

CODEXX WHITEPAPER

Mastering project selection through structured approaches

Determining which project is best

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Which project is 'best'?

A key challenge in any innovation programme – be it creating a pipeline of new product proposals, selecting service/process re-engineering projects or deciding how best to allocate budget across multiple project proposals – is how to determine which projects are 'best' and therefore which to select. Managers are often faced with several possible projects and have to choose which to back, long before there is enough information to build a conventional business plan.

Once a project proposal is sufficiently developed to include details of planned implementation, financial evaluation methods such as Net Present Value (NPV) can be applied. But for projects at earlier concept stages, *"over-reliance on strictly financial criteria may lead to wrong decisions, simply because financial data are often wrong"* - the words of Bob Cooper, who developed the stage-gate model for new product development. At this stage it can be tempting to simply fall back on intuition and previous experience but a better approach is to assess projects against a number of criteria which are pointers to likely success.

For example, when comparing two possible new products, factors such as: the size of the market; the level of competition; the ease of distribution; the amount of design work required and so on can be combined to give a good estimate of which product is most likely to succeed. The estimate of each factor may be uncertain but the combination of several is more robust. In this article we will discuss several approaches for using structured selection approaches based on selection criteria – and identify their strengths and weaknesses.

Strategic alignment

In developing criteria for choosing projects to take forward from a number of contenders, the selection criteria should be aligned with the strategic aims of the organisation within which these projects will be implemented. The 'organisation' can be a business, a business unit, a department or a team. For example if a business unit needs to make significant cost reductions as a priority, projects which focus on revenue growth would have less priority than those focused on saving money – and thus selection criteria would be defined accordingly. So a first step in developing project selection criteria is the revenue growth/innovation/improvement strategy which these projects will help deliver.

However progressive businesses today also need to ensure that they are open to radical or disruptive innovation opportunities. These types of innovations are much further away from potential commercialisation than more conventional projects. They may not fit well with the existing business strategy and thus would score poorly against a set of aligned selection criteria. So businesses need to ensure that there is 'space' for such opportunities to be identified and assessed separately to the bulk of more conventional proposals using flexible approaches which provide more opportunity for exploration, whilst still retaining structure and objectivity,.

Objective project scoring

Just making a check list of the important factors to be considered in choosing a project is valuable in itself because it ensures that nothing is missed out, and helps to avoid too much emphasis being given to one consideration alone. This approach can be further improved by giving a score of, say, 1

to 5 to each factor and so coming to an overall rating for the project. We show in Figure 1 a basic example of such a scoring tool. Note that the result is captured as an *average*, not a total. Either measure can be used but the benefit of taking the average of the factor scores is that it makes the results easier to interpret, because the total will depend on how many factors the tool uses - and this may be different for different tools.

Rating scale	5	3	1	Score
Factor				
Strategic alignment	Close fit to Strategy	Supports Strategy	Not fully in line with strategy	
Value differentiation	Significant differentiation	Moderate	Slight	
Competitive advantage	Strong	Moderate	Low	
Market attractiveness	Highly profitable	Moderately profitable	Low profitability	
Fit to supply existing chain	Fits current channels	Some change, not significant	Significant change required	
Technical uncertainty	High	Medium	Low	
NPV	>\$50m	\$10-50m	<\$10m	
			AVERAGE	

Figure 1: Project scoring tool based on that used by DuPont (Source: Cooper)

The key to this - in fact the key to scoring tools as a whole - is to define a scale for each factor and then to align them, as we describe below. The scales do not have to be numerical, provided there are clear *scaling statements* (or *anchoring statements* as they are sometimes known), that describe what that score would actually mean in practice. Vague statements such as High, Medium or Low, as used in the Dupont tool, should be avoided as far as possible in favour of things that could be actually observed, at least in principle. If you can't imagine arguing about it then it probably isn't a good scaling statement.

It is crucial to align the scaling statements so that a score of 3 on one factor means roughly the same as a score of 3 on another. The best way to do this is to choose one factor, which we call the *Base factor*, which can be described in reasonably precise terms and align the others to that. First you identify the *Pivot Point* for the Base factor. This is the value for which you would say: "If this were the only thing I knew about this project I would find it difficult to know whether to go with it or not".

The pivot would have a score of 3 on a scale of 1 to 5. Then you choose equivalent pivot statements for the other factors.

