Is There an IT Innovation Gap?

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Kubernan
Guiding Innovation

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Introduction

Technology innovation is a frequently discussed topic. However, there is a wide range of opinions relative to the value and the extent of innovation. For example, some pundits believe that innovation in general, and technology innovation in particular, is one of the strongest forces driving American competitiveness. To others, innovation in general is overrated and technology innovation in particular is running out of steam.

The purpose of this report is to put technology innovation into its proper context. The report accomplishes that goal by answering a number of very specific questions regarding technology innovation. Those questions include:

- Does innovation matter?
- Is there an Innovation Gap?
- Is it ok to acquire innovation?
- What companies are the leading innovators?

This report will answer those questions based on qualitative insight combined with quantitative analysis gathered as a result of survey.[1] Throughout this document, the people who responded to this survey will be referred to as the survey respondents. It should be noted that just under half of the survey respondents (45%) work in an IT organization. The rest of the survey respondents work in a variety of organizations, including engineering, marketing, sales, and operations.

This report will focus primarily, but not exclusively, on the development of new and innovative technologies that are targeted directly at enterprise IT organizations. The article will also focus exclusively on vendors of hardware and software products. Future articles will expand this focus and discuss service providers, as well as technologies that are targeted at service providers.

IT Innovation Report

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[1] *The survey base consisted of members of the Webtorials community, with a world-wide response base across a wide range of company sizes.*

Innovation: What and Why?

Defining Innovation

The term innovation has a variety of meanings. The form of innovation that will be discussed in this report is innovation that leads to at least one of the following:

- Providing functionality to the end user that is significantly different from what was previously available.
- Enabling a fundamental change in terms of how we deploy and manage IT.

Note that innovation can come from the:

- Development of new technologies.
- Repositioning of existing technologies.
- Creative use of new or existing technologies.

Innovation: What are the Drivers and the Inhibitors?

In order to determine which vendors are likely to be the leaders in innovation, it is important to understand the forces that either drive or inhibit innovation. One of the key drivers of innovation is the potential for vendors and/or venture capitalists (VCs) to make large amounts of money. The potential to make money typically occurs when a new market develops or when there is a fundamental shift in an existing market.

One of the other key drivers of innovation is the concern on the part of vendors that their current business is at risk. This typically occurs after long periods of price pressure or after the emergence of a new competitive threat.

Some of the key inhibitors of innovation are just the opposite of the key drivers. For example, innovation is less likely to occur:

- If vendors and VCs do not see the opportunity to make a lot of money, and/or
- If vendors do not see that their current business is at risk.

This type of situation is typically associated with a marketplace that is dominated by a small number of vendors who are comfortable with their existing market share and margins.

There are other factors that can also inhibit innovation. Very often a company that has been successful in the marketplace becomes caught in a vice. On one side of the vice, the company is reticent to consider innovation in an area that is too far removed from what has brought the company success in the past. On the other side of the vice, the company is reticent to consider innovation in their core business, as that might either cannibalize their existing product line or present a difficult migration path for their installed base. Hence, successful companies often limit their attempts at innovation to areas that are complementary yet somewhat distinct from their core business.

Does Innovation Matter?

Importance of Innovation

The survey identified a dozen fundamental components of IT functionality, such as WAN services, security, and collaboration. These will be referred to throughout this document as the components.

For each of the components the survey respondents were asked the following questions:

1. How important is it to your company that there is innovation in that component?
2. How much innovation do you see in that component?

Each of the two questions had a 7 point scale, where an answer of "1" corresponded to none or not at all, an answer of "4" indicated a moderate amount, and an answer of "7" indicated extremely significant or critically important.

This section of the report will focus on the answers to the first question and a subsequent section will focus on the answers to the second question. Looking at just the

mean of the responses to the question about the importance of innovation tends to make each of the components appear to be moderately important. To provide more granular insight, the importance of innovation was defined to be the percentage of the survey respondents that answered question #1 with a "6" or a "7".

Based on this definition of the importance of innovation, the components fell into three groupings. The following indicates which of the components belongs in each of the groupings, as well as the importance of innovation that is associated with that component.

Critically Important

- Security (72%)

Very Important

- Converged Applications (54%)
- Performance Management (52%)
- Mobility (49%)
- Voice (47%)
- WAN Services (45%)

Moderately Important

- Management other than Performance Management (39%)
- Collaboration (39%)
- Data Center (35%)
- LAN (34%)
- Metro Services (34%)
- WAN CPE (33%)

There is a wide range in terms of the importance that companies place on technological innovation based on the component of technology being discussed.

Innovation as a Criterion in Choosing a Supplier

The survey respondents were asked to indicate the importance of innovation as a criterion in their selection of a supplier. Their responses are contained in Table 1.

