THE ASPEN INSTITUTE

ASPEN IDEAS FESTIVAL 2014

ENGINEERING SERENDIPITY

Limelight Hotel,
Aspen, Colorado

Saturday, June 28, 2014

LIST OF PARTICIPANTS:

      GREG LINDSAY
      Senior Fellow and Director,
      Emergent Cities Project, World Policy Institute;
      Co-Author, Aerotropolis: The Way We'll Live Next
      Op-Ed Columnist, The New York Times

*   *   *   *   *

ENGINEERING SERENDIPITY

      SPEAKER: Good evening, everybody. Welcome to the Aspen Ideas Festival. Thank you so much for being here. I am proud to introduce Greg Lindsay who is going to be talking about engineering serendipity.

      He is a senior fellow with the World Policy Institute, where he directs the Emergent Cities project, a visiting scholar at New York University's Rudin Center for Transportation Policy and Management, and he is also a contributing writer to Fast Company and co-author of the book Aerotropolis: The Way We'll Live Next.

      MR. LINDSAY: Thank you so much for coming. I hope

everyone has their beverage of choice, it's much easier to engineer serendipity when you have a drink in your hand of some kind, I found. So, thank you, it's my great pleasure to be here and basically to talk a bit tonight about the metropolis, that's the track we are in. And really sort of give you a sort of overview of a book that I am working on with support from the Knight Foundation, hopefully coming in 2015 or '16.

By talking about engineering serendipity, what I am really talking about is, as we will try to go through, I haven't quite worked out the structure of the book yet. But talking about how do we design environments where we basically will bring together people we don't know and ideas we don't know and spaces and remix them? How do we find a completely new thing when we don't know what it is we are looking for, an unknown-unknown, and we don't know who the people are who can help us find that?

Sort of the overall arching sort of idea of this is that, you know, traditionally we organize things very hierarchically and top-down and we have a goal and we basically organize resources to get to that goal, and in many cases I think we are starting to see diminishing returns to this, particularly if you talk to pharmaceuticals companies. You know, they spend billions of dollars to identify, to basically crunch as many molecules as they can and organize research teams of the smartest people in the world, and then the drugs washout, they basically fail at it.

And if you look at statistics, you will see that the teams get larger and larger and the sums being spent get larger and larger and they are getting worse at coming up with new ideas and new drugs, not better.

So, what I am talking about a bit tonight is basically it sort of came out of my interest in research in cities about what makes cities special and basically how we can learn from cities to really enhance things like the office and organizations. And also how can we make cities better because if cities are the greatest creation humanities have come up with, you know, we are not finished yet. How do we actually figure out how we can optimize public spaces and things like this; optimize may be the wrong choice of word, but I do think we can sort of improve it.

And so with just one other addition, it's particularly gratifying and intimidating to talk about this tonight when several of the influencers or people who have given me ideas for this book are here. So I want to call attention particularly to Luis Bettencourt from the Santa Fe Institute who was on the Megacities panel with me earlier, yes.

(Applause)

He will also be again on a panel with me tomorrow on cities and big data. So if you have not gotten your fill yet, please come, although that's at 8:00 a.m. on Campus, so I might be sleeping in during my panel. And then also John Hagel is here from the Center for the Edge of Deloitte, whose book, Power of Pull has been particularly great stuff on serendipity as well, so.

(Applause)

So, without further ado, just sort of – I lose a slide here, I lost a slide. I did lose a slide – well, in any case, for the first slide, I hope they are all still here. Ah! They got reversed there. So, this is the first slide, or it should be. Does anyone recognize what this is?

A forest this close, this is actually a tree farm in Southern Germany, this is a beautiful, I always – when I see the image, I can – I always think it looks like a tennis ball to me or something. So, this is a tree farm in Southern Germany.

What's interesting about tree farms is they are one of the most efficient forms of, you could say agriculture, obviously it's not forestry ever created, right, it's extremely scalable, it's extremely efficient, when it works you can harvest trees by the thousands and it's also extremely brittle. When tree blight – when tree farms catch blight they also die by the tens of thousands as well.

Now, this is something Henry Ford discovered to his horror particularly in the 1940s when he built Fordlandia in the Amazon jungles, where all of his rubber plants packed as densely as he could make them all died horrifically and the project was of course a failure.

And this, my second slide, this is also a farm. This is a polyculture farm in Papua New Guinea, if I am not mistaken, which is interesting because this is a farm too. We would never be able to tell, unlike the tree farm, that this is a farm, as an outsider. It looks like it's a clearing in the woods practically, but instead it's a whole ecosystem of dense overlapping root structures, water structures, that basically feed each other, allow this to be a very productive farm, you know, year around essentially. And it's also much more resilient, right, this is not going to massively die out overnight.

The plants that are being grown shelter each other, feed each other, all those sorts of things, and the reason I bring this up here is because these are two examples that are called out by the anthropologist James C. Scott, in his very influential book among the cities crowd called Seeing Like a State, which has one of the best subtitles ever, How Certain Schemes to Improve the Human Condition have Failed.

And the other examples he gives in the book including tree farms are various cities, but also collective farms the Soviets used to basically push people off their land which also failed horribly, led to famines that killed millions, you know, other various sort of schema designed to do what he called legibility.

