> While Silicon Valley clearly is at the forefront of innovation for years Telcos must still be accused of a lack of innovation and market launch initiatives.

> Innovativ acting is only possible for those who have a clear picture of what is happening in its ecosystem and who knows about the consequences for customer segments, solutions for product development and all technological developments.

> The Innovation Radar provides a structure for this purpose and is an anchor in a rapidly evolving complex and digital ecosystem.
The United States have been trailblazing telecom innovation for over 10 years now and since 2007 alone, over $190 billion in venture capital investments have been made in US telecom and technology startups. Compared to other main telecom innovation hotbeds, in particular Europe, China, Israel and India, the US accounts for close to 70% of the total funds.¹

**Why the pilgrimage to Silicon Valley?**

With 3 times more telecom investments and startups than any other region in the US, Silicon Valley is clearly at the forefront of telecom innovation. There are more than 23,000 start-ups in the Silicon Valley alone ², according to the Global Entrepreneurship Monitor ³ there are more than 100 million businesses launched globally every year. Even though 90% of tech start-ups fail, this leaves a sizable number of start-ups to be watched for their business potential. Today over 25 fixed, wireless, and satellite operators from various parts of the world have outposts in and around the San Francisco Bay Area. Even those without a local office presence often send their carrier scouts to the West Coast on a regular basis in order to dig up interesting ideas, technologies and companies. Among these Telcos’ objectives there is one common denominator: To find the next big thing, or at least that new competitive edge over their rivals, be it other Telcos or non-Telco players.

Many large and small telecom companies have difficulties with embedding and maintaining an ongoing integrated market intelligence and foresight, which unifies the commercial (products & services) with the technology (IT, Network) view on market shifts and impact potential. Subsequently they are faced with a lack of agile and applied innovation and go-to-market capabilities. In need of an effective reaction to digital industry changes and disruptions or an proactive implementation of countermeasures, many are left with a mix of challenges which they hope to resolve or at least mitigate by setting up shop exactly where most of the digital disruption is born.

But just opening up an office in the Valley and transplanting a bunch of lucky expatriates, equipped with a laptop, a stack of business cards and a surfboard, to sunny California, is not cutting it. The tools being utilized by Telcos in the Valley range from scouting programs, mass outreach, events, to venture fund and strategic partnerships, with the setup of labs and incubators seeing the most growth recently.

¹ Telecom Council of Silicon Valley
² AngelList, 2016 (https://angel.co/silicon-valley)
³ http://www.gemconsortium.org/
This broad array of activities is underlined by a not lesser variety of Telco innovation priorities pursued by operators in the Bay Area, as the following overview from select Telcos with local presence shows.

**Is this just a Telco issue?**

Besides telecom players, individual companies in other industries and entire sectors are shaken and waking up, feeling the heat of digital disruption by a

Table 1: Extract of Innovation Priorities of Select Operators with Silicon Valley Presence

