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New Product Development Processes in The Australian FMCG Industry

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ABSTRACT

This paper presents a study of new product development (NPD) processes in two large Australian organisations (National Foods and Lion Nathan) involved in the production of fast moving consumer goods. The research utilises the Australian Business Excellence Framework as a research lens for exploring NPD processes with a focus on the role of sales and operations management. A case study approach used data collected from employees in the two organisations who were involved the NPD process. The results showed a number of significant differences between the two organisations in the conduct and the effectiveness of their NPD processes. Although both organisations employed a formal Stage-Gate process, Lion Nathan did this more successfully than National Foods, perhaps because of Lion Nathan's greater experience with using stage-gate methodology. This study highlights the importance of the role of sales and operation planning, especially in relation to collaborative demand forecasting. The importance of the leadership role was also evident particularly in relation to ensuring measurement, review, and improvement of NPD processes.

Keywords: New Product Development, Sales and Operations Planning, Stage-Gate, ERP, FMCG

INTRODUCTION

The efficient and effective introduction of new products into the marketplace is a way in which many organisations can gain significant competitive advantage. Product innovation is a mechanism companies use to head off competitors who are also releasing new products into the marketplace, to grow market share or grow the total market, and to obviate the need to compete on price alone (Stawicki, 2010). This is especially true in the manufacture and supply of fast moving consumer goods (FMCG) such as food products. Although various new product development (NPD) methodologies have emerged over time, the Stage-Gate model developed by Cooper (Cooper, 1990) is arguably the best known and most applied in practice, usually in a customised form to suit the user organisation. The model provides a roadmap for new product development based on the common processes followed by companies and project teams that execute NPD well. The basic Stage-Gate model consists of a series of sequential activities called "stages", e.g., stage (i) - concept development; stage (ii) - building a business case; stage (iii) - product development, stage (iv) - testing and validation; stage (v) - product launch followed by a post launch review. A promising idea for a new product that enters the NPD process is evaluated at each stage and either allowed to proceed through the gate to the next stage or the gate is closed and the project either terminated or shelved.

This research examined the role of sales and operations planning (S&OP) in the NPD process. S&OP is concerned with making key decisions related to balancing supply and demand. Key concerns in S&OP are setting production dates and production quantities, establishing inventory policy, and responding to deviations from plan. Sound S&OP decisions are critical to NPD success, but this is not easy due to the uncertain nature of some of the NPD processes. Demand forecasting for new products is particularly challenging (Simon, 2009; Herrin, 2010). Tensions related to S&OP decisions can also arise between members of the NPD team due to tight deadlines and different perspectives of what needs to be done. We found relatively little research that specifically addressed the role of S&OP in NPD processes, and thus identified this topic as being worthy of further study. There are three major issues in introducing new products (Hilletofth and Eriksson, 2011). First is introducing a product that appeals to the marketplace, second meeting customer expectations on delivery of the products to the market. The third issue is the reduction of the cycle time from conception of the idea to delivery of the product. This research focuses on the second issue, that is, the setting and realisation of customer expectations on delivery to market.

