Enabling Economies for the Future

Insight from the 2015 Strategic Innovation Summit at Harvard

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Cities and communities are now faced with the challenge of how to foster and enable innovation, as we move from a brick-and-mortar economy to an innovation-based economy. No longer are cities geographically limited – they are now connected to a global economy that can positively support and significantly impact their citizens.

The paradigm of industrial production, while still paramount for continued success, is no longer the sole driver of economic growth. New paradigms for employment and business are emerging. They separate the historical physical connection between employees or business owners and business facilities. The adoption of a virtual workplace, and the ability to work from anywhere, is radically changing how citizens work and live in cities while it simultaneously increases the number of virtual enterprises.

While the demand for services from communities rises, the ability to meet those demands often does not. Cities are faced with the dilemma of trying to provide innovative, improved service and governance – but while limited by budgets and infrastructures that do not necessarily track the fast-changing world around them.

How do cities enable innovation in their workforces and communities? How do cities innovate from within, to meet the ever-increasing, and highly dynamic demands of their citizens? Most importantly, how do the diverse stakeholders – who range from municipal leaders and infrastructure providers to end-user businesses and consumers – initiate the conversation to work together on viable solutions?

The 2015 Strategic Innovation Summit: Enabling Economies for the Future was convened on the campus of Harvard University to begin this critical discussion about what cities need to do, how to do it, and how to prepare for the rapidly-approaching future. The event was hosted by the Technology and Entrepreneurship Center at Harvard with generous support from Dell.

The Summit brought together senior leaders form a diverse array of segments to engage in a thought leadership discussion concerning the future of cities and the facilitation of their innovation economies. Participants included Chief Innovation Officers from several cities and large corporations, education professionals, and leading entrepreneurs.

The Summit provided a unique venue and rare forum for dialog and was organized around three main perspectives:

1. **City Chief Innovation Officer –** CIO is an emerging role found in only a few cities around the USA and the world. But the creation of this position is indicative of the shifting paradigm to innovation as a key component of government and a key enabler for citizens.

2. **Technology Infrastructure Partners –** How does technology impact the services of future cities? How can it be leveraged, and what partnerships are needed to install, adopt, and ensure the utilization of technology for governments, cities, and citizens?

3. **Innovation and Entrepreneurship End-Users –** What are the prerequisite tools and resources that cities, businesses, and individuals need to facilitate innovation? How do services and infrastructure impact the ability to be competitive in a global innovation economy? Are these needs being met?

The key findings from the Summit are synthesized in this report. This includes research summaries from presenters as well as case histories that highlight what works, what doesn't, and the current thinking of city governments, infrastructure partners, and end-users.

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Letter from the General Chair

The city of the future looks very different from the one that has been the cornerstone of society for the past centuries. The 2015 Strategic Innovation Summit revealed several trends that represent a fundamental change in how citizens use and interact with their cities. No longer are cities merely functioning as sources of infrastructure and services – and as common, centralized locations for brick-and-mortar companies. They are now becoming hubs of social cohesion. Citizens choose to live in them based on the availability of amenities and social and economic opportunities. Some examples of changes include:

- **Gig Economies :** People work on small jobs, rather than for a full-time employer.
- **Virtual Economies:** People work for companies thousands of miles away, or perhaps in a distant city across the state.
- **People-Centered Economies:** 9 to 5 workdays have become a relic of history. Many people now work longer hours, and they may also work in smaller increments of time throughout the entire day.
- **Frictionless Economies:** The traditional barriers that represented economic opportunities for many companies are fading away. Now anyone can buy and sell globally and anyone can design and build from anywhere in the world.

What does this mean for a city? How can a city chart a course to not only prepare for the future but also thrive in the future? The Summit convened a diverse group of city stakeholders including Chief Innovation Officers, infrastructure providers, educators, and successful entrepreneurs. The purpose was to discuss – and strive to answer – the profoundly important question of how cities can best prepare themselves for the innovation economy of the future.

This whitepaper is a distillation and examination of the Summit discussions. It attempts to capture the spirit and the ideas expressed and shared during the Summit, during formal presentations as well as informal discussions. In reflecting on the Summit and reviewing the excellent videos, I found five themes that permeated the discussions across several speakers and forums. I have included those as Innovation Insights which summarize these overarching ideas:

- The challenge of experimentation and risk for innovation in the public sector.
- The critical need for business model innovation.
- The focus on utilization versus availability of technology and infrastructure,
- The emerging importance of people-centered infrastructure.
- The role of disruption in innovation

This Summit was an exciting and engaging two days, for myself and all of the other participants. While it is not a conclusion, it succeeded in starting a discussion that addresses a future that will change not only how we live, but how we think about the role of our cities.

Sincerely,

Prof. David S. Ricketts, Summit General Chair

Technology and Entrepreneurship Center at Harvard

City Chief Innovation Officers

The position of City Chief Innovation Officer is a new one gradually being adopted around the globe. The role of this leader is to answer the challenges faced when creating a city that can compete in and take full advantage of the innovation economy.

Four CIOs were invited to speak about their respective city roles and initiatives. Cities that were represented included Burlington, VT, which just created the position a few months ago; Louisville, KY, recipient of a Bloomberg "Innovation Delivery Team" grant[1]; Riverside, CA, named "The most intelligent Community in the World" in 2012[2]; and Wellington, the capital of New, Zealand, and the first city in New Zealand to install high-speed fiber Internet.

What was the origin of the CIO role in your city?

Riverside - In 2006, city leaders decided to embark on a $1.6 billion infrastructure upgrade, which included a focus on becoming a smart city. The Chief Innovation Officer was created as part of this new vision to help guide the city and its initiative.

Wellington – The role was proposed by Philippa Bowron and was inspired by the CIO role in San Francisco, where Bowron had worked on a city-to-city relationship. The proposed role came at the time of a newly elected, tech-savvy mayor; a restructuring within the city council; a new initiative on asset management; and a focus on driving growth in what had been a flat economy.

Louisville – The newly elected mayor, Greg Fisher, campaigned on making Louisville a more sustainable, data-driven and innovative government. To make this happen, he realized he needed to create a position specifically responsible for driving this initiative. The CIO role was a commitment and an enabler to that promise.

Burlington – The newly re-elected mayor, Miro Weinberger, came from a business, rather than political, background. He was interested in transforming Burlington from a city slow to adopt change and new technology. As part of his mission, he wanted to create a role that would drive long-term infrastructure and technology goals. As a result, the CIO role was created.

1 http://www.bloomberg.org/press/releases/bloomberg-philanthropies-launches-42-million-what-works-cities-initiative/

2 http://www.intelligentcommunity.org/index.php?src=news&refno=722&category=Partner+News&prid=722

How do you define innovation and what programs do you focus on?

Riverside – The CIO manages the IT department as well as a nonprofit called SmartRiverside, which is aimed at narrowing the digital divide in the community by providing free computers to low-income families who complete a minimum level of computer literacy training. The CIO also manages and supports innovation programs across the city. The focus is on developing innovative programs within the city as well as in the community, whether they are city-sponsored or not. Examples include business incubators, technology boot camps, maker spaces, hack-a-thons, coding programs, etc. Riverside's philosophy was perhaps best put by Lea Deesing who said, "I think it's a great time to focus on our human capital by empowering citizens through technology and education."

Wellington – Innovation wasn't a term that was commonly agreed upon, so the City Council decided that was a first step. Innovation was simply defined as an invention or change that added value. While the innovation program includes some social projects and internal city council innovations, the majority of focus is on projects that will drive economic growth in the city.