The idea of legibility is so that outsiders can recognize a system, you could look at something at a glance from up above, if you are sitting in a capital or a World Bank office or the top of the CEO suite and look down and look at a system and it makes perfect sense to you. These systems are very close and very brittle.

And then what the tree farm represents, or sorry, what the polyculture farm represents is what he called an illegible system. It's one that is very opaque to outsiders, it's one where it has an incredible internal logic that only makes sense if you are really, really close to it, if you really sort of understand those conditions up close.

And so, you know, he gave sort of examples like I hear, like legible systems are closed, they have internal logic, but they are very close

to outside influences versus illegible ones, which welcome in new elements and new influences. This is the definition of the struggle between companies versus cities, right. One is extremely legible, the org chart, and cities of course are one of the most illegible organisms that exist.

The cathedral versus bazaar, that refers to a famous essay by Eric Raymond about open source software. Traditional software designed by a company is very closed, the source code is hidden, no one can see it, it's proprietary, versus the bazaar model where many, many hands can build something like a Wikipedia now, and of course it's a riotous confluence of various interests.

This is also the debate between Robert Moses and Jane Jacobs, you know, the sort of, you know, ultimate Manichean struggle in urbanism between the master builder of New York in the '60s and a community organizer who saved Washington Square Park and helped inspire the city we have today.

And it's also sort of what I define as sort of purposeful versus generative, right? A company, a legible system has a goal, it has an end state, it knows what it wants and it's trying to reach that outcome. Where a generative system is constantly open to these new influences, is constantly producing something new, even if you don't know what that outcome is.

And so to me, one of the whole interesting things about this, this whole sort of debate about, you know, how do we come up with new ideas, how do we generate better public spaces, is that we are trying to get away from legible systems, the terrible cities that we built in the mid 20th century, the modernist houses, to the more illegible ones, the ones that are more local, more walkable, that are basically more livable and produce better ideas.

And so the question to me is how do we go from this sort of tree farm to something better. And it's interesting that I am doing a lot of research right now and sort of studying the office, because as someone who writes about cities, it occurred to me, you know, that this is where we spent a third of our lives, the minimum, this is what we fill our cities with,

right, are these office skyscrapers. And if you've read Ed Glaeser's Triumph of the City, you know that he is a huge fan of height and density in the skyscrapers.

And what's interesting what I learn is that hanging out with people who actually study workspaces, can anyone hazard a guess of what is the peak utilization rate of a skyscraper like the Seiber (phonetic) building. So, the moment of the week, what percentage of it do you think is actually full of people? So, let's say like, you know, 9:00 a.m. on Monday or 10:00 a.m. on Monday. The highest studies ever been done are 42 percent, and the average is 30 percent.

So, we are taking our cities and we are filling them with buildings like this that are almost empty. And this to me is really interesting, because this is the ultimate sort of example of a legible skyscraper, right, floor plates where literally people sit down on pieces of paper and sketch out who you are going to sit to and where you are going to be, and then expect you to try to do work and talk to co-workers and come up with great new things.

And every attempt in the office is what I have been learning and writing about recently, has – every attempt to make the office more humane, more illegible, more understood by the people who create it eventually goes awry.

And the most famous example of that is the Action Office designed in 1964 by Robert Propst who was a serial inventor who has over hundreds of patents during his lifetime and was challenged by Herman Miller then to come up with a sort of new flexible architecture where workers could customize their workspaces as they saw fit to empower themselves and go through the day. And he created exactly that system and then they did the one thing that he told them not to do with it, and that was to fold it in by 90 degrees.

And to me this is really interesting because again this is the debate that comes up, right? Propst is trying to come up with an illegible where the workers would control it and understand their own environment, so managers, you know, would not come in and interfere, and then the

managers step in and did exactly that, and created, you know, a highly legible structure.

And you know, this is interesting because, of course, people hate the cubicle, we have struggled against the cubicle, and we have been trying to perfect the office ever since, right. Now we have the open plan where everyone sits in a giant room, which is the new hated form of the office where no one can get any work done and no one can hear themselves think. And now we are trying to improve it from there, which I will come back to in a little bit.

But if you basically took the cubicle and you built it into the form of a city, what you would end up with is Brasilia, right, this is the ultimate legible city, a city that was a designed by Oscar Niemeyer and Lúcio Costa in 1959, a city that was built in under 5 years according to President Kubitschek, who has this command of Brazil at the time.

And of course Brasilia was designed to be literally seen from above. It was designed to be seen from the air and if you look at it, it has the shape of a giant bird. It's beautiful at an architectural level and it's completely inhumane, and essentially most of the people who built it, most of the people who live in the Brasilia do not live in the pilot plan as this is technically called which like the office is actually half empty. Most of those apartments are unfilled or owned by owners who live elsewhere; most of the residents of Brasilia live in slums, which I will come to in a moment.

And so to me what's really interesting because Brasilia has failed the fundamental test of a city, right, it is a beautiful piece of architecture and infrastructure, but it has none of the vibrancy, it has none of the life that even Tokyo has here in the Shibuya scramble walk. And one of the interesting things to me about cities, what makes them great, is universal to them – and this will touch upon the Luis' work in a moment – is a notion of what is a city, how does this human dynamic work and is it universal across cities.