Having done this, you choose more scaling statements for the Base factor and for each one choose statements for the other factors which, as far as possible, are equivalent. This means that you could say “If I was faced by two projects and all I knew about one was the scaling statement of the Base factor and for the other the scaling statement for the second factor I would not know which to choose”. This is not easy, nor is it precise, but whenever we compare attributes of different projects we are implicitly making this kind of judgement. This formal process just makes it more objective. An aligned set of scales makes it possible to score projects in a reasonably objective and coherent way. It also avoids the need to allocate different weightings to different factors, as is sometimes proposed: the alignment process does it all. However it must be recognised that designing a coherent tool is not a quick job. It requires the collaboration and agreement of a group of people and is likely to take more than a few hours. In Figure 2 we give an example of a scoring tool designed on these principles. It may be that not all factors have as high an impact as the base factor, and so their scaling statements for the highest score(s) may simply be left blank, as seen here.

Factor	Scaling statements					SCORE
	0	3	6	9	12	
Our sales potential In a given time	> 1,000 units in 5 years (gross margin £300k)	3000 units in 5 years (Gross margin £1M)	10,000 units in 5 years (Gross margin £3M)	20,000 units in 5 years (Gross margin £6M)	50,000 units in 5 years (Gross margin £15M)	
Customer benefit	No obvious benefit to customers.	Some benefit to some customers	Clear customer benefits within existing norms; worth visiting existing customers to promote	A significant advance in more than one key feature of interest to customers	Eye-catching new benefits; a talking point at shows; entry to competitor accounts	
Competitive intensity in market	4 or more strong competitors	2 strong competitors	Usual competition; or 1 strong competitor	We will be alone in the market		
Business cost reduction or simplification	<£300k	£1M	£3M	£6M	£15M	
Industry / market readiness	No expressed demand OR requires major change of customer behaviour	Some customers have asked for this but requires some change in customer behaviour	Definitely attractive to most customers; no change to customer behaviour required	There is pent up demand for this		
Market growth	Stagnant market	<5% per year	5-10% per year	20% a year	>50% per year	
Future potential	Update of an existing product	May lead to further variants or applications	Will definitely lead to further product variants or applications	Could lead to a new product line or several applications	This is the beginning of a major new business OR many further applications are foreseen	
Learning potential	None	Useful learning	Corrects one or more core competences where we are currently weak	Class leading learning in competences vital for 50% of future business		

Figure 2. Example of a scoring tool for Opportunity with aligned scaling statements (Source: Mitchell)

Multi-factor scoring methods are very helpful in making decisions in the early stages of innovation projects or wherever accurate information is not available. In general such selection decisions will not be irrevocable. They will merely be a go-ahead for further investigations that will eventually lead to a proper business plan. An important by-product of the process is that it helps point out those factors that are most important to clarify in the investigations that follow.

Two different Domains

The factors that one typically needs to consider in assessing possible innovation projects fall into two categories: those that describe the *Opportunity* that the project offers and those that describe its *Feasibility* in implementing. These must be considered separately because a high level of one cannot compensate for a low level of the other: a huge opportunity is no use if we have no means of grasping it, and conversely a product or service that has no market does not become worthwhile just because it is easy to do. For this reason Opportunity and Feasibility should be assessed and scored separately and this separation itself gives extra insight. Characterising a project by two measures, Opportunity (O) and Feasibility (F) is useful but one often wants to combine them into an overall figure of merit. This is easy to do for the following reason: Opportunity is a measure of the Benefit expected from the work and Feasibility is a measure of the likely Cost of achieving it. Thus the product of O and F is a rough measure of the eventual return on investment, ROI.

$$\text{Opportunity} \times \text{Feasibility} \sim \text{Opportunity/Difficulty} \sim \text{Benefit/cost} \sim \text{ROI}$$

An example of using this approach in selecting services for re-engineering within a law firm is shown in Figure 3. A number of services (and internal processes) were proposed and they were reviewed and scored against six Benefit (i.e. Opportunity) and seven Feasibility criteria. *Feasibility* criteria included investment requirements, expected resistance to change and the stature of the change leader for each project. *Benefits* criteria included expected cost savings, revenue increases and service improvements. Scoring of each of the potential projects against these criteria showed that the Services C&E had the strongest balance between benefits and feasibility and they were selected for the first phase of re-engineering within the law firm. This was an effective way of both ensuring that the 'best' service opportunities were taken forward and also to provide a transparent decision-making approach to the firm.