Louisville – The CIO's priorities are the mayor's priorities. Innovation is focused on tackling some of the major issues that Louisville faces. Many of them are not high-tech or sexy, such as segregation, drugs, and many other social challenges. The impact was best expressed by Ted Smith's comment "...this is where all the headroom is, and so if you really take the innovation agenda seriously you say, 'That's honestly where all the opportunity is to make a difference.'" The CIO office focuses on those programs that will make the biggest social impact to the citizens of the city.

Burlington – As a newly created position, the CIO is working with the mayor to define a solid foundation for innovation. Initial focus has been on resident-city interaction and service outlets – trying to find ways to make it easier for citizens to receive city services. In addition, the focus is on improving infrastructure within the city and becoming a proactive participant in planning for new assets and infrastructure improvements. "Innovation shouldn't be something special, it should be part of everyone's day to day," summarized Beth Anderson.

Cities – Economies – Metropolitan Areas

Throughout the summit these three terms were used by different participants, often interchangeably. We provide a working definition below.

Cities: Is the common understanding of a municipality of significant size that is well organized and has permanent leadership and infrastructure management. Boston, St. Louis, Raleigh, would be common examples.

Economies – While well defined by economists, in the context of the summit economies refers to the economic interdependences and collaboration that occur within a city, a region, or collective group of individuals. It could be considered within he boundaries of a city, but was used more to represent the economic connection and thus may extend beyond the official boundaries of city.

Metropolitan Areas – IHS noted that many thriving economies occur not in a city, but in an area around a city. Metropolitan areas was used to identify those areas that may not be organized as a large city, but have the impact and economic cohesiveness of a city. One example is Silicon Valley in California, another is the Boston-Cambridge metro area.

Living Lab Project in Wellington, New Zealand

The Wellington City Council, in partnership with NEC, has created a Living Lab to explore how sensing technology may make the city safer and smarter - without compromising privacy.

The project does two things. It centralizes agencies' existing data – such as records of accidents, tagging, and crime reports, on a heat map. Then it adds data from new sensors that are taught to tell the difference between typical and unusual activity.

The sensors send alerts when visible and/or audible activity is beyond the norm. Glass shattering or a fight breaking out send an alert that prompts an officer to look at the live camera feed. This enables multiple agencies to collaborate more efficiently. The system can help detect a vulnerable person requiring assistance, for example, and enable Council to direct a community support person or medical facility team to attend to their needs

The centralized data will provide greater understanding of how that area of the city functions, leading to better-informed urban designs. The city can also offer non-sensitive, de-personalized data to its businesses, to help them gain a better understanding of their city and its patterns.

Philippa Bowron
Head of Innovation

Permit Review in Burlington, VT

As is true in many cities, Burlington, Vermont's legacy system for construction-related permitting is complex. At times, it can also be a source of frustration for residents hoping to make improvements to existing housing or build new homes. Over the years, changes have been made to the process, in an effort to make it more user-friendly. Now, with direction from the mayor and City Council, a new cross-department initiative has been launched do a "soup-to-nuts" review and reform of the complete permitting process. The evaluation will entail data analysis, public input, and best practice research – to help design a new process and identify new technologies to better support both staff members and permit seekers.

The project will seek to transform current thinking about permitting significantly, and not just make incremental changes. The initiative's goal is to explore opportunities to reform the entire permitting process across Burlington; to create a new process that is more efficient, transparent, and predictable; and to encourage investment in Burlington buildings and their enhancement.

Beth Anderson
Chief Innovation Officer

Code to Careers Initiative in Riverside, CA

Lea Deesing
Chief Innovation Officer

Studies show that there may be over a million unfilled high-paying technical jobs in the United States by the year 2020. SmartRiverside, a nonprofit aimed at empowering the community through education and technology, created a new "Code to Careers" program which consists of a community-based team of Riverside's educational, private, nonprofit and public partners. They have come together to create computer programming ("coding") programs for youth in Riverside. Their aim is to empower Riverside's youth with the coding skills required to apply for such high-paying jobs.

Many agencies involved with "Code to Careers" now offer free coding classes along with a board game-style roadmap where youth begin with an easy one-hour introduction to computer programming. The roadmap then guides the students onward. It gives them options to continue to learn computer programming through middle school, high school, and college – and to pursue the thousands of high-paying jobs waiting for them in that field.

In addition, Raspberry Pi is an exciting technology that can be used to teach computer programming and robotics. Newcomers of all ages can easily and intuitively see how a computer works, plug in components, and learn skills – in record time. SmartRiverside recently began teaching Raspberry Pi robotics coding to at-risk youth at one community center, and they plan to expand that program to other community centers, libraries, schools, and non-profits.

Smart Inhalers: Towards data driven solution to air pollution in Louisville, KY

Ted Smith
Chief Innovation Officer

Louisville has historically ranked in the top 10 worst places to live if you have asthma or allergies, and the city also has air pollution challenges. While air quality is measured every second in the USA by the Environmental Protection Agency, the impact on asthma has not been easy to demonstrate. The Mayor of Louisville, though his Chief Innovation Officer, designed a pilot program that leverages private philanthropy from the Foundation for a Healthy Kentucky and the Norton Healthcare Foundation. The pilot was the first community-based application of Asthmapolis (now called Propeller Health) of Madison, WI.

Three hundred Bluetooth sensors have been placed on the rescue medication inhalers of asthmatics. This enables a centralized data center to record the use of inhalers by individuals throughout the city, providing a view of where the worst areas are while also quantifying their severity. The initial heatmap of more than 5,000 rescue inhaler events showed clustering in specific Louisville neighborhoods that were in unexpected places.

The project (www.airlouisville.com) is scheduled to increase size to almost 1,500 inhalers in the next few years. The hope is that data will provide insight and pinpoint places within the built environment that may be good candidates for changes to traffic flow or green infrastructure, in order to remediate pollution and improve health.

New Urban Mechanics

Presented by: Nigel Jacob, Co-Chair Mayor's Office of New Urban Mechanics

The Office of New Urban Mechanics was formed in 2010 under Mayor Thomas Menino. The purpose was to address not only the big problems that face Boston, but the country at large – multigenerational poverty, a crumbling infrastructure and increasing climate change effects. Mayor Menino realized that if you just hope people will innovate, no one ever will. Instead, you need to find a way to drive to create a center of gravity, to create examples and to show how this can be done and to create team that is doing that 24x7. New Urban Mechanics is a startup essentially working in government whose job it is to develop or to explore the future of city services. They work with people in universities, startups, social entrepreneurs, private individuals, and grassroots organizations.

New Urban Mechanics takes the approach of experimentation, before full implementation. They test out new innovations, and fully vet them before they roll them out and try to scale them. They are an R&D rapid prototyping organization that first works with different agencies across the city to figure out what their issues are and then how to test where they should be going next. This rapid prototyping is enabled in part from a gift from the Bloomberg foundation, which provides private money that New Urban Mechanics can use to experiment – and fail – without using taxpayer dollars.

They conduct experiments with new innovations and then with quantitative and qualitative data decide whether it will work and more importantly whether they can scale the idea. They are thinking about scaling from the outset, they do not leave discussion on how to scale to the end, but rather it is baked into the experiment at the beginning. They want to know in principle what is needed to scale an idea if it's successful. The opposite is also true; if the idea fails they try to shut it down as quickly as possible. Nigel Jacob referred to this as the "fail fast" principle. There is also some space right in the middle which is essentially when things "fall flat". The idea is not an outright failure, but people just don't use it for whatever reason. This, unfortunately, is where many programs end up.

