finding a strategic direction for technology at GKN: technology management toolkit

based on an interview with Graham Chisnall, head of corporate strategy at GKN

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GKN is one of the largest remaining British domicile manufacturing companies. It is a tier 1 supplier of engineered products to OEMs in (largely) the automotive and aerospace sectors. GKN employs around 40,000 employees worldwide and has manufacturing operations in around 30 countries. Annual turnover is around £4 billion.

There are four divisions within GKN:

- drive-line business, which develops and manufactures drive-line products for the automotive sector, such as drive shafts
- powder metallurgy business, which develops and manufactures powder alloys and net-shaped parts using a sintered approach with powders (70% of this business is in the automotive sector, the rest supplies the general industrial applications)
- off-highway business, which develops and manufactures sophisticated components and systems for agricultural and construction equipment
- aerospace business, which develops and manufactures complex metallic and composite structures for the aerospace industry.

introduction

Graham Chisnall is Director – Corporate Strategy at GKN within the organization's corporate centre. He reports to the financial director who is on the main board.

Graham is responsible for developing the forward plan for the group. He works with mergers and acquisitions activities, but his role also involves extensive participation on the technology side of the business. The company has ambitious growth targets and hopes to achieve this, in part, by increased organic technology development.

finding focus

Like many of the larger manufacturing businesses operating in the 80s and 90s, GKN operated a single large, centralized R&D institute. However, it was found over time that the R&D activities of the institute had begun to become rather remote from the four divisions it aimed to support; in fact the R&D centre would select projects for its own agenda rather than working in support of the various businesses.

Recognizing this, the R&D centre management had begun to build a relationship with the Institute for Manufacturing and the University of Cambridge to help build in some strategic alignment. But the GKN management had decided the model of having a centralized unit would not provide enough technology projects that were strategically aligned to each of the four businesses, and the centre was closed in around 2000.

In response, GKN moved its R&D activities to an alternative model, one of developing dedicated R&D centers which were to be embedded within each of the main businesses to provide increased strategic alignment and where the R&D activities would be rooted within the division's function. (Each of the four divisions now has its own single or multi-centre R&D establishments funded and run directly by the businesses, ie each establishment is actively engaged in working on projects that are of value to its particular line of business.)

This change in R&D model began a discussion around how to co-ordinate technology development for the organization with four separate R&D business lines and led to a setting up of a sub-committee for technology.

The Technology Sub-Committee (TSC) currently consists of a chairman, Graham Chisnall, the heads of technology from each of the four divisions, along a few other relevant individuals. The sub-committee regularly meets to try to progress the technology agenda within the group. It was this group that decided to pick up the relationship with the IfM faculty.

relationship with the IfM faculty at the University of Cambridge

In 2000 GKN began sponsoring a professorial chair at the Institute for Manufacturing at the University of Cambridge for a period of 10 years under a millennium project. This led to a more hands-on relationship in a number of areas, one of which is been the area of technology strategy and technology roadmapping.

In around 2002, the IfM and GKN began thinking about how to get more proactive in terms of developing a sustainable strategy for technology. Further, while in the past GKN as an organization had been a company that had worked on fairly short planning horizons, typically 3-5 years, it was becoming more and more crucial to extend those planning horizons farther out in time. GKN needed to push the horizon of all businesses out to the year 2020. Thus the IfM introduced GKN to its newly-developed technology roadmapping methodologies.

IfM's technology roadmapping

Roadmapping is an inherently flexible technique in terms of:

- the wide range of aims that it can contribute towards
- the timeframe covered by the roadmap (past and future)
- the structure of the roadmap (layers and sub-layers, which can be adapted to fit the particular application)
- the process that is followed to develop and maintain the roadmap/s
- the graphical format that is selected to present information and communicate the roadmap.

figure 1: typical multi-layered time-based roadmap, linking technology to markets, providing an integrating framework to support alignment of perspectives across the organization © Dr R Phaal, IfM

However, this flexibility is subject to certain constraints, including the level of resources available and the need to integrate roadmapping with other systems, processes and management tools within the organization, eg the use of portfolio methods, balanced scorecard and stage gates in the new product development process.

The key areas to consider when planning a roadmapping activity are as follows.

- **Context**. The nature of the issue that triggered interest in roadmapping needs to be explored, together with any constraints that will affect the approach adopted. Careful consideration should be given to establishing a clear business need and ownership, defining aims and scope, and identifying key people from across the organisation that should be involved.
- **Architecture**. The layout of the roadmap needs to be designed (see figure 1), considering both timeframe and structure, comprising the layers and sub-layers. The roadmap can be considered

as a "dynamic systems framework", providing a structure within which the evolution of the system of interest can be mapped. Generally, this system relates to innovation, at the organizational or sector level, where there is a need to align markets (know-why) with applications and processes (know-what), and technology and resources (know-how), over time (know-when). The roadmap framework provides a common language, which supports communication between different communities (eg functions, technical disciplines or organizations).