LITERATURE REVIEW

The introduction of new products into the market place is a key activity for fast moving consumer goods (FMCG) based companies. NPD fits within a range of activities that firms use to grow market share within the existing market, or to grow the total market for their products. These activities include product improvement, extension to existing product lines, developing new uses for existing products, targeting new markets and finally, the most costly and risky is the introduction of new products (Kahn, 2009). Since its inception, the Stage-Gate model has been intended as a road map for projects with room for some flexibility, e.g., parallel processing in stages to shorten project completion times (Cooper, 1990). Over the years, due to significant usage, the model has become more refined and flexible. These changes are reported in the literature particularly by Cooper, who is the originator of the Stage-Gate process, and his colleagues (e.g., Cooper, 2008; Cooper and lion, 2008; Cooper 2009; Cooper and Edgett, 2012). Improvements have been made to areas of weakness such as project management, governance and decision making processes at the gates including the use of fuzzy logic (Samra, Lynn, and Reilly 2008). Flexibility has been increased in several ways to improve outcomes and to speed up the NPD. For example, projects of low complexity and risk are undertaken with fewer gates to speed up the process, and overlap of processes both within stages and between stages can be undertaken without necessarily requiring complete information. Active improvement of the NDP is encouraged using techniques such as value stream mapping. The following examples illustrate features and practices in the NPD process that would generally be supported as 'good practice' by the literature (e.g., Cooper and Edgett, 2012). Senior management should take an active leadership role and provide adequate resources for project teams. Project teams should be multidisciplinary to provide the required skills and appropriate representation from parts of, or functions in, the organisation. Brethauer (2002) prescribes the cross-functional team as the ideal structure for NPD project teams, and that typically such a team might involve representatives from R&D, engineering, manufacturing and marketing. This is particularly important to achieve a consensus on a product launch forecast (Park, 2008; Harrison, 2009). Where appropriate, customers and suppliers should have input into the NPD process although protecting intellectual property may inhibit the extent of this input. Hilletofth and Eriksson (2011) suggest taking a supply chain view to select appropriate contributors. It is important to achieve high quality decision making and discipline at gates. In order to achieve this, involvement of senior management in gate design and decision making is advocated. The gate assessment criteria should be clear and objective and supplemented with a scorecard method (Cooper, 2009; Cooper

and Edgett, 2012). Many organisations are now using Enterprise Resource Planning (ERP) systems which not only support cost control, but also appear to support new product development and introductions (HassabElnaby, Hwang and Vonderembse, 2012). The literature highlights the factors that need consideration at various stages of the NPD process (e.g., Søndergaard, 2005; Cooper and Edgett, 2012**)**. The early stages of the NPD process involve product conception and development. Economic justification and rigorous testing is important to support the business case. Definition of the objectives and deliverables of the NPD project is also identified as a critical step and assists in focusing the project team. Goals can be market-oriented or financial, and should be specific, measurable, achievable, realistic and time-specific (SMART).

In the Australian FMCG market where market power in the retail sector is highly concentrated, it is particularly important to involve customers in the design and planning processes at an early stage. Key suppliers should also be involved, for example, for food product factors, such as drought and seasonality in the agricultural industry, that affect the availability of core raw ingredients, such as milk and fruit. Brethauer (2002, p.46) makes the point that the exposure to financial risk is lowest at the earlier phases in the project, and that the right time to engage a wide range of resources is at the beginning, in what he refers to as “front-end-loading”. Any design or logistical issues are better discovered in the early stages, rather than when escalation of commitment becomes an issue. Similarly, Kumar and Krob (2005) observe that one of the characteristics of better NPD performers was the investment of resources in the up-front steps in the process. Slotegraaf and Atuahene-Gima (2011) suggest that organisations should attempt to form a strong cross functional project team at the start and limit changes throughout the project.

As a product nears its launch, planning becomes a critical element in determining its success. Failures in planning processes can have a myriad of consequences – stock-outs, higher than necessary inventory costs, and disposal of out-of-date product. In NPD, S&OP is responsible for establishing production targets and ensuring planning of manufacturing and procurement to meet those targets. This is not just an issue of balancing supply and demand but to investigate various options related to profitability S&OP (Muzumdar and Fontanella, 2006). Therefore, effective S&OP is of great importance especially in the latter commercialisation stages of the NPD process.