"New Urban Mechanics is a startup essentially working in government, whose job is to develop or explore the future of city services."

Nigel Jacob

New Urban Mechanics is a risk aggregator, as they operate outside of traditional city organization. If say a middle manager from the transportation department has an awesome idea of using flame throwers to melt snow, they can utilize New Urban Mechanics to try out the idea. Many times a department does not have the time, resources or money to try out new idea, but New Urban Mechanics has the funding and resources. If the idea is a failure, it is of no risk to the local governmental agency, but if it is a success, then they share in the positive press and congratulations for the successful idea with the agency.

New Urban Mechanics has several programs that have seen wide success. One was revamping the registration for school. If students did not register early, their chances of getting into the school of your choice plummeted. It becomes an equity problem and it was we often found it was families that were socioeconomically struggling that didn't completely the registration on time, and so they had fewer options. New Urban Mechanics developed a user friendly site akin to hotels.com for parents to choose the best school options and to register early.

Another innovation addressed the enormous parking issue in Boston. While not creating more spaces, the Park Boston initiative, made paying for parking easier and another initiative, TicketZen, mitigated many of the severe problems for those who didn't pay for parking – fines and license revocation. Park Boston is an app for smart phones that allows you to pay for parking on your phone, and if you do get a ticket, TicketZen, allows you to take a quick picture and you can pay it online. This single feature – of paying your ticket from a picture – has significantly reduced delinquency and escalating fines.

New Urban Mechanics has focused on what practical areas it could make an impact, ensuring to leverage its strengths and not tackle projects that it couldn't make successful. In this sense, it is a micro-innovation center that seeks the best bang for the buck. Scaling the many successes is the current mission of the program – how do they tackle some of the more intangible or difficult needs of the city and develop new innovations that scale.

"New Urban Mechanics is a startup essentially working in government, whose job is to develop or explore the future of city services."

Insights & Actions

1. Local governments should seek out or help create outside companies to develop innovative solutions to the problems facing their municipality.
2. Experimentation is a better way to try out a new innovation rather than spending a lot of time and money rolling out a new idea that may not work or that the people may not be receptive to.
3. Not all new innovations have to do with digital technology, sometimes they can be practical environmental solutions.
4. Feedback from people within a municipality is one the greatest indicators of whether a innovation will be successful and more importantly scalable.

"If I asked you to imagine a government service [...] in color, you may choose grey or maybe beige or something lackluster, maybe kind of works but kind of not. We need to do better than that. We need to find ways to reset people's expectations to show that we can actually build really killer things that people like to use."

Nigel Jacob
Co-Chair Mayor's Office of
New Urban Mechanics

Innovation Insights:

Experimentation and Risk

One of the tenets of innovation and creativity is the ability to experiment with new ideas and fail. Experimentation and failure, however, are two words not found in any politician's campaign promises. Enabling experimentation and managing risk were common themes throughout the Summit. Pilot programs and small initiatives are common in city government. But the idea of experimentation clearly suggests that the outcome is not known and there is the potential for failure. As one participant articulated it, "Some segments of the public, the media, and elected legislators do not think experimentation is a valid use of taxpayer dollars."

But how does one innovate if experimentation and the corresponding risk are not possible in traditional governance policy? Two solutions were posed by participants. The first, offered by Nigel Jacob, was that experimentation and risk can be taken offline into a program setup to specifically handle experimentation and risk, such as Boston's New Urban Mechanics. He explained that New Urban Mechanics represent a means for the city to move experimentation and risk to a localized "lab" to be examined, analyzed, and plant the seeds of innovation. Enabling the experimentation and risk tolerance of New Urban Mechanics is the private sector funding from the Bloomberg Foundation. Smith aptly noted "As it turns out, everybody stops asking the questions if you're not using tax dollars."

This raised questions – and possible solutions – related to public/private partnerships and private sector investment capital. The goal in this context was not to gain untapped capital, which has been one motivation for public use of private capital. Instead, the objective would be to use private funds to support activities that represent a what governments and taxpayers consider an unacceptable level of financial risk. The funding from the Bloomberg Foundation is one such example, one organization cannot fund every project in a city or every city in the world. Another solution is needed, one that is universal and scalable from small to large projects.

The second example came from Ted Smith, who suggested that a city may find ways to mitigate risk, thus making it more palatable to the municipality and its residents. One method would be to increase the number of stakeholders, so that it is not just the mayor's office involved – but perhaps the school district, the mayor's office, and a community foundation. He also shared the idea that public/private endeavors are a way to de-risk experimentation – just as the asthma program in Louisville and the Foundation for a Healthy Kentucky and Norton Healthcare Foundation have shown.

Where should a city start? The consensus from Summit participants was that cities should start with small pilot programs to answer basic questions:

- Is there a solution to the proposed problem (technology, process, etc)?
- Will that solution be readily adopted and utilized by residents?
- Is that solution scalable?
- Is there a business model that will sustain such a solution?

In deciding which problems to tackle first, there were two approaches recommended. The New Urban Mechanics program focuses on projects that fit with their expertise and resources. They choose projects that show great potential for success. An app that uses existing data and solves a problem for every parent waiting for the school bus is an easy win. It is a relatively small infrastructure investment, there is a clear need, and there is easy acceptance and scalability.

Louisville has taken a different approach. It uncovers the most important social needs and tries to find ways to de-risk those and obtain private funding for support. The asthma air-quality program is a great example. They focused on finding a solution for specific problems, even if the impediments were great.

Riverside has been focusing not only on programs, but also on the culture within their Innovation Department – which includes IT. Lea Deesing described it by saying, "I really think that's part of the innovative culture - building a safe environment where people understand that they can take risks and fail and they won't be harshly penalized. Really fostering a creative environment, where people are free to have divergent opinions and ideas and where that is still okay. That's actually a great thing."

Innovation in Education for the Future

Presented by: Richard Culata, Senior Advisor to the Secretary United States Department of Education

Richard Culata and his team at the Office of Educational Technology (OET) looked at innovation in cities through learning called Education Innovation Clusters. The purpose was to look at how different areas were using technology to transform and reimagine learning, and the role of learning in creating more innovative cities. He proposed three key focus areas for understanding and developing strategies in education that would lead to more innovations.

Learning in an informal space is as important as learning in formal spaces.

Culatta and his team did a scan of innovative cities that were robust with informal learning opportunities. They wanted to determine how influential informal versus formal educational opportunities were in the local school districts. What they found was that only about 18% of learning happens in formal spaces. So why were some cities concentrating so much on formal learning opportunities, when so little time was spent in that space? Their research showed that the most innovative cities had more informal learning opportunities.

Cities like Chicago, for instance, focus their efforts on learning in informal spaces by creating programs such as Chicago Ideas Week, in which they would bring in people to talk on a variety of interesting subjects and then answer questions by the students. Another initiative is happening in cities such as Dallas called City of learning, in which students can go online to find informal activities that they can do and earn badges to unlock even more informal learning activities.

Knowing How Your Learners Learn

Culatta and his team went schools to determine how students learn, and while it may have seemed to be a simple task, it was much harder than it seems. They asked educators to think of what a typical college student looked like and they would often point to a smiling coed wearing a backpack, happily walking across campus to class. They are bright eyed, alert and ready to sit through a lecture with pencil ready to make notes, and it is for these students that they create their curriculum. The problem they found is that the image educators had of a typical student, was not really a typical student. Statistics show that 75% of students are non-traditional students: parents completing their degrees at night, full time workers trying to move up within their company and military personnel trying complete a degree while on deployment.

