MET2 Paper 2 2007

CRIB

Crib: Question 1: (J.Moultrie)

You have just been appointed the product manager in "Precision Co.", a medium sized high-technology business developing precision instrumentation.

a) Describe the possible role of a product manager in this firm and how this might differ from the product management role in other types of organisation. 20%

Expect to see a general description of the role of the product manager, and their position in the organisation.

Origin of product management role – 1930s and then P&G in the 1950s. More common role in FMCG – increasingly part of organisation in technology firms

I would expect to see students distinguish between:

- product managers with profit responsibility and corresponding authority – essentially acting as business unit managers. This is common in large companies with distinct product ranges.
- product managers who take on a position of brand manager, responsible for brand development, promotions, etc. This is common in FMCG organisations.
- product managers in small technology firms – with either a sales alignment or a product development alignment. Here the product manager is more information gatherer and provider to enable decision making at a senior level.

The product range that you have inherited includes 3 classes of products: "entry level", "mid-range" and "high performance". The entry level products sell for approximately £10K, the mid-range for £25K and the high performance products for £100-250K. You have access to some key competitor information (figure X) and the sales (volumes and values) over the last 20 years (figure Y) for Precision Co.

b) Using appropriate marketing concepts, outline your perspective on the current status of these products. 35%

I would expect to see students apply concepts from the module – PLC, SWOT, Porters Value Chain, BCG matrix, portfolio management, market segmentation and positioning, etc.

They should comment on the lifecycle of these products and comment on the general overall decay and specific fall in sales of the higher priced performance products.

They should recognise that all products look like they are near the end of their lifecycles, and therefore product development and niche promotions might be necessary.

They might speculate on the reasons for the rise in sales of the mid-range products (and corresponding fall in sales of entry level products).

They should notice that the performance products carry a larger premium and that Competitor 3 is dominant in this sector. Precision Co is not dominant in any sector, but does well in mid-range.

c) *Propose a marketing plan, and recommend further research necessary in order to improve sales and future profitability for this product range.* *30%*

Students should propose potential actions that they could take to develop the business, addressing products, promotions, place (distribution), and pricing.

Students might recommend killing an unprofitable product, but should be aware that removing a 'cash cow' would reduce turnover overall. They should propose which segments they would aim to develop further and recommend how they might do this.

They should also indicate the research that they need to undertake to fully understand the dynamics of this market place – further market analysis, further customer research, further technology research.

d) *Comment on the strengths and weaknesses of using product lifecycle data as a basis for your analysis.* *15%*

It is difficult to be certain about the stage of the lifecycle that a product is in, and whether this is as a result of internal company actions or a factor of the external competitive environment.

It is difficult therefore to extrapolate any reliable trends from this data.

Students should recognise that they can influence the lifecycle and that it is not necessarily independent from the actions that the company takes.

Thus, used over simplistically, the PLC data can be dangerous. Used cautiously, the data might point towards potential actions.

Crib: Question 2 (E. Garnsey)

"Start ups flourish on change in the business environment and are continually reorganizing themselves to take advantage of it. But in established firms there is strong resistance to change, especially change imposed internally."

Is there evidence supporting the views of this entrepreneur about innovation in established companies? What would lead you to assent to or dispute his views? Could established firms introduce innovations more effectively by adopting practices used by new firms?

Guide to examiners

This question is eliciting the ability to integrate themes from two bodies of literature answer (1) innovation management and (2) entrepreneurship and creativity. The open nature of the question is intended to make it possible to give marks to students who structure their answer effectively and reduce marks for disorganized exposition. The question can be answered by combining material from the workshop on overcoming resistance to change and on entrepreneurial innovation. It could also be informed by literature on the management of change from third year Organisational Behaviour course. It could be answered in a variety of ways.

Content

The students could draw on a workshop on the *causes of resistance to change in established companies and ways of mitigating these factors*. They should point out that not all established companies resist change. There are companies like HP that have incentive structures that make their employees responsive to the benefits of change. While identifying the problems in the established company of endangering prior success and of vested interests in the status quo, the answer should also recognize, for example, that procedures supporting innovation can be introduced. They could suggest ways of reducing bureaucracy and supporting creativity in R&D and NPI in established companies.