Importance of Innovation in the Selection of a Supplier
Table 1

Importance	Percentage of Responses
Independent of the technology, innovation is always one of the top criteria	22.8%
For many technologies, innovation is one of the top criteria	29.9%
For a small number of selected technologies, innovation is one of the top criteria	17.3%
Innovation is a criteria to select a supplier, but it is seldom a top criteria	18.9%
Innovation is seldom if ever a criterion to choose a supplier	8.7%
Other	2.4%

The vast majority of companies (70%) use innovation at least occasionally as a top criterion when choosing a supplier.

The survey respondents were asked to elaborate on those instances in which technology is a top criterion that they use in selecting a supplier. There were a number of comments that put the importance of innovation into a business context. These included:

- "It is not innovation for innovation's sake. Innovation has to address a business need."
- "It depends on your business, your legacy systems and your pain points."

Technology innovation only matters if it solves an important business problem.

The survey respondents also listed specific technologies for which innovation is a top criterion they use when choosing a supplier. The technologies that were mentioned most frequently were:

- Wireless
- Security
- Application Performance
- Application Development using Web Services
- VoIP

In addition, a number of the survey respondents responded to the question of the importance of technology innovation in choosing a supplier with comments such as:

- "Only on new, less standardized technologies."
- "For technologies on the leading edge of development."

The preceding bullets underscore the fact that there is often a trade-off between acquiring an innovative product and acquiring a product that is standards-based and hence more likely to be interoperable. To quantify how organizations view this trade-off, the survey respondents were asked to indicate the relative importance of innovative products and standards based products. The question had a 7 point scale, where an answer of "1" corresponded to innovation being the most important, an answer of "4" indicated an even balance between innovation and standards, and an answer of "7" indicated that standards were the most important. Table 2 shows their responses.

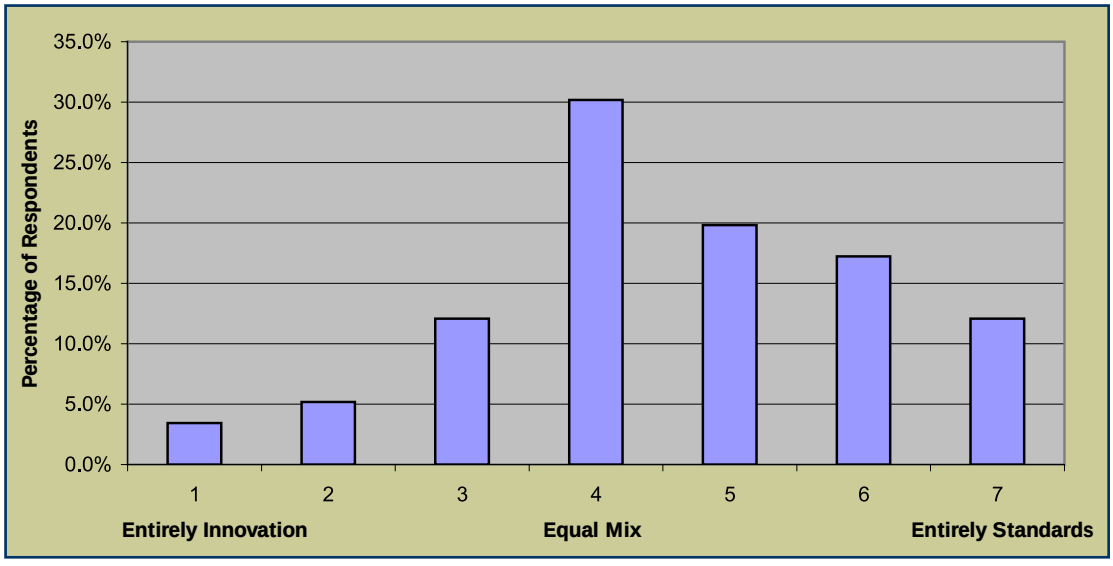
The primary value of innovation occurs early in the life cycle of a technology. In some cases, innovation later in the life cycle of a technology can be negative.

Is there an Innovation Gap?

This section of the report will analyze the answer to the question of how much innovation do the survey respondents see in each of the components? With that in mind, the amount of innovation was defined to be the percentage of the survey respondents that answered that question with a "6" or a "7".

Based on this definition of the amount of innovation, the components fell into four groupings. The following indicates which of the components belongs in each of the groupings, as well as the amount of innovation that is associated with that component.

