# Extreme Competition

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# An Architecture for Innovation

(Adapted from the book, *Business Innovation in the Cloud: Executing on Innovation with Cloud Computing*)

"Sustainable innovation can be achieved through a managed process aimed at resolving persistent business issues, creating new business models or designing products and services that address unfulfilled customer needs. A well-managed innovation process can be designed to elicit ideas that are highly relevant to an organization's specific or broad business objectives. In short, innovation can become a managed, reliable and fruitful process."[i] —Gartner Five Myths of Innovation, 2010 Update, Carol Rozwell and Kathy Harris

*How do you make innovation a systemic and repeatable process?* The starting point is having an architecture or operating environment from within which innovation can take place. This is the same as having a business or enterprise architecture for running your company.

An architecture is the use of abstractions and models to simplify and communicate complex structures and processes to improve understanding and forecasting the behavior of the system – in this case the system of innovation. Architecture uses sets of abstractions and models of an environment, problem space or domain, either physical or logical, with a set of associated views into that domain to provide:
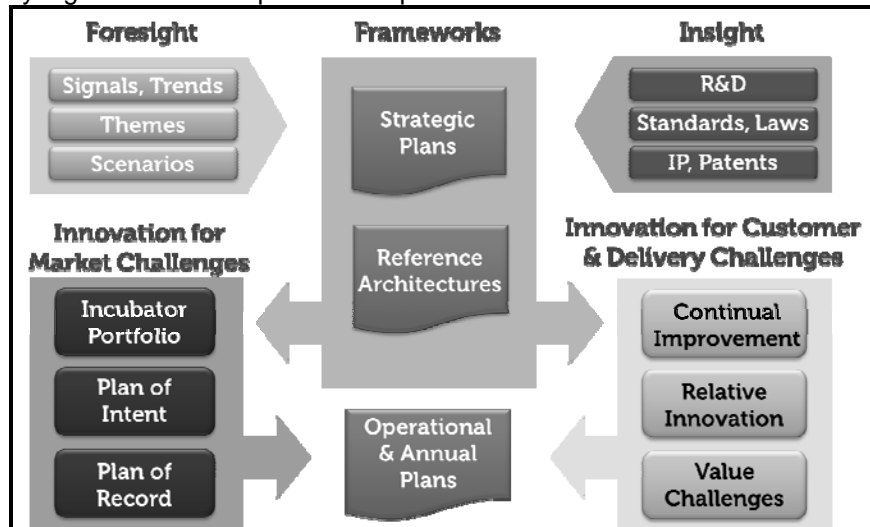
- o   Simplification and management of complexity in all of its forms (structural, procedural or informational), in particular the management, understanding and integration of the business and technical domains.

- o   Communication and common understanding of the problem space to multiple stakeholders from widely different environments by the use of multiple domain specific views of the architectural model.

- o   Completeness and relationship analysis of proposed solutions in the problem space or domain by examining the models and architectures from multiple differing viewpoints for incompleteness and gaps.

- o   Forecasting and predicting future architectures, strategies, structures, patterns, relationships and technologies in the business and technical space by extrapolation of abstractions and models.

In other words in relation to buildings, architecture has to do with the planning, designing and constructing of form, space and ambience that reflect functional, technical, social, environmental, and aesthetic considerations. Likewise from an organizational perspective, an enterprise architecture (EA) is a rigorous description of the structure of an enterprise, which comprises enterprise components (business entities), the externally visible properties of those components, and the relationships (e.g. the behavior) between them. This description is comprehensive,

including enterprise goals, business processes, roles, organizational structures, organizational behaviors, business information, software applications and computer systems, as well as terminology used and guiding principles for changing itself (self-similar, fractal and self – referential).

While at the micro level it comes down to the individual employees, their talent, qualifications and knowledge, that is the case for all work. What you want to create is an environment where the individual's work is eased for efficiency and effectiveness (ideas aren't being implemented if the staff is running around trying to figure out who to tell) and for leverage and diffusion through the organization.

Here is a very high-level and simplified example of an Innovation Architecture:



It is not meant to illustrate all of the connections, interdependencies, components, and interactions, nor is it a definitive process slide for an innovation management system. It is illustrative as a starting point for developing your own.

The key is to maintain a multi-dimensional and divergent (creative, intuitive, holistic, conceptual) view (foresight) of all the trends and ideas in as many domains as possible, translate those into the value systems and requirements (themes) that will be used for making decisions in the future and then construct stories based upon those requirements and values. Likewise, you have to maintain a broad view (insight) and stay rooted within the constraints in place (because changing status quo is hard). You'll also have to break away from the "practical, convergent, disciplined" (analytical, quantitative, sequential, specific) thoughts of your industry and markets.