<table>
<thead>
<tr>
<th>Bouygues Telecom</th>
<th>China Mobile</th>
<th>BT *</th>
<th>SK Telecom</th>
<th>Sprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Apps &amp; accessories for TV</td>
<td>- Apps &amp; accessories for TV</td>
<td>- Ultra-fast broadband services</td>
<td>- Ultra-fast broadband services</td>
<td>- Ultra-fast broadband services</td>
</tr>
<tr>
<td>- Internet of Things over LTE</td>
<td>- Internet of Things over LTE</td>
<td>- Content interactivity</td>
<td>- Content interactivity</td>
<td></td>
</tr>
<tr>
<td>- Password management &amp; cloud security</td>
<td>- Password management &amp; cloud security</td>
<td>- Software Defined Network</td>
<td>- Software Defined Network</td>
<td></td>
</tr>
<tr>
<td>- Indoor localization</td>
<td>- Indoor localization</td>
<td>- Big Data internally &amp; go-to-market</td>
<td>- Big Data internally &amp; go-to-market</td>
<td></td>
</tr>
<tr>
<td>- Carrier-grade &amp; federated network</td>
<td>- Carrier-grade &amp; federated network</td>
<td>- 100% coverage (small cells, macros, drones, balloons, etc.)</td>
<td>- 100% coverage (small cells, macros, drones, balloons, etc.)</td>
<td></td>
</tr>
<tr>
<td>- Trusted communication environment</td>
<td>- Trusted communication environment</td>
<td>- 100% reliability (satellite backhaul, device-to-device, self-healing networks)</td>
<td>- 100% reliability (satellite backhaul, device-to-device, self-healing networks)</td>
<td></td>
</tr>
<tr>
<td>- Flexible device solutions</td>
<td>- Flexible device solutions</td>
<td>- 100% performance (mobile edge computing, open source networks)</td>
<td>- 100% performance (mobile edge computing, open source networks)</td>
<td></td>
</tr>
<tr>
<td>- Open system architecture</td>
<td>- Open system architecture</td>
<td>- 100% performance (mobile edge computing, open source networks)</td>
<td>- 100% performance (mobile edge computing, open source networks)</td>
<td></td>
</tr>
<tr>
<td>- Customer experience</td>
<td>- Customer experience</td>
<td>- Social network of things</td>
<td>- Social network of things</td>
<td></td>
</tr>
<tr>
<td>- Entertainment, FinTech</td>
<td>- Entertainment, FinTech</td>
<td>- Crowd-sourcing</td>
<td>- Crowd-sourcing</td>
<td></td>
</tr>
<tr>
<td>- Internet of Things (edge computing, connected home)</td>
<td>- Internet of Things (edge computing, connected home)</td>
<td>- Little data</td>
<td>- Little data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The future of work</td>
<td>- The future of work</td>
<td></td>
</tr>
<tr>
<td>- Authentication (ID Management)</td>
<td>- Authentication (ID Management)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- API &amp; Ecosystem Partnerships</td>
<td>- API &amp; Ecosystem Partnerships</td>
<td>- Best in class customer experience</td>
<td>- Best in class customer experience</td>
<td></td>
</tr>
<tr>
<td>- Mobile Advertising</td>
<td>- Mobile Advertising</td>
<td>- Market share in business segment</td>
<td>- Market share in business segment</td>
<td></td>
</tr>
<tr>
<td>- Internet of Things</td>
<td>- Internet of Things</td>
<td>- Disruptive technologies in wireless (data), residential (connected home), media (interactivity)</td>
<td>- Disruptive technologies in wireless (data), residential (connected home), media (interactivity)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- IT infrastructure (SDN/NFV, cloud storage, mobility)</td>
<td>- IT infrastructure (SDN/NFV, cloud storage, mobility)</td>
<td>- Digital lifestyle (self-service, buying experience, usage insights)</td>
<td>- Digital lifestyle (self-service, buying experience, usage insights)</td>
<td></td>
</tr>
<tr>
<td>- IoT (beyond sensors/devices, management layer)</td>
<td>- IoT (beyond sensors/devices, management layer)</td>
<td>- Customer experience (customer care, business intelligence)</td>
<td>- Customer experience (customer care, business intelligence)</td>
<td></td>
</tr>
<tr>
<td>- Advanced media platform (personalization, context-awareness, analytics, delivery, discovery)</td>
<td>- Advanced media platform (personalization, context-awareness, analytics, delivery, discovery)</td>
<td>- Entertainment (streaming, content portfolio)</td>
<td>- Entertainment (streaming, content portfolio)</td>
<td></td>
</tr>
<tr>
<td>- Lifestyle enhancement platform</td>
<td>- Lifestyle enhancement platform</td>
<td>- Robotics</td>
<td>- Robotics</td>
<td></td>
</tr>
</tbody>
</table>

Source: Detecon
multitude of small single-purpose players and larger ecosystem companies, chewing away on core revenues and value propositions of these long-established industry players.

Industries like Energy, Health, Manufacturing, and Automotive are starting or accelerating initiatives to beef up different stages of their innovation lifecycle, knowledge, culture and processes not just through focused innovation research & analysis but also, similar to Telcos, through direct exposure to innovation hotbeds reaching from Silicon Valley to Berlin, the Middle East and other high tech epicenters.

But even after realizing that the wind is changing and that existing revenues need to be protected or new revenue channels and business models need to be thought up or costs to be cut, many are overwhelmed with grasping the evolving complexity of the new digital ecosystem they are in: players and activities that may affect them already or down the road, and new opportunities that are out there in form of new products or services, technologies and suppliers or partners.