And so the same dynamics that make Tokyo a wonderful city today are also what make slums very fascinating potentially vibrant places.

And so this is a Mumbai slum, these are some slides I borrowed from the Mumbai architecture firm CRIT, which published a really interesting essay called "Being Nicely Messy."

And what they argue is what makes Mumbai's slums, Dharavi, of Slumdog Millionaire, particularly interesting and worthy of study, is that they have a tremendous vibrancy to them that they call the blur. In places like Dharavi, the street is no longer set aside for vehicles. Every ounce of public space is colonized for some sort of activity. And so you can see on the sidewalks, you have micro-entrepreneurs who are crammed in next to each other filling every available space, increasing interaction to this incredible degree where people are constantly overlapping with each other and generating for what it is, a tremendous amount of economic output for example.

Something like Dharavi has an estimated $600 million of GDP per year, and for example, manufacturing in India, 80 percent of India's manufacturing exports come out of buildings like this, essentially which are vertical factories where people live under the shop or over the shop and producing these very sort of lightweight output.

And to me this is really interesting because if you saw Geoff West's session this morning, if you had any chance at the Ideas Festival, Geoff – I didn't see it – but he typically includes a slide of New York City in the 1920s, and it looks almost exactly like this. Mumbai today is what New York was a century ago and what Tokyo was directly after World War II. It was a city of very many small spaces, a city of very many people who lived in very localized illegible worlds.

And in that overlap, in that dance between them, they generated a tremendous amount of ideas and economic potential. CRIT, when they analyzed the slum, they called it transactional capacities, a city of tremendous transactional capacities is one that brings tremendous amount of people together in a very confined, condensed space to basically let overlapping walks of life and ideas emerge.

And what's interesting to me about this is that you know – this is a diagram I borrowed from the slide, where they argue that there is a

sweet spot in cities, right. So, at the far left, if you have a city that is all essentially towers, all office space, that is all the resources in the world but no blur, no transactional capacity, you have a sterile city, you have Brasilia. And at the other end, where you have all blur and no resources, you have the slum, you have essentially a hopeless situation. For example, if you look at some place like Lagos, I mean, Lagos in Nigeria has some of the most tremendous entrepreneurs you will ever meet, people who are hustling every single second of their lives, using every available asset. And yet they have absolutely no path forward, no way up the economic ladder because they have no resources and because they are so marginalized.

And so what CRIT argues in this, which I found really striking is that sweet spot where they intersect, the right amount of blur and resources. When it comes to city typology, they argue that the perfect city form is what they called, I believe, old labor housing. It's exactly the kind of typology that Jane Jacobs identified 50 years ago in the Death and Life of American Cities, when she talked about Greenwich Village, and she talked about the ability of programs, the ability of people to setup shops, the sidewalk ballet of interactions and walkable scale, all these things that make a city great.

And what's interesting is, you know, you can take that sort of dynamic and then you can start looking at what makes cities great. And so this is where I am borrowing from Luis' research with Geoffrey West, these are actually their slides about why cities are great and how this sort of blur translates into the economic output and health of cities.

And so if you are unfamiliar with their research, Luis and Geoff found that basically when you take a city and you double it in size, a city that has the sort of functional networks in place, it doesn't just get twice as good, it gets twice as good plus 15 percent, it actually – the city gets better and better as it gets bigger. And this is true across a number of criteria they found. Here is, I think, I am using wages and patents and the number of super creative, I mean, you can find their papers and then you will see it for dozens of categories.

And then they also found this thing – this is the part that has been exciting urbanists for the last few years – is that cities appear to be

something very, very different than any sort of other organism or human creation, including the company. So on the left there, that's what we look like and what companies look like; we are organisms, we are born, we mature, we plateau, and we die, hopefully we are closer to maturing than dying at this point, but every company dies. And if you ever had a chance to look, does anyone have any guesses about what type of company is the oldest company on Earth; the only companies that seem to survive for more than a 1000 years.

SPEAKER: (Off mic).

MR. LINDSAY: Beer, yes correct. Breweries are the only companies that are eternal.

(Applause)

I know that applause is well justified right there. But everything else, everything else is mortal and dies. And basically what Geoff and Luis found in their discussion is that cities are effectively immortal beings that can grow to sizes we don't technically know about yet. They are what they call super linear scaling unlike sub-linear. And so assuming you are going to support the resource regimen, which is really the focus of Geoff's talks these days, cities can continue growing forever.

Now, to me what's really interesting is, what is the mechanism by which this happens and can it be scientifically discussed. And this is a paper that Luis published last year in Science with an accompanying essay where he echoed Jane Jacobs, the kind of problem a city is, what is a city. Le Corbusier thought a city was a machine, and machines built for living. And that led to the disasters of the 20th century like Brasilia, like so much social public housing and others.

Patrick Geddes was another architect; he argued that cities were in fact organisms that we had to think of them as if we were gardeners, if we were pruning them and trying to improve them. But as Geoff and Luis' research shows, that's not true either, they are not organisms, they are something different.

And so Luis in his paper last year, he argued that they were this, they were a star, they were a sun, that what cities do is they take social networks – and I don't mean Facebook necessarily, I mean all of the social networks that invisibly connect us to everyone else. And what cities do is they take those social networks and they compress them in space and time, so you have this incredible density of social networks there, incredible density of people that overlap.

