Business Horizons (2012) 55, 293—305

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Identifying new product development best practice

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KEYWORDS
New product development;
Best practices;
NPD audit

Abstract New product development (NPD) practitioners are keen to benchmark NPD practices because identifying any practice that is able to more efficiently and/or effectively deliver a new product could represent the difference between success and failure. A common purpose is therefore to identify NPD best practices with the expectation that companies will manifest and sustain these to augment their NPD efforts. To help in identifying such practices, we present a framework developed from prior benchmarking studies, a Delphi methodology with leading experts, and a survey involving over 300 NPD practitioners. The uniqueness of the framework lies in its ability to distinguish NPD practice across seven dimensions: Strategy, Research, Commercialization, Process, Project Climate, Company Culture, and Metrics/Performance Measurement. The framework is also unique in that across each dimension, poor NPD practices are listed as a starting point from which to improve, alongside best practices to which companies should aspire. To further assist in continuous improvement, an audit tool is derived from the framework, suggesting investigative questions that practitioners can ask to evaluate their company's NPD efforts. We conclude with general observations about NPD practice as the continued search for NPD best practice endures.

1. Identifying NPD best practice

There is a way to do it better—Find it.
—Thomas Edison (1847-1931)

Bringing new products to market is crucial in today's competitive business environment as market leadership, healthy market share, and sustained growth are all enabled through the process of developing and launching successful new products and services. New product development (NPD) practitioners are therefore keen to benchmark NPD practices because identifying a practice—whether a technique, method, process, or activity—that is able to more efficiently and/or effectively deliver a new product could spell the difference between success and failure in terms of vitality for both the product and company. With organizations such as the American Productivity Quality Center (APQC) and the Product Development & Management Association (PDMA) focused on NPD, major benchmarking initiatives on NPD best practice have endured (Adams-Bigelow, 2005;

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doi:10.1016/j.bushor.2012.01.006

Barczak, Griffin, & Kahn, 2009; Cooper, Edgett, & Kleinschmidt, 2002, 2004a, 2004b, 2004c). Additionally, the PDMA has established NPD certification standards.

While these studies and standards designate practices that distinguish high performing NPD companies, two questions persist. One, is there a general consensus as to what constitutes an NPD best practice? This question addresses whether there is a general set of best practices or whether best practices are context- or industry-specific. Two, are NPD practitioners knowledgeable about the status of NPD research and what is says as far as what constitutes an NPD best practice? This question examines whether benchmarking results are properly disseminated to the NPD practitioner community. That is, are benchmarking results translating into actual NPD practice?

The framework presented herein delineates NPD best practice across seven dimensions and furnishes specific context and scope for best practice activity. While most NPD studies emphasize the identification of best practice, our framework lists both poor and best practices. Identifying poor practices can serve as a starting point for improving NPD practice. Best practices can then serve as aspirations to which NPD practice should ascribe. After discussing the framework, we provide guidelines and a list of questions which aid in conducting an audit of one's own company NPD efforts.

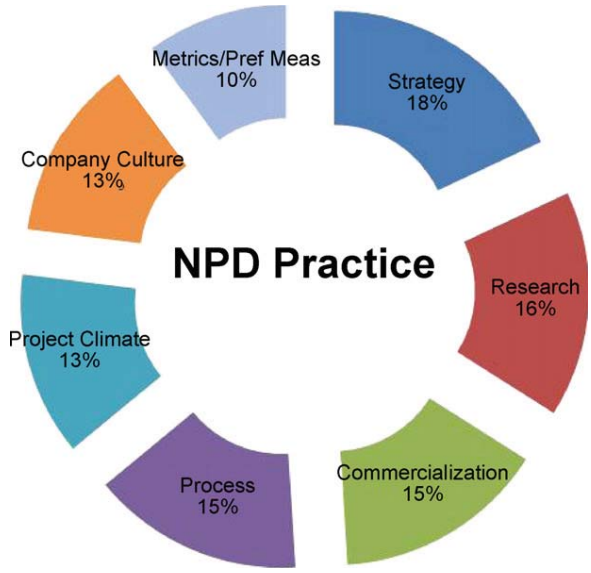
2. The multidimensional nature of NPD practice