However, the literature indicates two significant barriers to effective S&OP within the NPD process. First, demand forecasting is especially difficult for new products that cannot be modelled on demand for existing products (Kahn, 2009). Second the literature (e.g., Hilletofth and Eriksson, 2011; Galluci, 2008; Slotegraaf and Atuahene-Gima, 2011) highlights tensions between functions such as marketing,

sales and operations, leading for example to biases in debates over launch volumes. Dougherty (1992) studied barriers to successful product introduction and discovered several key personnel problems in developing and launching new products. She found that different functional groups such as technical, sales and operations have their own "thought worlds" that lead to them approach problems from different perspectives. Also, there was a tendency to under value the views of other groups and for different groups to have differing perspectives of the future. From a planning perspective this might manifest itself in conflict between what "might" happen (marketing) versus what "can" or "should" happen (operations). Herrin (2010) illustrates some outcomes from these intergroup tensions. Marketing may tend to promote their advertising and research, leading to upward pressure on forecasts. Sales may tend to be more conservative in their plans on the basis that their rewards are based on meeting or exceeding their sales budgets, and in some cases on the accuracy of their forecasts. Operations may tend to be more focused on issues such as reduction of inventory levels and, in the case of short-life consumer goods, prevention of finished goods stock losses balanced with the requirement to avoid shortages.

The complexity of decision making in NPD is further complicated by the way progress reports are interpreted. Van Oorschot *et al***.** (2013) researched the process and consequences of team decision making in NDP. They found that a bias towards a favourable interpretation of project progress can occur when teams are given a mix of good and bad news; good news easing the pain of bad news. They show how this information filtering effect compounded by group think can lead to decisions that negatively impact a project, consequently producing delays or unrealistic expectations.

Olson, *et al***.** (2001) investigated cooperation between marketing, operations, and research and development (R&D) at various stages of the NPD process. They found that there was a greater level of cooperation between marketing and operations and R&D and operations at the latter stages of NPD (commercialisation stages). Early stage cooperation between marketing and R&D and operations and R&D was associated with improved project performance irrespective of the degree of product innovation. Late stage cooperation between marketing and R&D and operations and R&D was of key importance in project performance for innovative products, but not for non-innovative products. Although their findings reveal a more complex situation than expected, they support the importance of cooperation between these functional groups for project performance. In the case of S&OP, cooperation between marketing and operations is particularly important.

METHODOLOGY

A case study approach was chosen in order to obtain a sufficient level of detail and understanding of context with a limited number of subjects (Yin, 2008). The field study comprised targeted, semi-structured interviews across the two case study organisations in Australia. Both organisations are in the FMCG industry. The first organisation is National Food and the second organisation is Lion Nathan. National Foods and Lion Nathan operate as separate business units of Lion-Nathan National Foods, a subsidiary of Kirin Holdings. Both organisations at the time of this research were undergoing restructuring activity, including consolidation of shared services. Lion Nathan and National Foods employ approximately 8,000 people in Australia, Singapore and New Zealand.

National Foods since 1991 has expanded through the acquisition of other players in the food and beverage industry, most notably Berri juices in 2005 and major competitor Dairy Farmers in 2008. Examples of key brands across a wide range of milk, dairy food, cheese, and juice offerings are Dairy Farmers, Big M, Yoplait, Australian Gold and Berri (www.natfoods.com.au). Lion Nathan was formed in 1988 from a merger between New Zealand retailer LD Nathan & Co (with a history going back to 1940) and Lion Breweries of New Zealand. Lion Nathan's headquarters was transferred to Sydney in 2000, and its listing from the New Zealand Stock Exchange to the Australian Stock Exchange. Figure 2 shows a list of the major brands to which Lion Nathan has the manufacturing and/or distribution rights in Australia and New Zealand. Examples of major brands of beer and wines that Lion Nathan has the manufacturing and/or distribution right in Australia are Tooheys, Steinlager, Heineken and Ridgewater Mill (www.lion-nathan.com.au).

