



Experiencing the Future – Highlights of the 2015 LEF Study Tour

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In a recent LEF research paper, we described the contemporary digital landscape as a *Matrix* of ever-richer and expanding capabilities that challenge us to *re-imagine* just about every aspect of society, while redefining how we as businesses must learn to operate and innovate.

Identifying and keeping pace with the technologies that will shape these dynamics has long been the mission of our annual Study Tours. In late September, we took an international cast of some 40 clients to Silicon Valley for six intensive days that included meetings with 15 large and emerging technology firms, supplemented by LEF and client presentations, demonstrations and discussions. This year's group seemed especially motivated to engage with the future and improve their organizations.

Ever since we began our consumerization research a decade ago, we have stressed the importance of *hands-on experience*, but this need is especially vital in today's environment of mobility, wearables, virtual reality, social collaboration and the internet of things. We believe that widespread personal usage of these emerging technologies is now an essential part of your firm's ability to exploit new digital opportunities and defend against potentially disruptive market shifts. Providing participants with multiple means for direct technology experiences was a major goal of this year's Tour programme.

While the Tour covered a wide range of technologies and issues, often in considerable depth, the key findings and messages coalesced around three main areas.

1. Innovation at the edge

The Tour kicked off with David Goldsby's demonstration of how National Grid worked with the LEF's Lewis Richards to use a variety of edge and Virtual Reality (VR) collaboration technologies to envision and empower the *field engineer of the future*. These efforts have helped nurture a more digital NG culture, while changing the perceptions of Enterprise IT. We will publish this story as a case study in October.

During the week, clients enjoyed numerous ways to experience the power of VR – manipulating objects, steering a drone, walking through a control centre, collaborating with colleagues, and of course all-out sword-fighting – thanks to our visits to Sixense, Samsung, High Fidelity and 3D ICC. Although VR has been around for decades, it has clearly reached a new threshold of affordability and capability. And while many Tour participants were familiar with the use of VR in entertainment, retail and travel applications, the potential in higher risk areas such as welding, surgery and therapy clearly resonated.

However, there was also a sense that while the promise of VR is great, the technology is still immature, with many vendors seemingly focused more on rendering cool-looking avatars than specific business applications, where human likeness and even human scale are often less necessary. Additionally, Tour participants recognized that today's VR headsets, although greatly improved, are still too big, too heavy and too hot for extensive use, and that the optimal balance between VR and AR (augmented reality) remains uncertain. Of course, much might depend upon what Apple eventually decides to offer.

Delegates were also intrigued by Samsung's mobile payment innovations, especially its ability to leverage existing magnetic stripe readers. Clients particularly enjoyed getting first-hand experience in mashing together various internet of things (IoT) capabilities using IFTTT (IFTThis Then That). IFTTT clearly points to a world where the web, mobile apps and the IoT can easily talk to one another on demand, without the need for programming or advance preparation. Finally, from an edge security perspective, clients were impressed by Yubico's key-based, two-factor authentication, as well as the threat isolation logic that underlies Bromium's *micro-virtualization* approach. Microsoft's decision to incorporate Bromium technology into Windows 10 appears to be an important step forward.

2. Evolving and emerging platforms

Here, there was a nice mix of evolutionary and revolutionary strategies. During our visit to ARM, it soon became clear that the UK-based platform design firm is not content just to be the hardware architect of most of today's mobile devices (itself an extraordinary achievement). Through its new server and storage designs, it is now nurturing a hardware ecosystem to challenge Intel, EMC and other enterprise data centre incumbents. Clients were impressed by the potential energy, space and costs

savings, and can look forward to additional supplier competition in the server marketplace. Overall, the success of 'British chips' was a source of much pride among the Tour's many UK-based delegates, and rightly so.

Of course, many platforms are now becoming more virtual. In this regard, we enjoyed an illuminating presentation and demonstration from Julie LeMoine, CEO of 3D ICC, which a decade ago developed a low cost but powerful virtual collaboration platform called Terf which has recently reached a bit of a tipping point. Terf provides a much less expensive (think \$10K) and much more agile alternative to the dedicated company video conferencing rooms that often sit empty and are typically only used by senior executives. Terf is now being used and/or tested by a number of large organizations.