It is essential to match the right educational experience with students actual needs. The United States is filled with people who have half or partially completed degrees in higher education. 31 million Americans in the last 20 years have partially completed degrees. In community colleges alone only about half of those that enter programs complete them. In order to create a more innovative economy, there needs to be a strategy to get those with unfinished degrees to complete them.

One of the ways that this problem is being addressed is through competency based education rather than the but- in-seat approach. Instead of forcing people to sit through a class an entire semester so they can mark it off on a transcript they develop a program that helps people in workplace situations to learn new skills in which they need to demonstrate competency rather than finishing a particular course.

Access to Learning

Culatta and his team felt that access to higher education for many students has been weak. The current efforts are insufficient for what is needed to create more innovative cities. Some states and cities are addressing this problem more aggressively like Tennessee for instance has made a promise that all students will have access to post-secondary education for free.

In Williamsfield, Illinois, they became tired of making their students buy expensive textbooks that were not relevant to what they needed to learn. They use open licensed digital resources instead of textbooks, and with the money they save they provide a computer for every student to use. Culatta states, "We can drop the cost of community college by 25% across the country by transitioning from textbooks to open sources."

Broad Adoption into the Ecosystem

The OET developed the initiative Education Innovation Clusters to bring innovation into cities. Culata says, "It is not about the schools, it is about bringing partners from different parts of the community together."

In Pittsburgh's Remake Learning, they have brought together their museums, higher education institutions and have come up with new innovative ways for students to learn both in and out of the classroom. In Forsyth County Georgia they have a program in which businesses all around put stickers in their windows that indicate they are safe places for kids to do their homework.

Three ways in which Education can create Innovation

The first way, Culatta suggests is that educators need to set a vision. For many years educators have included new technology to drive their vision. There are sites such as futurereadyschools.org that allows policy makers to see what the infrastructure would look like when building schools in the future that support more technology and digital types of learning.

The second is that we need to tell stories better about what is working in education. There are brilliant ideas and programs around the country that need to be shared. At tech.ed.gov/stories the Office of Educational Technology has created a space in which people from all over the United States can share what they are doing for others.

Finally, Culatta believes there needs to be a focus on more equity. Education Secretary Randy Dunn says, "If the technology revolution only happens for the families who already have money in education, it is not really a revolution."

Technology gives us very powerful levers to close equity gaps. In order to do this, there a greater access and opportunity for everyone to use it, and if not it just perpetuates the digital divide.

Insights & Actions

1. There needs to be more emphasis on informal education initiatives because these are indicators for higher levels of innovation in cities.
2. Communities need to become more involved and partner with one another to provide more learning opportunities for children.
3. There needs to be greater access to higher education, both financially and ease of entering college.
4. The future of innovation starts in schools with greater access to technology and a future vision of a technology driven infrastructure.

Innovation Insights:

Business model innovation

A point that is often missed when assessing technology and its impact on society is the business model for implementation/utilization of the technology. Glenn Wintrich and Brian Donnellan are co-investigators on a grant from the Science Foundation of Ireland researching smart cities. As part of that work they are investigating the role of business models and how they directly impact the adoption of new technologies in smart cities.

Point

Dell recently collaborated on a smart buildings project for a 40-story office building in New York City. By collecting data on the occupancy of the building and comparing it to the HVAC system settings, they found that they were cooling the buildings long after people had left for the evening. In addition, through data analytics, they found that during lunch the building occupancy was very low, allowing them to adjust the HVAC to accommodate that change. These two solutions produced a $250,000 per-quarter savings to the building owner. This solution was an easy sell to the building owners, who quickly asked where else they could realize savings.

Counter Point

Replacing parking meters with smart meters could allow a new level of service for city residents, such as enabling credit card payments and even providing the ability to locate unoccupied parking spots. The replacement cost of a parking meter, however, is not cheap. In Santa Monica, new smart parking meters cost $750 each[1] with a total capital investment of $4.5M. Seattle installed parking stations, which service 7 parking spaces on average, for a capital investment of $10.2M[2]. The expected payback period for Seattle is 3+ years and is based on a prediction of increased revenue from easier parking and reduced service expenses. A multi-million dollar capital investment with a 3+ year return represents a challenging initiative for any city government.

Glenn Wintrich
Innovation Leader
Dell

Innovative Business Models

Ericsson and Phillips recently introduce "Zero Site" an integration of wireless technology and low-power LED lighting[3]. Their goal is to provide a business model for cities, to fund the transition from traditional to LED lighting. The LED lighting provides energy reduction of 50%, but that may not be enough to support the capital cost for new lighting. What's the solution? Zero Site adds micro cells for cellular and broadband data that can be leased to data providers. The license fees help accelerate payback and support maintenance of the system.

Insights & Actions

1. Incremental savings is only one metric of the fiscal viability of a new innovation. Capital investment, even if small, can provide a barrier to governments that have limited budgets.
2. Scaling infrastructure projects from small single installations (such as commercial projects) to entire cities may inhibit adoption of many early proof-of-concept smart city projects.
3. Business model innovation is just as important, if not more important, than the underlying technology.

1 http://www.smgov.net/departments/council/agendas/2011/20111025/s2011102503-H.htm

2 http://www.dksassociates.com/wp-content/files_mf/1335560385Smart_Parking_Meters_Take_Over_the_West.pdf

3 http://www.ericsson.com/ourportfolio/products/zero-site?nav=productcatagory006%7Cfgb_101_0516%7Cfgb_101_0548

"..if we simply digitize traditional learning opportunities, we will not be solving problems, in fact, arguably, we could even be taking a step backwards….we need to make sure technology is being used in transformational waves."

Richard Culata

Senior Advisor to the

Secretary United States Department of Education

A Frictionless Future Economy and Implications for Cities

Presented by: Jim Stikeleather, Chief Innovation Officer, Dell

"Change fixes the past," explained Executive Strategist Jim Stikeleather, the Chief Innovation Officer for Dell. "Transformation creates the future." Rather than focusing on Dell product and services innovations, his particular role is to help Dell itself become a more innovative company, and that innovation extends also to the customer. His group conducts innovation training classes to facilitate Dell teams who want to address a challenge or opportunity.

A Frictionless Future

Stikeleather and his colleagues work on the development of processes and architectures around innovation and are responsible for foresight activities. They study the outside world in order to forecast or create future scenarios that have an impact on Dell's internal activity and how to respond to that vision of the future.

One of the key areas of interest is frictionless economy, and one of the main tenets of their process is that technology does not cause change. Technology can only enable, facilitate, and accelerate changes that already want to take place.

One of the misconceptions of technology companies is that they can force change to happen through technology. His group instead looks at technology usage patterns, to discover what people are already trying to accomplish with technology in order to facilitate that change which is already underway.

"We're painting a picture of the future and saying, here are the outcomes people are trying to accomplish," Stikeleather said.

Critical questions include those that ask which capabilities are necessary to accomplish the desired outcomes, and what types of products and services can deliver those capabilities. It is a different way of looking at the future.

An Epitaph for the Past

The way capitalism, business, and economics operated for the last thousand or more years is no longer applicable. If someone wanted to create a new product, they had to figure out where the raw materials were coming from and they had to acquire them, process them into goods, and transport the finished products to a retailer who could deliver consumers. That requires lots of time and capital, and ensured that there was a huge amount of information differential between all of those steps in the process. The retailer, for example, probably had no idea what the manufacturer went through or paid to produce those products.