Like many business processes, new product development has various facets and has been delineated across multiple dimensions into which numerous characteristics can be classified. While the number and labeling of these dimensions is dependent on the benchmarking study, a common purpose has been to identify best practices with the expectation that companies will manifest and sustain these (Adams-Bigelow, 2005; Barczak et al., 2009; Cooper et al., 2002, 2004a, 2004b, 2004c). The framework offered here builds on these best practice studies and PDMA certification standards, and portrays NPD practice across seven dimensions. The seven dimensions of NPD are:

1. *Strategy*: the defining and planning of a vision and focus for research and development (R&D), technology management, and product development efforts at the SBU, division, product line, and/or individual project levels; includes the identification, prioritization, selection, and resource support of preferred projects.
2. *Research*: the application of methodologies and techniques to sense, study, and understand customers, competitors, and macro-environmental forces in the marketplace (e.g., focus groups, electronic surveys, ethnographic study); research portrays the company's capability to gather and use information to drive innovation through NPD projects.
3. *Commercialization*: those activities related to the marketing, launch, and post-launch management of new products that stimulate customer adoption and market diffusion.
4. *Process*: the implementation of product development stages and gates for moving products from concept to launch, coupled with those activities and systems that facilitate knowledge management across projects and the overall company.
5. *Project Climate*: the means and ways that underlie and establish product development intra-company integration at the individual and team levels, including the leading, motivating, managing, and structuring of individual and team human resources.
6. *Company Culture*: the company management value system driving those means and ways that underlie and establish product development thinking and product development collaboration with external partners, including customers and suppliers.
7. *Metrics and Performance Measurement*: the measurement, tracking, and reporting of product development project and product development program performance.

Two points about these dimensions are worth highlighting. First, these dimensions were validated through a Delphi methodology with 20 leading academicians and thought leaders in the NPD discipline, in addition to the canvassing of 317 NPD practitioners from the United States, the United Kingdom, and Ireland, who reflected a median of 10 years' NPD experience (Kahn, Barczak, Ledwith, Nicholas, & Perks, in press). Second, although these seven dimensions are all relevant to NPD practice, our survey of practitioners asked the respondents to divide 100% of perceived importance across the seven dimensions; they are listed here in order of importance assigned. Figure 1 portrays pictorially the resulting percentages for each dimension.

Figure 1. Relative importance of NPD dimensions



3. Poor and best practice across the seven dimensions

As the definitions illustrate, each dimension is quite broad and encompasses a variety of elements. Thus, to make our framework useful, we developed a list of characteristics for each dimension based on the findings of prior benchmarking studies (Adams-Bigelow, 2005; Barczak et al., 2009; Cooper et al., 2002, 2004a, 2004b, 2004c). These characteristics were tested via the survey of practitioners, which asked respondents to identify elements in each dimension reflective of poor and best practice. Among the various characteristics associated with each dimension, Table 1 portrays those the majority of practitioners identified as poor and best. As can be seen, several dimensions (e.g., Strategy, Commercialization, Process) have a number of best practices associated with them. For example, regarding Strategy, best practice would involve a company having:

- well developed and clearly communicated NPD goals;
- projects in a portfolio that are aligned to the NPD strategy; and
- a portfolio management system that can prioritize key projects and ensure balance in the project portfolio.

On the dimension of Commercialization, best practice would be where:

- market planning is an integral part of the development process;
- planning for the launch starts early in the development; and
- planning for the launch is performed by a capable cross functional team.

On the dimension of Process, best practice entails:

- the use of a formal NPD process that is documented;
- a focus on quality of execution; and
- being flexible and adaptable to meet the varying needs of individual projects.

It is worth noting that practitioners could not identify any best practices associated with Metrics/Performance Measurement. Consistent with the low weighting assigned to this dimension, NPD practitioners may view it as a relatively new and emerging consideration (Barczak et al., 2009; Chan, 2004), and thus be uncertain regarding what constitutes a best practice. Reviewing the list of poor practices, it can be seen that practitioners are quite clear about things that should *not* be done with regard to Strategy, Process, and Metrics/Performance Measurement. Characteristic poor practice in Strategy would include:

- a company having no NPD goals;
- a very short-term and tactical view for NPD;
- prevalent pet projects;
- no system for portfolio management; and
- no prioritization of NPD projects resulting in a poorly balanced portfolio.