The participants were a mix of supply chain planning specialists, innovation managers, and operations specialists. The participants, upon agreeing to participate, were emailed a list of general questions. Interviews were then conducted with each individual. Where consent was given, the interviews were recorded. Both organisations have given the authors permission to reveal their identities in publications in academic journals. At National Foods, interviews were conducted with seven key managers who were intimately involved in the new product development process. Three of the major products produced by National Foods were investigated in relation to new product development performance. Three key managers involved in new product development were interviewed in Lion Nathan. The objective of the interviews was to obtain data on issues surrounding NPD, namely:

- Participants' perspectives on whether or not the NPD process is effective in delivering timely and accurate information to them, in order to facilitate the creation of timely and accurate operations plans;
- Participants' perceptions of the general effectiveness of the NPD process, whether it is consistently executed and whether it has a built-in self-improvement capability;
- The process behind developing and proliferating the launch forecast; and
- The ability to effectively plan the operational requirements for a successful NPD launch (and implicitly the requirement to define and measure success).

This research utilises the Australian Business Excellence Framework (ABEF) as a research lens for exploring NPD processes in the two case organisations (www.saiglobal.com). The ABEF is a broad based business improvement model which is similar to other excellence models, such as the European EFQM excellence model (Evans and Lindsay, 2010; www.efqm.org). Drawing on the literature, the high level ABEF categories selected as most relevant for this research were: leadership; strategy and planning; people; processes; systems and data and results. Figure 1 below identifies the congruence between the ABEF categories and sales and operations planning concerns at different stages in the NPD process. For each of the ABEF categories, key characteristics of an effective process are shown at the position in the NPD process that requires them. This analysis guided the development of the interview questions.

	Concept	Launch	Post-Launch
Leadership	Top-level endorsement of consensus forecast process Investment in systems and training		Leadership of process-improvement methodology Management of accountability for accuracy of forecasts
Strategy / Planning	Methodical translation of financial / and market-driven strategic plans into operational requirements	Early involvement of suppliers and customers in the planning process	Consistent methodology for tracking launch forecast accuracy and customer service levels
People	Use of cross-functional NPD project and S&OP teams		
Processes	Use of S&OP process including demand, supply, pre-S&OP and Exec. S&OP meetings		Methodology for capturing lessons-learned
Systems / Data	Data to support launch forecasts based on similar products Timely and accurate entry of Master Data to enable backwards-scheduling		Systems to measure performance metrics (Forecast Accuracy and customer service levels)
Results		Consistent methodology for tracking launch forecast accuracy and customer service levels	

Figure 1 Key S&OP concerns at each phase in the NPD Process

FINDINGS

The findings at National Foods and Lion Nathan are presented concurrently by issue.

National Foods implemented the NPD Gateway process in early 2010. The Gateway is based around Cooper's Stage-Gate methodology and comprises the following five stages with a gate between each: i) concept; ii) feasibility; iii) business case; iv) launch and post launch review. The concept stage focused on customer insights and market fit, and the feasibility stage prompted the project leader for additional data on return on investment and explicit assumptions underlying the commercial and market business proposition. A range of issues related to logistics, procurement, and technology and innovation were addressed at gate 2 of the feasibility stage. The business case required more detailed data on activity to support the launch and its readiness from a commercial perspective. Launch occurred after verification that all the requirements have been met. For example, the ERP system (SAP) must have the necessary information, such as material codes and bills of materials entered, and the launch forecast must also be signed off and entered into the system.

Lion Nathan also used an NPD methodology based on Cooper's Stage-Gate since 2005, when it replaced the previous poorly performing process. Two alternatives were available in the NPD navigator online tool that supported the NPD process. A 5-gate process was used to for completely new projects, and a 3-gate express process for line extensions and low risk projects (Cooper and Edgett, 2012). The decision on which route a project took was decided at a monthly gate meeting. The 5-gate process consisted of the following five stages: i) exploration; ii) design; iii) commercialisation; iv) production and v) launch. The 3-gate process consisted of the following stages: i) design; ii) commercialisation and product and iii) launch.

The Role of Leadership in The NPD Gateway

At National Foods, project leader was not a formal role, but was usually occupied by someone from marketing. The key leadership qualification was passion for the project, and it was thought that the wealth of experience that National Foods had in NPD combined with a more-or-less rigid gateway process would result in project success. While there was a defined methodology for progressing from concept to business case at National Foods, once the case has been approved the process became less rigid. It was suggested that this flexibility sometimes had negative consequences: on occasions projects had been pushed through by the senior management team who may have been unaware of the stress this placed on the system. It was evident that a

substantial investment of time had been made in defining the Stage-Gate process, suggesting strong support from the senior leadership team. However, the process was applied inconsistently, either within or across business units. There was enough rigour around the development phase, but rushing new products to launch creates problems such as the need to place urgent orders on suppliers, reprioritise production urgently, and rush data management processes to the point where many of the launch tasks become last-minute exercises, resulting in the entire launch phase unfolding under extreme stress. One manager commented:

> *"So when you talk about time to plan production, storage capacity requirement and all that stuff, I do think it's done on the run, seriously. […] To me, when you look at it from a distance, we run this very well, but it's not because of good management."*

A key concern in the application of the Gateway process was the measurement of results. For several reasons, the post-launch reviews are often not completed, preventing both objective assessment of the success of the project and precluding an organic self-improvement process. Comments from two managers illustrate:

> *"There are supposed to be three reviews. As far as I know, there aren't many that happen. […] That's because people have moved on. We've now got one-hundred-and-ten things to do, that doesn't include launch reviews and current projects, so we fight really hard to ensure that reviews happen. Sometimes they happen, sometimes they don't, and therefore the learnings aren't well captured."*

> *"More often than not, the project didn't meet expectations of business case, and very rarely do we get numbers that work, so there's a natural […] reluctance to go back and review what went wrong."*

The lack of traction in seeing the review process through seems to be caused by a combination of overwork and avoidance. Some causes could be a mixture of a simple lack of resources, an organisational or project structure which does not support rigid adherence to the review framework, or a lack of support, or perhaps enforcement, for compliance-to-process, which would need to come from the higher leadership tiers.

At Lion Nathan, the Stage-Gate process was also clearly defined and understood by those responsible for using it. In contrast, at National Foods a continuous improvement mechanism was in place, and this is evident in the Stage-Gate that they use. The process has undergone a number of improvements since its inception. These

improvements are the result of a formal process with participation across all parts of the business involved in actually using the gates. A comment from a manager illustrates:

> *"The gates are actually quite formal in terms of what documentation we need to come back with – I guess it's quite structured in terms of what needs to be answered at each gate before it gets processed to the next stage [...] It's quite strict, the way we go about it."*

The process was supported by two tools – the NPD workflow tools and the NPD navigator. An indicator of support from the leadership team was an active continuous improvement mechanism to which all parts of the business had contributed.

Strategy and Planning in NPD Projects

At National Foods, the Gateway is universally acknowledged as a sound process for its purpose, but three strategy and planning-related problems are evident. The first of these was the large amount of peripheral activity surrounding NPD projects, which often is the case in any complex business. This is especially true when activities such as consolidation of the manufacturing and distribution network are undertaken. The second, possibly related to the first, was slow decision making which resulted in a rushed commercialisation phase.

> *"We tend to be really lethargic in decision-making – As often as not, the Business Case is being signed at the last possible moment before packaging is being printed. […] We often find there's no room for a launch paper before the product is launched."*

This meant that the launch gate (Gate 5) did not function effectively. To use Cooper's (2009:48) phrase it acted as a 'tunnel", not a "funnel'. The consequences of rushing the launch phase vary, depending on the circumstances and factors, such as production lead-times and shelf-life. In the case of longer lead-time products, late changes to the production schedule meant resources needed to be reallocated and other products may not be supplied to the customer. The third key fault centres on the credibility of the launch estimates contained in the Business Case, particularly in the absence of a 'one number' forecast.

> *"The original Business Case [forecast] is invariably lined up with a budget need, but usually as projects reach their maturity, as you move from Business Case to*

launch and more information becomes available, they may or may not line up with the original budget need."