Today, by contrast, entrepreneurs can bypass the bank and access capital through crowd-funding sites like Kickstarter. Rather than waiting for products to arrive by ship, they can be produced with 3D printing. GE has actually printed a jet engine that works, and they can even print the electronic circuits and sensors that are the engine's components.

"The four major frictions in the economy are information, distance, capital and time. technology made almost all of that go away," said Stikeleather. "In effect, there's no more friction in the economy. That's actually a bad thing. Because, as it turns out, most companies make their profits on overcoming the frictions in the economy."

Because of that changed vision of the future, "We've always done it this way" is going to be the tombstone epitaph of more companies over the next five years than anything else.

New Models of Innovation

In a frictionless economy, two guys with a new idea and a 3D printer can come in underneath a competitor. Somebody else can come underneath them, and another party can once again undermine everyone else by following the same strategy. In effect, the entire opportunity for profits has gone. While that may sound slightly exaggerated, it is definitely not an exaggeration in the case of monopoly profits.

Monopoly profits can come easiest thanks to allies in government. But the other main path to monopoly profits is creation of a value proposition nobody else can replicate – and that comes through innovation.

"Ask yourself three questions, what is it that I am going to stop doing? What is it I am going to start doing? What am I going to do differently?"

Jim Stikeleather
Chief Innovation Officer, Dell

"With all of this friction out of the way," Stikeleather said, "it has some really interesting applications because on the business side it is totally changing the nature of operating models, organizational models, management models, and – most importantly – business models."

Ownership of Nothing

What's the largest transportation company in the world now? What's interesting about them? They own nothing. The largest hospitality company in the world owns nothing. The largest retailer has no stores and no real inventory.

In 1958, the average age of a company listed in the S&P 500 was 61 years. In 2013 it was 18. Almost 90% of the Fortune 500 firms of 1955 are gone, all driven by these changes.

The first major shift is from capital investment to operating investment. The new generation doesn't want ownership of thing like cars and houses. They prefer to use Uber and service like AirB&B. From a corporate perspective, everybody wants to shift from CapEx to OpEx.

Rolls Royce doesn't sell engines anymore, for example, because instead they sell power by the hour. They have so many engine sensors that they can tell exactly how much an engine has been used and they bill the customer accordingly. They can also detect that's going to fail before it fails and when the plane lands, they will have the technicians there and all of the equipment and everything necessary to repair it. In effect, that engine lasts forever. Similarly, CES, IBM and Samsung demonstrated a washing machine that monitors itself. It order supplies on its own, knows when it needs repairs, and can actually contract for the repairs – all without any human intervention.

Products Becoming Services

Meanwhile, most products are turning themselves into services. Nike sells running shoes, but consumers buy them for the wireless service that tracks their fitness and performance. Self-driving cars can be turned into robotic taxies.

Based on where that taxi goes, it's insurance coverage could be calculated to match the risk of each particular route – and insurers could become entrepreneurs similar to those who work for Uber. For a couple of thousand dollars someone could provide partial insurance for that vehicle – competing directly with the largest insurance companies in the world on price.

Companies need to ask how to create value for a customer. If an action doesn't do that it should be eliminated. "Ask yourself three questions," Stikeleather recommended. "What is it that I am going to stop doing? What is it I am going to start doing? What am I going to do differently? The key being that you focus and you build an ecosystem to supply everything that you choose not to do."

Social Value

Historically, the community tried to attract business with jobs and then the people would travel to the jobs. But today the physical infrastructure is less important than the virtual infrastructure.

That is going to cause a fundamental shift for cities and communities of all sizes. There is a changing focus on the population versus the businesses. Create a place where people want to live, and business will migrate there – unlike the traditional dynamic of establishing businesses that attract workers who subsequently build communities and cities.

The future will likely mean major transformations in industries, the nature of the work, and the demographics of the population and the work they are want to do. But one element does not lend itself to change.

"Social values are the one thing you can't go back on," Stikeleather said – and he issued a warning. "Always be thinking and focusing on what you are about to do before you do it. Because once you go down this path you can't get back from it."

Learning Points

- Historically, most companies have made profits from overcoming the frictions in the economy. As technology removes those frictions, the business models of the past are no longer valid.
- Cities and companies need to learn how the reduction of friction will affect them and understand that infrastructure and service to citizens will be fundamentally different going forward.
- Technology does not cause change. Technology can only enable, facilitate, and accelerate changes that already want to take place.
- Social values are the one thing you can't go back on. Always be thinking and focusing on what you are about to do before you do it. Because once you go down this path you can't get back from it.

Urban Competitiveness

This term was introduced to the summit by Brian Donnellan and Glenn Wintrich as framework for defining and measuring a cities' innovation progress. The concept of Urban Competitiveness is intended to frame a city's agenda around its ability to attract and maintain high-economic activities, which include both people and companies. The word "competitiveness" sparked a controversy at the summit as it suggested only economic factors were key. The participants clarified the definition as the inclusion of all factors, both economic, social and environmental, that attract and maintain high-economic activities. An alternative wording was proposed: Urban Differentiation, which focused on the uniqueness of the city.

Innovation Insights

Challenges and Opportunities with Disruptive Innovations

The Innovation

Cooper Martin presented preliminary results from the National League of Cities report, "Technology and Mobility," which covers the results from their first research project "What is the City of the Future." For the past 100 years, cities have been designed around the concept of a human-driven automobile. This paradigm may change within the next 10-20 years with the advent of driverless cars and the shifting paradigm to shared-use versus individual ownership of vehicles.

Automobile usage and storage represent one of the most significant infrastructure investments of any city. An estimated 20% of city land is dedicated to roads, and another 20% is devoted to parking. A 10% reduction in automobiles was calculated to provide 500,000 acres of reusable land in the USA alone. A recent study in Lisbon showed that a driverless fleet of cars would result in an 80% reduction in required automobiles, freeing-up significant amounts of land in cites while also reducing harmful vehicle emissions.

Cooper Martin
Program Director
Sustainable Cities Institute
National League of Cities

Preliminary results from the NLC study suggest the availability of "smart" and self-driving cars in 2020, with significant adoption in 2030.

The Disruption

While the benefits to cities from driverless technology appear immense, the disruption it poses is just as striking. A city without human drivers would be a city of automobiles that obeyed all traffic laws, always found approved parking spaces, and never broke down due to lack of maintenance. What would this mean?

An estimated 5% to 30% of municipal revenues, particularly in small towns, comes from traffic violation fines. Income from parking is also a substantial revenue generator. That was demonstrated by Pittsburgh's increased parking rates and enforcement time, which recently added $5M to the existing $20.2M parking revenue for the city[1]. In addition to direct revenue from current automobile infrastructure, there are hundreds of millions of dollars in secondary income from service providers for those who drive. One notable example is truck stops that provide drivers with fuel, food, and other supplies.

Another indirect outcome, which may be the most significant for many people, is the loss of jobs because of driverless cars. New York City alone has more than 13,000 taxis,[2] not to mention the 3.5 million professional truck drivers in the USA[3].

Where will they work? Perhaps they'll work for Uber, which has made a significant investment in driverless technology and hired people from Microsoft's mapping division and Carnegie Mellon's robotics center[4]. Uber is planning for the disruption, shouldn't cities also?

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1 http://www.post-gazette.com/local/city/2014/12/10/Pittsburgh-to-raise-parking-meter-rates-charge-at-night/stories/201412100208

2 http://www.nyc.gov/html/tlc/downloads/pdf/2014_taxicab_fact_book.pdf

3 http://www.alltrucking.com/faq/truck-drivers-in-the-usa/.