In 2006 the MIT Sloan Review issued an article with the title: “Companies with a restricted view of innovation can miss opportunities. A new framework called the Innovation Radar helps avoid that.” It talked about how big companies were facing challenging environments and referring to a need for innovation, in that “innovation will be the compass by which the business sets its direction” (Ford), that “innovation is central to the success of a company and the only reason to invest in its future” (General Electric), and that “innovation is the only way to keep customers happy and competitors at bay” (Microsoft). The framework was developed to assess business innovation within global enterprises with complex activities, including R&D.

What happened since then? The main challenges from 10 years ago still apply – slow growth, commoditization, global competition. But what else? Linear value chains, from Production to Sales, are outdated. New value networks are enabled by web and mobile, emphasizing on the customer interface, often detached from infrastructure, content, assets. Popular examples like Netflix in video, Amazon in ecommerce and cloud computing for businesses, Apple in smart devices and computers, Uber in transportation, Airbnb in hospitality are all evidence that technology enabled by web, mobile, software is disrupting many industries. For
digital players, such as telecom operators, this means the majority of innovation happens outside of their sphere of control. But the digitization and respective trends spreading across different industries are important success factors which need to be identified, evaluated, sorted out and pursued or implemented. In-house innovation had to be complemented with external innovation awareness: Therefore another form of an innovation radar with a more external view was established and used simultaneously to the internal radar. Well-known examples for these innovation trend radars are the Cisco Technology Radar, the DHL Logistics Trend Radar or the EIT Digital Radar.6

Szenarios and targets

We have witnessed the need for structured innovation management and tools like innovation radars as one component of it through the last decade in working with multi-national telecom operators and companies in many other industry

sectors. In principle not much has changed since then. The radar screen is still the visual front-page of a more extensive analysis, which includes customizable elements such as individual items spread across the radar dimensions, categorized into different maturity stages and relevance ratings, assessments of market- and customer-specific defined metrics at different levels, tracking tools, and prioritization methods.

With the number of promising innovations increasing and at the same time decreasing ability of a company to invest in too many lemons, a fully functioning filter is required to maximize its chance to identify winners when performing radar exercises. And these filters also need to be well aligned with the specific circumstances of the respective business, to fully reflect strategic targets, market environment, customer demands, etc.

The methodology to arrive at such end results can be applied to any innovation radar effort. It is constructed of different phases and activities within each phase, which eventually allow an execution on identified short-listed innovations.
Common radar stages cover initial discovery, long-list filtering, short-listing, short and in-depth profiling, including a versatile list of KPI assessments to allow for decision-making concerning next steps. The advantage of this approach is, that it is adaptable to different industries, divisions, target audiences, topics and purposes and its execution and visualization is 100% customizable to stakeholder needs.

Over the last 5 years we have noticed a significant uptake in adoption of these radars as a key lever for companies who desire to understand what is floating in the innovation pool, which is evidence for the value of the approach as such. Still, there are some important questions one should have an answer to, before allocating budget to such an effort:

> What can innovation radars being used for and by whom?
> How does the radar fit onto a strategy & innovation management timeline?
> How often should it be done or updated?
> Who can or should do it?
> Which buy-in and interfaces are needed internally to maximize the benefit?
> How to best execute on short-lists and recommendations?

Below we provide some examples of how the radar logic can be applied in different scenarios and with different intentions.

**Multiple Views:** Innovation radars are a vehicle to allow companies market perspectives from many different angles. It can be used for outlining trends in respect to products, services, technologies, adjacent (cross-) industries, socio-economics and other areas. It can be used as a discussion basis for experts to define the importance of certain external factors & innovations.

**Kickstarter:** If conducted as a one-time snapshot of defined dimensions it can jumpstart or inspire strategy or roadmap planning exercises.

**Periodic:** These radars are used as an ingredient to feed into market or ICT technology research, often combined with tracking of innovations in terms of how they materialize and mature over time.

**Management Dashboard:** It is also a very simple management tool to be able to convey strategies or background to certain chosen paths and to give management a guidance for decision making.
Spying Glass: Infused with a competitive analysis spin, it can provide transparency on peer activities, market entrants and industry practices of players across the world. As radars can offer very different means for different target groups, it can be quite a powerful lever for market challengers to identify ways to compete with incumbent or larger-scale players.