Due to the nature of the brewing industry compared to dairy, Lion Nathan had fewer NPD projects than National Foods and operates in a more mature market and organisational environment. There were fewer requirements in the brewing industry for new products. Lion Nathan also had a significantly less complex distribution network than National Foods. This allows for faster decision making. The process of developing launch forecasts was arguably better integrated than at National Foods. At Lion Nathan, there was a defined methodology around progressing from a preliminary forecast at stage 1 to a top-down forecast at stage 2 to a Bottom-up forecast at stage 3. The methodology stipulated the inputs, process, and outputs into the forecast at each stage, the key players, and their role in the process. As distinct from National Foods, the Demand team was involved from stage 1. This produces a coherent forecasting process with the key deliverable being a "one-number" forecast at each stage, which is recommended approach (Park, 2008). Operations employees were involved early in the planning process (stage 1 compared to stage 3 at National Foods) consistent with the idea of 'front-end-loading' prescribed in the literature (Brethauer (2002). There was a well defined process, supported by an Excel-based charting tool for managing the sequence and timing of product launch activities, e.g., sign off of artwork, manufacture of packaging and distribution.

People Involvement in NPD Projects

At National Foods, a key people challenge to consistent application of an NPD process was high staff turnover, which seemed to be a particular associated with the marketing profession. This appeared to contribute to the lack of review of NPD projects after the launch was complete as the following manager's quote illustrates:

"We still struggle to take all our learnings and grow from there. We have a great rotation of marketers, and they're invariably project leaders, and when you're rotating through people so quickly, you tend to not get as good a transition of knowledge, and as often as not the people who launched the project are not there after twelve months, for a number of reasons – not usually because of [poor] performance, usually because the opportunity is there and they leave, or they change their focus, so continuity of people in some spaces is more challenging than others"

At Lion Nathan a key point of interest was the participation of a dedicated NPD Operations Manager in the gate meetings. The role of the NPD Manager was to ensure that the operational requirements for product launches were satisfied and that the NPD launch would not put the supply network under stress. The NPD team's involvement also provides for the proliferation of information about NPD projects to the breweries. Gate meetings were attended by a cross-functional team including representatives from marketing, sales, finance, and operations, with optional attendance from a number of other areas of the business. The involvement of operations in the gate meetings allowed Lion Nathan to respond in a timely, ordered way to urgent changes due to external conditions, such as a change in competitor actions.

Also, as mentioned previously, the involvement of the demand team from the first gate onward facilitated a coordinated progression of the launch forecast from a speculative preliminary one to a robust bottom-up forecast at the business case. The transparency of assumptions and the explicitly defined review stages had a positive influence on operations planning. As one manager put it:

> "*There are variances between the [forecast at] different gates depending on the level of detail and who we're engaging with to come up with the forecast, but it's trying to maintain the same assumptions throughout and the challenge is around the assumptions rather than gut feel and I think that adds a lot of rigour to the process*".

The Stage-Gate Process

All the participants from both National Foods and Lion Nathan agreed that the introduction of the Stage-Gate was a step in the right direction. The process has served to institute a mechanism which was accepted by all parts of the business responsible for NPD activities, where previously a published and widely proliferated process did not exist. At National Foods, a drawback to the usefulness of the NPD process was the lack of a "one-number" forecast, which is a prescribed deliverable (Park, 2008). A robust discussion around launch forecasts based on differing agendas and perspectives is expected. However, it did not result in a forecast that aligned to both business objectives and the requirements of S&OP, which is one of the deliverables frequently prescribed in the literature.

This is another area where there was divergence in both practice and outcomes in the two participating organisations. By contrast, the more mature NPD process at Lion Nathan appears to be closer to best-practice as prescribed in the literature, both in theory and in practice. From an S&OP perspective, the key points of note are:

- The activities at each stage are defined both in an NPD Navigator and in an NPD Workflow tool. Projects do not pass the gates if the required information is unavailable, while the tools provide all the support required for members of the venture team to compile this information;
- The accountability for information at each stage is stipulated in the workflow, according to RAPID (Recommend, Agree, Perform, Input, Decide). The RAPID matrix for each stage is defined in the *NPD Forecasting* matrix used by the Demand team; and
- A continuous improvement mechanism is evident from the fact that Lion Nathan has evolved the Stage-Gate since its inception by way of formally updating the process.