Poor practice on the dimension of Process is:

- the absence of a process; and
- no documentation to guide NPD.

With regard to Metrics/Performance Measurement, poor practice represents those companies that:

- use no metrics;
- have no evaluation criteria for their NPD efforts;

Table 1. Poor versus best NPD practices

STRATEGY	
Poor Practice	**Best Practice**
Most NPD projects fit with the mission, but some pet projects exist that do not	Clearly defined and company-visible NPD goals
No NPD goals	The company views NPD as a long-term strategy
The company views NPD only as a short-term tactical initiative	Mission and strategic plan help define strategic arenas for new opportunities
Unclear NPD goals	NPD goals are clearly aligned with company mission and strategic plan
A variety of NPD projects are supported with little to no regard for mix appropriateness	NPD projects and programs are reviewed on a regular basis
No concern over types of NPD projects being developed	Opportunity identification is ongoing and can redirect the strategic plan in real-time to respond to market forces and new technologies
No prioritization of NPD projects	There is a ranking or prioritization of projects
No process for undertaking portfolio management	There is keen consideration for balancing the number of projects and available resources
NPD projects may or may not be aligned with company's mission/strategic plan	
Pet projects are prevalent	
All trade-offs amongst NPD projects are made informally with no set criteria	

RESEARCH	
Poor Practice	**Best Practice**
Customer/user is uninvolved in NPD process	Concept, product, and market testing are consistently undertaken and expected with all NPD projects
Little if any market research is undertaken	Customer/user is an integral part of the NPD process
No real evaluation of testing (concept, product, market) results is undertaken	Results of testing (concept, product, market) are formally evaluated
No market studies are undertaken to understand marketplace	

COMMERCIALIZATION	
Poor Practice	**Best Practice**
Marketing budget decisions can dramatically change up to the point of launch	The launch team is cross-functional in nature
	Cross-functional teams make decisions concerning manufacturing, logistics, marketing, and sales
	A project post-mortem meeting is held after the new product is launched
	Logistics and marketing work closely together on new product launch
	Customer service and support are part of the launch team
	A standard protocol for planning a launch exists within the company

Table 1. (*Continued*)

PROCESS	
Poor Practice	**Best Practice**
Criteria for evaluating NPD projects are not defined	A common NPD process cuts across company groups
Limited documentation exists regarding the NPD process	Go/No-Go criteria are clear and pre-defined for each review gate
Minimal testing (concept, product, market) performed	The NPD process is flexible and adaptable to meet the needs, size, and risk of individual projects
No NPD process exists	The NPD process is visible and well-documented
There is no discipline in using the company's NPD process	An IT infrastructure with appropriate hardware, software, and technical support is available to all NPD personnel
There is no NPD process owner or NPD process champion	A clear NPD process exists
Not all NPD personnel have access to the same IT tools (software, hardware)	
Projects are not reviewed at completion	
The NPD process can be circumvented without management approval	

PROJECT CLIMATE	
Poor Practice	**Best Practice**
No identifiable NPD group	Each project has a core cross-functional team which remains on the project from beginning to end
No project leader(s)	Each project has a clearly identifiable project leader
NPD personnel are involved in too many projects	NPD activities between functional areas are coordinated through formal and informal communication

COMPANY CULTURE	
Poor Practice	**Best Practice**
NPD is not a management priority	Top management supports the NPD process
All NPD ideas come from within the company	The company actively works with customers to develop new solutions
Management is primarily focused on operational efficiency and cost savings	

METRICS/PERFORMANCE MEASUREMENT	
Poor Practice	**Best Practice**
No standard criteria exist for evaluating NPD projects	
No standard criteria exist for evaluating the overall NPD effort	
One person does all NPD project evaluations	
Projects are never killed	

- rarely, if ever, kill projects; and
- have one person doing project evaluation.

Interestingly, practitioners only identified one poor practice in the area of Commercialization, suggesting that they are not clear about activities to avoid for successful launch efforts.