From a more futuristic perspective, clients appreciated our visit to High Fidelity's trendy downtown San Francisco loft. We were grateful for the extended talk from CEO (and Second Life founder) Philip Rosedale, one of the true pioneers in the VR field, who took us through the past, present and future of the virtual world. High Fidelity's mission is to build an ecosystem that leverages the power of the world's personal computers and internet bandwidth to create an almost infinite (and essentially free) virtual space. Think of it as a *crowd cloud*, based on open source principles. While the applications are uncertain and the project faces many challenges, the company's ambitions are impressive.

3. Management and control

In a world of billions of connected devices, there are obvious concerns regarding IT deployment, management and security, and many of our visits focused on these issues. For example, MobileIron showed us how the same processes used to manage mobile devices can, if it makes sense, be used to securely manage the IoT, while Space-Time Insights emphasized the importance of integrating today's data silos to provide real time 'situational intelligence' in the face of *brontobytes* of data. Similarly, Salesforce stressed how only modern cloud platforms can cope with today's pace of change and deliver the innovative customer experiences that just about every industry is now developing. Fast-growing Docker also emphasized the need for new approaches to speed up deployment and lower costs.

To learn more about the latest management tools, we leveraged our relationship with Andreessen Horowitz (A16Z), whose CEO, Marc Andreessen, founded Netscape and has since become one of the most influential venture capitalists in Silicon Valley. A16Z specializes in software firms that take on difficult computer science problems, and we were fortunate to be introduced to three of its leading enterprise software start-ups: Tanium, which seeks to deliver more rapid and accurate asset visibility; Mesosphere, which provides a data centre operating system designed to improve resource utilization, and Databricks, which seeks to simplify Big Data applications by making Apache Spark easier to use. During the patio reception at A16Z's posh Sand Hill Road offices, many business cards were exchanged, especially with Tanium, which is A16Z's single largest investment. Many clients were struck by A16Z's view that out of 4000 technology start-ups, just 15 firms will generate 90 percent of the eventual returns.

Additional observations, services and acknowledgements

During our end of Tour wrap-up session, the consensus was that the biggest 'wow' factors were earned by Tanium, Bromium, IFTTT and Yubico (note no VR). Additionally, we were impressed by how positively so many suppliers spoke about Microsoft – especially Windows 10 – with new CEO, Satya Nadella, getting very high marks. This marks a significant change from previous years.


For this year's Tour we also integrated our Value Chain Mapping framework into many of the company visits. After most sessions, Simon Wardley quickly developed a preliminary map that greatly helped in clarifying the strategic positioning of each firm. We also had an excellent presentation by James Findlay, CIO of HS2 (the high-speed UK rail initiative), which showed us how that 'massive government start-up' is using mapping to plan for and meet its demanding IT requirements. Clients interested in exploring this year's Tour from a mapping perspective should contact Simon or their local LEF representative.

In assessing these firms, it's important to keep in mind that as our clients come from a diverse range of industries, our Tours tend to focus on firms that develop *cross-industry* capabilities. But, of course, there are many influential *industry-specific* start-ups these days. Clients interested in exploring a sector-specific tour – say in finance, healthcare or another industry – should contact their LEF representative.

As always, we thank our clients for committing a full week of their valuable days (and nights), with a special thanks to ARM CIO Andy Smith for his splendidly poetic re-cap of the actual Tour experience. We also need to thank the many companies, speakers and supporting staff who so graciously hosted (and fed) us. Finally, months of LEF effort goes into shaping the Tour, especially by Jane Kingston and Victoria Gristwood (for the countless arrangements and logistics), Lewis Richards (who heads up our Xperience Lab project as well as all things VR), Simon Wardley (for his mapping expertise and deep knowledge of the Valley ecosystem), and of course the Tour's long-time godfather, Doug Neal.

As our Tours typically sell out early, we advise clients interested in our Autumn 2016 Study Tour to book early to avoid disappointment.

Supplier Profiles (in order of our actual visits)

 **SIXENSE** Sixense is helping to consumerize the virtual reality industry by selling low-cost VR kits that are now used by many developers to build systems for gaming, retail, training, therapy and other applications. The company has patented motion control technology designed to eliminate motion sickness.



High Fidelity was founded by Second Life creator, Philip Rosedale. Our visit focused on the company's ambitious efforts to leverage the spare computing and bandwidth capacity of consumers to build a vast, virtual space where all manner of new applications can emerge.



ARM Holdings provides much of the architecture of the mobile world, and there are over 60 billion ARM-based chips in use today. Our visit focused on ARM's 'everything is becoming a computer' market perspective, the latest trends in mobile devices such as wireless charging, the use of smart watches as building access identifiers, and the use of ARM technology for data centre server and storage systems.



Space-Time Insight focuses on helping firms track their physical assets by integrating data currently trapped in various silos. Our visit highlighted their ability to generate meaningful alerts, avoid false positives, and visualize complex logistical environments.



Samsung discussed its strategy and demonstrated its capabilities in virtual reality, mobile payments, integrated IoT support, 'Knox' mobile enterprise security solutions, online music delivery, and customer loyalty and support in today's 'multi-brand' household environment.



MobileIron is a leader in mobile security systems. Our visit focused on current IoT vulnerabilities and the company's ability to systematically manage IoT devices to assure the necessary identity and trust.



Tanium is a rapidly growing and well-financed start-up that has developed an innovative 'chain' architecture that enables improved asset visibility and response times for organizations with large numbers of endpoints (such as PCs and ATMs). It is currently used by roughly half of the Fortune 100.



Mesosphere (named after the layer of the atmosphere just above the stratosphere) provides a 'data centre operating system' that transforms multiple IT silos into a single shared environment to reduce complexity and increase utilization efficiency. It is used in many demanding digital environments including Apple, Verizon, PayPal, Netflix, Bloomberg and eBay.



Databricks was founded by key members of the Apache Spark open source project. The company seeks to merge diverse data sets, make Spark easier to use and thus 'make Big Data simple'. Its IaaS offering currently runs on Amazon AWS, but other services will be added.



IFTTT is short for IF This Then That. The company provides a free and easy-to-use consumer service that enables web, mobile and IoT services to communicate on demand, with no programming or advance preparation required. IFTTT now supports some 200 'channels' (such as Nest and Wemo) which can be daisy-chained into functional 'recipes'. There are many enterprise possibilities.



Bromium has pioneered *micro-virtualization* technology that provides protection for end-user devices by creating a virtual machine for every task, which serves to isolate and limit the impact of any one cyber attack. The company is now partnering with Microsoft to integrate these capabilities into Windows 10.



Salesforce is the leading cloud-based CRM provider. In our session, Peter Coffee discussed how a wide range of industries are being transformed by novel data uses, but argued that most companies have yet to develop the mindset, skills and capabilities needed to compete in this emerging IT-driven world.



3D ICC's primary product, Terf, provides low-cost, agile, immersive collaboration capabilities that are used by many large organizations. It is particularly useful for dispersed teams and people who work at home who must be able to view and share complex information.



Yubico was founded in Sweden and manufactures a durable, hardware-based two-factor authentication YubiKey that does not require any client software or ongoing service fees, and has a retail price of \$50. The keys are now used widely at Google and many other leading technology firms.



Docker grew out of the Docker open source project. The company has grown rapidly in the last two years due to the ability of developers to use its 'container' technology to make applications much more portable, easy to deploy and lower cost.

About the Leading Edge Forum

The Leading Edge Forum (LEF) is a global research and thought-leadership community dedicated to helping large organizations identify and adopt Next Practices at the growing intersection between business and information technology. We believe that as business and IT become inseparable, virtually every aspect of work and the modern firm will need to be re-imagined, and this creates exciting new digital opportunities.

Through an annual membership programme of research, events, onsite workshops and advisory services, we support Chief Information Officers and other senior digital business leaders in areas such as strategy, organizational change, executive education, staff development and the future of the Central IT function. Members enjoy personalized access to our global network of thought leaders, clients and leading practitioners.

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