Importance of Innovation and Standards-Based Products
Table 2



Significant Amount of Innovation

- Mobility (48%)

Moderate Amount of Innovation

- Security (37%)
- Voice (34%)
- Converged Applications (34%)

Modest Amount of Innovation

- Metro Services (22%)
- Collaboration (21%)
- LAN (20%)
- WAN Services (20%)
- Performance Management (19%)
- WAN CPE (17%)
- Data Center (15%)

Very Little Innovation

- Management other than Performance Management (10%)

The Innovation Gap is defined as the difference between the importance of innovation and the amount of innovation. Thus, it is possible to have a negative innovation gap. However, that did not occur for any of the components.

For every component of technology covered by this report, there is more need for innovation than there is perceived innovation occurring.

The Innovation Gap for the various components fell into three groupings. The following indicates which of the components belongs in each of the groupings, as well as the Innovation Gap that is associated with that component.

Significant Innovation Gap

- Security (35%)
- Performance Management (32%)
- Management other than Performance Management (29%)
- WAN Services (25%)

Moderate Innovate Gap

- Data Center (20%)
- Converged Applications (20%)
- Collaboration (18%)
- WAN CPE (16%)
- LAN (14%)
- Voice (13%)
- Metro Services (11%)

No Innovation Gap

- Mobility (1%)

The Innovation Gap associated with technology varies widely. However, it is rare to find a technology for which there is not at least a moderate Innovation Gap.

Is it OK to Acquire Innovation?

During the big growth spurt in networking in the 1990s, many companies added to their technology base by acquiring other companies. For instance, during this timeframe:

- Cabletron acquired Yago as well as the networking division of Digital Equipment Corporation.
- 3Com acquired Chipcom and US Robotics.
- Bay Networks, which was formed by the merger of Synoptics and Wellfleet, acquired Rapid City before being acquired by Nortel.

However, over the last decade, Cisco has spent more money and made more acquisitions than any other company in the networking industry. One of the first examples of how Cisco used acquisitions to acquire innovative technol-

ogy is how Cisco bought the LAN switching market in the early to mid 1990s.

In the mid-1990s, all of the drivers of innovation discussed in section 2.2 were in play. For example, in 1993 Cisco did not manufacture a hub. Hence, Cisco was not concerned that moving into LAN switching would cannibalize their existing product line. In addition, LAN switching represented a fundamental shift in the LAN marketplace that offered Cisco the potential for significantly increased revenues. Between 1993 and 1996, Cisco spent roughly eight hundred and fifty million dollars to buy firms such as Crescendo, Kalpana, Lightstream, Grand Junction, and Nashoba Networks.

Cisco's interest in acquiring LAN switch vendors did not end after making these acquisitions. While this report was being written, Cisco announced their intention to acquire Wireless LAN switch vendor Airespace.

While the LAN switching market may be the first example of Cisco using acquisitions as an alternative or supplement to internal innovation, it is hardly the only example. For example, Cisco's penetration of the carrier marketplace was accelerated by its acquisition of Stratecom while its entrance into the enterprise storage marketplace was enhanced by its acquisition of Andiamo, and NuSpeed Internet Systems. Cisco's penetration of the enterprise wireless marketplace was accelerated by its acquisition of Aironet, ExiO Communications, Radiata and JetCell. Finally, Cisco's penetration of the enterprise voice communications marketplace was accelerated by a bevy of acquisitions, including Selsius, Active Voice Corporation, Vovida Networks, Komodo Technology, Calista, and Amteva Technologies.

The survey respondents were asked if they have a preference to do business with a vendor based on how that vendor acquires innovation. It would have been reasonable to expect a wide range of responses to this question. However, the responses to this question (Table 3) clearly indicate that there is strong support for two opposing positions, and virtually no support for any other position.

Preferred Approach for Gaining Access to Innovation
Table 3

Approach to Gaining Access to Innovation	Percentage of Respondents Who Prefer that Approach
Virtually 100% of the time based on internal development	5.6%
Primarily through internal development, but occasionally supplemented by acquisitions	36.3%
From a roughly even balance of internal development and acquisitions	16.9%
Primarily through acquisitions, but complemented by some internal development	8.1%
Virtually 100% of the time through acquisitions	0.0%
Any way they choose. It does not matter to us.	31.5%
Other	Other

The majority of companies prefer to do business with a vendor with a strong emphasis on acquiring innovation through internal development. However, a very sizeable minority of companies does not care how innovation is acquired.

What Companies are the Leading Innovators?

It is not possible to compare the overall innovation of a startup company with the overall innovation of a large mature company. For that reason, this report focused only on large mature companies. However, as will be discussed below, it is also somewhat difficult to compare the innovation of large mature companies if they are drastically different in terms of their annual revenues.

