Creating a Sustainable Innovation Ecosystem

By: Mark Cummings, Ph.D.

Telcos, cellcos, and cable companies (CSP's) and their large infrastructure vendors are facing a "softwarization" revolution. Customers, regulators, and technology evolution are creating serious scale, complexity, and volatility problems that can only be dealt with through innovative software. To be successful, CSPs need to have an ecosystem of innovative suppliers that includes small and start-up companies. This means that changes in business structures and technical ways of onboarding and deploying new technology are required.

Of course, change doesn't come easily, and many steps are involved. These include funding early technical and business case studies, proof-of-concept demonstrations, lab tests, and so forth. And then, companies must provide an on-ramp to paid field tests, small deployments, and more. Implemented properly, these serve as stepping stones to successful innovations.

Softwarization, technology evolution, and pricing pressures—plus new entrants— make the reliable availability of software innovation a survival question for today's CSPs and their large infrastructure vendors. Let's take a closer look.

Softwarization Changes the Game

Technology is moving so fast now that yesterday's advanced technology is today's legacy. Examples abound, but a few stand out. NFV (Network Function Virtualization) was touted as the transformative force for telcos as recently as last year (and some declare it still is today). But many are now saying that virtualization is passé. What is needed is cloud-native and containerized. Another example can be found in the concept that though we are in the very beginning stages of 5G, there is already work underway on 6G.

What lies behind all this is a move to a software-dominated world. In a software world with DevOps, this morning's advanced technology system can become old hat by afternoon. As the customer base embraces softwarization, demand for communication services is more and more often generated by software, while the infrastructure itself becomes software-centric. SDR (Software Defined Radio), SDN (Software Defined Networking), cloudification, and more are part of a wave crashing over earlier hardware-centric infrastructures—both systems and people.

5G Adds More Scale and Complexity

To meet the demand for ever-increasing bandwidth, 5G dramatically grows the number of basestations. Estimates of the increase vary by market and range from 8X to 15X. This creates an obvious scale problem, but the complexity of deploying and operating such a carpet of cells also goes up dramatically.

At the same time, demands on service are dramatically increasing. 5G IoT (Internet of Things) applications also require dramatic increases in latency, bandwidth, and reliability. To add to the complexity, network slicing is starting the industry on a path away from traditional "best efforts" service contracts to explicit SLA's (Service Level

Agreements) with significant financial costs for failure to meet them.

Meeting these requirements with today's highly manual operations will result in a dramatic increase in costs. Such an increase is not sustainable, especially in the face of continuing pressures on prices.

The Way Out

Given this environment, innovative software offers the only way out. How can we be sure that innovative software can solve these problems? The reason is that it has been done before. Examples abound in enterprise and OTT, the software-based businesses that ride on top of CSP services. Examples include Google, Uber, Facebook, Salesforce and more. In each case, small groups of talented people came together to develop innovative software that propelled them all forward.

Up until now, the CSP space has been "protected" from this kind of activity by a combination of regulation and high cost of entry. But the rise of super funds—like those developed by Son-san and SoftBank—and the decreasing costs in related spaces like satellite launch are spawning new entrants.

So, for existing CSPs the choice becomes about embracing innovation or running the risk of being displaced by new entrants. How do we know that displacement will occur? Because it has been done before—see Western Union, Motorola, and others. The only way out is to embrace innovation.

Barrier to Overcome

Many CSPs have been talking about the importance of innovation for some time. How come then, hasn't it happened? Despite the best intentions, current ways of dealing with technology have created a barrier.

Innovation generally comes from small groups, either start-ups or small companies. Current CSP approaches favor very large suppliers. A Silicon Valley venture capitalist tells the story of a CEO from a major telco complaining that he didn't see enough start-ups. The VC says he told the CEO that they didn't see many start-ups because they killed them.

The small number of very large vendors that provide CSP infrastructure can have senior staff groups work for free with CSP advanced technology groups, standards organizations, open source groups, and more while waiting for a very large comprehensive RFP (Request For Proposal). They have dedicated sales teams that "live" with their respective CSP. Then, they have specialized groups to respond to the large RFPs. These large vendors are very happy to do this because they see this process as a barrier to entry from new competitors.

The large vendors are able to recover all the expense inherent in this system in their large RFP-based sales. In terms of competition between these large vendors, they all have the same expense profile, so they do not compete based on these expenses. In other words, for the large vendors, this is simply a cost of doing business.

CSP's realize these costs in what they perceive as inflated margins on the products they buy through these large RFPs. They respond by trying to squeeze as much out of the large vendors as possible through unpaid activities. Unfortunately, the CSPs apply the same pressure for unpaid activities on the start-ups and small companies that do not have the requisite financial structures to survive and stay in this game.