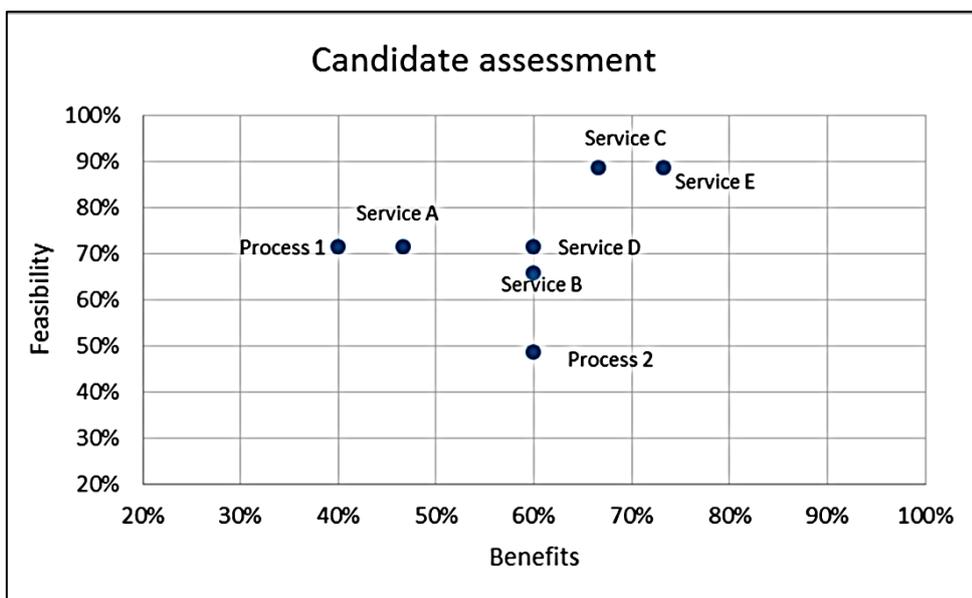


Figure 3: Scoring of potential service re-engineering projects against impact and feasibility (Source: Codexx)

Case study: Grundfos - priming the pump

Grundfos, based in Bjerringboro, Denmark is the largest manufacturer of pumps in the world, employing 18,000 people and manufacturing over 12 million pump units a year with development and manufacturing operations in Europe, Asia and the Americas. The company spends over 7 million Euros a year on R&D.

In 2011 the company reorganised its New Business Development organisation. There had been trouble with projects running late because of technical issues so a new 'Front Loading' department was created whose job was to ensure that all the major technical and marketing issues had been sorted out before the project went into the main Product Development process. The separate Technology Department would continue to do longer-term studies. Christian Rasmussen, manager of the Technology department, had the task of creating a tool for selecting Front Loading projects. *"They had to be evaluated against a broad range of criteria, not only technical. It was too early to use financial analysis"*, he says. The company makes a distinction between relatively long-term Strategic projects and shorter-term Tactical ones. Different management and governance processes are used for each type and the first requirement was for a simple but objective method to allocate proposed projects between the two streams. A single factor set was used for this, as shown below.

For each factor the pivot statement was chosen so that higher scores would suggest a Strategic project and lower scores a Tactical one. The average over the factors pointed to which category was appropriate. The tool worked well and gave the team the confidence to move on to a selection tool for the Tactical products, which is shown in figure 4.

Factor	0	5	10
How would the project fit into the development Streams later on?	The technology is beyond the scope of the development Streams	A stream could handle the project within 6 months	A Stream could handle the project immediately
How well is the project aim defined?	No written statement yet	Core features have been demonstrated and applications verified	Full definition available
How well would the potential offering fit the sales process?	Competences not available in sales force OR require opening a new customer segment	Some sales representatives could handle it with training	Well within the scope of existing processes
How well would the potential offering fit the distribution channels?	Entirely new distribution channel required	75% of the distribution could be fulfilled with existing channels	Can be supplied with existing channels without change
How well would the potential offering fit the production and supply chain?	Major part of the supply chain would have to change OR new production technology required.	Changes in supply chain or production are required but within our capability	Can use existing supply chain and production with scale-up as necessary
How new would the related service be to Grundfos?	A new kind of service would be required to enable the offering	A new but not unfamiliar service setup would be required	!The required service business already exists

Figure 4: Grundfos' scoring tool to separate Strategic and Tactical projects.