And all of this has to be available to your teams 7x24x52 so they know where you need fresh ideas, how to communicate their fresh ideas, how to test those great ideas, and then how to execute on them.

### Foresight and Insight

Somewhere in the organization someone has to be monitoring the outside world, what is it doing, where is it going, who is out there… all the elements of scanning identified in "Observe" in OODA. (See OODA Loops discussion in BPTrends, July 2011).  Identify trends, using for example the STEEP Framework (Society, Technology, Environment, Economy, and Politics), that cause change resulting in challenges and opportunities for you and your customers.

If you want to be innovative, you want to understand that the ability to innovate is driven by your OBSERVEation and your ORIENTation capabilities. The key is your ability to understand social,

economic, business and regulatory trends, and for formulating scenarios of where they're going to end up, and your ability to apply technology to the problems and opportunities uncovered.

*Foresight:* A foresight model anticipates and monitors changes in markets, economies, regulations, demographics, business models, processes, values, priorities, etc. – all of which would benefit from enablement, facilitation and acceleration from technology. Technology trends are also investigated to ensure what is possible is understood in order to establish probable time lines for the anticipated changes. The changes to be looked at are not just products and services but new businesses, new business models, new business processes—and the sea change of technology transformations that are going on outside of your specific industry that will radically affect your industry.
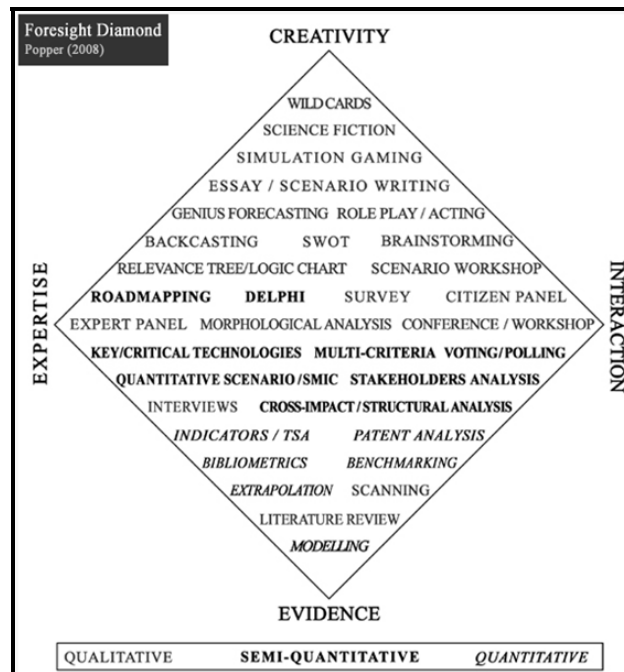
Foresight should be focused as far into the future as possible, it should identify thought leaders (both in and out of your domain), and it should be looking for patterns and the emergence of trends very early on, sometimes called weak indicators. It requires heavy immersion into the information stream noticing what is being said, and what is no longer being said. The key to foresight is not to predict an innovation or new technology or new need, but to describe what future buyers will value, what their decision processes and criteria will be, what expectations will exist (how many companies introduce a new product only to find the market has moved on?), what conditions and environments for buying and consuming might be like.

That foresight is then translated into a series of themes that describe the high-level or meta-level behavior of the future. Those themes are used to construct scenarios that can be used for strategic product and services planning. These scenarios are really stories about the future; they paint a picture of what might be and how the world would operate if that came to be – like a good science fiction short story. Additionally scenarios provide a framework wherein the inter-relationships of the scenarios can be used for investigating and positioning the potential for innovation. Consider scenarios related to the Internet of Things that drives Big Data; Big Data, in turn, drives embedded real-time actionable business intelligence which in turn drives the need for multi-sensory man-machine interfaces like the AlloSphere (http://www.allosphere.ucsb.edu).

*Insight:* In some ways insight is the opposite of foresight. It is based upon the linear trends; the best practices; what customer surveys say; what the industry gurus and analysts say. It also looks at what would constrain the course of action or degrees of freedom that are available for innovation. This could include both de jure and de facto standards and practices, current business assumptions, and the current legal and regulatory environment. Insight also looks at the not-so-distant future that is more easily predictable in terms of where the potential breakthroughs are. What is coming out of your own and others labs and research? What Proof of Concepts and trials are going on in the market? In many ways, insight is what most companies have done in preparation for their strategic planning in a convergent thinking manner.