Cross-Fertilizer: For a telecom operator an innovation radar can be, besides above application fields, the cornerstone of an analysis that shows how product or service developments impact technologies, IT and network infrastructure.

Impact Gauge: For a telecom operator an innovation radar can be, besides above application fields, the cornerstone of an analysis that shows how product or service developments impact technologies, IT and network infrastructure.

Partner-Pool: Partnering, as another crucial element of today’s Telco player reality, will depend heavily on the operators’ capability to identify, assess and prepare for potential cooperation targets. Excellence in this first evaluation step is crucial for

Figure 3: Radar Application Examples Across Organizations or Processes
success, as it directly impacts the probability of successful monetization of innovations. Within potential service partnerships or acquisitions the timing element is of utmost importance. The faster an upcoming opportunity can be identified against competition, the higher the chances of being able to exclusively monetize on such a service for the longest time. Also an effective market scouting increases the chances of decreasing total T2M and hence TCO.

As with most industries, the telecom market is constantly evolving which makes market intelligence and visibility a key ingredient in strategy and planning exercises.

How would this look like for specific trends?

To illustrate the multitude of application options an innovation radar offers, we outlined two examples for current innovative communication industry topics below: Internet of Things (IoT) and Fifth Generation Mobile Network Technology (5G).

Structure and filter complex ecosystems: The Internet of Things is a very broad term and spans across many different applications, technologies, business models, players and industry segments. But it is on most telecom operators’ roadmaps and therefore requires a dissection to allow a better understanding of opportunities, threats and how to position the company in this complex ecosystem. From specific application environments such as Connected Car, Smart Home, and Industrial Internet, to entire industries like Retail, Transport and Health – each field provides a host of IoT use cases. Marketing wants to tap into it for new sources of revenue but needs to understand when which use cases mature in which area. Network and IT must be aware of the emerging IoT technologies and enabling platforms as well as players and link this knowledge to respective infrastructure requirements, cost and impact on technology roadmaps.

End-to-end view on technology-enabled evolution: 5G is a pure technology play, which brings together a host of wireless access technologies for a more integrated and of course faster network access. Guided by the 5G objectives, originally defined by the project METIS 7, one already derive possible areas for a 5G-specific innovation radar exercise. The new technology is supposed to allow for higher mobile data volumes per area, user data rates, number of connected devices as well as longer battery life of low power devices and significantly reduced end-to-
These objectives generate specific user and network driven requirements for 5G and will foster innovations across network and IT technologies, devices and applications in many consumer and business environments, with use cases reaching from IoT, context aware services, public safety, to extreme video and gaming applications, explosive data density usage and the retirement of legacy communication systems.

As shown in above examples, an innovation radar can be applied to shed some light on some of the previously highlighted questions. The format, breadth and depth can be adapted, depending on the topic, purpose, audience, frequency and desired decision factors. The broader application in core telecom fields like IoT, 5G and other popular topics can of course be much narrower in form of more specialized radar editions.

It goes without saying, that each of those versions can be broken down further to highlight specific aspects, for example more product- or service-oriented or technology-focused analyses.

Use the Innovation Radar as an effective management tool

Innovation radars are increasingly utilized across industries and companies are making use of the versatile nature and customization options. However, all radar activities are meaningless and a waste of money, if the objective is not clear or how the results will be applied and by whom, be it as an exercise to source items for roadmaps or to identify prospects for partnering or acquisitions. Therefore, not only the ultimate outcome has to be very clearly defined but also the required stakeholders and decision makers which can take it to the next step.

In summary, companies of different industry background and size can benefit and should utilize the innovation radar as an effective management tool since they offer maximum scalability to the needs and budget of companies in terms of depth of analysis, focus of the analyzed segments, iteration of market scans, etc., despite the fact that the internal drivers for radars can be very different.

Digitization impacts all sectors that struggle to get a clear picture of what is happening in the ecosystem, how it affects customer segments, product development approaches, technology evolution. The innovation radar offers to provide structure and focus in a rapidly developing, complex digital ecosystem.