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<th>Dynamic capability in action at PharmaCorp</th>
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Chapter 7

Dynamic capability in action at PharmaCorp

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Background and context
PharmaCorp is a subsidiary of one of Japan’s largest pharmaceutical companies, employing 60 people in its Dublin bulk pharmaceutical manufacturing plant. The plant makes the active ingredients for four products, supplying them for conversion to other, larger pharmaceutical companies that are licensed to sell the drugs. It is common practice for Japanese firms to licence sales of their products outside Japan to companies who have stronger brand image and marketing capability in these markets.

Because of the nature of its production, PharmaCorp is licensed by the Irish Environmental Protection Agency (EPA). PharmaCorp’s integrated pollution prevention control (IPPC) licence requires, amongst other obligations, the company to maintain an environmental management system and to demonstrate continuous improvement of its environmental impact. Companies are expected to pursue environmental change through the adoption of ‘cleaner technology’: cleaner technology is when production process produces less waste, use fewer resources and consumes less energy. This can be achieved by changing the raw materials used to less toxic alternatives, improving the efficiency of processes and equipment, and increasing the use of recycling etc. Adopting cleaner technology requires companies to change their production technology radically and can be very challenging; companies in Ireland have struggled with the demands of IPPC licensing.

Early influences on capability formation
The plant has taken an integrated approach to environmental management from the beginning, with the design of the physical plant incorporating a high level of
environmental protection. This is a reflection of the vision of the CEO who has been responsible for PharmaCorp from its conception and was given free reign in the physical plant design and management structures.

When I joined … I spent four months living in Japan on my own. The mandate I had was 'look, come over, have a look at what we are doing, see what we are doing, and put together an organisation'. And what I did was in the last month really sat down and put the structures together and incorporated within that would have been the environmental aspect of the business.

The management approach at PharmaCorp is characterised by a strong sense of ownership and responsibility for its own future. This is a reflection of Japanese practice in the management of subsidiaries.

In [PharmaCorp] it is not like a big American multinational, they will support you but you do it; that is the difference. Direction is … very much left to the team that is working on it. There is a clear policy on what you do; how you do it is your responsibility.

Environmental responsibility was integrated into the management structure of the new operation.

What I was able to do was to put together a management structure and incorporated within that would have been the environmental aspect of the business … By actually incorporating it in there and putting it in each department rather than saying 'I am responsible for the environment and you will help me to do it.' We don’t actually have that; every department has its own environmental side to it.

The original organisational design aimed to diffuse environmental responsibility throughout all departments and represented an early commitment to the development of learning. Practices to support integrated responsibility and environmental learning opportunities included removing the distinction between environmental and production operators, and making sure that all operators have some experience of the environmental processes.

People come in here one thing, and they change completely over the years, because it is a small team and they want to learn. Even with our operators, we move them around quite a lot and some companies would give their right arm for that, in other companies the operators would say, well we want more money for doing that. Here if you tried to stop it you would have a problem on your hands.

The plant’s early and proactive involvement in environmental management has been recognised with national and international awards, including in 1990 the European Community and United Nations Award for Good Environmental Management. This led to an invitation to become part of the pilot study for the EU Eco Management and Audit Scheme (EMAS). The company was the first pharmaceutical company in Ireland and the UK to be accredited to the BS7750 environmental management standard. The company was accredited to further
environmental management standards, the international standard ISO14001 and the European standard EMAS. The early recognition of their environmental management was a significant encouragement and validation of their approach:

A good thing happened to us, back in 1989 we won the good environmental management award, in Ireland, and … we went on the next year to win the European award, and that was a very good thing for the factory here. People knew that they were the best, and when you are the best what do you do? You try and hold onto it, and you don’t hold on to draw, you hold on to excel. That has stood us in very good stead.

**Implementation of cleaner technology**

The plant is rare in its use of a systematic approach not just for management of treatment and monitoring but also for planning and implementing waste reduction. The plant was able to use the involvement in the EMAS scheme, and the external expertise provided to develop a strong EMS – and most significantly a thorough understanding of the plant’s environmental impacts through the development of the EMAS site profile. As part of the EMAS pilot, the company prepared a site profile that identifies and quantifies ‘how does [PharmaCorp] interact with the environment’ [EMAS Statement 1997](#). The understanding gained from the site profile has been crucial in driving the plant’s program of cleaner technology projects. By identifying and prioritising impacts it has encouraged the plant to explore projects in areas outside its past experience, developing new technical skills and wider future options. The CEO identifies ‘routine setting of new environmental targets and objectives with subsequent evaluation of performance’ [Sheerin 1997](#) as one of the core elements of the plant’s EMS.