And this to me is interesting because this explains the blur, this explains why cities get better as they get bigger, this explains why Brasilia fails because it's too hyper formalized and there is no human interaction. And to me what's interesting is, I started looking into what explains the mechanisms for that, what is the fusion reaction in these cities of stars?

Instead of giving off light and heat, they give off new ideas and they give off quality-of-life, they give off economic output and productivity and all these factors, but it doesn't explain the mechanism, which hopefully Luis will talk about at the very end of my talk and sort of his research into how can we sort of model this at the very local illegible level.

And what I decided based on my own studies is this is what serendipity is. Serendipity is the action of fusion. This is what happens when you walk down the street and you meet a stranger, you are in a public space like this. And you discover someone, someone you may know, someone you have a friend in common with, perhaps a complete stranger that has that idea that has that missing piece, it could be love, it could be a business idea, anything and when those fuse together that is the sort of the process the puts out this productivity.

And so serendipity is a word, it's a very interesting word, Robert Walpole coined it only in 1754 and only really came into use in the 1940s, to sort of mean these sort of – now it refers to sort of happy accidents, the name has sort of been bastardized. But really it was sort of referred to this notion of being able to recognize the moment it happened, this fortuitous discovery by accidents and sagacity.

And sort of the classic examples of serendipity pop up all the time in invention and science. This one is Alexander Fleming, the discovery

of penicillin, right, he leaves out a mold culture by accident overnight, and when he comes back he discovers a new mold that is – yeah, he leaves out a bacteria culture, and when he comes back he discovers a new mold that's eating his bacteria, and the rest is history. We now have antibiotics and we no longer die from routine infections.

A new case of this just happened at IBM Labs where a researcher was working on a new variety of plastics, she made an accident in her lab work and when she came back she found her stirrer frozen stuck, and a whole new family of plastics that are incredibly strong and lightweight. This is the classic version of serendipity, right, someone in their own head is able to recognize a unique set of circumstances.

The problem with this model of serendipity is that the lone genius, the lone inventor having this great idea, that's less and less about sort of routine everyday interaction. We do research in teams formally, and we come up with our best ideas when we talk to someone about it. So how can we figure out new structures, new ways of enhancing serendipity inside of organizations and out.

And this is something that I'm talking about when I am working with people about the future of the office, I got into this whole discussion because I came to the realization, what if the future of the office is the city. What if we no longer work in towers that are only a third full all the time, but what if it were to happen if we start treating the actual city itself as our office.

And so this is not a new idea actually, we started looking into the history of this, this is the London coffeehouse of the 17th century. If you read Jurgen Habermas, the German philosopher, this is the classic example he pointed to when he talked about the invention of the public sphere. This is really the first social structure, the first environment where men – sorry women, it was only men because it was the 17th century, could come together and discuss the ideas of the day regardless of class. This was the actual social institution that allowed the first stirrings really of parliamentary democracy because you were no longer rigidly confined by the fact that you are an aristocrat or a commoner. You could come here and have this discussion.

And it's also, if you look at – if you read Samuel Pepys' diaries, you will see that he was the original mobile worker in 1666. His office was near his house, he commuted regularly to the docks because he was a naval bureaucrat, to court, and then would end his day at a coffeehouse or a pub actually doing business, debating the issues of the day, trading gossip, trading information, doing all these sorts of things.

And this sort of structure evolved, right, the next machine, the next serendipity engine that sort of came about also in London at the time was the gentleman's club of the 18th century and the 19th century. This was – the Athenaeum Club in particular, this was a club where men of the same social rank but of various fields could come together and discuss the attitudes of the day. So, the Athenaeum is my particular favorite because Charles Dickens and Charles Darwin were both members at the same time.

I wish history had somehow recorded the conversations they would have had, and Thackeray was a member and there are all these great explorers of every different type of club there devoted around the arts, devoted around various themes, the Athenaeum was for scientists and gentleman explorers.

And so this was another structure that they'd invented where you know you could basically have these discussions and accelerate ideas and knowledge in the context of the city.

So, advancing that forward, even as the time where the office was being developed and the original office building was designed as a factory for paperwork, designed according to the principles of Frederick W. Taylor, of course they used stopwatches to measure factory productivity.

At the same time that was being developed, there was a whole different type of research lab under construction in New Jersey in the 1940s that we now know as Bell Labs, and this was a completely different type of animal. This is where they took researchers of different fields, so you would have theoretical physicists, metallurgists, you would have practitioners who were hands-on, others who were more theoretical

and you put them in the same labs, you would try to make for as much diversity as possible. And then you squeeze them into narrow corridors where of course they would have to have interactions in the hallway on the way to the offices and the cafeteria.

And this is the office layout that produced the laser, the satellite, the refined radar, that produced many of the scientific discoveries that really made the 20th century, it made much of our modern technology still quite possible.

And at the same time that was going on, there was another famous structure at MIT, this is Building 42, which was built during World War II to be a temporary wooden building, and instead it stuck around for 50 years. And it was in that building that they stuck all of the odd balls on MIT's campus; all of the departments that didn't fit anywhere else.