Students could draw on material on problem solving and creativity in entrepreneurial enterprises. The answer should recognize that new companies often lack the resources and procedures to operate as do large companies. As to whether large companies can introduce such methods, the reasons why these methods are distinctively entrepreneurial should be explained. New firms cannot prevent resource constraints and uncertainty, hence they attempt to use these to their advantage, if necessary shifting their objectives and reappraising the opportunities they target as conditions change. In contrast large companies pursue consistency, budget to cover needed resources and engage in project management to reduce and manage uncertainty. Investors encourage start ups to operate in this way.

Marking Criteria

A first class answer would recognize that the common issues centre around organizational incentives to innovate and would provide detailed material from both sets of workshops and readings to illustrate and elucidate common themes (see above).

An upper second answer would either provide an integrating framework or a detailed account of the operation of incentives and disincentives affecting innovation in established and new organizations but would fail to include some of the key points and lack analytical edge.

Weaker answers would fail to identify integrating themes or be unable to provide an account of obstacles to innovation. A third class answer would fail to make effective use of any of the relevant material presented in the module and present generalities or irrelevant evidence.

Crib: Question 3 (E. Garnsey)

"Moving work offshore where labour is more abundant is a logical extension of scientific management (i.e. Taylorism) whether in the factory or the office." Explain and assess this argument, citing case evidence to support your position. Can anything be done to mitigate stressful working conditions associated with Taylorism in offshore sites of work?

Guide to examiners
This question assesses the ability of candidates to identify closely related themes in two separate bodies of literature and to organize their ideas coherently.

Content
The decomposition of tasks as advocated by Taylor and embodied in Scientific Management allows for higher levels of productivity but this requires specific product market and labour market conditions. It must be possible to achieve *economies of scale and standardization of output. It must be possible to pay lower salaries for decomposed tasks – opposed by unions in some countries, e.g. Sweden).*The search for these product market and labour market conditions has led to the relocation of work 'offshore' in lower wage economies. This is why Globalization can be characterised as a logical extension of Taylorism. Students could show why in the absence of high volume, or of standard products/services (in low volume, differentiated, custom built product) and unless labour markets provide workers at lower salaries for decomposed tasks, work organization based on the Taylorist decomposition of tasks will not reduce costs or raise productivity. Administrative costs are very high and must be recouped by high volume sales at lower wages. In the absence of the required product and labour market conditions, small scale, flexible production as in Silicon Valley or North Italy may be more efficient.

The students could draw on case study evidence revealing the extension of Taylorist methods into office work (on insurance claims and other routinized service tasks) and food processing. For the final part of the question, they could draw on a workshop on LP and stress to identify the main causes of stressful working conditions and point out that these can be mitigated as has occurred at Toyota, with the evolution of LP in Japan;
1. by reducing resources *in response to rather than in anticipation* of productivity increases
2. By introducing technical changes such as total preventative maintenance,
3. by worker participation in improving tools and task organization
4. by provision of employment security.

But where low wage labour is plentiful it is unlikely that such measures will be introduced without use of labour conventions tied to trade agreements.

Marking Criteria
Students would not have to make all the arguments set out above but should produce a coherent answer showing they had reflected on the market conditions required to make LP work effectively.

A first class answer would be able to bring the literature on task decomposition and the literature on off shoring together in a coherent way. It would focus on the conditions required for moving work offshore and identify features of lean production and task decomposition that facilitate offshore strategies, together with ways of mitigating stress (as above). It might examine ethical issues of multinational offshore activity.

An upper second would show some grasp of what the two sets of issues have in common but would lack coherence and miss some of the key empirical points.

Weaker answers would simply reproduce material from slides and reading without understanding the HR dynamics of offshore developments. Third class or lower answer would be unfamiliar with the materials covered in class and would produce generalities without detailed evidence or coherent arguments.

A coherent account of stress mitigation could contribute 1/3 of marks or more if well done. But the issues should be examined in the context presented by the question and not reproduced by rote.