We would set ourselves objectives every year, the whole group would be involved in that, myself included. We would go through what we did in the last year. Unfortunately management sometimes concentrates on what is ahead and forgets to look back and see what did we do. We will have set ourselves pretty reasonable but demanding challenges for the next year … and sometimes we fail, but we record that as a deviation, that’s life.

The systematic use of the site profile to plan future work, but also to review and consolidate past achievement has encouraged PharmaCorp to explore environmental improvement in many directions, not just in the area it was traditionally strongest in, environmental technology for containment. The plant has accumulated problem-solving knowledge capital, built on routines for problem identification, information gathering and solution generation. Using this capability the plant has undertaken projects in a broad range of areas: clean technology, solvent recovery, solvent recycling, resource use reduction and material substitution. The current projects being driven by the site profile are utilities reduction projects and waste minimisation in production.

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1 PharmaCorp’s EMAS Statement, 1997
An energy profile carried out by the Clean Technology Centre (CTC) at the Cork Institute of Technology has set the priorities for utilities reduction work. The plant has put in place cross-functional routines for developing a thorough understanding of site energy use and generating a broad range of solutions. A site Energy Group has been formed, with members from engineering, environmental management, environmental systems operators and R&D. Overall energy consumption (gas and electricity) per tonne of product was reduced by 33 per cent in one year.

Projects included:

- a boiler plant and control system
- a condensate recovery project; waste heat recovery from the incinerator
- improved efficiency of refrigeration plant.

Water meters were installed and a water mass balance calculated, in conjunction with advice from the CTC. This revealed that the site was a very high user of mains water. PharmaCorp has made changes to substitute well and rainwater for mains water use, where possible. The introduction of condensate recovery and a new cooling tower achieved a reduction in mains water use of 7.2 per cent, as well as improved energy efficiency gains. Further water reductions of 20 per cent are being pursued through a project to recycle extra cooling water through the new cooling-tower system; this project has experienced some difficulties.

**Developing capability in process development**

In the area of waste minimisation, in 1994 PharmaCorp undertook its first solvent elimination project, to explore the removal of very toxic solvents, toluene and methylene dichloride, from the production of nicardipine. This project is a good example of how management at PharmaCorp are prepared to undertake projects in areas outside its familiar activity and competences. Historically PharmaCorp has had limited opportunities to undertake process development projects. The company is not typically a start-up plant for the production of new products, but receives established products and technology from the parent company. The work of R&D has been confined to process optimisation (minor adjustments to process conditions) and exploration of recovery, and as the plant produces only four products, there are limited opportunities even for this type of work. The solvent elimination project involved collaboration between PharmaCorp, the parent company and the CTC in Cork. PharmaCorp carried out the lab work, and successfully demonstrated solvent elimination in the pilot plant.

PharmaCorp sees the real achievement of the solvent elimination project as being in building capability and experience. This contributes to the plant’s strategic commitment to create a process development capability at PharmaCorp. The plant has a direct relationship with its commercial customers (licensees) and works hard to maximise the value and therefore profitability of these relationships to the company. Although typically PharmaCorp has not been involved in process development, the CEO took the decision that expertise in this area was important.
to maximise efficiency of production but also as part of the CEO’s overall strategy for the evolution of the plant. To this end, PharmaCorp opened its new Manufacturing Technology Building. It is intended that this will increase the involvement PharmaCorp have in R&D and process development:

That is something which we are now facing up to … where we are heading at the moment is to lift the intellectual capacity of our organisation, and that is process development.

PharmaCorp is heading into a period of expansion, with a number of new products being introduced to the plant. The new group’s function will include the improvement of existing products, including environmental impacts. Process development work pursued for environmental goals, using external and corporate expertise, is cited by the CEO as having had a role in building the skills and experience within the plant that will now support a Process Development function. In the development of this facility the plant’s capability for maximum learning is again expressed:

What I have tried to do in this building is I have put a load of chemical engineers and a load of chemists in, in the belief that they can talk to one another, work together.

A waste minimisation group was formed to identify waste minimisation opportunities through process development, based on priorities identified in the site profile. The company feels that it has learning, experience and physical resources to make this initiative feasible. This is an area in which the plant will again be ahead of practice in the parent company, and PharmaCorp anticipates that this group will act as a corporate resource so that the benefits of their learning can be shared within the company. The change is driven by commercial factors, to offer a better service to commercial customers:

It is extremely important for us at each and every opportunity, and with my own staff I emphasise that point, for us to be more efficient.