On the dimensions of Research, Project Climate, and Company Culture, there are a small—almost equal—number of poor and best practices identified by practitioners. Under Research, best practice companies:

- provide adequate resources to support the research function; and
- gather a variety of market information to learn customers' current and unarticulated needs, problems, and benefits; customer reaction to the proposed product and price sensitivity; market size and potential; expected sales revenue; and competitive situation (Cooper et al., 2002).

Poor practice on this dimension includes:

- incomplete market research;
- no customer/user involvement; and
- no evaluation of technical or market results.

With regard to Project Climate, best practice describes a climate where:

- NPD work is completed by dedicated, accountable, and empowered cross functional teams; and
- entrepreneurialism is encouraged (Cooper et al., 2004a).

Poor practice on this dimension describes a project climate where NPD work is completed by individuals on an ad-hoc basis.

With respect to the dimension of Company Culture, best practice is characterized by companies that:

- use multiple sources for ideas (suppliers, customers, competitors, etc.); and
- where senior management supports and rewards the NPD efforts of employees.

Poor practice on this dimension is a company where:

- all NPD ideas originate inside the company;
- senior management does not encourage creativity; and
- senior management does not support the NPD efforts of employees.

4. Implementing the best practice framework

Having identified the dimensions and poor versus best practices within each dimension, how does a company use this framework to assess and enhance its NPD practices? Translating the framework into a detailed audit can allow firms to assess their current innovation practices, identify gaps between their current practice and best practice, and define action plans to close those gaps (Chiesa, Coughlan, & Voss, 1996).

Incorporating the characteristics for poor and best practice, we derive a set of 100 questions to serve as the basis for an NPD audit (see Table 2). The company can ask itself these questions to ascertain if it is ascribing to poor or to best practice. We recommend that a team be formed, comprising personnel from a variety of different functional backgrounds and representing a broad cross-section of people within the company (Chiesa et al., 1996; Francis, 2000). This will help secure commitment to the audit initiative and ensure its legitimacy (Bessant, 2003).

The team would go through each of the questions and assign a score of -1 for a 'no' response, a score of 0 for 'possibly' or 'partially true,' and a score of +1 for a 'yes' response. After answering each of the questions, a total sum would be calculated. The potential range for the total sum would be -100, exemplifying a truly non-existent NPD process, to +100, exemplifying a technically perfect, best-in-class NPD effort. A total score in the negative range would suggest a company with more poor/deficient practices than best/enabling practices. Such a company would be reflective of a deficient NPD effort. A score close to 0 would indicate a marginal and self-limiting NPD effort; it also would likely suggest a company with an unexceptional process. A score above 0 would suggest an enabling NPD effort, with the company reflecting certain best practices. Naturally, the company with a positive score would still want to address its deficiencies, but overall the NPD effort would be comparably favorable. A higher score would characterize a better performing NPD effort.

Each dimension is weighted by the number of questions listed such that its assigned importance is considered. That way, the team can see which

Table 2. Audit questions corresponding to each dimension

		No	Partially True	Yes
Strategy The defining and planning of a vision and focus for (R&D), technology management, and product development efforts at the SBU, division, product line, and/or individual project levels; includes the identification, prioritization, selection, and resource support of preferred projects	Do most NPD projects fit with the company mission?	-1	0	+1
	Does your company have NPD goals?	-1	0	+1
	Are NPD goals clearly defined and visible within the company?	-1	0	+1
	Does your company consider NPD as a long-term strategy?	-1	0	+1
	Does your company have a formal strategic planning process?	-1	0	+1
	Do mission and the strategic plan help define strategic arenas for new opportunities?	-1	0	+1
	Are NPD goals clearly aligned with the company mission and strategic plan?	-1	0	+1
	Is the variety of NPD projects supported with careful regard for mix appropriateness?	-1	0	+1
	Are NPD projects and programs reviewed on a regular basis?	-1	0	+1
	Does the company carefully consider the resource requirements necessary to support the types of NPD projects being developed?	-1	0	+1
	Is opportunity identification ongoing?	-1	0	+1
	Can the strategic plan be redirected in real-time to respond to market forces and new technologies?	-1	0	+1
	Is there a ranking or prioritization of NPD projects?	-1	0	+1
	Is there a process for undertaking portfolio management?	-1	0	+1
	Is there consideration for balancing the number of projects and available resources?	-1	0	+1
	Are NPD projects aligned with the company's mission/ strategic plan?	-1	0	+1
	Is the prevalence of pet projects minimized?	-1	0	+1
	Are trade-offs among NPD projects made using set criteria?	-1	0	+1
Weight = 18 Questions	**SCORE**		0	
	TOTAL			