Crib: Question 4 (Yongjiang Shi)

a) *The product life cycle (PLC) is a well established concept in marketing. Describe how this management tool might be applied to the management of a manufacturing operation. (25%)*

b) *Outline how the PLC model might be linked to a firm's decision on foreign direct investment (FDI). (25%)*

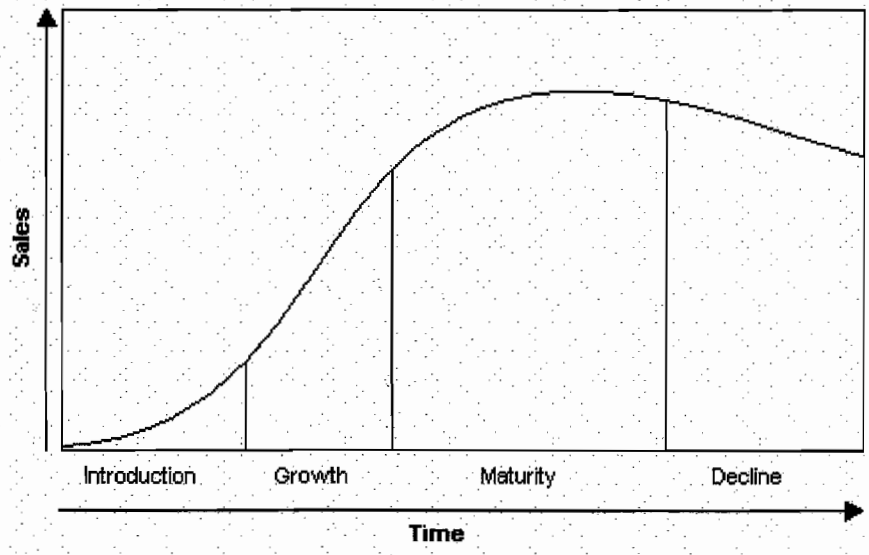
c) *Describe how the nature and characteristics of an international manufacturing network. (25%)*

d) *Discuss the relationship between the PLC and international manufacturing networks. (25%)*

Key Points of Answers:

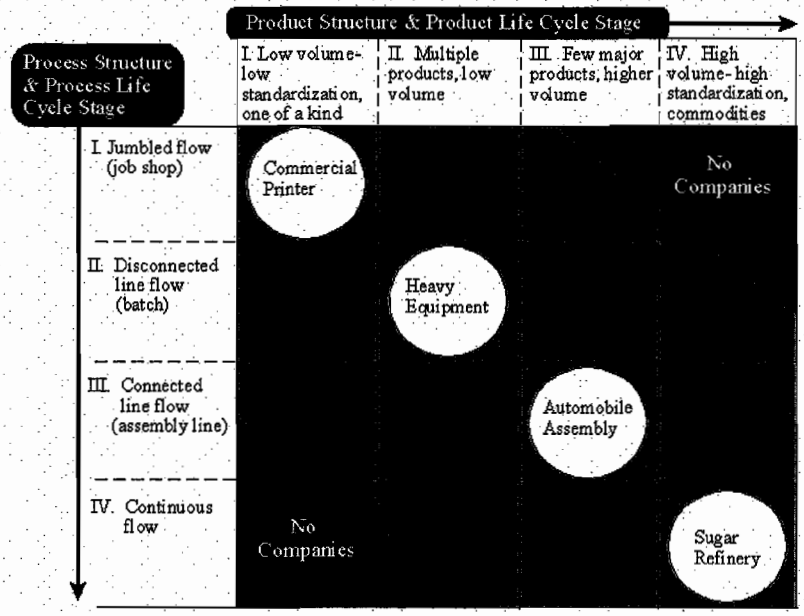
1. What is a product life cycle (PLC)? What are the key implications to manufacturing management? (25%)

   PLC can be divided into four stages: product introduction; product growth; product maturity; and product decline. It can be demonstrated as the following picture:



   Hayes and Wheelwright (1975) published a paper on the relationship between product life cycle and production processes – product-process matrix (PPM). (the students needn't to introduce PPM model, but need to brief the implications).

Product-Process Matrix
Matching major stages of product & process life cycles*



* Adapted from Hayes & Wheelwright, Exhibit 1, p. 135.