So this is where Noam Chomsky ended up where he was working on his theory of linguistics, and this is where the radar teams worked, and this is where they would also collide in the hallways because the numbering system of Building 42 is so messed up that people would wander lost for days.

And so what's interesting to me is that Building 42 of course was also a structure where people could make use of it as they wanted to. It was a very informal place, you can knock down walls, you could drill holes and everything, and so people were able to run all sorts of experiments.

The most interesting example of those two today, I should add in here, I saw this amazing research paper is Paris 12, it's a – Paris 12 is sort of Harvard Medical School of France – of Paris. And in there, there was a natural experiment done over 17 years where because of asbestos removal every single lab in the building got picked up and dropped somewhere at random. So, you'd be doing research on cancer and you would end up next to neuroscientist or whatever else.

And what's interesting is that if someone went through and looked at every single paper written during those 17 years and figured out

where all the research labs were, and what they discovered was that at the moment your lab was taken from where you normally hung out and working with the scientists across disciplines you normally did and dropped you among strangers, from then on you were likely to produce three to five times as many papers in these entirely new research disciplines.

They were more likely to be three to five times more widely cited and you are more likely to work in three to five times as many different fields. And so really the best research strategy they could come up with at Paris 12 is to literally drop them at random somewhere else in the campus.

And what to me this tells me is that basically we still have no idea how to organize people and physical space, but we keep trying and we are getting better at it I think, or we hope to.

And so just as the structure of Building 42, it's one of the classic examples of Frank Duffy, the architect, who was the one who really studied why office buildings are so empty, and his research was then folded into Stewart Brand's famous book, How Buildings Learn. And they used this structure right to show that buildings and cities evolve at different scales, right, there is – the interior of our house evolves at a much faster rate than the actual structure. And then we need to incorporate that in how we organize people and how we organize ideas.

And so today on the place of Building 42, this is the Stata Center, which was designed by Frank Gehry, and the Stata Center was an attempt to actually formalize all the things that went on in Building 42. It is an attempt to actually make workspaces and collaboration spaces that were really fluid and that you could basically bring together teams and have all these impromptu ideas.

Stewart Brand famously called it an abortion, so he wasn't impressed. But Frank Gehry was undeterred and now Frank Gehry is working on the same thing. The ideas that were embodied in Building 42 and also in Bell Labs are suddenly bubbling to the surface again in Silicon Valley.

If you go to Google or Facebook that Frank Gehry is designing, you go to Amazon's Urban Campus in Seattle where the whole first floor of Amazon's Campus will be completely open to the public, it will all essentially be giant co-working spaces where you can work (inaudible), all of these companies are trying to rearrange traditional office. They realize they've reached a limit that you can do with the traditional cubicle or the open plan.

And especially if you talk to Facebook and you go to their campus Duzay (phonetic), you will see that it's actually laid out like a city, they have streets, they have avenues, there is a main street. Google has a very urban feel to it of course as well.

And what's interesting about this one to me with Frank Gehry is that when Mark Zuckerberg hired him to design the office, Mark told him, don't touch the interior, don't build anything, he hired the world's most famous architect and told him to build the biggest room he possibly could. The new Facebook campus is a mile-long and I believe its several thousand feet wide; it is going to hold 3,000 engineers.

And what's interesting is that all of the desks will be mounted on castors, so the teams can rearrange themselves as often as possible and so the engineers can collide inside of there.

And if you talk to Google, their new campus, the Bay View Campus is designed so that anybody who's within that million foot square foot imprint can get to anyone else within 90 seconds, and they are putting coffee bars on all the roofs, so basically people will hang out there and share ideas. And they talk about creative collisions in that case, and the quote that was given to Vanity Fair when they announced the project is that you can't schedule a meeting for innovation.

They are trying to design these new environments where they can increase the amount of serendipity, where they can bring together researchers and combinations that they don't actually know what they're looking for. And in Google's case this has paid off in fruit, right.

Google News, Gmail, and Street View were all the product of

engineers who were essentially meeting each other at lunch and freelancing across their different divisions. Sort of like Paris 12, Google has realized that it has no real idea how to formally organize its employees to get the maximum use out of them. And so it's resorting to trying to figure out physical environments that can actually do a better job with this.

And so it's fascinating to me in particular that basically Google, Facebook, and others are inexorably evolving towards the city. They are trying to build a city within their own campuses, which I think gets results, but it is ultimately going to have a limit. And so to me it's sort of interesting – I bring this up because this is what I talk about when I talk about engineering serendipity, I wrote an op-ed for The Times, and this is the graphic they used – which is, how do we figure out which employees we want and bring them together or how do we figure out – how do we create spaces where everyone should be coming together.

And so you're probably familiar with the famous Pixar example, right, you have one set of bathrooms, so everyone has to see each other on the way there, that's one way to do it. But I suspect we are going to start seeing in both companies and cities, we are going to start seeing the combination of physical space like they're trying to do with Frank Gehry, and also increasingly rich social networks which are being laid on top of us.

We are all carrying around right now – I would hazard the majority of us are carrying around in our pockets right now a GPS transceiver, which is married to a social network on their phone, and these are going to evolve into something I think that we haven't really yet begun to imagine what it can do.