After one such high-priority, highly successful proof-of-concept, a start-up completing a successful PoC (that could not be accomplished by the large vendors) asked a senior CSP advanced technology manager for a paid lab test engagement. The manager responded, "Why should I pay you anything? I already have everything I need." Do you see the barrier to innovation?

Small companies do not have the financial structure to do a lot of work for many years and wait for a big RFP. Furthermore, they are unlikely to be able to provide everything

—the soup-to-nuts infrastructure—called for in these large RFPs. Trying to do these things does not end well for start-ups. That is why the VC told the telco CEO that he killed start-ups.

The large suppliers have been reliable in providing after-sales support of hardware but are burdened with legacy product and talent portfolios that prevent software innovation. In the past, hardware-centric infrastructure components with 50-year useful lives made this long-term support very important. However, as we have seen, softwarization has changed the game fundamentally, as it has utterly changed the emphasis. As a result, these large vendors do not have the ability to provide the innovation that is required.

Many CSPs also still focus on long-term support as a key requirement. In a softwarization world, a focus on long-term support is in fact a hindrance rather than a positive. The CSPs also have many staff members that have legacy-hardware-oriented skillsets throughout all roles in the organization.

Some see open source as a solution to this problem. They think that open source software is free and that it will provide the required innovation. However, neither is the case. Current open source CSP initiatives have heavy participation and influence from the same large vendors with the same limitations. There are those in the industry who have raised serious questions about the CSP industry having the necessary scale to make open source work. Open source by its very nature, requires a company to implement it and deliver it. In this, it is confronted with the same legacy problems described above. In the softwarized world, there is a role for open source. It has been most successful in providing components that are widely used in many industry segments and that is likely to work best for CSPs too.

This confluence of legacies has created a barrier to the innovation needed in a world of softwarization. Obviously, change is needed. Change is never easy, but if we can develop a consensus on a path that overcomes these barriers, it will be easier.

The Shape of the Solution

Start-ups and small companies have demonstrated an ability to provide the innovation stream that is so desperately needed. They are often encouraged to demonstrate in unpaid PoCs. These PoCs can be important in providing both the innovative team and the CSP an opportunity to learn how to work together. But, for the reasons described above, such PoCs are generally not in themselves paid engagements and do not lead to paid engagements. Payment is reserved for the RFP process.

A solution then, involves paid on-ramps for innovation. One way these on-ramps can be created is through a series of funded steps. Such funded steps might include:

1. Funding early technical and business case studies
2. Proof of concept demonstrations
3. Lab tests
4. Paid field tests
5. Small deployments

In this context, it must be clear that not all efforts at each stage will be successful. This means that CSP managers have to be evaluated not on the success or failure of a particular effort, but rather on:

- Degree of innovation sought
- Professional handling including clear and complete documentation of requirements; development and adherence to a realistic schedule; clear, measurable criteria for success; documented test plan for measuring success; and definition of next step if success is achieved.

In this, there needs to be some sense of portfolio management. In many VCs, a 90 percent failure rate is expected. The 10 percent of successes pay for everything else and create above-average returns on investment. CSPs may expect more than a 10 percent success rate at every one of the five steps above. But even if there is a 75 percent success rate at each of the five steps, the conjoint probability of a particular

effort starting at step 1 and achieving success at step 5 may be fairly low. Management has to understand, accept, and support this throughout the process.

The next question is how to fully onboard the proven innovative technology. Here there are two possible approaches. The first requires the CSP to break its acquisition process down to smaller and different types of acquisitions. For example, instead of buying a "complete" xG infrastructure, the CSP may need to acquire separate subsystems in a series of separate acquisitions. RFPs may be appropriate for these. But it may also be clear a sole source contract makes the most sense based on a successful end of the five steps above. Also, most innovative software today is sold as Software-as-a-Service (SaaS). This looks to a CSP like an expense item and not as a capital expenditure, whereas infrastructure is generally considered a capital expense. As a result, some accounting adjustments may be needed

A second possible approach is for the CSP to work with one or more of the large vendors to get the large vendor(s) to acquire the innovative technology to deliver to and support the large CSP. This requires the least change by the CSP. It also provides a sustainable path for the large vendor. But it can run into the not-invented-here syndrome in the large vendor. So, while this appears to be an attractive alternative, it is fraught with difficulty.

Fostering Innovation

Of course the devil is in the details. Let's consider what's important, though. By providing funded projects, the lifeblood of small innovative companies, CSPs can create evolutionary niches for successful start-ups and small companies. And in so doing, they create a sustainable innovation ecosystem that can provide the innovative software that they themselves so desperately need.