Systems and Data

Both organisations had chosen different approaches in their ERP strategy. National Foods had an integrated approach to planning using SAP for all key business functions. Each of the SAP modules covering functions such as sales and distribution, human resources, procurement, production planning and finance and controlling was designed in a fully integrated way. Because of this integration and the way the SAP system worked timely data, entry for tasks related to activities like ordering packaging and the launch forecast needed to be completed on time. As mentioned, the finalisation of the launch forecast was often subject to delay, and there were significant flow-on effects. Given that packaging manufacturers typically require up to three months lead time to supply, it is clear that much of the work in NPD at National Foods is done off-system. The result is the type of “scrambling” to which several participants refer. This may be an endemic issue with highly integrated ERP systems such as SAP.

Lion Nathan’s approach was to use separate systems that are chosen carefully to match their requirements; these include systems for forecasting, production planning and sales and distribution. While this approach lacks the integration of SAP, resulting in some duplication of effort maintaining some records across multiple systems, the lack of interdependency has the advantage of increased flexibility. This flexibility allowed decisions to be made without necessarily having all approvals up to date. Although not necessarily desirable, this type of flexibility proved effective in terms of NPD process performance. Inflexibility leads to learning failure, and this effect is worsened when the technological environment of the firm is turbulent (Sethi and Iqbal, 2008). Learning failure adversely affects the market performance of new products.

Measurement in the Gateway

It was unanimous among the participants at National Foods that the review process stipulated in the Gateway was applied inconsistently. A further problem relates to consistency in the performance measures used to assess the success of NPD projects. Project leaders measure performance against business case, whereas S&OP measures forecast accuracy based on actual sales versus the forecast in SAP, which are often different numbers.

Project performance at Lion Nathan was measured in a more comprehensive way than at National Foods. Commercial success was measured by comparing performance against the business case in a post launch review. Forecasting accuracy was assessed differently, for example, unlike National Foods, at Lion Nathan, there was a defined methodology around progressing from a preliminary forecast at stage 1 to a top-down forecast at stage 2 and then to a Bottom-up forecast at stage 3. Further, at Lion Nathan operations success was measured in a number of ways, for example, the elapsed time between the business case approval and launch was a key measure used. In addition, the operations team also measured customer service levels. This data was useful in improving the NPD process. The elapsed time between the business case approval and launch was a key measure used. The operations team also measured customer service levels. The data collected was useful in helping to improve the NPD process.

CONCLUSION

The purpose of this study was to evaluate the NPD processes at both subject organisations against the practices prescribed in relevant literature on new product introduction, using the Australian business excellence model as a basic framework. Both organisations have implemented a Stage-Gate process, as have many leading organisations whose businesses depend on innovation. Both had done so after experiencing difficulties from failed NPD projects resulting from of a lack of discipline in their former NPD processes. Both considered the change to have been beneficial.

Of the two cases, Lion Nathan had been using the Stage-Gate process for longer, and arguably, in a more mature market and in an environment less affected by organisational change. The logistical issues for Lion Nathan were also less complex than for National Foods. Nevertheless, it is evident that the Stage-Gate was used in a more methodically and effectively by Lion Nathan than by National Foods. The literature has proven useful in defining what might be considered best-practice in executing NPD projects. Several gaps are evident when comparing best practices with

current practices at both organisations, although these are more evident in the case of National Foods. These gaps are discussed below with some suggestions for improvement.