The implications of PLC to manufacturing management are:

- different stages of PLC have different characteristics of product
- different stages of PLC have different priorities of management tasks mainly because external competition environments and customer demands are different
- different stages of PLC ask different types of product system to match with in order to achieve strategic objectives of manufacturing system

2. What are linkages between product life cycle (PLC) and company's foreign direct investment? (25%)

Vernon (1966) use PLC model to explain why firm need to invest production facility in foreign country.

Key reasons are:

- when a firm's product approaches to maturity stage, the firm's home market has more intensive competition
- the firm then needs to explore new geographic market
- the reason why the firm is able to penetrate into foreign markets is mainly because of its technology and management advantages (exploitation of advantages)

3. What are the international manufacturing networks? (25%)

International manufacturing networks are internationally dispersed factory network of a product group/family owned or partly owned by multinational corporations. The network includes factories as the network nodes and relationships between factories, as well as a set of managerial mechanisms to operate the network.

There are many types of international manufacturing networks. But the networks can be mainly divided by two key dimensions – geographic dispersion and management coordination – and into two main categories – multi-domestic network and globally coordinated network.

The multi-domestic network has strong individual factory autonomy and very weak integration or coordination between factories; the globally coordinated network has very strong integration and interaction between factories in the network.

4. Is there any relationship between PLC and international manufacturing network? (25%)

One of the linkages between factories in an international manufacturing network is an individual factory's role in the network. Ferdows (1997) introduces six roles the factory can plan in the networks, addressing strategic motivations and capabilities of factories.

Philips links PLC with different roles in the network. Philips Mountain Model describes that different roles along the PLC stages. For example, EU based factories have more technology-based resources and capability, and usually play innovation role in the network by introducing new products and pilot new manufacturing process. Some factories can have more ramp-up capability in the development stage of PLC, and some of them will have mission to focus on large scale production mainly for matured products. As a group, Philips has to control the role strategically to prevent local non-strategic moves.

Crib: Question 5 (D. Probert)

(a) Explain what is meant by the concept of 'technology management' in the context of a technology intensive business. Give a process model for technology management, discuss its relevance in operationalising this concept, and illustrate with examples. (40%)

(b) Define both disruptive and sustaining technology, and discuss what the significance of these might be for the technology strategy of a company. Give examples of disruptive and sustaining technology in the photographic industry. (30%)

(c) How might "technology intelligence" concepts be applied to anticipate the effects of disruptive technology? (30%)

(a) The following definition of technology management was given during the teaching module, as used by the European Institute for Technology and Innovation Management:

Technology management addresses the effective identification, selection, acquisition, development, exploitation and protection of technologies (product, process and infrastructural) needed to maintain a market position and business performance in accordance with the company's objectives.

Students should be able to reproduce this or at least give an equivalent version.

The process model given for operationalising technology management in a firm is the ISAEP model – Identification, Selection, Acquisition, Exploitation and Protection.

Good students should be able to elaborate the meaning of these processes, and explain how they enable individuals in a firm to play a coordinated part in technology management. Examples of individual roles and activities should be given: gathering information from conferences and journals, working with universities, patenting and licensing technology, looking after key knowledgeable people, etc.

(b) A good answer to this part of the question requires the candidate first to define disruptive and sustaining technology:

A sustaining technology is one which improves the performance of existing products with reference to current customers' performance measures.

A disruptive technology is one which may initially give a worse product performance on current customers' performance measures, but which presents a new value proposition.

As a consequence the disruptive technology may initially be overlooked by incumbent firms, who only become alerted to the possibility presented by the new technology after it has been exploited by new entrants.

The consequence for technology strategy is that the firm may need to take an explicit position with regard to reacting to the emergence of disruptive technology. It is not necessarily advantageous to be an early adopter of such technologies, it may be better to wait and see if they succeed and then be a fast follower. The identification of disruptive technology is in itself not a simple matter, as the impact of new technologies may take some time to become apparent.

In the photographic industry, a sustaining technology would be APS (Advanced Photo System) which basically refined existing wet chemistry photography. A disruptive technology would be digital photography, which initially offered worse picture resolution, but other benefits such as immediate picture review, which ultimately proved attractive to the majority of customers.