PharmaCorp’s strategy is to develop the plant’s importance and competitiveness by developing its relationship with its commercial customers and upgrading the quality of the service they offer:

If you take the evolution of a plant like ours: you are kind of a local manufacturer supplier; then you become a contact point for your customers and you add value to the system; then you start developing the directed approach of supporting your customers.

Role of external help

Maximising the learning capability of the plant is central to the CEO’s management strategy. Another commitment that the firm has made is to avoid the use of external consultancy.

We try and avoid consultants …, we try and do as much as possible ourselves.
For example, the company did not use any external consultants in their preparation for ISO9000 or ISO14001 accreditation. The company draws a distinction between consultancy advice and accessing and internalising external knowledge. If they need external expertise, they ensure that it is used as an opportunity for learning within the company.

Where there are areas, what we do there is rather than sending out people to do these courses we would bring in the leaders, wherever they may come from, here. We will put in a bunch of maybe 10 people, people that may not have any great bearing on that but who would like to learn … So our competency is increasing all the time.

PharmaCorp is committed to accessing fundamental research in order to increase its environmental capability and has a policy of working with research institutes to increase knowledge of environmental technology. It is a founding member of The Clean Technology Centre at the Department of Chemical Engineering in Cork Institute of Technology. It is also a founding member of Questor, a research centre based at the School of Chemistry, The Queen’s University of Belfast. PharmaCorp has worked with these and other institutes to develop understanding and solutions to particular environmental problems.

Summary

A strong sense of ownership can be seen in both commercial and environmental management decisions that, while challenging in the short term, are important for the plant’s long-term development. The plant has a high awareness of its external (commercial and regulatory) environment and puts effort into planning. This has allowed it to anticipate changes such as new stringent environmental PCI legislation. Importantly for a small company, it is then able to absorb new requirements at its own pace and according to a planned program that allows it to maximise the learning opportunities associated with new developments. This attitude is partly a reflection of the self-directed management style, and the management style of the parent company.

If you are working in the likes of [a US pharmaceutical multinational company] and you are going to build a new plant, well before you know where you are you will have whole team of experts out there. We don’t have that. But what is has allowed us to do, we have had to work harder, we have had to build up our own expertise in many areas that people would not have been qualified or trained on. That’s actually good, it has added a little bit of excitement, and the knowledge base.

The company has a very good record of compliance. In 10 years of operation it has never received a complaint from the public. In records kept for the FDA it has recorded only one quality non-conformance. The plant has 100 per cent compliance with the emission standards in their environmental PCI licence. A benefit and reinforcement of their environmental strategy has been the increased standing that it gives them within the corporation.
The Japanese would not have had a very clear view on environmental issues … They had on certain areas but not to the extent that we have now here. And in fact a lot of them now would be copying our systems. As well as the technology coming in we are actually exporting it out… For instance we didn’t use any consultation on the ISO1400, or ISO9000, we did it all in-house. We are now actually giving these data to some of our sister plants around the world. And we would be seen by the parent company as being leaders in that area.

As well as having a commercial importance, competitiveness is important to maintain the plant’s standing within the corporation and to ensure that the plant is selected to produce future products. The integrated nature of the plant’s environmental capabilities is reflected in how they support and are supported by more general competitive capabilities.

Don’t worry about the competition outside … Worry about your own internal competition … We are here to try and bring them [the parent company] more business, more added value business, and that is what it is all about. Why should they give us something if we are not competitive?

PharmaCorp has a strong, integrated and broad-based array of environmental management capabilities founded on the strong dynamic capabilities for learning and planning that underpin all of the firm’s activities. Common to all decisions about future activity is the plant’s concern to anticipate and plan change in a way that ensures that the change can be absorbed at a pace that allows for the maximum leverage of learning and experience within the firm. These deliberate efforts to ‘lift the intellectual capacity of the organisation’ result in a wider array of strategic options in the future. Environmental management at PharmaCorp is not characterised by the development of any particular technical capability, but by the importance placed on integrative organisational processes for generating learning and deep understanding throughout the facility. This can be seen in the most recent plans for future expansion, and in the CEO’s description of the development of environmental management at the plant.

Discussion questions

1) Dynamic capability is the capability to identify and acquire new capabilities. Dynamic capability is underpinned by ‘search routines’ – routinised processes within companies that are aimed at changing other processes. What are the search routines that you can identify at PharmaCorp?

2) An early contributor to capability theory, Edith Penrose (Penrose 1959) developed the concept of ‘image’ – she believed that the management’s perception of future paths open to the company is a reflection of the plant’s current capability set and past history. Do you think PharmaCorp has a perception that affects its dynamic capability?

3) What would you say are the broad categories of dynamic capability as seen at PharmaCorp?
4) How has dynamic capability in environmental management benefited PharmaCorp overall?

References: