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HOWE SCHOOL ALLIANCE FOR TECHNOLOGY MANAGEMENT

Pathway to Innovation

Jack Emert

I - Innovation by Design

The drive to innovation as a source of growth and competitiveness is prompting company executives to revise their company structures and processes in order to enhance their level of innovation effectiveness. For this to be useful, the innovation process needs to be understood within the context of their specific business environment and their company goals, strategies and resources. Merely mimicking another successful company's approach could be counterproductive if the drivers, requirements and gaps are significantly different.[1]

Though innovation can occur via both planned and unplanned routes, it is difficult to design for that which is completely unknown. However, by understanding key facilitators of the innovation process and incorporating critical behavioral as well as structural factors, probabilities of success could be substantially improved for deliberately designed innovation projects. The change in the underpinnings and fundamentals of the organization would also better prepare it for recognizing unplanned opportunities and taking advantage of them in a timely fashion.

II - Definition of Innovation

We start by suggesting a working definition for innovation to guide us:

Innovation is the generation, selection and implementation of new ideas into profitable reality

This definition suggests that innovation consists of several components:

Creativity: The generation of new concepts or new ways of looking at and resolving old problems

Vision: The ability to see how these ideas could play themselves out in the marketplace over the long term. This is necessary to select areas of focus for the company's project portfolio based on early judgments of value potential and probability of success.

Finishing: The problem-solving skills to reduce selected ideas to practice and capture their value in the marketplace by overcoming the inevitable obstacles and issues.

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DIRECTOR'S NOTE

In *Pathway to Innovation*, Jack Emert of Infineum Ltd, one of the HSATM Partner organizations, discusses key enablers of the innovation process. These include critical behaviors as well as structural factors, many of which have been or are in the process of being adopted by Infineum. As Emert says, his article provides a "holistic picture of how a company could set up their projects to better prime them for innovation." The article incorporates many of the learnings that Emert has shared with Alliance Partners at recent Roundtable meetings and in his presentation to the 2007 HSATM Conference.

Many articles about innovation stress the importance of understanding and satisfying customer needs. Robin Karol and Richard Tait argue that the concept of 'customer needs' is often incompletely understood, with the result that a critical set of customer needs is often overlooked. They offer a re-thinking that will provide the reader with a more complete perspective of what it means to "satisfy customer needs."

The 2008 HSATM Conference will be held on June 4. Please see the back page for details.

Larry Gastwirt

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III - Innovation String

There is a common misconception that innovation consists primarily of an inspirational event where the idea or concept is created followed by the perspiration necessary to implement the idea in the marketplace. In reality, bringing a successful new product or process to market requires a sequence of numerous innovations, some large and some small, where the creativity, vision and finishing processes are applied repeatedly throughout the sequence. We refer to this model as the "innovation string," and the entire organization from research to manufacturing, sales to logistics must be fully engaged to be successful on a regular basis.

IV - Pathway to Innovation

In this discussion we will not focus on the details of brainstorming, decision-making and problem-solving methodologies, but rather on the holistic picture of how a company could set up their projects to better prime them for innovation. We will attempt to establish common principles that are key enablers and things to avoid. These principles are summarized below in seven elements that should be considered in designing and implementing projects. Three of them focus on project design and the remaining four on project implementation:

Project Design:

(1) Defining the opportunity
(2) Laying the foundation
(3) Co-creating the vision

Project Implementation:

(4) Assembling a high performing team
(5) The innovation process
(6) Project and risk management
(7) Celebration and recognition

V - Designing Projects for Innovation

(1) Defining the Opportunity

Much of the success of a project (or lack thereof) is due to the up-front thinking done before any technical work has begun. The first key question that needs to be addressed is: Are there clear current or potential market needs in this area that are not being satisfied that this project will address? The answer to this question is critical in defining the incentive for the project. Customers and stakeholders should be engaged to understand the underlying fundamentals, competitive topography and evolving needs in the marketplace in order to make a reasonable judgment on market potential.

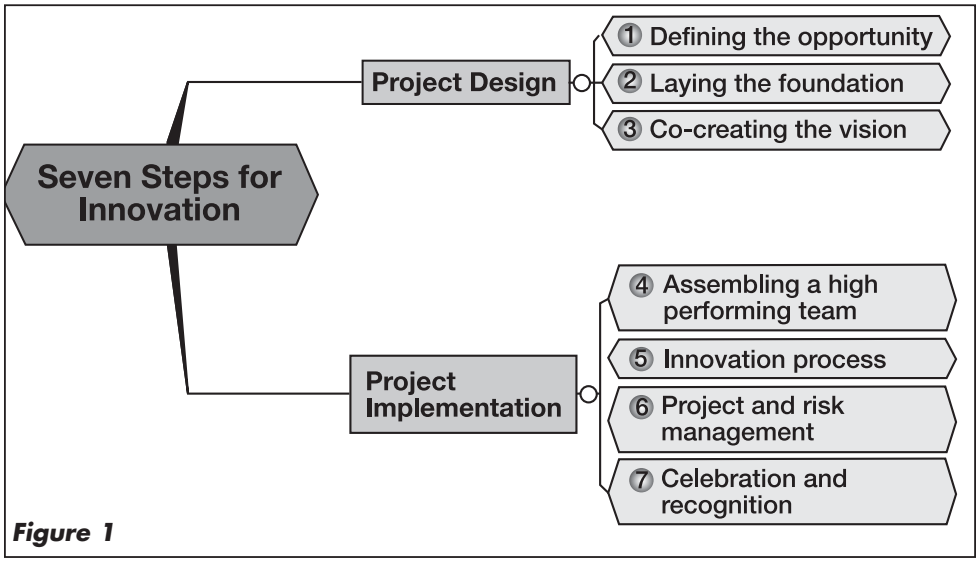


Figure 1

The second key question is: Could these needs be translated into technical objectives that fit with the company's strategies, business model and technical competencies? This determines whether this is a challenge that the company is set up to tackle. Even if the value of the prize is high, if company capabilities have to be generated from scratch, the likelihood of a timely innovation is low.

The answers to these questions allow assessment of the risk-reward balance (i.e. what is the potential value of a successful outcome against its probability of success and cost). There is no simple model to calculate what constitutes a good project, but collecting this information is necessary to exercise good judgment while managing risks and uncertainties.

(2) Laying the Foundation

Even when the required expertise for an opportunity generally matches the company competency profile, a significant innovation will require venturing into unknown territory and stretching existing capabilities. Time needs to be allotted for the discovery process to expand the knowledge base and develop innovative concepts if valued solutions are to be created. Beginning the innovation process once the problem is publicly known and market opportunities have crystallized limits the time window available for invention because of competitive forces in the marketplace. This drives companies to incremental improvements because of real or perceived time limitations. Monitoring the marketplace regularly to identify opportunities early enables "Laying the Foundation" activities to be initiated with sufficient time to provide a competitive advantage.

Stage-gate Process for Core Businesses Projects

There is a danger that needs to be pointed out here. Stage-gate processes are ubiquitously practiced to manage research and development projects. Though detailed formats vary, most systems require quantitative financial justification of the reward and high probability of success to initiate a project and progress from stage to stage. These requirements are necessary to avoid large expenditures on speculative ideas and low value outcomes. Projects within the business and competency comfort zones are well served by this system.

It should be noted that this type of stage-gate process tends to be more tunnel-like rather than funnel-like as typically depicted in the literature. This is because the up-front requirements filter out projects that are risky. Thus, projects will rarely be stopped unless unexpected obstacles appear or market

forces change. The down side of this system is that this encourages incremental thinking since the route to the answer and the solution to any obstacles needs to be clear at the beginning.

Stage-gate Process for Step-out Innovation Projects

Step-out innovation projects, on the other hand, will normally be accompanied by substantial uncertainty and risk and often cannot meet the requirements of this type of stage-gate process.[2] An alternative process that fosters concept development, exploration of non-conventional approaches and development of fundamental understanding of critical phenomena in new areas is required. The purpose of this system is to build knowledge and develop options (rather than finished products) in high value areas where a potential market need is envisioned. University expertise could be usefully leveraged with this system to develop the critical knowledge base during this learning period.

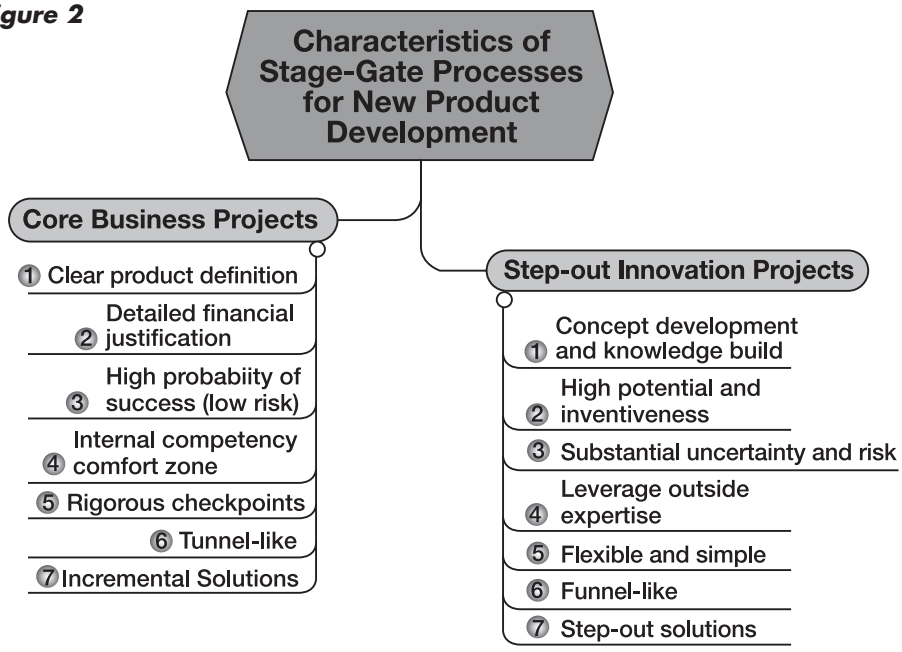
The process is characterized by flexibility, simplicity and modest funding with the outcome focused on increasing the knowledge to assumptions ratio, and development and verification of concepts even if not yet practical. Potential impact and inventive logic are used to justify these activities rather than net present value expectations. The process is much more funnel-like, characterized by energetic learning with ideas being tested, discarded and redirected as new insights build.

This exploratory environment is also an opportunity to engage customers and stakeholders in conservative industries to get them comfortable with coming trends and expected change. Customers and stakeholders who contribute collaboratively to the development of new knowledge or concepts tend to accept step-out solutions based on these concepts more readily. Customers can also help estimate the value of potential alternatives to enable better decisions when the reduction to practice phase begins. If successful, insights developed in these "pre-project" activities are more readily integrated into ultimate product design in the normal stage-gate system for product development, providing more innovative solutions.

Care must still be exercised to allow room for invention and reduction to practice in the normal stage-gate process using the concepts developed in the "Laying the Foundation" activities. This will be facilitated by the confidence in a potential solution built during the option creation phase. However, if a near perfect solution is expected, the "pre-project" stage will become very lengthy and require a high degree of funding, largely negating its value.

Much of the success of a project is due to the up-front thinking done before any technical work has begun.

Figure 2



(3) Co-creating the Vision

With insights and inventive concepts from "Laying the Foundation" activities in hand, an innovative but realistic market vision can be formulated taking account of the potential properties and value of the nascent technology. Probability of success in realizing the vision is greatly enhanced by driving to joint ownership of goals, decisions, successes and failures by the Marketing and Technology functions. This is best achieved by co-creating the vision from the dual perspectives of what product designs and performance features are possible to construct (Technology), and what could create and capture value in the marketplace (Marketing). The integrated ownership developed in this manner is much stronger than that achieved by step-wise alignment of functions. In our experience, this joint sense of ownership is one of the strongest factors influencing ultimate success in bringing innovations to fruition in the marketplace.

It is critical in creating this vision that representatives of all key stakeholders are involved. The vision must then be translated into clear objectives and success measures that are uniformly understood throughout the organization. Copying a large number of people with project documentation of objectives and plans does not achieve this goal, as different people from different functions will understand the same words very differently.

Success measures should be defined jointly and should include detailed targets, priorities and methods of measurement. What is necessary, and what is desired as a stretch,

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should be distinguished clearly. The bases and economic value of the targets must be credible and easy to understand, so that everybody can realistically picture the value proposition and potential customer slate. Strategies could then be constructed on how to get there and what approaches and methodologies would be used. Involvement of a knowledgeable customer to continually provide input as the project progresses helps in key decision-making and maintains a sense of urgency.

Issues frequently arise during project execution having the potential to destabilize the project team, causing unnecessary anxiety. This could occur via organizational overreaction to unfavorable evolving information and results that produces a crisis atmosphere. Designated experienced Business and Technology champions that can position the interpretation of these issues with calmness and credibility, and propose ways forward, are indispensable and will anticipate and avoid many problems.

VI - Implementing Projects for Innovation

(4) Assembling a High Performing Team

Four areas should be considered when assembling a high performing team for an innovation project [3]:

Creativity: The continuous generation of new and useful ideas coupled with the diversity of skills and experience to grow ideas into insight is essential. Though much attention is focused in brainstorming activities on opening thinking broadly to coax out more ideas, the limiting factor in successful innovations is often growing ideas from their fragile, ethereal state to insightful concepts that can be tested and acted upon. Care should be taken not to expend too much energy in managing and categorizing ideas when they are still in the early state. Instead, the focus should be on building and developing ideas until they are either discarded or transformed into useful kernels of insight.

Creativity needs to be exercised not only in the initial concept development mode but also in the reduction to practice mode. The team should be capable of continuous creative problem-solving from start to finish. Thus, a combination of abstract thinkers and pragmatic finishers is generally optimum for a high performing team.

Values: The team must be characterized by high ownership of, and commitment to the objectives, with a uniform clear understanding of the vision, targets and priorities. Team members must have the courage to challenge each other as well as accepted organizational tenets, and be willing to expose their data and fragile ideas to broad scrutiny and rapid testing. Courage should be coupled with the confidence to venture into uncharted territory and deal with adverse results and disagreements with calmness despite the passionate desire to succeed. High conflict, high respect debates characterized by openness in exchange of information and viewpoints should be commonplace in day-to-day activities. Decision-making and communication based on integrity and credibility must thread through all activities of the team, especially in flagging issues to management and in dealing with expectations that don't match initial promise.

Collaboration: Integration of functions, disciplines and experience can produce synergistic effects that are extremely powerful. The extent that this can be captured is related to the "oneness" of the team. Is the team a conglomeration of expertise that works together via formal mandate, or a seamless, unified unit that collaborates naturally? The former will not lead to substantial synergies while the latter will.

Leadership: Leaders play a key role in the success of high performing teams by (1) painting a clear and inspiring vision that motivates the team, (2) creating a collaborative learning environment with the appropriate tools and processes that enable the team to innovate effectively, and (3) modeling its values.

In addition to painting the vision of the end zone, leaders must transmit a credible picture of strategies on how to get there given the unknowns (i.e. we can overcome these challenges!). Designation of clear accountabilities and responsibilities for the team so that everybody knows who is responsible for what activities and how decisions will be made is important in giving each team member a mandate to jump into the water. This is often overlooked, with undesirable "freeze-up" consequences.

In our experience, a joint sense of ownership (between the Technology and Marketing functions) is one of the strongest factors influencing ultimate success in bringing innovations to fruition.

Successful leaders focus more on enabling rather than managing the team. A key enabler is the creation of a natural, collaborative environment that facilitates cross-fertilization of ideas, and encourages reasonable risk-taking in the development of new concepts. Testing and advancing these concepts must be facile with the required facilities, methodologies or linkages in place, without bureaucratic encumbrances. Thus, "context" management should take precedence over task management.

Leaders must embody the team's values and model them consistently. Their influence will be mirrored in proportion to the respect and credibility earned via their actions. Leaders should be strong and visible team advocates, "shining by reflection" rather than via independent charisma. Guidance and challenge need to be provided periodically, but should be balanced with wide latitude to team members to ensure that initiative is not stifled.

Leaders should drive the team to a solution of the problem rather than manage data collection. Hence, ideas must get tested quickly and rigorously to make decisions on areas of focus. Leaders sometimes need to act as insight managers, ensuring that learnings and their implications are linked together and acted upon efficiently. At gates where the project focus changes (e.g. product design to manufacturing), leaders can ensure that the transition from function to function occurs smoothly. For example, in a technology project, leadership typically flows from research to development to manufacturing and logistics.

In summary, leaders must inspire and enable the team, manage the context, model the values, and drive to a solution with consistent clarity of vision of the project goals and strategies.

Team Composition: A high performing team should be diverse in a range of dimensions covering technical and behavioral factors as well as experience. The team should be multidisciplinary and multifunctional from beginning to end but with uniform, broad ownership of goals and targets. A combination of new hires and experienced professionals can provide an influx of new ways of thinking while maintaining a stable knowledge base able to stay the course during periods of high uncertainty.

With increasing global focus, it should be noted that remote collaboration can be difficult, and co-location is desirable especially for the highly fluid discovery stage of a project.[4] New virtual collaborative tools help significantly, but the transmission of information and its associative "feelings" are still a challenge. In any event, timely, frequent communication at several levels is necessary to compensate for not being together.

Team Dynamics: Not all high performing teams fit the "lovey-dovey" model where all members genuinely respect each other and enjoy working together. A creative and tumultuous team with lots of debate could be very productive, provided the challenges are harnessed to capture the fruitful diversity of perspectives without a debilitating impact on team dynamics. High ownership and motivation linked to a clear understanding of value and direction must be maintained throughout as these are the key drivers to bring the project to closure.

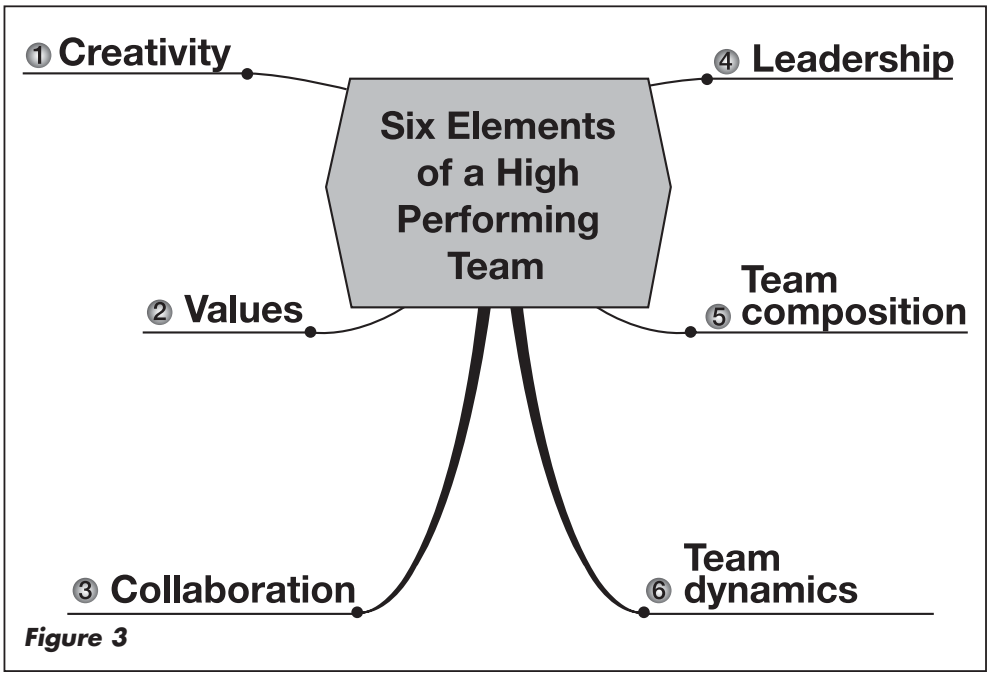

Figure 3

The team needs to maintain a sense of urgency throughout the project with a strong problem solving mentality. A "get it out fast and optimize later" strategy should be adopted where possible, but discipline needs to be exercised to ensure ultimate closure on gaps in knowledge and performance. Rapid scale-up is a valuable way of learning about processing issues early, provided it can be done safely.

The team needs to feel empowered to make decisions with access to all relevant information. The general rule should be that the team recommends the path forward and management endorses or provides a detailed explanation as to why not. The team should not expect management to make decisions for them.

(5) The innovation process

A successful innovation generally requires a string of creative ideas and mini-innovations across multiple dimensions over the entire cycle of the project. Thus, high energy and ownership must be maintained throughout the project. It is generally a good idea to keep the original inventors in the loop to the end, as they will have the highest degree of ownership and insight to solve problems that occur down the chain.

Innovation cannot be orchestrated but must be nurtured and facilitated. We can sow seeds, fertilize the soil, water the plants and provide lots of sunlight, but innovation must be allowed space to sprout. To provide a fertile environment for innovation, the following four elements should be considered [3]:

People need to have the right skills, must be motivated and feel empowered.

Structure and culture must be supportive of new ideas, tolerant of risk and able to respond quickly to opportunities.

Processes need to be enabling and not bureaucratic.

Technology tools should facilitate information access and rapid decision making for swift and continual innovation.

Business or manufacturing constraints are sometimes viewed as inhibiting innovation. These could include a long list of requirements such as low cost, broad activity, no deleterious side effects, long shelf life, environmentally friendly process, secure supply chain and logistics, timing, etc. In actuality, bringing a product to market successfully requires clear understanding of the relative importance of each of the constraints up front. This enables the team to define their strategy for innovating within the multiple constraints, to provide solutions that will meet market needs practically.

(6) Project and Risk Management
All projects and especially complex interactive projects benefit from application of project management tools to link activities, understand constraints and priorities, and manage work flow. It should be noted that though these tools work very well for development or manufacturing projects, they are generally not designed for the highly fluid discovery environment where activities are very dependent on unpredictable results. Some adjustments will likely be required in using standard project management tools for the early discovery stage.[5]

Step-out innovation projects typically generate significant risk because they venture into areas outside of the organizational comfort zone. A risk management team is essential to identify all areas of uncertainty, and make judgments on what level of risk is acceptable. The team should also track what is being done to mitigate each risk area and increase the knowledge to assumptions ratio. Timely, clear communication to the rest of the organization is imperative because of the tendency to assume the worst in the absence of information.

Because of the high level of uncertainty, this team should be multi-functional to view issues from different perspectives and address tactics, issues and differences of opinion. A clear conflict resolution process should be in place and a final decision maker identified with clear authority. This team could also help build and capture combined organizational insight which could be used subsequently on other projects.

(7) Celebration and Recognition
Recognition is key to maintaining organizational vibrancy, and its impact is often overlooked or underestimated. In my experience, the prime motivator of most colleagues is not to "take" from the organization but rather to "give." Most colleagues desire to make an impact of value, and acknowledgement by management of the value of goods received is a means of encouraging even higher levels of giving. Thus, the prime purpose of recognition should be to acknowledge the value and impact of a contribution. Recognition must, therefore, be consistent, timely, personal and genuine to be credible and send the right message.

After a successful project where many of the above elements came together fruitfully, management should consider how best to re-invest in this potent tool rather than simply disbanding the team and starting over again.

A key enabler is the creation of a natural, collaborative environment that facilitates cross-fertilization of ideas, and encourages reasonable risk-taking in the development of new concepts.

VII – Pathway to Innovation: Summary and Conclusions

(1) Make sure you are working the right thing

(2) Lay the foundation for the organization and industry

(3) Co-creation is preferable to stepwise alignment

(4) Everybody needs to fully understand the vision and bases

(5) Importance of team values and organizational context

(6) Leaders must enable the team, model the values and drive to a solution

(7) Continually innovate throughout the project

(8) Manage the risk

(9) Recognize and celebrate ■

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About the Author:

Jack Emert *(j.emert@infineum.com)* is Chief Scientist for Infineum Ltd, a joint venture of ExxonMobil and Shell Chemical in the lubricating oils and fuels additive business. Jack received his PhD in organic chemistry from Columbia University. Upon graduation, he joined the faculty of the chemistry department at Polytechnic University where he established a research group designing systems to control the rates and course of chemical reactions. In 1981, he joined Exxon Chemical Co. where he led R&D teams developing a range of additive products for automotive lubricants. He has recently been engaged in study of the innovation process, using his experience to identify best practices for new product development. He is author or co-author of over 90 US patents, with products deployed in about one quarter of all the cars and trucks in the world.

The Corporate Innovator's Challenge – Creating a Winning Bundle of Customer Experiences

Robin A. Karol and Richard H. Tait

Rethinking What it Means to "Satisfy Customer Needs"

It has become a business truism that the best route to corporate innovation success is to deeply understand customers' important and valued needs (both expressed and latent) and to have your innovations satisfy those needs better than they are being satisfied today. The original business community answer to what constituted "customer needs" was simply that they were the desirable product/service features and attributes that customers lacked and wanted – i.e. the product/service qualities and characteristics that customers were asking companies to provide. A more recent answer is that what customers really want are the desirable and useful outcomes associated with the "jobs" that the product/service would be "hired to do" – i.e. what the product/service can do for them. [(1), (2)]

We think both the "features and attributes" and the "jobs to be done" approaches, while valuable, are incomplete. In particular we believe that they can – and often do – miss a critical set of customer needs. To explain we begin with the following perspective:

Proposition – businesses sell products and services but people buy experiences.

While new products and services are what business innovators are selling, we believe it is the "experiences" provided by those new products/services that the customer is actually buying. And specifically it is a key array of "emotional," "psychological" and "cognitive" experiences that customers are looking for that we believe the "features and attributes" and the "jobs to be done" frames miss. If the focus during innovation development shifts to the potential adopter's (i.e. customer's) "experiences," then the goal of the corporate innovator becomes designing that valued new and unique "bundle of experiences" that goes beyond just satisfying the functional "jobs to be done."

To make this "experiences-based" construct useful for the corporate innovator we must develop frameworks and tools to analyze customer's desired experiences so that a "winning bundle" of them can be designed. To that end we have developed a taxonomy of customer experiences (see Table I) to classify and systematically identify those involved in a given customer/market situation. In the rest of this article we explore this taxonomy and its implications. As part of the discussion we use a familiar but still powerful innovation story – the Apple iPod – to illuminate our points and to ground our conversation in the reality of the marketplace. A key point is that while this example is from the B-to-C (business to consumer) world, the concepts are just as relevant in the B-to-B (business to business) setting since in the end both come down to the psychology of people making choices.

Taxonomy of Customer Experiences — **TABLE-1**

- "Utility and use" experience
  - *How did you find it performing in the job you hired it to do?*
- "Aesthetic" experience
  - *Did you find beauty, harmony and elegance in form & function?*
- "Content" experience
  - *How did you experience being informed, educated, enlightened or entertained?*
- "Social" experience
  - *What did you experience "person to person"?*
- "Emotional state of being" experience
  - *How did it make you feel?*

- Financial experience
  - *How did you experience the exchange of $'s, ¥'s, €s, £'s, … ?*

The iPod Story

The Apple iPod is arguably the most successful new consumer product introduction of the last decade. There were several portable MP-3 music players in the market when the iPod was introduced but it quickly came to lead the market. Since its debut in 2001 the iPod has sold more than 140 MM units and should soon pass the Sony Walkman record of 180 MM units. Revenues from iPods and associated Apple offerings reached almost $11 B/yr in FY 07 (see Fig 1) and the iPod currently dominates the portable MP-3 market with about a 70% share world-wide.

This strong market performance has been credited to the combination of attributes and features that the iPod brought together: a massive music storage capacity, outstanding audio quality, a slick user interface, a compact form factor, the ability to legally download virtually any song desired from the i-Tunes Music Store and an elegant and aesthetically pleasing design. But what Apple really accomplished was to transform the way users could personally experience music by enabling them to create a personalized music library that they could enjoy anywhere they chose, in the sequence that they wanted to enjoy it, enveloped in a personal auditory "cocoon" and with an unmatched ease-of-use experience. And, all the while making them feel really cool.

Exploring the Taxonomy of Customer Experiences

There are six classes of customer experiences in our taxonomy (see Table I) with the top five intrinsically on the credit side of the customer's experience ledger and the last one intrinsically on the debit side.

"Utility and use" experience – How did the innovation perform in the job you hired it to do?

This class is all about functional "jobs to be

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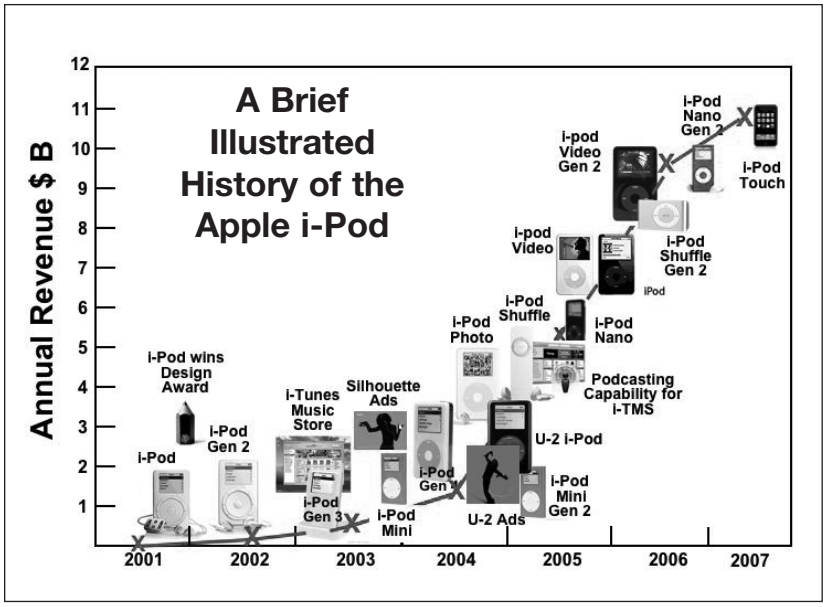

FIGURE 1

done" and is what potential adopters (particularly those in the B-to-B world) usually think about upfront when engaging innovative products or services – i.e. they ask "will this innovation accomplish the task I need done (utility) and what will I experience when I put it to work to do that task (use)?" Adopters routinely look first for the functional results they want to experience. As marketing guru Theodore Levitt famously said – "People don't want to buy a quarter-inch drill. They want a quarter-inch hole!" And they look next at the full array of operational experiences associated with getting those functional results. Adopters want to know, "Will it be easy to use? Will I have a steep learning curve? Will I experience a failure? Etc."

The job music lovers hired a portable MP-3 player to do was to make their music listening experience fully mobile. What the iPod uniquely accomplished was to package a very high music storage capacity (1000 songs in the original version and 40,000 songs today) in an "ultra-portable" device that "fits in your pocket." [3] In addition the iPod had "Apple's legendary ease of use" [3] that included intuitive navigation through the operational software and "one-hand" operation. It also had a range of supporting capabilities – especially the FireWire high-speed downloading connection – that competitors did not match.

Following launch Apple enhanced the iPod's utility and ease-of-use experience by systematically upgrading the product line (see Fig 1), both improving the way current jobs were being done and satisfying new and different jobs. This included adding the experience of being able to legally access an extensive downloadable library of music (via iTunes Music Store), enhancing the portability experience (with the iPod Mini and the iPod Nano), adding the capability to store and view visual content (first photos then videos) and most recently enabling direct wireless access to the internet for on-the-go music downloads (with the iPod Touch). These enhancements kept the iPod continuously ahead of the competition and enabled Apple to both grow the market and increase market share.

"Aesthetic" experience - Did you find beauty, harmony and elegance in form & function?

This class of customer experience – which contains elements from the artistic sensibility like balance, symmetry, proportion, tension, contrast, simplicity, depth, style, etc. – is emerging as a major potential differentiator as companies become adept at meeting customer's functional needs as a matter of course. The author Virginia Postrel has said, [4] "Aesthetic pleasure itself has quality and substance. The look and feel of things tap deep human instincts… Whenever we have the chance we're adding sensory, emotional appeal to ordinary function." As an example, the aesthetic appeal of a quarter inch drill – and not the hole it produces – is often a deciding factor for purchase/adoption. As one tool owner commented in an interview by NPR, "Tools! I collect them like art objects."

In the past many corporate innovators avoided thinking about this class of customer values, either deeming it unimportant relative to functional performance or thinking it too individualistic to assess (i.e. "beauty is in the eye of the beholder"). But beginning in the 1930's an entire business discipline – industrial design – appeared that said the customer's aesthetic experience was both important and directly addressable. Over the last 30 years the profile of design as a critical business discipline/practice has steadily increased to the point that it is now fully mainstream (note BusinessWeek cover story May 17, 2004). In fact the term "elegance" (a key aesthetic experience) is now being used by firms in industries as diverse as software, orthopedic devices, consumer electronics and chemicals to describe their products/services/solutions.

Apple is known as one of the most "design capable" companies in the world and it exploited this capability in spades for the iPod. The devices ultra-thin form-factor and stark white color have become icons of design, it has won design awards and several iPod models are in the permanent collection of the Museum of Modern Art. The term "cool" has become a stand-in for aesthetically pleasing design and the assessment of the iPod is that it is the epitome of "cool" (In 2005 the iPod was identified by Dr. Carl Rohde – President, Signs of the Times, Cool Hunt Research, the Netherlands – as the coolest product in the world). The importance of this cool aesthetic to the iPod's market performance is a matter of debate but it is clearly a differentiating feature and some have argued may be at the heart of its success. [5]

"Content" experience – How were you informed, educated or entertained?

The rapid growth of computer-intermediated experiences – particularly those through the world-wide web – has given the concept of "content" wide currency and built sensitivity to how content is "delivered" and "engaged." But humankind has been involved with content and content delivery/engagement for a lot longer than the 30+ years that the personal computer has been around – e.g. just think of experiences like stage performance, narrative, education and instruction, public oratory, book and newspaper publication, etc.

Content experiences (whether passive like watching a Cirque du Soleil performance or interactive like an on-line operator training program) can be viewed as a form of "utility and use" (since customers are looking to get the "job" done of being educated, informed or entertained). But

experiences in this class have a unique characteristic that set them apart – namely that the "outcomes" (e.g. enjoying a pleasurable two hours under the Cirque du Soleil tent or learning how to operate a new process control system) are all mental experiences with no physical deliverables (such as a quarter inch hole). We believe that the "utility and use" experiences from offerings like the New York Times on-line or the Grand Theft Auto® video game are all so qualitatively different from those from something like a quarter inch drill that they warrant a separate classification.

When Apple launched the iPod it focused on providing an outstanding "content delivery" experience with the goal of CD-quality sound. While successful, this class of customer experiences was not initially a major winner for the product since sound quality – once at a "good enough" level – was not a differentiating experience for customers. It wasn't until Apple opened the iTunes Music Store (first to Apple users and shortly thereafter to Windows users) that sales took off because Apple then transformed the music "content delivery" experience of the user community by enabling them to easily – and legally – build whatever content library of songs they desired.

Note: Determining where in the taxonomy to slot a particular experience/capability is less important than ensuring that the potential customer value for that experience/capability is effectively explored. Listening to an NPR podcast is straightforwardly classified as "content" and "content delivery" experience, but deciding whether being able to access the full collection of NPR shows for download to your iPod is a "content/delivery" or a "utility" experience is not so obvious. We argue it doesn't matter so long as we fully assess/understand if that experience is valued by customers (which in this case it is as shown by iTunes Store download data).

"Social" experience – What did you experience "person to person" with the innovation?

The human animal is by nature a "social creature" and is inherently sensitive to "social experiences" whether these experiences are consciously created (e.g. mingling with fellow product development professionals at a PDMA conference) or simply encountered during the course of the day (e.g. connecting with a barista at your local Starbucks). The importance of the customer's person to person experience has long been recognized by service companies, particularly firms who have front-line retail staff that directly "touch" consumers (e.g. coffee shops) and firms who stage "social networking" events (e.g. business conference organizers). In addition there are many product-based companies who understand the value of "community" and have created/facilitated networking structures (e.g. Apple user groups) to support product use and enhance sales.

But we are now in a qualitatively different era. The growth and development of the world-wide web has added whole new dimensions (with tools/capabilities to go with them) to the way people can experience interacting with other people. There are now a multitude of sites whose main function is to enhance/exploit the social experience in unique ways including destination social networking sites (e.g. My Space.com), self-organized on-line communities (e.g. SeeMeGarden.com) or massively multiplayer on-line role-playing sites (e.g. Second Life). And the economic scale associated with this arena is rapidly growing. as evidenced by the price (almost $600MM) that Rupert Murdoch's News Corp paid to purchase MySpace's parent company.

While new products and services are what business innovators are selling, it is the "experiences" provided by those new products/services that the customer is actually buying. ...The goal of the corporate innovator becomes designing that valued new and unique "bundle of experiences" that goes beyond just satisfying the "jobs to be done."

This class is the least represented in the original iPod bundle of customer experiences, except in an inverse fashion. The iPod offered no direct social experiences when launched and in effect encouraged an "individual experience," since donning the earbud-style headphones essentially foreclosed the possibility of "socializing." But the "cocooning" that the iPod enabled turned out to be one of its attractions since it allowed the user to consciously exclude potential social interaction whenever they chose. The introduction of full internet connectivity to the iPod product line (via the iPod Touch) gives Apple the opportunity to alter this situation.

"Emotional state of being" experience – How did it make you feel?

The personal emotional experiences that are wrapped around products or services – i.e. how they make you "feel" – are an integral part of the value they offer potential buyers/adopters and can be at the heart of the purchase/adoption decision. (It is a truism in the sales community – in both the B-to-B and B-to-C worlds – that "while people make decisions intellectually they buy emotionally"). Even when purchase decisions appear to be based strictly on "utility and use" considerations, a deeper look often shows they are emotionally driven. A good example is again the proverbial quarter inch drill. A major driver in how many serious home do-it-yourselfers select one drill over another is how "professional" it makes them "look and feel."

The number of possible emotional states is very large (one list of emotions we found had over 500 entries) with both positive and negative states present. Looking at just a small sampling of some that are routinely exploited commercially – i.e. feeling "sophisticated" or "pampered" (luxury goods), feeling "threatened" (business data network security software), feeling "loved" (on-line matching services), feeling "exhilarated" (high tech roller coasters) and feeling "under control" (operational process monitoring systems) – shows how broadly this class can drive product/service innovation.

The emotional state-of-being opportunity that Apple has most effectively tapped with the iPod is the desire of people to feel "special" and in particular to feel "cool." Apple's advertising campaigns – particularly the classic "silhouette" ads – have been

Continued on next page

very successful at exploiting the iPod's cool aesthetic to convey the message that if you purchase an iPod you yourself will feel/be cool. And, in fact, Apple has been so successful here that is has sustained this customer emotion despite the large number of iPods now on the street. Apple has also exploited the need of people in specific communities or niche markets to feel "special" within their community by offering them tools to "compete." A case in point here is the Nike+ offering that combines a sporty Nike running shoe with a wireless pedometer (that fits in a special compartment in the shoe) that can be tracked by your iPod Nano. This has created a tool that members of the elite runners community now use to capture and document their performances to share and "showoff" to other members.

Financial experience – How did you experience the exchange of $'s, ¥'s, €'s, £'s, … ?

Thinking of the financial transactions/interactions around the adoption/acquisition of an innovation as an "experience" offers a unique way to approach it. This is the one class of experiences in our taxonomy that is almost universally thought to be on the debit side of the experience ledger, where the worst can be very bad (e.g. the cost of a number of exciting innovative new bio-based drug therapies can be over $100,000 per year) and the best is usually only neutrality (e.g. the zero cost for someone doing a Google search.) But this experience is always one high on the customer/adopters priority list and clearly needs to be addressed to optimize this "debit" experience for the customer.

The original price for an iPod was relatively steep (MSRP of $399) and did generate complaints from some reviewers. However the iPod delivered such an attractive bundle of experiences (which Apple continuously enhanced) that it kept customers willing to have a relatively expensive "financial experience" even as volume and competitive action grew (the average price for an iPod three years after introduction was still almost $300). Where Apple did create a new customer financial experience was around legally paying for songs that they wanted to load/play on their portable players. Before the advent of the iTunes Music Store, if a listener wanted to legally get the top 2 or 3 tracks from an album they had to purchase the whole CD. ITM enabled them to pay just 99¢ for each song they wanted individually.

The "Total Value Experience"

The aggregate of all the experiences an adopter has with an innovative product or service – whether in a B-to-B or B-to-C context – we call the "total value experience." This includes both the bright stars throughout the taxonomy that positively differentiate the innovation and all the "nuts and bolts" of use (and misuse) that go along with them. The total value experience encompasses all customer experiences along the full "consumption chain" (see Figure 2) associated with identifying, selecting, using, servicing and finally disposing of the innovation [6]. And it is the aggregate value that drives the adoption/purchase decision, with the negatives in the aggregate always having the potential to outweigh the positives.

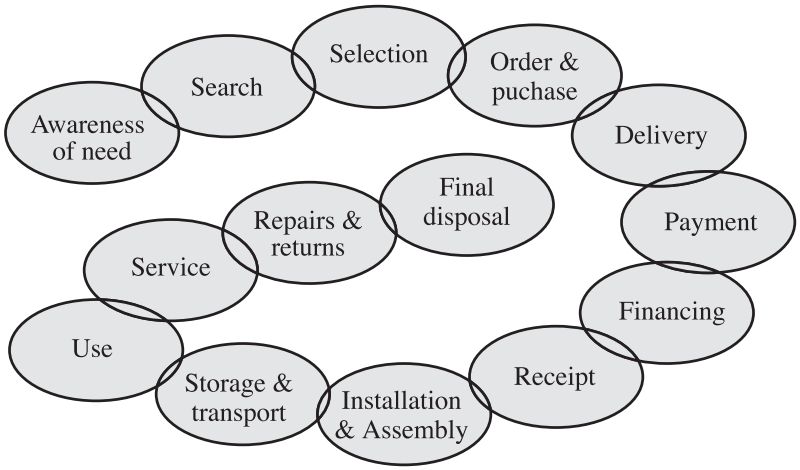

FIGURE 2. Typical Consumption Chain (From Ref. 6)

It is here that the iPod was the clear winner. The fact that the iPod was relatively fragile – and that when introduced had to be recharged more frequently than competitors – were more than compensated for by the overwhelmingly positive customer experiences we outlined above. As the business columnist and writer Steven Levy said, the iPod is "the perfect storm. It's a device that solved a problem just at the right time where it could change our lives and it did it so well." [5]

Defining "Customer Requirements"

A key question is how to systematically spot potential customer experiences – like the bundle that characterized the iPod – that will drive innovation adoption? In the last 15-20 years a powerful voice-of-the-customer (VOC) framework has emerged for identifying "customer requirements" that has proven extremely effective at capturing the functional "utility and use" experiences customers are looking for be they in the B-to-C or B-to-B setting. This framework/process (delivered under a variety of names including Concept Engineering®, Outcome-Driven-Innovation® and Market Driven Product Definition® among others) begins by engaging/interviewing multiple customers (preferably in their "home" environment) to understand the problems they face, the objectives they are trying to achieve and the difficulties they are experiencing with current products and solutions in the arena of interest – i.e. what is getting in the way of successfully doing the jobs they want done.

With this information it is possible to create an extensive list of "requirement statements" – phrased in user experience terminology – that describe possible functionalities that could be built into innovative products and services to address these problems, meet these objectives and resolve these difficulties. (An example of what one requirement statement might have looked like for portable MP-3 players is: "User can load a full CD into their player in minimum time"). This list can be systematically pared and prioritized via team convergence and quantitative customer survey techniques to provide a guide for development of innovative solutions. Market winning innovative products and services across multiple industries been developed using this approach.[7]

Designing for Experience

At present the VOC/"customer requirements" tool set is challenged to identify everything customers are looking for in the other classes of experiences in our taxonomy. Many elements of these types of experiential needs will be uncovered in the customer engagements/interviews (and the interview process can be shaped to elicit as many as possible) but some may still be missed.

An exciting new conceptual approach is emerging from the design community that may point to a way to address this challenge. This new approach – known variously as "design for experience" (typically applied to the design of physical products and direct services) or "user experience design" (typically applied to software or web-site design) – aims at getting beyond just functionality, usability and convenience to include experiences like pleasure and meaning. New approaches to understanding desired customer experiences including participatory projective/empathic techniques (e.g. asking people to create and share collages or personal narratives in the area of interest) and direct customer experience modeling by the development team (e.g. through staged role-playing) are being tried that get at a range of emotional experiences.[8] All of this opens a path to fully build out a framework to define "customer requirements" for aesthetic experiences, social experiences, content and content delivery experiences and emotional experiences.

Putting These Concepts into Practice

Given these perspectives, what can the corporate innovator do to put this "customer experience" framework to use? Possible actions include:

- Start by first ensuring that the potential adopter/customer and their values and needs are at the heart of the innovation process.
- Begin to use the language of customer experiences and customer experience design in the internal innovation effort.
- Because the "utility and use" class of experiences is typically the most important one, consider applying the structured VOC/"customer requirements" framework to get at the desired utility and use experiences.
- Consider enhancing your internal "design" capability to get at the other customer experiences in the taxonomy.
- Systematically explore the full consumption chain for positive and negative customer experiences – both experiences they now have and the ones that your innovation can and will produce.

The overall opportunity is to use the framework to invigorate the innovation conversation and practices in your firm.

Concluding Thought

Approaching the assessment of customer needs and values based on the broad "bundles of experiences" they are looking for enables the innovation team to connect more directly and personally with customers. In addition it ensures a more holistic view of what they should be delivering. Finally it enables the team to explore the rich complexity of customer needs in a more systematic way. All in all, it provides a new way to frame the innovation conversation that will open up new opportunities for differentiation. ■

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About the Authors:

Robin A. Karol *(rakarol@rakarol.com)* is CEO of the Product Development & Management Association. She is a former Manager of DuPont Consulting Solutions, an internal business consulting group, and Director of Innovation Processes at DuPont. She led the New Offering Development Process which installed a newly revised Innovation process for growth at DuPont. Robin holds a Ph.D. in Biochemistry from SUNY Buffalo. She recently co-authored *New Product Development for Dummies*, Wiley 2007

Richard H. Tait *(rhtait@aol.com)* had a 22-year career with DuPont that included positions as planning manager for DuPont Corp. R&D Planning and R&D lab director for DuPont Diagnostic Imaging. He led DuPont's Corporate New Product Network and was a founding member and innovation manager for the DuPont Center for Creativity and Innovation. He is currently president of R.H. Tait Associates, Inc. Richard has a Ph.D. in physics from Cornell. He recently coauthored the book *Value Innovation Portfolio Management*, J.Ross Publishing, 2006.

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- **Donald Stanford**, formerly CTO and Technology Fellow, GTech and currently Adjunct Professor, Brown University, *Confronting the Risk vs. Innovation Dilemma*
- **Jeff Krull**, formerly VP of Product Development for Shure, Inc, *The Enemy Within: Overcoming Internal Resistance to Innovation*
- **Michael zur Muehlen**, Assistant Professor of Technology Management, Stevens Institute of Technology, *Balloon or Marble? Governance, Risk and Compliance vs. Process Innovation*

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Wesley J. Howe School of Technology Management
Stevens Institute of Technology, 1 Castle Point on Hudson, Hoboken, New Jersey 07030

Sharen Glennon 201-216-5381 or Sharen.Glennon@stevens.edu