And so this is the social network map. This goes back to – this is analysis by Ronald Burt, he is a socialist at the University of Chicago and he has been writing about what he calls structural holes for 40 years. And so his premise is, in any given social network, any sort of network of a company for example or any organization, there is gaps in it, there is basically people, there is a single person or a handful of people who connect entire divisions of the company together.

And oftentimes those are not the people who are the CEO or the top or the top VP or the head of innovation; it's some random person whose basically bridged that gap. And so this is Burt's analysis of a global pharmaceutical company, exactly the kind of company that is struggling to figure out ways to innovate. And so he sat down with management and he mapped out the top 256 executives around the world and he found that there were essentially three key chokepoints in them.

I can't see them with this resolution, but you can see one in sort of the top center, and there is one sort of in the middle connecting to that huge arm on the right, and there this one down below. And in all three of those cases, they are not the top-level executives; they were not identified as the next up and comers within the organization, they were completely unknown to the management.

It was only when he actually graphed out this exercise and did the research and figured it out, did they really understand who these people were. And so of course they immediately rushed to put those executives into their top management program and fast-track them for leadership because these are the people who are the real social glue of the company.

And what's interesting is in Burt's research, when he looked into this, he did a project with Raytheon, the defense company in mid 2000s, and found that the people who straddle these structural holes come up with better ideas more consistently as measured by their peers and they also profit from them. If you straddle a structural hole, you're more likely to have higher salary, to get promoted faster.

And what Burt found – and this is his one liner on it is that these people, they don't actually come up with better ideas, they are not super creative inventors who are sitting there fusing ideas together, they just talk to the right people, they talk to the people in the various groups that they are bridging and then they realize that somebody over in this arm had a good idea, that somebody in the other arm would basically be able to put to you use.

And so as he puts it, creativity is not invention, it's an import export business. All you have to do is be able to put the pieces together. And so his work is basically figuring out how to help companies do this more effectively.

So this is a bit of jargon, I should probably skip over this one, but it basically shows the sort of returns that come out of this. And so I have been following, for the last year or so, the companies that are trying to basically take Facebook and Twitter to the next level, to start doing what Burt talked about with structural holes and start using the combination of software and information in social networks to start figuring out where those holes are and start plugging them as fast as possible.

So, this is a company called Relationship Science, they launched a year ago. They basically built a social network of the 1 percent, the top 3 million people in the world as far as their customers are concerned. And so if you go in there, you basically sign up, you can create a profile, if you pay the $3,000 per person per year to use it and then what it will show you is how you are connected to everyone else in its database. And it will show you the strength of that connection and then you can that the red lines there and it will tell you, do you know this person through past companies, through boards of directors, through college, through anything else, all these criteria that they assembled by hand using 800 people, most of them in India, combing through tens of thousands of publicly available databases to figure out this map of, this very small map of reality as they know it.

And so when you use Relationship Science, you basically plug in your name and it will start showing you the three degrees of separation to anyone else and there is only ever three degrees of separation and it also show you the intensity of that link.

And what's interesting you know most people will use this – use it to raise money, right, this is you know how do I get to so and so, so that I can ask them to give me cash for the company or something else. But what it shows is that you we are increasingly reaching the point where these first-generation of social networks like Facebook and others are

becoming increasingly granular and powerful, it's increasingly our ability to understand the world and see how we are connected to anyone around us.

I have used this application and I am told others do too where you will go to a party or go to an event like Aspen Ideas and people who use this and go hide in the bathroom with their mobile phones and start figuring out how they are connected to that person – start figuring out how are we actually connected to reality. And this is only going to get more powerful over time.

So this is an applicant, it just came out called Rexter. What Rexter does is it sits in the background on your desktop machine or your laptop and reads all of your e-mail very quietly and it reads your Google Calendar and it reads all of your sort of background information and it starts building its own map of how you are connected to everyone else in your day-to-day work.

And then what it tells you is that age-old question when you are working which is what do I do first this morning, what do I do, who are the most important people to me in my network and so it builds a sort of a scorecard and tells you when you get to work that day, here is how you should actually go through your tasks, here are the most important people to talk to. And this is only going to get more and more powerful, this is going to move off the desktop into the real world.

So, my friend Ben Waber who is at the MIT media lab, he worked with Sandy Pentland who wrote the book Social Physics among others, has invented this device he calls a Sociometric Badge. It's about the size of your smart phone, hangs on your neck like a lanyard and when you walk around it measures where you're going, who you're talking to, it listens to your conversation without recording it, but it's listening to your vocal intonations, who you are speaking to and how and then where you go afterwards.

And so you can basically wear it into a meeting and you can see who's dominating the conversation, who is really talking to each other, what are the patterns, everything else and then you can start figuring out

how these people are connected to each other. So, you can use it to start building a real-time social network map of everyone in the office, who is really working, how does work really get done.

And so he's using this for corporate consulting of course because that's where the money is and so for example he went into a bank, he went into whole retail banking operation, I believe it was Bank of America, he did some call center work for them as well, and basically started to figure out how could their employees be more effective, how could they redesign their offices and figure out how to plug people.

So having had a little crash course in social network analysis, of these three diagrams, which do you think of these three bank offices is the most productive, as when you map the social network against whatever performance indicators they were using, any guesses? I hear a convergence on one, I hear a few twos which is interesting. So the most productive office is number one; that's the one where there's a lot of people who are all connected. It's not too cliquish, everyone's really involved, the social – there is no real structural holes in that map.