*A Caution.* One can get carried away with this process thing. It is there to support and enhance the "creativity" thing and that sometimes gets lost. The purpose of the FORESIGHT process is to create and encourage creative, divergent thinking. The data, information, outcomes and analysis should be creative, intuitive, qualitative, subjective, reflect possibilities (what could or might be). They should represent a holistic view (not just a narrow perspective—how many buggy whip manufacturers were thinking about the transportation industry and were prepared for the automobile?), and generally should generate conceptual abstractions. On the other hand, foresight needs to be balanced by the INSIGHT—very analytical, rational, quantitative and sequential analysis and convergent thinking around what can be seen *tangibly*. The information from insight should be driven by *constraints* (what cannot be done, at least from a rational perspective), should be objective and should always be backed up with specific details.

It is then combining those two different views of foresight and insight that you now can be truly observant (OBSERVE in OODA) of all that is going on and can orient (ORIENT in OODA) yourself to the best course of action and the right form of innovation.

Foresight Diamond, Popper (2008)

### Frameworks: The New Role of Strategy

When thinking about the future, how do we avoid what the economists and behaviorists call the "horseless carriage syndrome;"[ii] referring to how early automobiles tried to be as familiar to horse-drawn carriages as possible, including the addition of whip holders and even fake horse heads? At the same time can we avoid "blinkered views,"[iii] an inability to get out of one's own mindset and appreciate some one else's point of view, and at the same time not fall prey to the "irrational exuberance" every new technology or technology application brings along with it. The key is to create effective strategies—the Decide phase of a strategic OODA.

Based on smashing together the work of insight and foresight, the resulting dialectic of thesis (this will happen), antithesis (that can't happen) and synthesis (ah, here is another way to achieve that outcome) the organization could articulate potential challenges and opportunities for itself and its customers in many ways, for example:

- o  Probability of occurrence

- o  Vertical segment (if applicable)

- o  Operational segment (if applicable)

- o  Geography

- o  Timeframe when the challenge would occur

- o  Possible technologies (available now or in the future) that could be used to solve the challenge

- o  Means to have checkpoints along the way that let us know if the probability for the occurrence and timing of the challenge is on track

- o  Which executives (CIO, CFO, others) within a company will be directly and indirectly responsible for solving the challenge

Combine these and others with traditional strategic methods: SWOT (strengths, weaknesses, opportunities and threats) analysis; McKinsey 7Ss; Porter's 5 forces; Ohmae's 3C's; Hammer's Impact Value framework; Prahalad's Strategic Intent; and ADL's Matrix—whatever floats your boat. Then you can begin to set the boundaries and foci for innovation in your organization.

Two things should come out of this process (the DECIDE part of OODA)—and not necessarily a strategy per se. One thing that should come out of the process is a set of Strategic Goals, the strategic Action from OODA. These will drive the structural changes in the organization—new products, services, markets, and so on. The Strategic Goals support the *macro* innovation process and should drive three forms of innovation activity:

- o *Plans of Record:* These are committed products and services that currently exist and are either being delivered or committed to customers. The influence of the strategic goals is to provide evolutionary guidance as to how they can begin to morph to fit the future, or perhaps more importantly, how they should begin to die out.

- o *Plans of Intent:* These are the actions necessary to acquire or develop new capabilities within the organization so that when the time is right, they can be applied to new products and services not yet announced or delivered to customers.

- o *Plans of Investigation:* These are research projects – technology, market, customer or combinations, often involving proof of concepts or the incubation of new offerings. There is just not enough information or confidence to invest into a plan of intent or a plan of record (actually building the product or service for customer use and scale) so the plans of investigation are macro innovation insurance policies to gain information to later decide one way or the other.

The other things to come out of this process are Reference Architectures. A significant amount of publicly available information has been published on the Internet regarding the definition of reference architectures. An architecture itself is the use of abstractions and models to simplify and communicate complex structures and processes to improve understanding and forecasting (see above). Although there is some divergence, common descriptive themes include:

- o based on existing successful architectures, practices, and solutions;

- o takes into account future needs and opportunities;

- o written for a specific area of interest (domain);

- o written to a certain level of abstraction (ranging from very specific to highly conceptual);

- o supports design of predictable, quality solutions; and

- o provides common terminology for consistent communication.

The Embedded Systems Institute provides the following criteria for a good reference architecture:

- o understandable for a broad set of heterogeneous stakeholders (internal and external);

- o accessible and actually read/seen by the intended audience (defined and inclusive);

- o addresses the key issues of the selected domain (identified goals);

- o satisfactory quality as measured by stakeholders (metrics);

- o not politically compromised (quality not sacrificed by desire to build consensus);

- o up-to-date and maintainable (stays current); and

- o adds value to the business.