Table 2. (*Continued*)

		No	Partially True	Yes
Research The application of methodologies and techniques to sense, learn, and understand customers, competitors, and macro-environmental forces in the marketplace	Are studies of customers and users focused on both current and future customer needs and problems?	-1	0	+1
	Is market research an integral part of all NPD projects?	-1	0	+1
	Is concept testing an integral part of the NPD process?	-1	0	+1
	Is product/product use testing an integral part of the NPD process?	-1	0	+1
	Is market testing an integral part of the NPD process?	-1	0	+1
	Are testing results formally evaluated?	-1	0	+1
	Are customers/users an integral part of the NPD process?	-1	0	+1
	Are testing results accessible for use by NPD project teams?	-1	0	+1
	Does the organization have a formal market research function?	-1	0	+1
	Does the organization truly employ voice-of-the-customer studies for NPD projects?	-1	0	+1
	Does the organization have a formal budget for market research?	-1	0	+1
	Can NPD project teams readily access market research results?	-1	0	+1
	Is market research used to develop product definitions?	-1	0	+1
	Are market studies on customers, competitors, and macro-environment trends undertaken to understand the marketplace for every NPD project?	-1	0	+1
	Are testing and market research results used to improve new products being developed?	-1	0	+1
	Can NPD project teams readily access marketplace study results?	-1	0	+1
Weight = 16 Questions	**SCORE**		0	
	TOTAL			

Table 2. (*Continued*)

		No	Partially True	Yes
Commercialization Those activities related to the marketing, launch, and post-launch management of new products that stimulate customer adoption and market diffusion	Does the company have a standard launch process/protocol for new products?	-1	0	+1
	Is there a team charged with planning the launch of a new product?	-1	0	+1
	Does the launch planning team oversee the implementation of the launch plan?	-1	0	+1
	Does the company avoid changing marketing budget decisions dramatically and up to the point of launch?	-1	0	+1
	Is the launch team cross-functional in nature?	-1	0	+1
	Is a cross-functional team involved in manufacturing decisions for a new product?	-1	0	+1
	Is a cross-functional team involved in logistics and supply chain decisions for a new product?	-1	0	+1
	Is a cross-functional team involved in marketing decisions for a new product?	-1	0	+1
	Is a cross-functional team involved in sales decisions for a new product?	-1	0	+1
	Is a cross-functional team involved in customer service and customer support decisions for a new product?	-1	0	+1
	Is a project post-mortem meeting held after the new product is launched?	-1	0	+1
	Do logistics and marketing work closely together on new product launch?	-1	0	+1
	Are customer service and customer support personnel part of the launch team?	-1	0	+1
	Is there a formal connection between the NPD team and the product launch team, if the two teams are different?	-1	0	+1
	Is commercialization a formal part of the NPD process?	-1	0	+1
Weight = 15 Questions	**SCORE**		0	
	TOTAL			

Table 2. (*Continued*)

		No	Partially True	Yes
NPD Process The implementation of product development stages and gates for moving products from concept to launch, coupled with those activities and systems that facilitate knowledge management across projects and the overall company	Are criteria for evaluating NPD projects well defined?	-1	0	+1
	Does a common NPD process cut across all company groups?	-1	0	+1
	Is there documentation on the NPD process?	-1	0	+1
	Are Go/No-Go criteria clear?	-1	0	+1
	Are Go/No-Go criteria pre-defined for each review gate?	-1	0	+1
	Is the NPD process flexible and adaptable to meet the needs, size, and risk of individual projects?	-1	0	+1
	Does a formal NPD process exist?	-1	0	+1
	Do company personnel understand the NPD process?	-1	0	+1
	Does the company reflect a discipline in using the NPD process?	-1	0	+1
	Is an information technology (IT) infrastructure with appropriate hardware, software, and technical support available to all NPD personnel?	-1	0	+1
	Does the NPD process have a process owner or process champion?	-1	0	+1
	Does a clear NPD process exist?	-1	0	+1
	Do NPD team members have access to the same IT infrastructure (software and hardware)?	-1	0	+1
	Does the company review projects at the point of completion?	-1	0	+1
	Does the company prevent the circumventing of the NPD without management approval?	-1	0	+1
Weight = 15 Questions	**SCORE**		0	
	TOTAL			

		No	Partially True	Yes
Project Climate The means and ways that underlie and establish product development intra-company integration at the individual and team levels	Is the company climate conducive to NPD project work?	-1	0	+1
	Is there an identifiable NPD group in the company?	-1	0	+1
	Does each project have a core cross-functional team?	-1	0	+1
	Does the company have a mechanism for identifying appropriate NPD project leaders?	-1	0	+1
	Does each project have a clearly identifiable project leader?	-1	0	+1
	Does the company appear to have the right number of projects individually assigned to NPD personnel?	-1	0	+1
	Is there careful consideration of how team members are assigned to teams?	-1	0	+1
	Is NPD cross-functional in nature?	-1	0	+1
	Do functional areas work well together on NPD activities?	-1	0	+1
	Does the core project team work on the NPD project from beginning to end?	-1	0	+1
	Is the NPD group dedicated to just NPD work?	-1	0	+1
	Is there enough formal communication to properly coordinate NPD activities?	-1	0	+1
	Is there enough informal communication to properly coordinate NPD activities?	-1	0	+1
Weight = 13 Questions	**SCORE**		0	
	TOTAL			

Table 2. (*Continued*)

		No	Partially True	Yes
Company Culture The company management value system driving those means and ways that underlie and establish product development thinking and product development collaboration with external partners, including customers and suppliers	Does the company culture facilitate the NPD effort?	-1	0	+1
	Is NPD a senior management priority?	-1	0	+1
	Does top management provide the necessary resources to support NPD activities?	-1	0	+1
	Can NPD ideas come from outside the company?	-1	0	+1
	Does the company actively work with customers to identify new product opportunities?	-1	0	+1
	Does the company actively work with customers to develop new products?	-1	0	+1
	Does the company co-develop products with customers?	-1	0	+1
	Does senior management encourage knowledge sharing across different SBUs?	-1	0	+1
	Does the company culture embrace the concept of open innovation?	-1	0	+1
	Does senior management encourage risk-taking?	-1	0	+1
	Does the company support open innovation?	-1	0	+1
	Do senior management interests go beyond just meeting revenue and financial targets with regard to NPD efforts?	-1	0	+1
	Are there financial resources to pursue 'white space' innovations?	-1	0	+1
Weight = 13 Questions	**SCORE**		0	
	TOTAL			

		No	Partially True	Yes
Metrics & Performance Measurement The measurement, tracking, and reporting of product development project and product development program performance	Does the company have specific NPD metrics?	-1	0	+1
	Are there standard criteria for evaluating the overall NPD effort?	-1	0	+1
	Are there standard criteria for evaluating individual NPD projects?	-1	0	+1
	Are NPD project evaluations made by multiple persons?	-1	0	+1
	Are NPD project decisions based on standard NPD metrics?	-1	0	+1
	Are NPD metrics clearly understood by company personnel?	-1	0	+1
	Are NPD metrics visible to senior management for decision-making?	-1	0	+1
	Is a team approach used to evaluate NPD projects?	-1	0	+1
	Are multiple review points used in evaluating NPD projects?	-1	0	+1
	Are NPD projects ever killed before they reach launch?	-1	0	+1
	Is there a formal NPD performance measurement effort in place that tracks and stores performance data?	-1	0	+1
Weight = 10 Questions	**SCORE**		0	
	TOTAL			

dimensions are contributing to and which dimensions are limiting the company's NPD effort, as well as recognize which dimensions to prioritize. This demonstrates that the audit can be conducted at both the dimension level and the company NPD effort level. It also recognizes that a company could be reflecting best practices on some dimensions and marginal or poor practice on others. Conducting the audit will reveal NPD strengths and deficiencies to indicate where management attention is needed. Those dimensions with the lowest scores will likely deserve the most immediate attention. If all dimensions reflected a similar score—say close to 0—the course of action would be to address Strategy, then Research, then Commercialization, and so on, according to the importance order ascertained from practitioners.

Along with a numerical assessment, the company team should consider conducting a descriptive assessment by asking 'why' to those questions indicating a deficiency. Examining the responses to 'why' should offer insights regarding root causes for the respective deficiencies; remedies could then be proposed. Even asking 'why' to strengths could provide insight regarding how the company is manifesting success. These insights for success might then be extrapolated across problem areas.

All innovation audits have their own criteria for assessing the NPD effort. We believe that the audit offered here has certain advantages over previous audits (e.g., Chiesa et al., 1996; Hallgren, 2008). First, many audits tend to focus on the NPD process, examining the stages and gates that a company employs for managing projects. This new audit highlights that the NPD process is one of seven elements; thus, it is more comprehensive than previous audits and provides greater granularity for dissecting the NPD effort. Second, this audit attempts to help the company identify and prioritize areas for improvement. Most audits will identify strengths and weaknesses, but directions for where to begin are not necessarily clear. The varying importance of the seven dimensions, and the listing of specific characteristics within each, can provide explicit direction for next steps. Third, the audit is relatively easy to deploy and parsimonious in application since the audit team simply needs to answer 'no,' 'possibly,' or 'yes' to the audit questions. Certain audits require much more substantial information and take longer to complete. We therefore characterize and position this new audit as providing a general overview of the NPD effort, providing enough information to assist the company in pursing better—if not best—NPD practice. Moreover, the simplicity of the new audit means that it can be implemented relatively quickly and by an internal team, thus saving time and financial resources. Other, more involved audits can require outside assistance and become resource-consuming. As a general audit, its purpose is to provide a direction for improving NPD practice.

5. Getting to best NPD practice

In attempting to develop and validate an NPD practice framework, we sought to answer two guiding questions: (1) Is there a general consensus among practitioners about what constitutes an NPD best practice, or NPD poor practice? (2) Are NPD benchmarking results disseminating properly to the NPD practitioner community, thereby translating into actual NPD practice? Our research suggests 'yes' to both questions. The fact that practitioners are cognizant of best practices and translating them into behaviors affirms the continued benchmarking of NPD best practices.

Our findings indicate that practitioners are readily able to distinguish certain NPD practices as best practices, as well as distinguish others as poor practices. For some characteristics, the consensus was unanimous. This infers that certain NPD practices are generalizable across company and industry contexts. Thus, a general audit like the one proposed here would be applicable and have credence across a variety of NPD situations.

Interestingly, practitioners appear to reflect greater consensus over NPD poor and best practice on the dimensions of Strategy and Process, as compared to the other five dimensions. We speculate that the relative importance practitioners assign these, especially Strategy, places greater attention on the activities involved. Prior prescriptions by researchers and consultants to focus on Strategy and Process appear to be clearly heard and resounded by the NPD community. The latter implies that practitioners are, indeed, cognizant of best practice prescriptions made by benchmarking studies. Further, the fact that the identified best practices parallel benchmarking results lends further support to the claim that benchmarking study results are disseminating within the NPD community.

While the focus of benchmarking studies is the search for best practice, we find that practitioners are slightly better able to agree on what constitutes a poor practice versus a best practice. In the validation study, 34 poor practices were identified compared to 28 best practices. For example, practitioners acknowledged four activities as poor practice with regard to Metrics/Performance Measurement, yet there was no consensus on what constituted best practice. Given that poor practices could be identified more readily, it is clear that

there is a greater cognizance around what constitutes poor practice. Thus, it may be slightly easier to discern poor NPD practice—that is, what does *not* work—than to conceive best practice. If this is the case, establishing and documenting poor practice can represent a feasible first step toward achieving best practice.

Some would suggest that there is no one best way to high performance, but rather different routes to the same end goal. For instance, it has been argued that the level of innovativeness of an NPD project influences the type of NPD process that should be used (Cooper, 2006), and that radically new NPD projects would require less structure and more exploration than incremental projects (O'Connor & DeMartino, 2006). A similar conclusion was made by Davidson, Clamen, and Karol (1999), who emphasize the need for process flexibility such that a process can continually adjust to the company's needs and desires. Our conclusion is that there are certain avoidable NPD practices and certain aspirational NPD best practices, regardless of context. Hence, those companies wishing to reflect higher NPD performance would benefit by thinking about their NPD effort as comprising seven dimensions of practice, avoiding those practices listed as poor, ascribing to achieve those practices listed as best, and conducting a general audit to discern potential directions for continued improvement. Where the adjustment and difference across contexts may lie is in the implementation. In other words, the general practice itself—such as having NPD goals—would be generalizable across contexts; how the practice is implemented in the respective company and industry context is where customization becomes required. This highlights that companies need to recognize two steps in the benchmarking endeavor: the recognition of NPD best practice and the latter step of properly implementing that practice into the respective company context.

Benchmarking studies also present the important conclusion that higher performance NPD companies do not succeed by using just one new product development practice more extensively or better. Rather, these companies use a number of practices more effectively, simultaneously. Decomposing the NPD endeavor as the framework here suggests, shows that there are seven different areas via which the NPD effort can be improved. Each area has an impact on NPD effort effectiveness. Within each area, there are a number of characteristics to avoid and to pursue. Identifying a characteristic of interest by reviewing the framework is a preliminary step, with the full audit offering a systematic way to guide the company toward NPD best practice.

It is the continued pursuit of best practice that distinguishes high performing companies, as they appear to heed the knowledge gained through the dissemination of NPD benchmarking results. The NPD framework and audit, supplemented by the knowledge base that has developed from prior NPD benchmarking studies, presents the opportunity for all companies to realize a more manageable and effective NPD effort.

References

Adams-Bigelow, M. E. (2005). First results from the 2003 comparative performance assessment study (CPAS). In K. Kahn (Ed.), *PDMA handbook of new product development* (2nd ed., pp. 546—566). Hoboken, NJ: John Wiley and Sons, Inc.

Barczak, G., Griffin, A., & Kahn, K. B. (2009). Trends and drivers of success in NPD practices: Results of the 2003 PDMA best practices study. *Journal of Product Innovation Management, 26*(1), 3—23.

Bessant, J. (2003). *High involvement innovation: Building and sustaining competitive advantage through continuous change*. Chichester, UK: John Wiley and Sons, Inc.

Chan, A. (2004). Using an effective metrics program to support business objectives. In K. Kahn (Ed.), *PDMA handbook of new product development* (2nd ed., pp. 445—454). Hoboken, NJ: John Wiley and Sons, Inc.

Chiesa, V., Coughlan, P., & Voss, C. (1996). Development of a technical innovation audit. *Journal of Product Innovation Management, 13*(2), 105—136.

Cooper, R. G. (2006). Formula for success. *Marketing Management, 15*(2), 18—24.

Cooper, R. G., Edgett, S. J., & Kleinschmidt, E. J. (2002). *Improving new product development performance and practices*. Houston, TX: American Productivity and Quality Center.

Cooper, R. G., Edgett, S. J., & Kleinschmidt, E. J. (2004a). Benchmarking best NPD practices — I. *Research-Technology Management, 47*(1), 31—43.

Cooper, R. G., Edgett, S. J., & Kleinschmidt, E. J. (2004b). Benchmarking best NPD practices — II. *Research-Technology Management, 47*(3), 50—59.

Cooper, R. G., Edgett, S. J., & Kleinschmidt, E. J. (2004c). Benchmarking best NPD practices — III. *Research-Technology Management, 47*(6), 43—55.

Davidson, J. M., Clamen, A., & Karol, R. A. (1999). Learning from the best new product developers. *Research-Technology Management, 42*(4), 12—18.

Francis, D.L. (2000). *Assessing and improving innovation capability in organisations*. Unpublished doctoral thesis, University of Brighton, Brighton, England, UK.

Hallgren, E. (2008). *Employee driven innovation: A case of implementing high involvement innovation*. Unpublished doctoral thesis, Technical University of Denmark, Lyngby, Denmark.

Kahn, K.B., Barczak, G., Ledwith, A., Nicholas, J., & Perks, H. (in press). An examination of new product development best practice. *Journal of Product Innovation Management*.

O'Connor, G., & DeMartino, R. (2006). Organizing for radical innovation: An exploratory study of the structural aspects of RI management systems in large established firms. *Journal of Product Innovation Management, 23*(6), 475—497.