- **Process**. This comprises the staged set of activities needed to build roadmap content, make decisions, identify and agree actions and maintain the roadmap that is developed. Typically the process will involve one or more workshops, for which the agenda needs to be designed to incorporate a logical set of facilitated activities, which can be combined in a flexible way to address the issues of interest.

developing a roadmap at GKN

The IfM began by facilitating a two-day session at GKN with the aim of establishing an initial technology roadmap for each of the various businesses. However, this session was of mixed success; it was up to each of the businesses to pick up and use the roadmaps, and some businesses did it with more enthusiasm than others. The businesses that did pick up and use the roadmaps, though, began to develop reasonably sophisticated insights into how they should be planning their technology developments.

The view was taken in 2005/06 to pick up the technology roadmapping methodologies and use them much more consistently across the different businesses and also to develop them to become an institutionalized-capability within the organization that the businesses could use for themselves going forward thenceforth.

In early 2006 the IfM and GKN decided to push on with the technology roadmapping process, but to have it tailored to the specific needs of GKN. In this respect, a conference was arranged with the top 60 technologists from across the GKN group.

The conference had two aims.

1) To develop more comprehensive, better-quality roadmaps for each of the main businesses using the technology roadmapping as it had been developed by the IfM to that date.
2) To use the opportunity to look at white-space topics (related areas of activity that GKN could potentially expand into using the technology capabilities that resided within GKN, but that were not being worked on at that time).

The technologists were chosen because of their intimate knowledge of their particular fields, and with inputs from the IfM and members of the TSC, on the social, political and environmental aspects, the technologists worked to capture anticipated trends and likely time horizons of disruptive events happening in a process that was mentally rather than data driven.

The mindset wasn't to be too scientific or overly precise, rather the group was engaged in trying to identify what it thought would be a likely date that something disruptive to the GKN business would happen. The concept that was deployed was that firstly, GKN needed to know the earliest date that a disruptive event would happen relatively reliably and secondly how long a response time GKN would need before that date to respond as a business.

For example, viable commercialized fuel cells for automobiles would have a profound impact, not only on the industry, but in particular GKN's drive shafts business. If cars were to become completely electric, then the need for drive shafts will be affected radically.

In this particular instance, the focus is on achieving a consensus across the experts in the business about what would be the earliest practicable date that commercially-viable fuel cells would be available in quantity for the automotive sector. If fuel cells were, say, 15 years away and GKN needed 6 years to get into shape before that event happened, then it is something that does not need a big resource investment now. However, if fuel cells were 5 years away and 6 years were need to prepare, then it would be something that GKN needed to get serious about instantly.

picking the winners

Following the conference, a mass of data had been collated, with both long and short-term projects for GKN's consideration. However, pinning down resources to every project would not have been viable, so essentially GKN needed a "picking the winners" strategy to follow up.

Initially, the process of picking those projects that were commercially most attractive to the business began with iterations of the strategic brainstorming sessions and involved a group of the same technologists. The iterative brainstorming sessions were aimed at refining thinkings and thoughts around the projects.

Then a group of the technologists and the TSC got together to use some extra facilitation and process development from the IfM, and the group tried to work the issues with a more determined focus to try and actively challenge the views and assumptions around the items on the roadmap.

The final stage was the application of filters. This was so that work would only be carried out on a small sub-set of the items: those that would be compatible with the overall group strategy. The filter was a group strategic filter for the output that determined if the area of activity would be aligned to what the company's vision was going forward.

current situation

In 2008, GKN continues to work with IfM in refining and tailoring the technology management toolkit for its own particular needs.

While roadmapping has proven itself to be a powerful and flexible technique for strategic planning and innovation, a principle benefit is the communication that is engendered, both during the development of the roadmap and afterwards. The "hands-on" nature of the workshop-based process is a key feature, where the group is responsible for building a common visual representation of their strategic context, issues, goals and plans. Roadmaps can be used as a common reference point and language to support the ongoing dialogue that is essential for effective innovation and strategy development and implementation.

related Pure Insight resources

- Strategic roadmapping in portfolio management: insights from Boeing
- Strategic roadmapping: linking technology resources to business objectives
- Strategy and technology roadmapping
- Technology scouting and roadmapping