

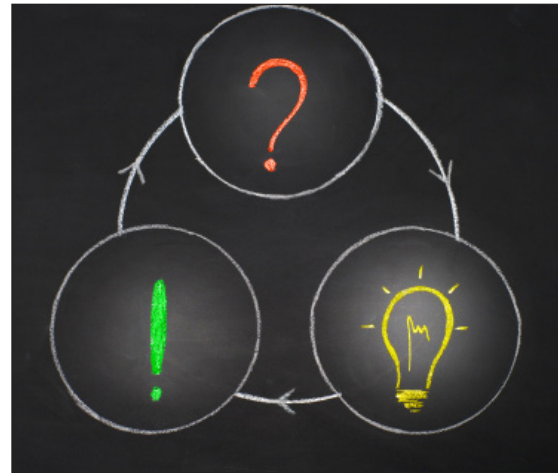
Incumbent Innovation: Changing the Face of Telecom

By Tim Young

Innovation: it's what makes technology, business, and even society itself move forward. It's not a tangible end-goal as much as it is a process. A journey, if you will, rather than a destination.

Often, we see innovation most clearly in the work done by tiny, agile start-ups staffed by plucky iconoclasts dedicated to the idea of fundamentally changing the way things are done. Within communications and entertainment technology (COMET), we generally look for this innovation to come from cutting-edge OSS and BSS software vendors and smaller competitive carriers and over-the-top (OTT) players. In short, we expect innovation from those who have little to lose and everything to gain from shaking up the status quo.

But this would be a vast underestimation of the truly insightful R&D work being undertaken every day by the major incumbent carriers through massive and well-funded in-house labs. In many ways, of course, we have these sorts of labs to thank for the existence of much of the OSS and BSS technology we cover every day which can be traced back to work done in the labs of companies like AT&T, BT, Deutsche Telekom, Verizon, and the like.



"I think it's fair to say firms like BT actually are massively innovative already and have been for years," said Tim Whitely, Managing Director of Research and Technology for BT Innovation, the R&D nerve-center for the British telecom powerhouse. "If you look at technologies such as fast copper access, single mode optical fiber and a variety of new routing and switching technologies, these have all been developed by telcos."

And of course these companies have a history of innovation. They've helped to create the industries they now take part in. AT&T, for example, traces its heritage back to the very genesis of telephony, beginning its tech timeline with Bell's invention of

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the telephone in the 19th Century (though its direct corporate lineage--due to the break-up and make-up process of the various Baby Bells--is the SBC Labs, established 1988). BT, meanwhile, claims even deeper roots. "BT is the oldest telco in the world, with a direct line of descent from the first national telecommunications undertaking," said Whitely. "The Electric Telegraph Company incorporated in 1846, was the first anywhere to develop a nationwide communications network exploiting leading edge telegraphy technology."

Every move that these companies made, early on, was innovative to its core. The trails had not yet been blazed, so each new technological advance required a combination of careful planning and bold invention. However, Whitely noted that much of this previous work enabled other technologies, but was not, itself, done within view of the public.

"Now the pace of change means we are firmly in the public eye," said Whitely, which BT considers a good thing, in many ways, as it helps the service provider stay connected with its subscribers, something Whitely considers a key component for success.

Different Strokes

Those changes, of which incumbents are a fundamental part, demand the R&D wherewithal that major carriers can provide to keep the whole process moving forward.

The philosophies underpinning these lab efforts vary greatly. AT&T Labs, for instance, employs researchers that don't shy away from big ideas, tackling research agendas that range from the very practical (data mining and assistive technologies for users with

"Theoretical research is history!" says T-Labs head.

disabilities) to the more esoteric (communications theory and artificial intelligence).

Others such as Deutsche Telekom's T-Labs, shy away from research done solely for scientific purposes. Heinrich Arnold, Head of Telekom Innovation Laboratories. "Theoretical research is history!" he told Pipeline. "T-Labs focus on the business areas of the company, support and challenge them, and find disruptive solutions for existing services or businesses." The labs are directed by the carrier's Digital Business Unit (DBU) and are dedicated to new business development and, "incremental steps for the enhancement of existing services."

BT, meanwhile, looks to partners to help drive innovation without jeopardizing its main business goals.

"To strike the right balance between forward thinking and maintaining our core competency," said Whitely, "We build very strong bridges with our customers, with industry partners as well as with leading universities such as MIT and EBTIC in Abu Dubai." These partnerships, in turn, promote learning and research while also bringing the ideas lab research uncovers back into the central business proposition.

"Our governance means we are constantly reviewing and checking what we are doing is working in the

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market and that we can draw a strong solid line from BT's group strategy all the way to our research."

This same sort of partnership strategy has been central to recent innovation efforts undertaken by Verizon Wireless. In addition to its other R&D activities, VZW recently launched its new Innovation Centers, which are designed with the expressed intent of creating an ecosystem designed to leverage the potential of the carrier's 4G LTE network. The centers, located in Waltham, MA and San Francisco, opened last summer, but were born out of discussions between members the VZW network team, Debra Lewis, VZW spokesperson, told Pipeline. "Even before 4G LTE was out there and ready to go, there was discussion among the engineers about this grand new technology and the ecosystem needed to capture its potential." In response to this need, VZW tapped partners like Ericsson and Alcatel Lucent, among many others, to develop a slate of new product and application prototypes in a rapid way.

While the Innovation Centers have already rolled out some promising products, Lewis emphasizes that the efforts weren't driven by the marketing or sales teams, or developed as a sort of engineering window dressing. "These centers came out of the network."

