcome was successfully integrated into BAU, delivering the required benefits.

Having a structure is only the start and if engineers and scientists are to deliver projects successfully they need a simple, pragmatic set of tools to help them to get through each stage successfully. The basic toolkit (see Table 3) is a response to this and again feedback has been unanimous in confirming that their use has improved project outcomes.

There's no doubt that, as organisations and individuals are exposed to good project management practices, all are seeing the imperative – the business need – for a more foundation level of project management capability, at all levels and within all areas of the supply chain. This in itself poses a problem as organisations struggle to understand how to do this. Just sending people on training courses will never be enough for the cultural changes needed. They

need to consider three support elements – infrastructure, network, and the toolkit.

So let's all agree that project management capability is now *core* for an organisation: most people need a basic level of knowledge and skills; most will be involved in a project at some point in their lifetime. Organisations have to therefore develop a better infrastructure, a toolkit and a culture to embrace this core capability.

In terms of an infrastructure – organisations need to have a clear route that all projects follow. This is usually some form of stage gate process. Any project management toolkit needs to therefore link in to this key governance process. Finally, people need encouraging to develop project management capability through formal recognition via performance management processes: after all, measures determine behaviours. To fully develop the culture there should be a way to network across the organisation: to foster knowledge management, mentoring and peer-to-peer coaching.

If you take the above thoughts to their natural and logical conclusion I guess I'm saying that we all need some level of project management capability. The way we approach changes in our organisations is fundamentally different: they are projects. This difference is driven by our need to maximise delivery of benefits so that we make the most of all the time, assets, money and people we invest in our businesses via project delivery. One way to do this is to sustainably improve project management capability within chemical engineers and non-chemical engineers so that the value of good project management is seen within our industry.

So if we all want to ensure that our process improvement and business changes are effectively delivered, if we want to save money, spend money wisely and effectively and above all manage the uncertainty associated with non-routine activities within our business then we *all* need project management.

The next time you're involved in a non-routine activity ask yourself 'why am I doing this and what will stop me being successful?' In that instance you are acting as a project manager – managing value for your business in an uncertain world. **tce**

Trish Melton (Trish.Melton@mimesolutions.com) is the founder chair of IChemE's Project Management SG, a former member of IChemE Council and a member of the Membership Committee. She is owner and managing director of MIME Solutions.

| Stage one: Business case development | Stage three: Project delivery |
|---|---|
| Why are we doing this project?<br>• 'Why?' checklist<br>• Project charter<br>• Benefits hierarchy<br>• Benefits specification table<br>• Business case tool | Are we delivering this project in control?<br>• 'In control?' checklist<br>• Risk table and matrix<br>• Earned value tool<br>• Project scorecard<br>• Project completion checklist |
| Stage two: Project delivery planning | Stage four: Benefits delivery |
| How are we going to deliver this project?:<br>• 'How?' checklist<br>• Path and table of critical success factors<br>• Stakeholder management plan<br>• RACI chart (defines project team)<br>• Project resource schedule plan<br>• Control specification table | Have we delivered the benefits?<br>• 'Benefits realised?' checklist<br>• Benefits tracking tool<br>• Project handover report<br>• Project assessment tool<br>• Sustainability checklist |

Table 3: The basic project management toolkit