Participants acknowledged that practice at National Foods did not support agreement between representatives from demand, sales, marketing and operations on launch forecasts. No process currently existed to facilitate the creation and proliferation of a true consensus forecast, as advocated in the literature. The lack of reconciliation between the strategic business plan forecast and the later 'bottom-up' launch forecast resulted in problems.

There are two useful prescriptions in the literature:

- Facilitate the creation of a 'one-number forecast' by developing a mechanism for demand planners, S&OP managers, and innovation managers to agree on a launch forecast. This may include mandatory meetings as part of the NPD Gateway or appropriate organisational changes; and
- Business systems can also assist the collaboration between forecasters, S&OP, and marketing. For example, a business forecasting tool such as SAP Business Intelligence Warehouse can be configured to suit this purpose.

As noted earlier, National Foods had struggled with managing data through the NPD process, resulting in scrambling to get production plans and material requirements into SAP and performing activities such as raw materials procurement and work in progress planning off-system due to lack of the right data at the right time. Lion Nathan to some extent avoided this problem by virtue of the lack of dependencies between the finance, planning and transactional modules. Solutions might include:

- The use of 'development' master data records which can trigger planning, but no procurement would allow visibility of materials requirements without the dependency for pricing or costing to be finalised; and
- Coordinating the entry of data into SAP using a workflow tool (such as that used by Lion Nathan) would serve to formalise the role of data management in the launch stage in the NPD Gateway.

It was unanimously acknowledged by the participants from National Foods that the launch stage is one of the least functional parts of the Gateway. Each interviewee could name projects which have been executed poorly at the final stages, resulting in scrambling or "calling in favours" to perform required tasks at the last minute or reorganise capacity, poor customer service levels, or the need to throw out dated stock. As for data management, a formal, system-enabled workflow process might introduce

some rigour around the final stages of product launch. While this be at the cost of flexibility, it would ensure the 'boxes get ticked' in the right sequence. The literature indicates that the NPD environment is complex; for example, the trade-off between control and flexibility is a delicate one (e.g. Sethi and Iqbal, 2008). The introduction of a dedicated NPD Operations (or S&OP) resource would introduce a useful skill set to project teams and give project leaders access to experience in (and focus on) the operations field which may, in turn, prevent some of the uncertainty characteristic of currently NPD launches. This experience should also be shared through training for project teams and project leaders. This not happening may be indicative of a lack of high-level focus on getting the launch process right. It was evident from the interviews that over-selling against a business case can have as severe an impact on the success of an NPD launch as underselling, which is to say that the accuracy of the launch forecast is an important metric missing from the post-launch review.

Given the relative immaturity of the Gateway process at National Foods, having been implemented in 2010, whereas Lion Nathan had been utilising it since 2005, fine-tuning is required. Many of the inhibitors to an effective post-launch review mentioned in the literature review appear to be deeply rooted and will likely require concerted effort to overcome. In terms of solutions, the literature strongly supports the view that commitment to the NPD process must come from the top-down. If problems such as underselling against forecast or chaos in (planning and execution) at the launch phase are routinely occurring, as would appear to be the case, it suggests that corrective action is required and must be driven from the senior management level. The most obvious solution therefore is to force the launch review to take place that involves the senior layer through active oversight, with the intention of ensuring:

- The review process occurs at a specified time after launch;
- The discussion is held with key metrics at-hand;
- The discussion includes a process review, with prescriptive recommendations; and
- The recommendations are shared with other business units and recorded for future use.

It is evident that the two organisations would have benefited from shared information on their NPD processes, thus supporting the more general use of internal benchmarking as a potentially valuable improvement method. The area of S&OP has received little attention in the extant literature, and therefore this research makes a worthy contribution to supplement knowledge in this area. The use of the ABEF in the research was useful. The areas covered by the framework provided a systematic way

to examine the NPD process both from a theoretical point of view and, more importantly, in the case enquiry.

LIMITATIONS

The study has limitations. Two case organisations were examined and thus any generalisations from the results should be made with caution. The use of the ABEF as a research tool in the research could be further developed.

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