Building the Future

The thing that sets these major incumbent labs apart from some of the other research being done in the industry is the size involved and the number of patents that result. AT&T, for example, maintains some 1,800 staffers in its Labs division in a number of regional offices.

BT, meanwhile, enjoys a current patent portfolio in excess of 5,000 (though Whitely notes that the number filed in the century and a half since the company's founding is many times more than that). T-Labs, meanwhile, applied for 244 patents in 2011 alone, and owns more than 7,500 property rights.

Some of these patents are a part of a path toward what many see as the strategic future of these companies. The T-Labs, for instance, have invested a great deal of time and energy on next-generation handsets. "We are aware of new trends very early," said Arnold, noting that T-Labs have been on the leading edge of the open mobile internet movement. "We became a member of the open handset alliance at an early stage and offered the first Google phone in Germany."

But the work being done at these innovation labs aren't just proving that major carriers can be on par with other firms and service providers. Rather, these labs seek to leverage the unique combination

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of consumer trust, financial wherewithal, and technological acumen their companies possess to change the way that they do business. As old service business lines erode, here are a few projects that incumbent innovation labs are exploring as the new way forward for telecom giants.

Securing Handsets

Security is a major concern for every subscriber, and is a special consideration for subscribers who regularly deal with sensitive or confidential information. While handset manufacturers have made strides towards producing secure devices, carriers like Deutsche Telekom understand that there are still weak points that the carrier is best-equipped to address. "T-Labs have contributed massive knowledge in the development of a very secure mobile handset which will be used by governments and within high confidential areas," said Arnold. DT has been hard at work on microkernel technology, which secures the typically monolithic kernels found in most mobile operating systems, which prove to be a common Achilles' heel among handsets.

Need for Speed

BT, meanwhile, is engaged in research on advanced fiber optics, fast copper, and wireless which unite to spread its Superfast Broadband coverage to every home in Great Britain. In addition, BT is engaged in projects on so-called 'big data': "the huge amounts of raw data being generated by technology and the web," said Whitely, "its advanced software algorithms, visual analytics and making this useable."

Healthy Networks, Healthy People

Telehealth and telemedicine are also major goals for many of the incumbent labs. Since patients are not always close to the help they need at the time when they need it, carriers are developing ways to allow interaction between doctor and patient even when they are thousands of miles apart. Since these interactions need secure, reliable connections to make them happen, a number of incumbent providers have taken on this as a central part of their innovation research. AT&T's work on telehealth, for example, aims to not only transform the role of AT&T and telecom, more broadly, but looks to transform

the entire healthcare industry by making it possible to collect reliable, high-quality medical data at any time from any location.

Verizon Wireless, likewise, has made telehealth a part of its innovation strategy, undertaking projects with partners like BL Healthcare to develop applications that leverage the bandwidth delivered by VZW's network to enable remote health management solutions that can bring doctors to patients in high definition.

Leveraging Devices in New Ways

Other innovations may not be crucial components of the future of the organizations, as a whole, but are undeniably cool. "The one I really like is some of our future media services," said Whitely. "We are working on technology that allows someone on their iPad to communicate and interact, for example, with their kids at home using video conferencing, high definition voice and interactive apps. So a parent who is away for the evening can see, talk and interact with their kids in real time all while reading their bedtime stories. It's very cool and what's more, uses technology we have now and that people understand and can relate to."

Body Language

Sometimes even the most practical research leads to new technologies that tend toward the fanciful, but change the way that people interact with their devices and, by extension, the network and the world around them. For example, while working on smartphone sensors, the T-Labs developed a "gesture based device interaction model based on influencing the embedded compass sensor using a regular piece of magnet taken in fingers," says Arnold. "This extends the interaction space beyond physical boundaries of the device in a natural flexible manner," and "allows the interaction using the space all around the device even at the back or when the device is covered."

Odds and Ends

AT&T Labs, likewise, has been doing work on a range of offerings designed to make life easier and more enjoyable via cloud-based services and innovative interfaces. The solutions, highlighted in a recent showcase include a bio-acoustic door lock, a car alert system that lets you know when you've forgotten an item, and "Air Graffiti", which allows users to tag a location with information, memories, music, and more.

Verizon Wireless, meanwhile, makes sure that its Innovation Center work isn't limited to serious

Carriers are proving that they are willing to dedicate resources to staying at the forefront of those changes

business like utilities and education (though these are important verticals for the carrier). The wireless giant also works to enable a good time in its work with companies like jukebox player TouchTunes. Through its work with the VZW Innovation Centers, TouchTunes has not only figured out ways to ensure broadband connectivity in its nearly 50,000 locations, but has figured out ways to integrate app controls and photo sharing to enhance the end user experience. And Verizon Wireless notes that there are plenty more applications in the pipeline. "It's early days," said Lewis.

Changing Faces

In all of these examples, from the most serious to the most trivial, we see major incumbents bringing significant R&D resources to bear on problems and opportunities that face subscribers today. These efforts are proof that even major incumbent carriers aren't unaware that the industry is changing. In fact, in some cases they are driving the change themselves.

If history is an indication of the future, the story of each major incumbent CSP is one of near-constant change. Telegraph gave way to telephone. Video and wireless became mainstays of the communications landscape. Business models changed. Through the years and as evidenced by their continued commitment to innovation, CSPs are proving that they are dedicated to staying at the forefront of the next generation of communications and entertainment services and helping shape the face of thing to come.