4 http://www.popsci.com/war-driverless-car-service-has-begun

Photo: https://commons.wikimedia.org/wiki/File:Google%27s_Lexus_RX_450h_Self-Driving_Car.jpg (see this for usage rights0

"Change is reversible. Transformation is not."

Jim Stikeleather

Chief Innovation Officer, Dell

Innovation Insights:

Utilization versus Availability

Richard Culatta shared an image similar to this one of an unfished building. With it, he highlighted that any citizen would see an unfinished building and immediately feel the need to finish it. But what about those programs in our cities we cannot see that are unfinished? One example Culatta said, is that "31 million Americans in the last 20 years have partially completed degrees." If one looks at community colleges, about 50% of students don't finish their degrees. His point was that having educational infrastructure was meaningless if people don't use it to graduate.

Michael Curri shared his experience with fiber optic installations in the USA. While fiber has become popular in affluent suburbs for increasing multi-media streaming, it is also a key driver of economic success in small- and medium-sized businesses. These businesses, however, have been slow to adopt and utilize fiber.

Curri said that he was brought in to help the North Georgia Network, which was just six months away from completing a $43M fiber installation. But the network only had an 18% "take rate." Business were not interested in the new service. Curri surveyed them, and found that they did not understand the benefit of the new service. Many, in fact, viewed it as an expensive service with no clear and immediate return on investment. Counter to many people's intuition, the challenge wasn't in getting the technology (fiber) to the companies. The real challenge was convincing companies to utilize the service. "Availability does not equal adoption and does not equal utilization" concluded Curri.

Michael Curri
Founder and President
Strategic Networks Group, Inc.

Innovation is defined in many ways, but one simple definition is "generation of new value." The two key criteria are "new" and "value." As part of the innovation course we teach at Harvard, we dedicate a lecture to the topic of invention versus innovation. We ask the students, approximately 60% of whom are from the sciences and engineering, to consider how invention without innovation provides little economic and societal value.

Invention has become so intertwined with innovation that many couple the two as if they were one in the same. The key to innovation, however, is the generation of new value – not new technology. Making technology and other services available does not lead to or ensure innovation. They may be requisite parts of the equation, but innovation requires delivered value. These two examples show how some projects can provide the "something new," but still fall short of capturing value. To truly be innovative, cities and all stakeholders need to focus on the end game of realizing value. Technology, infrastructure, and services that are underutilized only serve to drain our wallets, not enhance our cities.

Photo by: William Murphy https://www.flickr.com/photos/infomatique/8200729406

Problems of Startups as Economic Development Policy

Presented by: Dan Isenberg, Entrepreneurship Policy Advisors

Despite what you may read or hear, there is little persuasive evidence that increasing numbers of start-ups is the critical path to prosperity. Startups are not the be-all and end-all of entrepreneurship. Entrepreneurship is one thing; startups are something else – one small slice of that. Recently a startup initiative, Start-Up New York, promised 2,000 jobs – but only delivered 76 jobs at a cost of $28 million dollars.

In order to illustrate the issue, the OECD came out with some statistics that showed Belgium had the lowest ratio of startups. Based on that, you might expect that Belgium is in crisis. But if you look at the data you'll find that Belgium is number one in firms that are growing – and if you look at post-entry several years from now, the growth rate is even higher.

In the United States, the states that have a higher number of start-ups have fewer growth companies. Montana and Wyoming, for example, had the greatest number of growth companies, whereas New York, California, and Massachusetts had the highest number of start-ups – but the least number of growth companies. Although there is a negative correlation between the number of growth companies and the number of start-ups, there is no correlation between the amount of venture capital invested and the number of startups.

"I think entrepreneurship is extraordinary growth"

Daniel Isenberg
Entrepreneurship Policy Advisors

A Gallup Poll further showed that when unemployment is high people start new businesses, and when employment is low, there are fewer start-ups. A study by the OECD showed that companies that were at least 16 years old had the greatest growth rates in the United States. The greater the survival rate of a company, in other words, the greater the growth. If more and more firms grow more – and more rapidly – in a specific region, the economy will grow.

There are some serious problems with the notion that start-ups create jobs. Those that have venture capital usually generate meager results. Only about 5% of startups create net jobs. This may be due to the fact that oftentimes, because they are not tested, startup jobs are low quality. There is a significant body of empirical research that shows that 15-25 year-old companies are the ones that create jobs. Yet there is still this idea that we need more startups to reduce unemployment and improve economic development.

The 5 "P" Practical Principles of Entrepreneurship

Place

Infectious entrepreneurship is geographical in some cases. There was a Boston innovation district that started with no budget and no full time people allocated to it, but it has been very successful. Meanwhile Lawrence Massachusetts, only 29 miles away, has had very little growth, very high unemployment, and problems with social cohesion. If you look at Woods Hole Massachusetts, they have only 1000 full time residents and has been the host to 56 Nobel Prize winners. But since 1888, there has only been one new company.

High Potential

Focus on existing ventures with revenues – rather than startups, micro-enterprises, small businesses, or large companies. In the Milwaukee area, for instance, there about 19,000 companies that have a revenue of between $1 million and $10 million dollars. Dan Isenberg argues that 10% to 20% could achieve growth trajectories with a minimal amount of support and mentoring.

People

In most work environments that have 10-20 leaders, if they decide to do something together, they can accomplish it in a short amount of time. If you want growth you need to convene the 15-20 most effective local leaders from different sectors of an entrepreneurial ecosystem (policy, markets, human capital, support, culture, and finance) for training, alignment, and planning.

"Mid-sized companies created 92% of net new jobs since 2008"

American Express and Dunn & Bradstreet Report

Purpose

Set specific objectives for how many firms need to grow more rapidly. In most places around the world there are usually no more than seven doctors for every 1,000 people. Doctors are important, and we need them, but more is not necessarily better. Similarly, entrepreneurial growth is important, but not everybody needs to be an entrepreneur. Growth is inspiring, not for everybody, but for enough people.

Practicality

Achieve and broadly communicate "quick wins." The advantage of post-revenue companies is that they already know how things work. They know how to invoice, how to collect, and what it means to go to the bank. These companies can show growth in six to 12 months. Growth events occur in short periods of time.

Insights & Actions

1. The data suggests that start-ups are not the driver of jobs, but rather mid-size, high-growth companies are the driver.
2. Startups are needed to seed high-growth companies. But resources are more efficiently placed in support of high-growth companies that have already survived the initial incubation period.
3. High-growth in an economy stems directly from the growth of its businesses. Data suggests this high growth is driven by mid-size companies, rather than startups or large, established companies.
4. Isenberg proposes five practical principals of entrepreneurial growth- Place, High Potential, People, Purpose, and Practicality.

1 http://www.businesswire.com/news/home/20150414006423/en/Middle-Market-Companies-Playing-Vital-Role-U.S.#.VhpL8flViko

Innovation Insights:

People-centered Infrastructure

A panel of entrepreneurs from around the USA were assembled and asked about what mattered most to them and their businesses, in the context of city governance and infrastructure. The answers surprised the participants – what they cared most about was livability. They wanted a city to be a place where they wanted to live in and one that would attract high-talent workers across many industries.

The idea of livability and attractiveness surfaced in many other discussions. Taken alone it seems obvious, however, taken in the context of what is the most important service of a city – creating a livable and attractive space – that runs counter to the traditional notion of a city providing electricity, water, sewer, police, etc. The core of the discussion might be summarizes as: "people-centered infrastructure design."