The survey respondents were given a list of large mature companies and asked to indicate how broadly the company is a leader in terms of overall technology innovation. The five vendors that had the highest number of responses were:

1. Cisco
2. IBM

3. Microsoft

4. Juniper

5. HP

However, the companies listed above have huge range in terms of their annual revenues. For example, Cisco's annual revenues are at least fifteen times larger than Juniper's. In addition, HP, IBM and Microsoft each have revenues that are at least three times larger than Cisco's revenues.

In order to determine how relatively innovative a company is, it is important to consider the company's revenues. That follows because a company with fifty billion dollars in revenues can afford a considerably larger R&D budget than a company with five billion dollars in revenues. In order to quantify how relatively innovative a company is, the following assumptions were made:

- It is not reasonable to expect that if Company A has twice the revenues of Company B, that it is twice as innovative.
- It is reasonable to expect that if Company A has ten times the revenues of Company B, that it is twice as innovative.
- It is reasonable to expect that if Company A has one hundred times the revenues of Company B, that it is three times as innovative.

The assumptions listed above were used to create a methodology that was used to derive what will be referred to as Normalized Innovation Scores. The five companies with the highest Normalized Innovation Scores were:

1. Juniper

2. Avaya

3. Nortel

4. Cisco

5. Alcatel

In addition to being asked to indicate the overall leaders of technology innovation, the survey respondents were also asked to indicate the most innovative companies for each of the individual components. Their responses were normalized to account for company revenues and are shown in Table 4.

The Three Leading Innovators by Component of IT (Normalized Scores)
Table 4

Component	Most Innovative Vendors
WAN CPE	1. Cisco 2. Juniper 3. Nortel
LANs	1. Cisco 2. Juniper 3. Nortel
Voice	1. Avaya 2. Nortel 3. Cisco
Data Centers	1. IBM 2. HP 3. Cisco
Security	1. Juniper 2. Cisco 3. IBM
Collaboration	1. Microsoft 2. IBM 3. Cisco
Mobility	1. Cisco 2. Nortel 3. Avaya
Performance Management	1. Juniper 2. HP 3. Cisco
Other Management	1. HP 2. Microsoft 3. Cisco
Converged Applications	1. HP 2. IBM 3. Avaya

The perception of how innovative a company is changes significantly when the company's revenues are taken into consideration.

It is interesting to note that there are ten components of technology listed in Table 4, and that there are six different companies that are the leading innovator for one or more of the components. It is also interesting to note that when asked to indicate the leaders in overall technology innovation the top three vendors were Juniper, Avaya and Nortel. However, when asked to name the top innovator by individual component, the top three vendors are Cisco, Juniper, and HP. This apparent discrepancy highlights the difficulty of determining which vendor leads in terms of technology innovation.

No company is perceived as the dominant technology innovator.

Summary

This report addresses a number of questions relative to technology innovation. One of the questions raised by this report was does innovation matter? The answer to that question was that there is a wide range in terms of the importance that companies place on technological innovation based on the component of technology being discussed. For example, innovation in the area of security is critically important while innovation in the area of WAN CPE is only moderately important.

The report also addresses the issue of the role of innovation in choosing a supplier. The conclusion is:

- The vast majority of companies (70%) use innovation at least occasionally as a top criterion when choosing a supplier.
- Technology innovation only matters if it solves an important business problem.
- The primary value of innovation occurs early in the life cycle of a technology. In some cases, innovation later in the life cycle of a technology can be negative.

The second question addressed by this report was whether or not there is an Innovation Gap. The answer to this question is highly dependent on the technology component. For example, the respondents indicated that mobility is an area in which it is very important to have innovation. However, the respondents also indicated that they saw a lot of innovation in this area. Thus, there is not an Innovation Gap relative to mobility.

There is, however, a significant Innovation Gap relative to:

- Security
- Performance Management
- Management, other than performance management
- WAN services

The third question raised by this report was whether it is acceptable for a company to acquire innovation. The answer to that question was that the majority of companies prefer to do business with a vendor with a strong emphasis on innovation coming through internal development. However, a very sizeable minority of companies does not care how innovation is acquired.

The final question raised by this report dealt with the issue of what companies are the leading innovators. Accounting for the differences in revenues, the leading innovators in overall technology innovation are Juniper, Avaya, and Nortel. The leading innovators on a component by component basis are Cisco, Juniper and HP.

The conclusions drawn in this report frame the challenge facing enterprise IT organizations. In particular, innovation is often very important to these organizations, and yet it is rare to not have at least a moderate Innovation Gap. In addition, even looking just at large mature companies, no single company dominates technology innovation. Hence, IT organizations need to understand the innovation coming from a wide range of companies and to relate this innovation to the ability of the innovation to add measurable business value.