The third one, yeah, I mean, there is a lot of really intense relationships, but intense people, they tend to have group thing, right, if you talk to someone every day, you know how they think, you're not going to be sharing good ideas or learning from each other and there is a couple of people on the fringe.

And the second one is completely dysfunctional. Does anyone have a guess about why it's completely dysfunctional? What was that?

SPEAKER: (Off mic).

MR. LINDSAY: Yeah, but can you guess why it's bifurcated and bipolar. And this is a single physical location.

SPEAKER: (Off mic).

MR. LINDSAY: Yes, you're correct, the second office is on two floors. So basically the people on separate floors never speak to each

other. And this is the research that actually bears out.

So another MIT researcher, Thomas Allen, in the 1960s actually did this. He came up with the Allen Curve which basically showed that the further a person away a person sits from you the less likely you are to ever speak to them. Someone who sits more than 60 feet away from you might as well work in another building and might as well work in another city.

This to me is interesting because this shows the importance of face-to-face interaction when it comes to communication, when it comes to sharing ideas, which comes back to this whole notion of – who we're really speaking to and how can you figure out how to speak to people much more often. And so there is a this sort of map here.

So there's another company that is doing this sort of thing as well within companies and they're called People Science. Really think they have to get more original with their naming structures here but – well, this is People Science's work and they're doing the same sort of thing. This is a single company; one group is in sales, one group is in HR, one group is in marketing and none of them really talk to each other.

This is what happened after they sat down, mapped it out, and worked out a series of exercises and series of office space redesigns to bring them all together to figure out, you know what you guys really need to be working together.

And I don't actually have the exact regimen that they used for that because it's still proprietary. This is actually was done in UnitedHealth Group, one of the largest health companies in the world.

And this is what they sort of did afterwards, to sort of bring these people together and bridge them so they could basically start learning from each other more effectively. And it was not just again a cultural practice. It was actual physical redesign of the office. They used physical space to start shaping their behavior and start bringing people together.

And I think what's going to happen over time is, and this comes back to my thesis about cities, is – is that now that we realize, now that we have basically work flow, the way work gets done when you sit down and you do work. You're doing it on a computer most of the time, and those work flows move through the Cloud.

Well, if that's what's going on and we know that physical interaction is the most important thing in terms of who you talk and who you learn from, the question now becomes who should we really be working with and where. There's no reason any more to go to an office, the same office every single day with the same people especially when we know they were not actually doing that, that no one's really there.

It raises all these new opportunities of where should we work, who should we learn from, where – what kind of work should we be doing. Because some people are introverts; they want to be able to put their heads down among other people and actually sort of have a more quiet environment. Others are extroverts, who want to go out and meet every one they possibly can. There's no reason anymore to sit in the same office and do that, not when you can actually sort of work across the city when you can find all these different environments in different offices and meet people there.

And so this – first this whole notion of how do we actually redesign the office as a social network came out of a phenomenon called co-working, which is about 10 years old now. So co-working is the idea of working in the same physical space with people who are your peers, but not your co-workers. They're not your colleagues. They're not drawing the pay check from the same employer. They're people who are in your social network or people who actually might be in similar fields or they share the same style of work. But someone you could actually learn from more effectively than others.

And so in the last 10 years we've seen an explosion of new work places like this. WeWork Labs is the biggest perhaps. They've got over a million square feet of office space in Manhattan. They've a huge member – they've over 2,000 members I think at last count. Many of them are in technology, but other in fields are in architecture and design. And

it's leading to all sorts of new types of organizations.

And so this is an image – this is from their branch at Varick Street in SoHo in New York. On the top floor of that building, they put in a single office space for architecture firms. And so they went to an Israeli designer named Drauer Brenchri (phonetic) who has designed islands in Abu Dhabi and designs furniture. And they told Drauer, we want you to ask everybody you've worked with, all of your fellow architects, laser cutters, material scientists; bring them into the same office with you. And this isn't his company, these are just the freelancers he works with. And so he did that; he eventually located about 200 people on the same floor.

And I was talking with the CEO of WeWork the other day, and you know, one of the architects that Drauer works with came there with a group of Chinese clients. They were bidding for a project at an airport in Southeast China, and basically told the Chinese this is our firm, and totally lied to the Chinese pretending that it was their entire firm. And of course the Chinese believed it because everyone knew them, they knew their names oh of course it's great to see you. We're working on this with you. And the Chinese gave them the deal. And the punch line of the story is that 50 people in that office are now working on that airport project.

And so we're starting to see what might – what goes back to the original version of the coffee house, the gentlemen's club. The co-working space is becoming the sort of new club or the new guild. We're seeing people who are basically brought together by the same sort of work style or professional interests but not the same background. They're learning from each other, they're cross pollinating their ideas colliding in space leading to sort of this engineered serendipity because of the fact that it's the same co-working overarching space otherwise.

Another example is this where it starts to – really start to bleed into the city. This is in San Francisco, this is the San Francisco Chronicle building; where inside is a whole ambitious program called 5M, where eventually they're going to build conventional office space over the next couple of years. But until then there's a co-working space called the Hub where over 200 different organizations that are basically devoted to social good are there, including projects like the Carbon War Room that

Richard Branson sponsored and others.