An example of such design was mentioned by several participants: The Hunt Library on the Centennial Campus of North Carolina State University. What was most surprising is that the example was not from Boston or the cities where any of the participants lived. That demonstrated a national attractiveness for this particular library.

The Hunt Library was completed in 2013 and received rave national reviews from top news outlets, such as Time Magazine and the Wall Street Journal. The building also received dozens of architectural awards, including the Stanford Prize for Innovation in Research Libraries[1]. The reason? It goes against everything we have thought a library was supposed to be.

Entering on the main floor, one is awed by a 4-story open atrium that continues for the entire length of the building, surrounded by floor-to-ceiling windows. The area offers comfortable seating that would be the envy of any coffee house, and includes a small technology showcase where students can check out non-traditional items such as HD cameras, iPads, laptops, audio recorders, and more. Fifty percent of the 4-story library is an open plan, created for the use and enjoyment of students. It is a magnet for students and faculty, due to its beauty, comfort, and proximity to technology and resources.

The other 50 percent, which represent the floors adjacent to the 4-story atrium, are not full of books – but rather there is room after room of meeting space, computer spaces, and multimedia rooms. Technology access includes multiple professional recording studios, a full green-screen video production room, and likely the most used amenity – a Game Lab that features a 20-foot screen for students to play and create video games. The Hunt library combines the draw of beauty and comfort with technology that most students and faculty would never have access to otherwise. It is truly a magnet for people and epitomizes the idea of people-centered design.

So where are the books? They are in the basement – where a multi-story robot handles all of the shelving and checkout. Just click on the desired book online, and within five minutes the robot delivers it to the circulation desk.

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1 https://www.lib.ncsu.edu/documents/publications/awards/Libraries%20Awards%20Sheet.2015.2.pdf

Photo Credit: Seannator (Own work) [CC-BY-SA-3.0 (http://creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons"

Perspective:

Governance Model for Innovation in Cities

Prof. Brian Donnellan participated in a panel on infrastructure development for cities and introduced the idea of Governance as an important concept in the development of infrastructure plans, in particular with technology and innovation. He leverages an existing framework developed for the IT industry on ensuring that initiatives meet all stakeholder's needs and provide the greater impact that is desired for society.

Brian Donnellan
Co-Director
Innovation Value Institute

Generally IT Governance has 5 dimensions associated with it:

1. Strategic alignment
2. Value delivery
3. Risk management
4. Resource management
5. Performance measurement

Although the IT Governance principles were developed for a different context, Brian's contention is that some impediments to progress in Smart Cities can be traced to an immaturity in these five areas. Specific examples include

- Strategic alignment: poor levels of citizen engagement and uneven involvement and buy-in from key urban stakeholders
- Value delivery: lack of sustainable business models once pilot studies and prototyping has been completed. Also, what constitutes "public value" is not always well understood.
- Risk management: the results of failure of Smart City projects can be devastating at a societal level. More sophisticated and comprehensive risk analyses are needed.
- Resource management: mature co-creation / co-innovation models between cities and IT vendors that include robust public procurement policies and exploitation plans are scarce.
- Performance measurement: there is a need for integrated performance and impact assessment systems that combine social, physical and environmental metrics.

As smart city program management becomes more mature, there is a realization that a series of unconnected technology testbeds does not integrate to a Smart City. Governance issues such as those outlined above may provide a useful starting point for important discussions on how to arrive at a more holistic view that combines social, physical and environmental perspectives.

Jai Menon on how big data really is:

"Every conversation from the beginning of time in every region of the world in every era, add it all up and it's 5 Exabyte's ... A self-driving car generates a gigabyte per second of data. There's 13,000 taxi cabs in New York City – That's 26 Exabyte's a year. This is five times as much data in one year for one application in one city."

Jai Menon
Vice President,
Chief Research Officer and
Head of Dell Research

Action Plan

In the final Sunday session, participants worked in small groups to find actions for themselves and others who are seeking to create a future-ready economy. A summary of the core areas for focus is presented below:

Business Model Development

A critical area of innovation is not just in city services and programs, but also in the business models that make such innovations possible. Focus needs to be placed on how an innovation can be adopted and scaled by a city, not just on the innovation itself.

Governance

This Summit brought together six Chief Innovation Officers from cities in the USA and New Zealand. The concept of the CIO is a relatively new one, but represents a general realization that there needs to be a dedicated focus on innovation. It does not come as a byproduct of other programs, but instead must be a deliberate and intentional part of city strategy.

Innovation Plan

While all participants were interested in innovation, it was clear that many cities have not developed a dedicated innovation plan. Such plans may include a mission statement, a roadmap that extends 5,10, and 20 years into the future, as well as a strategy for creating and enabling innovation within a city. In addition, innovation itself is not well-understood. An educational process for city innovators is needed, to help grow a common language, set of skil ls, and framework.

Urban Competitiveness/Differentiation

One of the key outcomes from the Summit was the paramount need for cities to be global attractors of talent. Virtual business has made physical location less important, and looking into the future the focus is on talent, rather than brick-and-mortar. Some participants viewed this as competitiveness, while others saw it as differentiation. The whole community, however, agreed that establishing a plan for talent attractiveness is vital for an innovation economy.

Infrastructure

As mentioned multiple times at the Summit, the key metric is the utilization of technology and services. This is a paradigm shift for many technology-focused initiatives that rely on new technology to create new value, while ignoring the evidence that value is not always a result of new technology. In addition, data was highlighted as one untapped resource that is low-cost to access and may provide extensive value to cities and their innovation process.

Co-creation

In multiple discussions, the establishment of private/public partnerships was raised as a means to enable experimentation. It was also offered as a means to develop projects that meet both commercial, as well as social, goals.

Social Cohesion

Social cohesion was a concept raised early in the Summit by Ted Smith. It epitomizes the concept that the future relies on integrating the social network of city inhabitants, and that the ability for interaction, communication, and (most importantly) sharing, is a key component of attraction and livability.

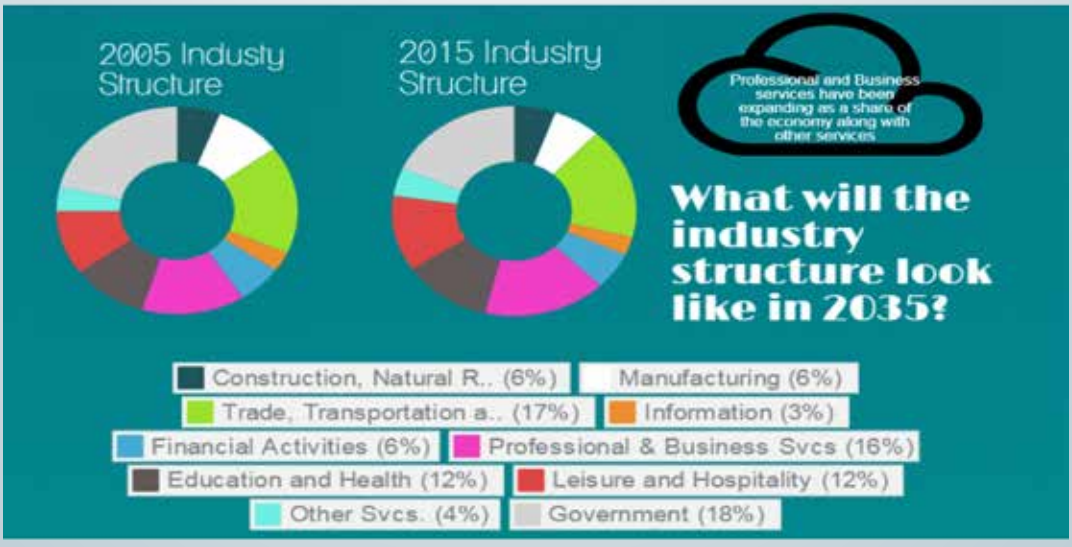
Data and Analytics:
Measuring Metros

Jim Diffley and Karen Campbell from IHS presented on data and analytics for measuring the current and future state of metro areas. The data presented here is a sampling of the measurement and analytics that can be used to asses the current and future state of cities and metro areas.