(c) The ideas of technology intelligence are relevant in that they provide a means to scan the technological landscape for the emergence of new and potentially disruptive technologies, alerting the firm in advance of their impact in the market place.

Good students should be able to review the four modes of gathering technology intelligence presented during the course, and discuss how these can be operationalised.

Mine: the searcher is aware that the information has been gathered and where it is.
Trawl: the searcher is not aware where the information is kept or if it has been acquired at all.
Target: the searcher knows what to look for, outside the system (usually firm) boundaries.
Scan: the searcher has not previously identified which information to acquire.

The scan mode is particularly relevant to identifying the emergence of disruptive technology, and requires the firm to set up activities to find and attract potentially interesting and useful information. Exceptional students may describe the roles that can be undertaken in the scanning mode: scout, pathfinder, handler, recruiter, informant.

Crib: Question 6 (K. Platts)

"One of the most powerful ways of integrating information -making it more concise, comprehensive, convenient and accessible -is by using images" (Eppler)

Making use of the Eppler and Burkhard framework, or otherwise, discuss this statement in relation to the use of visualization in the process of strategy development and implementation.

Guide to Examiners
This is a challenging question, as it requires the students to integrate learning from two different fields -the process theory of strategy, and the theories underpinning the use of visual methods in management.

A good answer should outline the main stages of the strategy process and use the Eppler and Burkhard framework to structure the information requirements at each stage, showing how visualisations can help in making the information `more concise, comprehensive, convenient and accessible'.

During the strategy module the students were introduced to many visual tools and frameworks to assist the strategy process, e.g.: SWOT matrix, Porters 5 forces, PEST, strategy charting, Importance-Performance, and so on. They had specific lectures on

Modelling and visualisation, including the Eppler and Burkhard framework, see below. There are several ways in which the question could be answered. One would be to divide j the strategy process into analysis, development, planning and implementation, and to identify the requirements, (what needs to be visualised) the benefits (why visualisation is useful, and the techniques (how). This is expanded below.

Analysis Stage
The analysis stage of the strategy process is concerned with accessing and structuring data and information on the external environment, within which a company operates, and on the internal strengths and weaknesses of the company.

In this stage, visualization mostly serves the purpose of representing and synthesizing quantitative and qualitative data. Although much of this data can be gathered from existing company sources, not all data is of this form. In addition to gathered data, managers' opinions, basic assumptions, and implicit understandings need to be surfaced, made explicit, and made accessible to all involved in the strategy process. Typical gathered data that may have to be visualized during this stage are sales and market statistics, as well as internal indicators regarding past events and developments. Opinions that should be visually represented include assessments about market threats and opportunities, as well as internal strengths and weaknesses.

In the analysis stage, visualization is most valuable because of its cognitive benefits. Specifically, visualization enables managers to process more data (through its synthetic ability) and avoid information overload and subsequent mental shortcuts or cognitive biases In addition, visualization can be used to elicit the implicit mental models of managers and align the assumptions present in a management team. In this stage, managers can employ information visualization methods that structure a great amount of information in an ordered way, so that (convergent) synthesis and inference processes become possible. Hence, Structuring Methods are the most commonly used techniques in this stage. These provide a

ready-to-use structure (often with predefined categories) to organize and synthesize information.

Quantitative data, typical of sales and market data is often summarised by using standard techniques such as: Bar charts, line charts, pie charts etc. Qualitative data can be structured in many ways. Standard structures, such as 2 by 2 matrices can be customised by the user for a particular application, or may have already been customised for specific tasks, for example the Boston Consulting Group Matrix or the SWOT matrix. Other task specific visualisations also exist, for example, Porter's five forces diagram, S-curve diagram, which allow particular perspectives to be taken.

Development Stage

In the strategy development stage, visualization aids the generation of options for action. These options include potential strategic goals, milestones, activities and possible resource deployments. By visualizing all feasible options and their parameters, they can then be more easily assessed, selected, and operationalized in the subsequent planning stage.

