



Research portfolio management

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One of the main difficulties confronting firms is where and how to put their scarce research resources into action. For some it is a matter of running their own R&D activities but for most it is going to involve a combination of inside and outside activity. But no firm can afford to do everything, so it needs some tools to help it decide where it should put its resources.

Many such tools are available but most are based on the idea of a portfolio that looks at research activities in terms of their impact on the business and the way in which they can support the business strategy.

How does it work

The basic idea behind portfolio models is that there are different types of technology - typically:

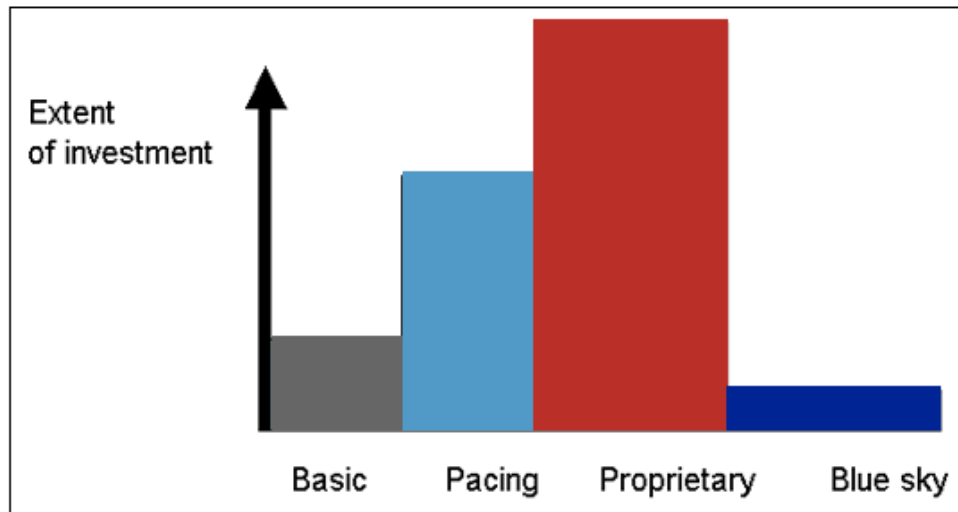
Basic technologies, which everyone needs and uses to underpin their products - for example, electric power, mechanical engineering, established chemical reactions, etc. These are essential but they won't give any competitive advantage in themselves since they are freely available and not protected by any patents, etc.

Pacing technologies, which are those newer technologies that are key to moving forward in a particular area. For example, in computers chip technology in processors and memory would be pacing technologies, whilst in pharmaceuticals they would include genetic engineering and computer simulation of active molecules. Technologies of this kind are essential to getting into and staying in a race to develop new things, but you may have to pay to access these - for example, by licensing or by investing in your own R&D programme to generate them. They can give competitive advantage but they may also be available to others.

Proprietary technologies, which are those that the firm owns and understands and has control over. The control could come through having patent or other forms of intellectual property protection, but it could also come from simply not telling anyone, or from the sheer complexity of what it involves. They are the main source of competitive advantage and provide the basis for 'core competency'.

Blue sky technologies are those that have very high risks and long timescales attached. They represent long shot bets, but if they do come off they could provide powerful proprietary technology advantages - providing the firm has taken steps to get into them and protect their investment.

This kind of portfolio is shown below.



Firms need to keep an eye on all of these and to make some kind of investments - a typical portfolio might be to spend most on developing and maintaining proprietary technologies, to rely on the open market for access to basic technologies, to work with others in collaboration or with specialist ventures into key pacing technologies, and to maintain a watch on blue sky work in research labs and universities, perhaps spending small amounts to make sure they are up-to-date with what is going on and can access it if something promising emerges.

Making the choice on how to allocate resources to these can be helped by adding a second dimension: how important is it for the business and how strong is the firm's position? If the technology is important and the position is strong, then investing to reinforce is important. If the technology is important but the position is weak, then trying to get into it may best be done through some form of collaboration. If the technology is important to sustaining the business but is not going anywhere - for example, a mature technology like welding - then the firm may decide to keep a watch but to invest little. And so on. The table below shows an example of how such a portfolio can be built up.

Strategic research portfolio

Market position	Clear leader	Strong	Favourable	Tenable	Weak
Basic technologies					
Pacing technologies			Maintain/build up research		
Proprietary technologies		Support		Build up - risk of competitors entering	
Blue sky					

Hints for using this tool

As with all simple matrix representations the key is not the diagram but the discussion it can provoke.