Metros drive the Economic Growth of States and the US

90% of jobs added in 2014 were in metro regions

What changes to your economy will bring new opportunities?



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Measuring Future Readiness

Throughout the summit there was an underlying discussion on how do we measure progress towards future readiness? While not conclusive, the following was distilled from the summit discussions and the working sessions. It presents a starting point for examining important attributes and quantitative metrics for measuring the readiness and success of innovation programs that enable economies for the future.

Governance
1. Existence of an innovation program or CIO
2. Number of public-private Joint projects
3. Explicit prototype or experimental process
4. Risk –tolerance/mitigation plan
5. Measurement process
6. Mission and vision in place for future development (5+ years)
Commerce
1. Urban competitiveness SWOT assessment
2. Urban competitiveness strategy in place
3. Inclusion of growth businesses strategy in addition to startups (scaling up)
4. Private-public partnerships (shared savings)
5. Education-private partnerships
6. Economic growth
7. Financial instruments (resources for city)
Infrastructure
1. Adoption and utilization of services
2. Open data plan
3. Data analytics initiatives
4. Attractiveness
a) Ease of mobility
b) Affordable housing
c) Innovation spaces
d) Interactive community (connection spaces)
e) Resiliency (security, disaster recovery, faults..)
f) ICT (speed, network nodes)
Human Capital
1. Livability
2. Attractiveness to people
a) High-standard of living
b) Low crime
c) Health-rating
d) Informal learning outlets
e) Education outlets – access and adoption
f) Cultural outlets
g) Philanthropy/mentoring
3. Affordability
4. Upward mobility
5. Labor force participation

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Outlook

At the conclusion of the Summit a few things were clear. Innovation is becoming a key focus for cities as they grow and compete on a global scale and the focal point of innovation, while not universal in title, is becoming a recognized role of city government.

What was also apparent at the Summit, was that the diverse group of stakeholders present, do not normally think about the role of the city in enabling an innovation economy. One of the most important realizations – and the simplest – was that the city is integral to enabling innovation. What role and how to enable innovation was not clear, but Lousville, Boston, Riverside and Wellington showed progress in developing a process and role for innovations as a core part of their city governments.

In addition, the Summit brought out the need for innovation in areas not traditionally focused on, such as in business model development on scaling of programs and on shifting the focus from physical infrastructure to virtual infrastructure. We hope these insights will seed future discussion on how to create and grow innovation within ciites.

Opportunities

One of the biggest challenges in all of the projects shared in the Summit, was the difficulty of capital cost of technology, adoption by users and scaling of solutions. Also mentioned throughout the Summit was the new use of data as a source of innovation. Cities compile data on thousands of aspects of the city and its citizens and is naturally progressing to digital management systems to help organize and archive data. This natural progression of the city – to collect, store and organize data digitally, is perhaps the best near-term opportunity for innovation. The capital cost has already been made for existing data collection and many application of existing data, particular digital solutions have been shown to be easily adopted and scale. Perhaps one of the easiest entry point for innovation is the use of existing data and its analysis to improve and create new city services and revenue.

Our cities were not build in a week, neither will an innovation platform, but we hope this and future Summits can help be a catalyst for all stakeholders in understanding and enabling innovation.

About the Strategic Innovation Summits

The Strategic Innovation Summit series was convened to enable multi-disciplinary discussions of senior leaders on relevant topics of the year. Unlike conventional discipline specific conferences, where topical content is narrow and participants are generally from the same discipline, the Summits bring together people from many sectors. These include government, business, education, non-profit, and the arts and sciences. The goal is to create and stimulate conversation that would normally not take place elsewhere, between senior leaders on important topics related to innovation and society.

The Summits provide three important benefits to participants:

1. **Education –** As experts in their fields, participants learn from one another through interactive sessions and dedicated talks. These aim to educate, raise important questions, and present the latest data on trends and the current state of the Summit topic.
2. **Multi-disciplinary Engagement –** The Summits are sized such that even during the main session, a conversation can occur amongst all participants. Questions and answers are not only between the speakers, but also the participants. Facilitators and moderators from HBS, TECH, and other centers are brought in to ensure engagement and to be a catalyst for the conversation.
3. **Action –** The ultimate goal of the Summits is impact. For this to happen, action is a critical component. The summits dedicate approximately 25% of the time to action sessions with the participants. That format drives the discussion and ideas presented into an action set for both the participants and the broader community.

Summit attendance is by application only, and senior leaders from any discipline that is relevant to the topic are encouraged to apply. Summits are generally convened on the campus of Harvard University, however off-campus Summits do occur when the topic and location enhance the opportunity for conversation and engagement of the participants.

Summit topics are proposed by participants, senior leaders in industry and government, and the Fellows in TECH. Topics are chosen based upon relevance and potential for impact in a broad sense, to include: economic, societal, and environmental benefits.

For more information about the Strategic Innovation Summit series, please contact the Program Chair, Prof. David S. Ricketts (summit@theinnovatorsforum.org).

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We would also like to thank the speakers, panelists, and participants in the 2015 Strategic Innovation Summit. Their participation created the foundation for a robust and successful learning environment

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Lauren Hirshon, Leadership for a Networked World

Kyle Hollifield, Magellan Advisors

Daniel Isenberg, Entrepreneurship Policy Advisors

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Glynn Lloyd, Boston Impact Initiative

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Cooper Martin, National League of Cities

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Jai Menon, Dell

Dorothy Najda

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Victor Seidel, Technology and Entrepreneurship Center at Harvard

Shawna Slack, Genesis Advisers

Ted Smith, City of Louisville

Ria Spencer, VML

Scott Stedman, Northside Media Group

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The 2015 Strategic Innovation Summit at Harvard

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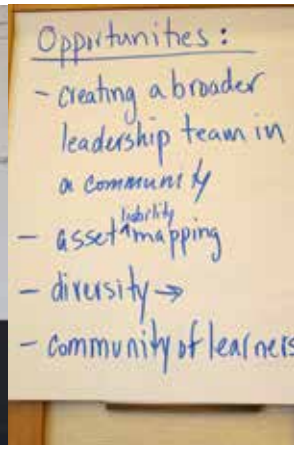
Opportunities:
- creating a broader leadership team in a community
- asset mapping
- diversity
- community of learners

DARREN

Notes

Notes

Technology and Entrepreneurship Center at Harvard

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The Technology and Entrepreneurship Center at Harvard (TECH) hosts the 2015 Strategic Innovation Summit. TECH, part of the Harvard School of Engineering and Applied Sciences, is both a real and virtual space for students, faculty, alumni, and industry leaders to learn together, collaborate, and innovate. TECH enables this holistic exploration by sponsoring and supporting opportunities for the innovation community to gather and exchange knowledge via courses, study groups, mentorship relationships, innovation programs and special events. Find more information at www.tech.seas.harvard.edu

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Contact Information

www.theinnovatorsforum.org
summit@theinnovatorsforum.org

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