The purpose of the Reference Architecture is to enable at the *micro* level of OODA Action, numerous elements: a learning environment, creative thinking tools, design guidelines, engineering standards, research methods and tools, enabling work practices, an amenable culture, specific organizational structures, supportive management frameworks, numerous business processes, information systems, and the support infrastructure to allow and enable individual employees to look for, identify, investigate, communicate, suggest opportunities for innovation and then involve the organization as a whole for addressing them. In most cases three types of innovations and innovation processing have been observed:

- o *Cross application innovation*: a technology, product, services, process or business model has been used successfully somewhere else, and it might be applicable to the problem, issue or opportunity at hand.

- o *Continual improvement innovation:* an opportunity to do what is currently being done but in a faster, better or cheaper manner.

- o *Problem-solving innovation:* using creative tools and techniques such as TRIZ, crowd sourcing and value challenges or open innovation fairs to address problems, issues or opportunities that there is no previous experience or track record (or success record) with.

Caution, however, is in order. Frameworks run the risk of suffering from the same mistakes organizations historically face with their strategy efforts. One difference and advantage is that the outcomes of frameworks (strategic goals and reference architectures) can be immediately translated into OODA *Actions*. But care should be taken to avoid the common pitfalls:[iv]

- o Failure to face the identified problems.

- o Mistaking goals for strategy. Notice that the *macro* and *micro* actions are not financial—they are "do the work" activities so there is no "grow revenues at 20% with 20% margins," only what Action (OODA) is to be taken.

- o Be as specific as possible. While innovation itself can be a fuzzy activity, you do not want the attention and focus on innovation to be fuzzy.

- o Avoid fluff. The individuals in the organization who will be your source of innovation need to understand what you mean, so keep it simple and in plain language.

- o You can't do everything, and your staff knows it—and your customers too, so be careful with the marketing and PR material The macro plans and micro support environment sets the playing field for what will be done, so either support your staff (resources and time) or don't include those activities you are not funding.

When thinking about innovation it is important to keep in mind that there are many forms of innovation. Innovation doesn't happen in a vacuum. People innovate in response to new challenges or new opportunities that emerge. Systematic innovation processes also typically begin with the identification of a dilemma that needs to be solved or a new opening for improvement. Changing the status quo requires proactive management, and the recognition of a problem or opportunity provides an incentive to try to do things differently, and serves as the driver for directing an innovation process.

- o Innovation can be Disruptive, Breakthrough or Incremental to the work you do today.

- o Innovation can be driven by business model change and the way your organization creates value. Southwest Airlines is the classic example of business model innovation. And Dell, for example, revolutionized the personal computer business model by collecting money before consumers' computers were assembled—creating a net positive working capital for seven to eight days. Such innovation addresses market and industry

challenges, your plans and your strategy—often creating incubations, plans of investigation and plans of intent.

o Innovation can be driven by the industry or market or customers' changing needs and emerging opportunities impacting your offerings—changing your core products or services or changing the way you link or "bundle" offerings to create greater value. Microsoft, for instance, links a variety of its products, such as Word, PowerPoint, and Excel, into a more valuable "Office" bundle.

o Innovation can be driven by specific customer's immediate, ongoing or short term needs – continuous improvement through six sigma or constraint theory improvement, relative innovation taking ideas from one part of the business, market, industry or from far afield and applying it innovatively, or addressing problems that are not amenable to your existing ways of creating value. These innovations begin to change your (and your customers') supporting services in which you deliver a service beyond or around the core offerings; your core process and the way you create and deliver value and respond to customers; and your enabling processes (likely to increasingly be outsourced) that support your core business model, products and services.

### Takeaway

Recognizing innovation as a systematic business process is far more important than just creating "an innovation," for if a company is to lead, it must set the "pace of innovation." To become a serial innovator, a company will need to view innovation as an ongoing *business process* that spans all the dimensions of business innovation that are framed in the context of a rigorous Innovation Architecture.

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[i] 12 February 2010, ID Number: G00174076 © 2010 Gartner Five Myths of Innovation, 2010 Update , Carol Rozwell, Kathy Harris

[ii] http://computerperformance.co.uk/ezine/BestPractice/BestPractice64.htm

[iii] http://www.thefreedictionary.com/blinkered

[iv] www.mckinseyquarterly.com/Strategy/Strategic_Thinking/ The_perils_of_bad_strategy_2826

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