

# Integral IAM and new product processes are the future

It is only a matter of time before the integration of IP and product development becomes part of the mainstream business process. Companies have to decide whether they want to be leaders or laggards as this happens

By **Brad Goldense** and **John Cronin**

It is well known that corporations are deluged with external and internal suggestions for future new products or features. Marketing and product management capture and package these collective suggestions into a market and product strategy for a corporation where generally the execution of the strategy greatly exceeds capacity. Product development professionals are over-stimulated by this input and those that did not make the cut go directly to product development to lobby their case.

An analogous barrage of intellectual property opportunities has been increasing steadily over the last two decades. At the same time, intellectual property is rapidly becoming a tradable commodity with a lifecycle and revenue stream, just like new products. The revenue potential of the IP in new products will soon compete with the revenue potential of the new products themselves. On some products, the IP opportunity will make the business case and on others the product revenue opportunity will make the business case. Product development and decision processes have become quite sophisticated over the past two decades. The time is now for IP and intellectual asset management processes to increase their sophistication and become

more like product development processes. After all, both originate from the same R&D investment. Business cases should give an equal weight to both potentials simultaneously in the not too distant future.

Intellectual property processes have historically been reactive when compared to product development processes. As the magic disappears from IP through its commoditisation in the coming years, many more of the various IAM activities that create IP will come to reside within corporations. The specifics of the various areas of IAM expertise will come to be held by a wider population – not only corporations, but also their respective employee bases. Just like product development, everyone will know a little bit about it. IAM and product development processes are becoming fully integrated, along with the people that perform them and the decision makers that enable them. Forward-looking corporations will become early adopters of concurrent IAM and new product development (NPD) processes.

The devil is always in the detail, however. There are many kinds of new products – from breakthrough platforms to simple extensions and individual features themselves, intellectual assets are rapidly approaching this complexity. The similarities between a new product asset and an intellectual property asset are great. Their business cases, types of activities that must be performed to support them, lifecycles, and mutual dependencies will inevitably merge. Is your corporation positioned to be in the foreground of this new reality?

## Today

The vast majority of new product development and pipeline processes, such as voice of the customer or conjoint analysis or focus groups, do not involve intellectual

property processes. Technical feasibility analysis and design reviews touch on the subject, but thoughts and/or findings are usually then referred to the IP department or the corporate or outside counsel. Further, many product marketers and engineering design managers feel that knowledge of patents of others may actually hamper creativity and limit new designs.

For most corporations it is not natural to deal with both subject matters with the same group of people at the same time in the same processes. There is some fear of doing so. These barriers, while significant, are issues that industry has dealt with before. Soon, the business potential that IP will bring to the table will drive organisations to address current barriers. There are numerous gains to be realised if there are aligned NPD-IAM processes:

- Technical – clean designs, free and clear products (freedom to operate); increased speed of development through the leverage of prior art.
- Business – improved supplier, alliance management, outsourcing flexibility and value; identification of additional revenue streams in conjunction with product; simultaneous revenues and profits from separate sources through licensing; leveraging in supplier/customer relations via use of strong IP.
- Market – improved market and product knowledge via alliance and product relationships; leverage in margins due to patent protected products.

### **Early IAM and product planning will increase corporate ROI**

The data on product innovation is very clear: designs essentially become fixed once the first 10% to 20% of the development budget has been spent. This means that the crucial front-end work has an extremely high impact on the total R&D budget for a new product. Worse yet, it is also shown that more than two-thirds of things that go wrong with new products can be traced to the activities occurring in this first 10% to 20%.

Increasingly, industry is finding that IP issues could have been identified much earlier. Product developers took years to discover this. Innovative companies do not need the same hard lesson to repeat itself. Companies should include activities on IP landscaping, IP mapping, IP analysis and IP-protected inventing in a concurrent manner during the front-end development process. The potential to increase the total business outcome from both investment in and alignment of these two business

activities is significant. Among other techniques, problem extraction of historical patents can inform projections for new product and technology roadmaps.

Product developers have discovered that good technical product planning requires seven years of relevant technical experience to foresee the possible pitfalls. Good project management planning requires five years. However, typically, little knowledge of IP and IAM processes resides in these professionals. If IAM representatives and decision makers couple with their associated product developers and decision makers, the outcomes of these corporate investments will be greater than they are today. Over time, knowledge will diffuse and become more widely held. Time to market will speed up. The certainty and confidence in designs will increase. Most importantly, multiple revenue streams and overall revenue potential will increase.

Thinking further ahead, the financial R&D productivity measures do not yet include IP productivity. Companies are approaching this by creating CTO function and an IP function and chartering them to be in lockstep with R&D. It is not a lean approach, but industry often starts this way. Respective measures are reported separately, as islands of automation, if you will. We believe that inevitably, just as product management and product development have significantly integrated measures, so will the CTO and IP functions over time. In addition, a number of new composite measures will arise as the financial value of IP increases to become material when compared to the sales/profits of the products themselves.

### **Deconstruct IP processes to identify integration opportunities**

*Ad hoc* processes are usually opportunistically driven by inventors (they invent as they see fit), and the inventions are not directed by prior art on the front end. If the inventor determines that the invention warrants protection, and if the inventor has time, the invention is submitted to legal counsel for review. Chances are that legal review would be just that: a legal analysis of patentability. It would not be a business, technical or marketing view or value. It would probably be quite narrow, limited to what was presented and not what might also be. At least, though, industry's *ad hoc* IP processes do create value in obtaining patents specific to product component coverage, which is important. It is easy to see the additional opportunities that are rapidly coming in

Initial explorations of the very early stages of innovation by Goldense show there is little alignment between the steps, people or formality of the product development and IP processes (Figures 1a, 1c and 1e refer to product development; Figures 1b, 1d and 1f refer to IP). While this data (Figures 1a and 1b) does not specifically show the overlap in people between the two processes, it can be reasonably inferred that it was limited to one or two individuals in an *ad hoc* manner. It is clear, however, that the level of cross-functional participation is less in IP processes. This data (Figures 1c and 1d) does clearly show that the number of decision steps for IP is closer to the traditional single-step process in product development that existed for most of the 20th century, and that there is less formality (Figures 1e and 1f) in the IP process. While this data is not current-year, it indicates that IP has not kept pace with product development maturation.

**Figure 1a question: B1**

How many times does the company review a given idea/concept/definition/proposal before finally making a business decision either to formally approve or formally reject a proposed RD&E product and/or investment project?

Number of respondents = 201  
Margin of error = +/- 4%

**Figure 1b question: D1**

How many times does the company review a "potential" copyrightable, trademarkable or patentable IP proposal before finally making a business decision either to formally approve or formally reject the proposal?

Number of respondents = 201  
Margin of error = +/- 5%

**Figure 1c question: B2**

How many people are involved in the 2.5 step or two-step selection process you referred to in B1 above? Include actual decision-makers only, not everyone consulted during the process.

Number of respondents = 165  
Margin of error = +/- 4%

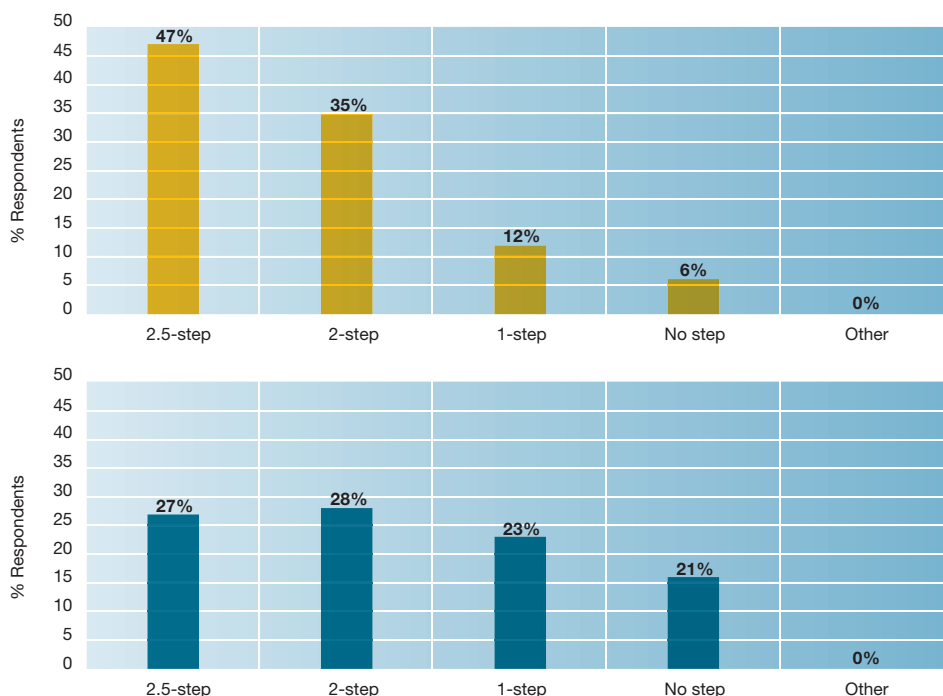
**Figure 1d question: D2**

How many people are involved in the 2.5 step or two-step selection process you referred to in D1 above? Include actual decision-makers only, not everyone consulted during the process.

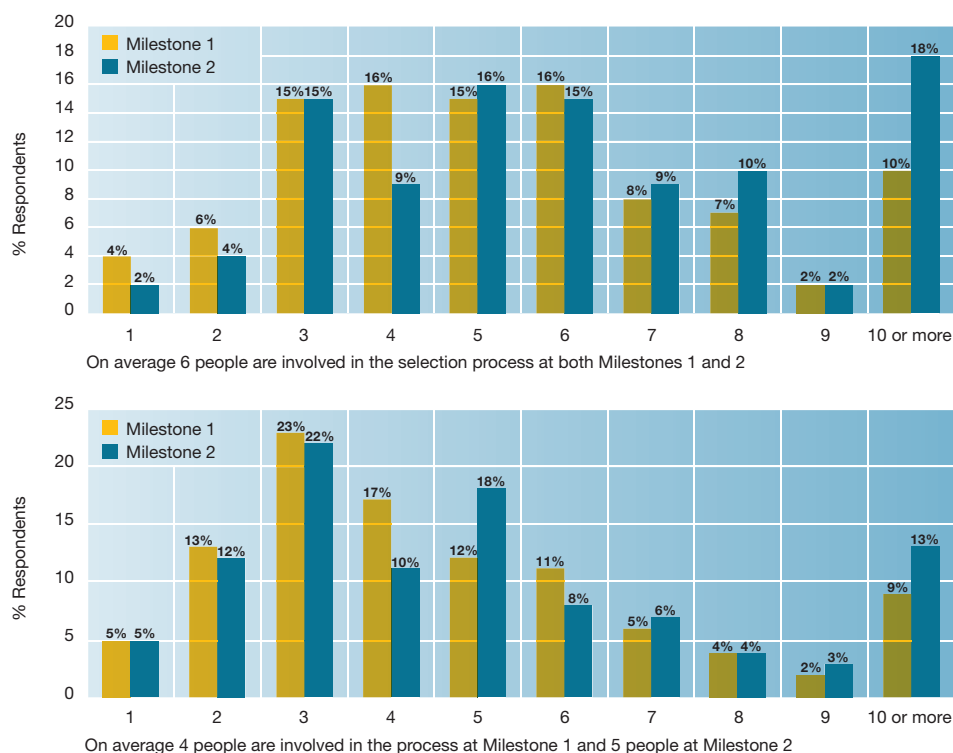
Number of respondents = 111  
Margin of error = +/- 5%

**Industry focus on pre-product development in 2008**

Figures 1a and 1b. Comparison of decision steps



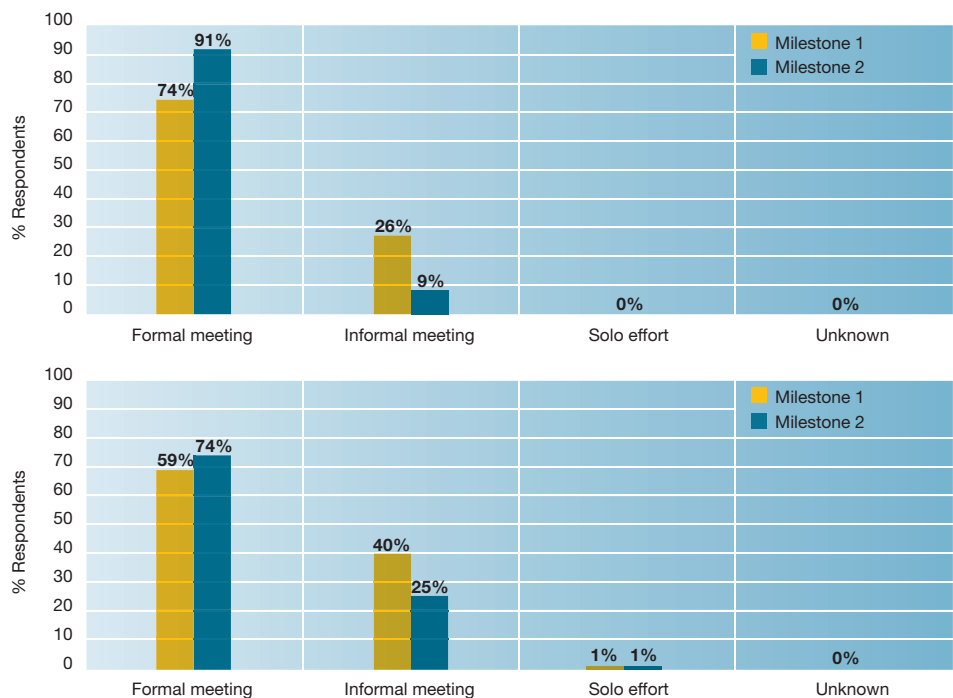
Figures 1c and 1d. Comparison of people involved



Source: Goldense Group Inc, Needham, Massachusetts, US

Industry focus on pre-product development in 2008 (continued)

Figures 1e and 1f. Comparison of process formality



**Figure 1e question: B2**  
 The 2.5 step or two-step selection decision process you referred to in B1 is best described as:  
 Number of respondents = 165  
 Margin of error = +/- 3%

**Figure 1f question: D2**  
 The 2.5 step or two-step selection decision process you referred to in D1 is best described as:  
 Number of respondents = 111  
 Margin of error = +/- 4%

Source: Goldense Group Inc, Needham, Massachusetts, US

front of industry. Many historical values and business practices are limiting to the possibilities that now exist to leave inventing up to opportunistic inventors.

Systematic processes are more balanced by business, technical and marketing considerations, and their associated processes. They usually involve a number of key elements:

- An agreed upon and documented understanding of the business issues and how they can earn a strong ROI from an investment in IP.
- A systematic extraction of existing IP, using proven non-legal methodologies.
- An IP landscape of the business, to map the company's existing IP and the patents of its competitors.
- A simple, no-nonsense IP strategy which evolves from the aforementioned data-driven approach that gets to the core of realising the ROI.
- Advanced market feasibility analysis to complement the advanced technical feasibility analysis already being performed.
- Directed invention sessions to create IP in the areas defined by the strategy driven from the business issues, as well

as IP strengthening sessions to invent around to be filed claims.

- Quarterly reports to the board, monitored by the CFO, as to how the assets on the balance sheet are building.
- Simple processes installed to ensure the IP strategy gets executed.

Most of these IP elements have analogous NPD elements that can be better aligned. Product management and product development have found the common ground. Pervasiveness of IP is the next great opportunity.

Until IP can be easily assigned a dollar value as a purchasable or tradable commodity, it will not fully mature. However, much can be done now to align the processes and people in anticipation of that inevitability.

**Making a case for early IP strategy**

It is important to recognise the essence of what is truly important in any business endeavour. In product design, the essence usually involves meeting new or perceived customer needs in new ways. Spending time developing a product that was useful two decades ago, like developing a better

typewriter, makes no sense. So, when a new product design is contemplated, it is usually a result of a strategic analysis of things such as the market customer and technology roadmaps.

These good planning techniques would be further augmented if they were performed in concert with company IP strategies. For example, it may be that the IP strategy for past products that has helped to protect margins is to use trade secrets for leverage. Without informing the new product design group of the need to understand, create and document trade secrets, the company is not creating its best opportunity. The reverse is also true. A new product concept might require new IP strategies to protect it, such as publishing the incremental advantages early into the design and development of the product so no one can patent on top of the product. Either way, and very soon for most companies, new product design strategy should be informed by IP strategy and vice versa.

Delving deeper into the IP side, essential IP strategy involves the use of tactics that get embodied in IAM practices. Aligning the IAM tactics to the IP strategy, which in turn is aligned to the product design, which then in turn is aligned to the product and technology roadmaps, is the future.

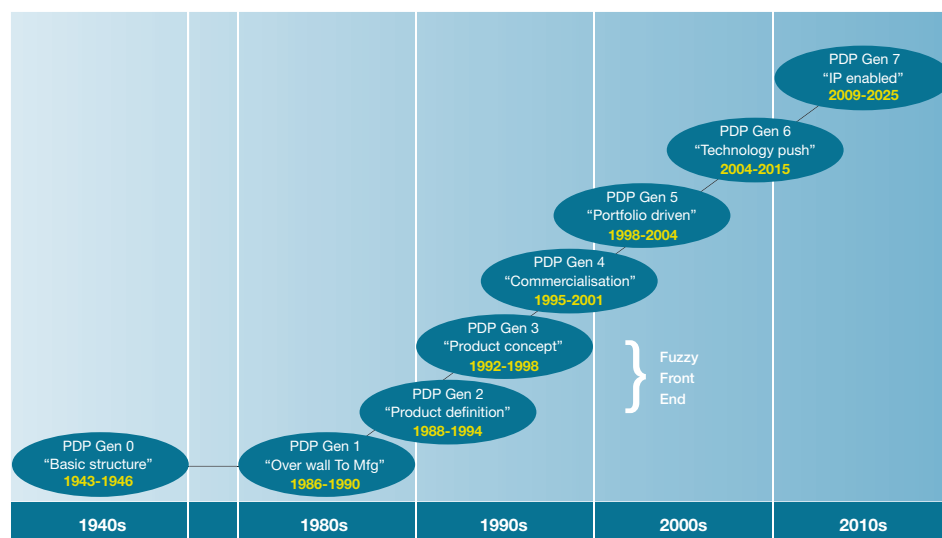
### Innovation generations

Over the past 25 years, from several initial pegs in the ground in 1983, product development has transformed from an inefficient and haphazard technical process

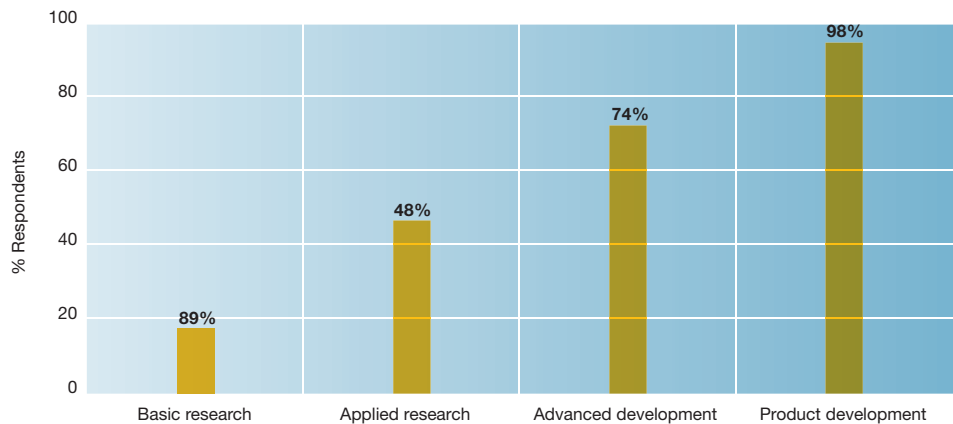
that was only loosely coupled to business processes to an integrated business and technical process that involves several top corporate functions. All this has happened because of the increasing importance of new products to the health of the corporation. Shortening product lifecycles have driven the need for corporations to have a high-quality innovation factory that turns out new products with high unit margins reflecting their level of innovation. While nirvana has not yet been attained, significant progress has been made and is continuing to be made.

The maturation process got underway in 1916 when standard parts design emerged to support the assembly line process. It was not until World War II, when the US and other late entrants had to ramp up a design and production capability across many bodies of knowledge in a very short time, that design proficiency became critical. Both speciality and overarching disciplines such as systems engineering emerged. The initial structuring and communising of processes across industry and government reached a new level in the 1940s (generation 0). Maturation was then incremental until the early 1980s, when the bubbling of a new wave began. US-based consumer stereos, consumer electronics, machine tools, automobiles, semiconductors and other industries were all of a sudden heading overseas. Deming and Juran had already spoken. Logistics and manufacturing processes had significantly standardised and communised. Fed Ex and other standardised carriers started in 1983, marking the end of

### Product development and innovation process generations



Industry focus on pre-product development in 2008



Research shows tangible industry movement in the innovation direction since the year 2000. Three-quarters of all companies now invest in innovative activities that precede product development.

Question: C1

Without disclosing any indications of emphasis or percentages of R&D investment, and without regard as to whether the company accomplishes the type of R&D internally/organically or externally/open or both, please indicate the type(s) of R&D in which your company engages.

Number of Respondents = 209

Margin of Error = +/- 5%

Source: Goldense Group Inc, Needham, Massachusetts, US

logistics transformation. Manufacturing transformation carried on for another decade as the “back half” of the industry followed the leaders who were largely done. The central issue for success was now R&D and design, a much more challenging subject.

Since the early 1980s, steady progress has been made in R&D. The first generation improvement challenge was in the middle of the process. Simply put, stop engineering from throwing it over the wall to manufacturing. The rework takes time that does not exist anymore in the emerging global economy.

The second generation addressed the tremendous impact that accurate and timely product requirements and specifications have on effective and efficient engineering. The third generation extended from the second and focused on early-stage product conceptualisation that preceded detailed requirements and specifications. The 3M Post-It Notes case was the icon for this process. To think that a product with such potential floated around corporations for months and years due to the lack of a cohesive starting process to capture it was a revelation. The second generation and third generation came to be known collectively as the “Fuzzy Front End”.

With the front end of the process now on the way to maturity, industry realised that it had really been focused on the wrong endgame. Up to then, most processes were called development processes. The end game was commercialisation processes. All of a sudden, developers inside had successfully teamed up and leaped forward, and products were being collectively thrown over the wall to the marketplace.

Enter the fourth generation, the commercialisation generation. The focus was now on the back end, the last phase before launch and the unstructured territory that immediately followed it. Team reviews against goals, post-launch management reviews and improved product maintenance policies rounded out the process structures that now started with a concept and ended with one/three/five-year post-launch reviews. An important observation is to note that this activity was the NPD portion of the product lifecycle initiatives that spawned and matured alongside of it. The fourth generation concluded the definition of the beginning-to-end structure of modern product development processes. The next few generations are higher level in their thinking and deal with what is put into the processes. If history repeats itself, the subsequent generations will again deal with output.

Generations five and six

The fifth generation began in 1997 when Robert Cooper published *Portfolio Management for New Products*. Industry was not quite ready for it, but Cooper’s contributions of the previous decade caused movement. Some companies skipped generations thinking they could jump to portfolio management without the predecessor learning experience. Recognising that industry adapts practices over a period as long as 20 years, leading edge on one end and laggards on the other, five generations of evolution have passed for leading-edge companies who are now in the sixth generation. If one is to have a forward-looking multi-year portfolio strategy, then



one must also have the underlying multi-year technology and beyond that a multi-year intellectual property strategy to give it life and make it robust.

This sixth technology-push generation of new product processes was a predictable successor to the portfolio-driven generation. And it gained additional coincidental but timely energy from true global competition that was becoming reality in the early 2000s. This, in turn, drove the need for increased innovation. Given that R&D investments generally range from 2% to 30% of corporate sales each year, this technology-push strategic corporate process needed to be improved. The new product development process is the way that most investments in R&D are executed and commercialised, and its additional refinement and the development of even earlier predecessor processes will be critical to the technology-push generation.

In 2004, when many say the innovation revolution began, a number of companies resisted; they limited the amount of at-risk money in the R&D budget and focused the majority of their energies on the product development process. Executives were proud of their ability to contain the typically unproductive portion of their budget while generating increased returns from the product pipeline. Well, that has been changing and will continue to change in the coming years. Recent research shows industry's status in 2008 contrasted to an estimated 90% focus on product development in 2004. The speed of transition is remarkable and recent global economic fluctuations do not seem to be dampening this trend.

#### **The seventh generation – IP and IAM led**

This brings us to the seventh generation. Bleeding-edge companies have already entered this stage. With long-term roadmaps giving life to the product and technology strategies, the insurance policy to make it all robust needs to be put into place. The seventh generation is the IP-enabled generation. IP has steadily been rising in importance in product development for the past 20 years. However, when industry's attention was highly focused on satisfying customer needs throughout the 1980s and 1990s, the incremental nature of this development approach minimised total inventiveness. Enter true globalisation, where the number of competitors that can enter a given geography is geometric to companies competing for the same space before the year 2000, it is clear that the era of

innovation is here and it will have several phases. To that end, companies have been focusing much more on the subject. Customer-directed product development will remain essential. Individual-directed will be its next incarnation. But technology-push products will be the products that generate the large unit margins of the future while allowing competitors to differentiate themselves globally. Adoption will take place over roughly 20 years, but this future is now for tech-push.

The seventh generation is a logical next step of tech-push in a global world. The additional value created by IP will further augment competitive differentiation. Historical models invent a product in one place and localise its production in different geographies against the product standard design. The sovereignty of countries ensures that this practice will remain. Numerous countries are rapidly gaining the ability to invent and to protect their inventions. Like the common language of mathematics, IP is the common language across sovereign countries. Product development will necessarily remain localised, but products themselves will continue to be manufactured and sold globally to compete. IP will become the basis for a winning global product in the long run.

As the seventh generation begins, product developers will be clamouring for cut and dried IP rules to apply in a global and time-driven world. Certainly this will not be easy. IAM processes have only begun their expected 25-year maturation curve. Worse yet, IP-inclusive business plans and resultant financial projections will be subject to many types of cautious and possibly fickle legislation. Product developers will want it yesterday and IAM professionals will be saying we have not got there yet. Bleeding-edge companies are currently struggling with concurrent IAM-NPD processes.

#### **Getting started on the seventh generation**

Having a clear view of the IP landscape in the technology roadmap and throughout the early phases of product development will become increasingly critical. If the customers are retail consumers, then the IP landscape will probably need to inform the product design on IP ownership of competitors. If the customers are B2B or custom engineering, then a strong understanding of supply base IP may be the emphasis. In either case, knowing your IP landscape will be essential to sound

decision-making. Start by conducting an innovation-IP audit. This involves identification and analysis of the following:

- Marketing-based ideation, conceptualisation and requirements practices.
- Marketing-based competitive analysis and positioning practices.
- Product roadmapping and product portfolio management practices.
- Technology roadmapping and technology portfolio practices.
- Intellectual property landscape and IP portfolio practices.
- Product selection and decision-making practices.
- Capabilities, competencies and awareness of professionals.
- Dependent variables between business, product and IP strategy.

Once this has been done, recommendations can be made to cover the easy first steps to take; the high-value opportunities that may exist; the construction of a high-level roadmap for concurrent innovation IP; and other findings of value. It should also be possible to estimate the potential value of alignment.

#### **Benefits of seventh generation IAM and NPD processes**

The benefits of improved NPD processes have been thoroughly documented since the late 1980s. Concurrent IAM-NPD will be a meaningful addition by any yardstick and will deliver a number of additional benefits, including:

- Leverage of previous knowledge of the prior art.
- Protection from copycats.
- Improved freedom to operate as other IP is identified as early as possible.
- Early patent filing to assist against long delays at the patent offices.
- Early understanding of IP threats before products are committed to design.
- Improved inventor skills through leveraging creative inputs (patents of others).
- Obtaining and leveraging IP on supply chain, value chain and manufacturing equipment.
- Higher unit gross profit margins and higher total gross profit.
- Improved branding and brand recognition, likely to lead to higher market share.

If one considers the list above in light of revenue augmentation, cost avoidance and market share potential – and the value of

the IP asset itself – it is a surprise that most companies do not already have IP in their business cases for new products. The problem remains that generally accepted accounting principles (GAAP) do not yet exist. At the same time, though, they are inevitable as the underpinnings have been in process for a dozen years.

#### **The IP era**

Industry has been following a path of improving product development that is largely predictable, both in its focus and in its duration, for the past 25 years. With each step, effectiveness has improved. While efficiencies have occurred, the magnitude of opportunity is still so great for IP and NPD that they have been less important. This is in stark contrast to manufacturing improvement, where efficiencies are everything in a matured business function.

Product managers and developers are currently in the middle of a technology-push generation, driven by the increased need for innovation in mature economies in a global business world. An era of intellectual property is upon us. Bleeding-edge companies have already started the journey. As they lead us to step-function improvements in IAM prowess, new product development processes will come to embody intellectual property processes. Intellectual property knowledge will become commonly and widely held, just as occurred with new product knowledge. Professionals will come to view both as an everyday responsibility, not the preserve of a specialised department and external experts.

It is clear what is going to happen. Identifying the areas that provide the most leverage across business and product and IP strategy, along with the proper touch points for the processes and the people that orchestrate them, will be the key to success in the coming decade. The question every company has to answer is what they wish to be during the predictable 25-year industry adoption curve: a leader or a laggard. **iam**

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