Rasmussen says *“It took 2 days in all to design and present the first tool - later on, with experience, we found we could design a tool for a new requirement in a couple of hours. You need to involve several people in this, especially for the anchoring statements, which are the key to the whole thing. We also found that people need to understand the theory behind the method, otherwise they don’t feel comfortable; so you have to do some explaining. And it’s helpful to score some projects together, at least the first time, to make sure that everyone has the same interpretation”*.

Participants always start by scoring separately. This was important as *“it allows people to access information that they didn’t know rather than be embarrassed by not knowing and make a silly guess”*, said Rasmussen.

It typically took a team of 4 about half an hour to review and score each project and collate the results; a total effort of 2 man hours per project. Says Rasmussen, *“That’s not a lot compared with the time we used to take, debating round and round - and considering the importance of the task”*.

Grundfos’ production department soon adopted the approach for their own project selection. Says Hans Jørgen Klein, head of the Production Technology department: *“We use scoring tools for three types of projects: internal ideas; external ideas (from universities and other industries); and things which can produce a direct benefit for our customers. Our problem is that we have a lot of project ideas, typically 15 a month, and we have to find an efficient way to make the initial decision whether to investigate an idea further or to park it for the moment.”* It took a couple of 4-hour discussions with a group of 4 colleagues, plus quite a bit of work on his own to design a tool they all felt happy with. It uses separate assessments for Opportunity and Feasibility. *“The structure of the tool and the anchoring statements makes for much more concrete discussions than we used to have. We get a lot of “buy-in” from this process.”*

Hans finds that project scores tend to be less well-differentiated than they would like. *“For some reason, people don’t feel happy giving very high or very low scores. Maybe it’s a Danish cultural thing. Anyway we can always present the results on a narrower scale to emphasise the differences”*.

“We never follow the scoring slavishly. The important thing a carefully-designed tool does is to clarify and present the information so that you can have a reasonably objective discussion. It may point the way but it can’t decide for you. You could say that we use it as a guide but not as a master”, says Rasmussen.

Case adapted from Goffin and Mitchell. You can see an interview with Christian Rasmussen at www.macmillanihe.com/companion/Goffin-Innovation-Management-3e/learning-resources/Chapter-06

Reviewing and balancing your portfolio

A carefully executed scoring process will allow the candidate projects to be listed in order of expected value (OxF). One may then select from them in priority order until the available budget is used up. This gives the best value for the budget. But there may be other criteria to consider. For example it may be considered important to have some projects aimed at expansion and some at efficiency; or to have a spread over different aspects or divisions of a business; or to balance risky projects with more certain ones. The simplest way to do this is simply to allocate a separate budget, or *Strategic Bucket*, to each aspect and do a separate selection of projects within it. This has benefits

in ensuring that some business areas are not over-represented in projects and that any project overrun is borne by the area owning it – and funds come from their ‘bucket. However this approach may reduce the benefits to the business as a whole as some areas may simply have a better portfolio of contender projects than others. So this approach needs to be used carefully.

But however the balancing is done it necessarily means including some projects of lesser value. “Balance” is really a misnomer; it is always a “Compromise”. Perhaps at some time in the future ways will be found to estimate the extra value produced by the balancing and so to justify the loss of value from the individual projects. Meanwhile managers must be alert to the issue and be prepared to justify their compromises.

Project selection benefits from a structured approach

Selecting which projects to do is a challenge faced by businesses every single day – for not all can or should be performed. However selection is a challenge, especially for projects which are innovative. There is often a lack of firm data on likely project outcomes upon which selection can be based. So assumptions must be made. This article describes approaches for improving the robustness of project selection and thus improving the likelihood that an organisation’s resources are allocated to the best projects.

Note: this article is based on work completed by Rick Mitchell and colleagues at the Institute for Manufacturing at Cambridge University and by Alastair Ross in projects completed with Codexx clients. For further information see: <https://www.ifm.eng.cam.ac.uk/research/ctm/ctmpublications/ctmworkingpapers/scoring-methods-for-evaluating-and-selecting-early-stage-technology-and-innovation-projects/>

About the authors

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About Codexx

Codexx was established in 2002 to provide innovation and transformation services to the industrial and service sectors. It has worked with major businesses in multiple sectors in the UK and internationally including manufacturing, law, insurance, financial services, education and management consulting. For information on Codexx services and experience go to www.codexx.com.

For more information

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