In this stage, the cognitive benefits of visualization are still present, but increasingly the social benefits of Visualization become apparent. The cognitive benefits of Visualization here are twofold: firstly, it can enable the re-framing of current views and foster a change in perspectives (for example by switching levels of analysis or time horizons or by visualizing issues from an outside view); secondly, it can facilitate the systematic and global comparison of many options. In this stage, the social, co-ordination function of visualization plays an important role, by enabling a transparent and focused discussion and prioritization of the developed options.

For the maximum social benefit, visualisations should be designed and used in a way that allows mangers to interact with them. This could be in the form of manual methods, for example, sticking adhesive notes or symbols onto a chart, or in the form of computer supported visualisations, for example, an interactive software package running on a .computer with a projector allowing all managers to see and update the picture. Strategy development requires firstly the generation of options, and then the assessment, and reduction of options until a particular course is selected. Visualization methods, therefore, should first support divergent thinking in order to assist managers in the development of a great variety of feasible options and scenarios (i.e., visual brain writing). This multitude of options can then be assessed and combined with more convergent visualization tools (for example morphological boxes). Hence, Elaboration Methods are used. These provide rules and a relatively open structure to elaborate on information, discover new patterns, build a common understanding and develop options. In the divergent phase, techniques such as knowledge mapping, concept mapping mind mapping can open up areas for consideration. In the convergent phase, techniques such as decision trees or morphological boxes can be used to help select particular courses of action.

Planning Stage

In the planning stage, the strategy becomes much more tightly defined. The broad aims are now translated into specific objectives, and plans to achieve these are formulated. This includes the development of timelines, resource allocations, responsibilities and deliverables. In the planning stage, convergent thinking along a time axis becomes paramount. Here visualization can assist managers in focusing on a reasonable sequence of goals and actions. In the planning stage, the social function of visualization becomes crucial. The main benefit of visualization in this stage is to provide for the easy communication of the planned sequence of goals and steps. By facilitating communication, the use of Visualization can lead to new insights regarding possible positive or negative interdependencies among goals or

implementation steps. The visualization of the planning information can also be helpful in the subsequent implementation stage. Hence Sequencing Methods are the most common forms of Visualization used. These use rules, categories and graphic structures to organize information, such as objectives and actions, chronologically to show precedence and inter-dependency. Techniques can be generic, such as timelines; or can be increasingly specific e.g. CPM diagrams (critical path method), and PERT diagrams (project evaluation and review technique

Implementation Stage

In the implementation stage, actions, relationships and results need to be visualized. Actions may be departmental projects, strategic initiatives of a business unit, or the required behaviour patterns of individual employees. The results of these actions are typically captured in key performance indicators and provide valuable feedback to management whether strategic progress is made or not. In this stage, the emotional impacts of Visualization come to the fore. A great strength of a carefully constructed visualization is that it can trigger positive emotions and motivate a workforce through engaging images and inspiring symbols. Creative, thinking is needed in order to develop images that will capture the employees' attention and imagination and promote buy-in for the new strategy through original and informative ways of communicating it. A new strategy that uses old, clichéd ways of communication may run the risk of indifference or cynicism on the part of the employees. In addition to this emotional benefit of motivation, cognitive and social benefits are also present.

The ability to visualize progress in real-time and highlight areas where the strategy implementation may not be going smoothly, allows managers to visually track the progress of the implementation process and quickly identify deviations from the plan. Use of a common Visualization by managers in different functional areas can be used to promote an understanding of the `bigger picture' and build a sense of common purpose, while ensuring that individuals know where their own activities and goals fit in. Interaction Methods are used here. These provide an interface to capture, aggregate, present and explore information. Visual metaphors are in common use in this stage. One class of metaphors stresses the importance of gathering controlling data together in a summary form such as management controlling dashboards/cockpits, (using the analogy of the flight deck of an aircraft). Another class uses the metaphor of a controlled journey using for example, tracking diagrams such as flight plans. A third, and increasingly common, class uses a journey across a landscape. Here a goal might be represented by a mountain peak, and a rough track might represent the general direction of the strategy. Obstacles to be overcome on the journey might be represented by rivers or canyons which need to be bridged. The bridging activities might be key tasks, achievement of which represent specific milestones, and so on. The benefit of this type of representation is that it can be evocative and hence inspiring and engaging.