And they've also put in an arts incubator and they also put in a tech shop where basically hacker space where you can come in there and play with metal and invent new things. And all these people are cross pollinating in this massive city block inside San Francisco. And so you're seeing here again the sort of fusion with the city, the offices blurring across these multiple sites there.

And the ultimate example of that, which I don't think I have any slides of in this deck, you know, is what Tony Hsieh is proposing to do in Las Vegas. If you're familiar with the Downtown project he's basically taken his personal fortune from when he sold Zappos, the shoe retailer to Amazon five years ago; and is investing it in building himself a creative class company town.

It's got maker spaces; it's got its own schools, its own – its own everything else. And the idea is that its own co-working network and of course Zappos headquarters was moved from a suburban location on the edge of town into the former city hall in the core of the city.

And so what Tony tells you the reason you should come work and live in Downtown Las Vegas is because living there will make you smarter. And the reason is he says expressly is we're trying to cultivate serendipitous encounters. We're trying to get people to collide on the street. We're trying to encourage cross pollination.

And he's even taken it to the point of placing sensors in the entrance of buildings to start figuring out who is intervening where and how these sort of interactions are happening. And the reason he is doing this of course is because he basically wants to help Zappos become more than a company.

He's done the reading. He knows that Zappos sooner or later will lose its head and she will become another calcified ossified company and will eventually die. And so he sees that if he can basically harness the energy of the city and its serendipity. He can basically try to cause Zappos to learn faster and grow into something beyond itself.

It's a completely open question whether this will work. I think it will be very good for the company and I think in a way it's going to be ultimately very bad for Downtown Las Vegas. He's taking an entirely new culture and dropping on to the existing one.

But we're seeing on the other places try to do this as well and also in downtowns and offices everywhere.

In Grand Rapids, Michigan this seems to be the most interesting one; six stodgy old companies; a shoe manufacturer, a grocery store chain, a healthcare company, Steelcase, which makes office furniture. So they're interested – took their most creative people and put them in the same office in downtown rather than in suburban campuses. And you know the ostensible idea was so that their young people, they were worried about brain drain; could live downtown and be in a more hospitable environment. But it's a very conscious experiment to see if these six different companies in different sectors can basically learn from each other by being together in physical space.

And the early results are encouraging and they've shared a research, they've shared ideas. The people are learning from each other in terms of how to do their jobs. But there's no billion dollar product that's come out of it.

And so eventually I think we're going to seeing these sensor-ed environments this is a – I finished runner up in a contest on the future of office design. But there's – I call it the serendipity engine naturally which imagines a sort of co-working space of the future where there are sensors built into the office.

And so when you sign up that day you can actually ask the co-working space. Who shall I be working next to? You can tell that I feel lucky, tell me to put me next to someone. And so you can sort of break through the sort of social mores you know where you don't really want to bother anyone. You can actually have the system be that digital icebreaker for you.

And I think we'll start seeing more interactions like that. But doing that in the office isn't enough right? And the fact that we're walking on the streets with these cell phones in our pockets. We already carry these incredibly powerful sensors. An Apple among others is putting some more and more power and sensors into them all the time. Instead of wearing Fitbits in the next two years we're just going to be basically have that data on our phones.

And so this is a sort of my – my sort of three premises you know when it comes to city, serendipity and all these sensors. One is that we basically use our mobile phones to see the city. I actually have a theory that I cannot prove that one of the reasons millennials are so interested in cities and why we're seeing the resurge in the cities is because of the data – the information we're overlaying upon them.

Aspen and other cities are getting richer all the time because we know how to navigate within them – within a strange place we've never seen. We know how to find things in them because of Google Maps and others. And we're fine in these incredibly rich environments.

And two, like I said, cities killer app is serendipity, it's – what they do that no other environment does is they bring together those networks of strangers and produce these unforeseen outcomes. They're the ultimate serendipity engines.

And so the ultimate killer app, the next generation of social networks will be serendipity as a service borrowing from software as a service. Something that can basically tell you who is the person you should be talking to in cities.

And this idea again is not really necessarily new, right? I keep coming back to the map of Manhattan because this is a very legible way to organize a city. I mean we can trash Brasilia. But when they sat down in 1811 and designed Manhattan they literally ignored the topography and everything else, and just put out the street way that covered the entire island. They had to go back eventually and put in Central Park into the plans.

And so it's a very, very structured way to actually bring people together. And today you now have a digital version of that. This is the map of my Foursquare check-ins. Its probably – I think I've checked in twice as many times since I put this. But you know now we have a certain digital record of my movements through the city and where I've been.

You can see that I live in Brooklyn Heights, and I work in Dumbo, I have an office there and then I basically surf my way across the city when I can. And Foursquare is just the beginning right, where as a user all I'm really allowed to see is this map, a historical map of where I've been and where people have been. They have the data though. They know where all of us are. They're watching my social network at Foursquare move through the city in real time.

We can now really start to see how people are using and where these social networks compressed in space and time are actually overlapping. It just becomes a question of how do we build – build into the city a way to use it and how do we actually bring them together. So Foursquare is the first major technology of serendipity in cities.

The second one is basically how we start opening up the buildings we have. How do we move beyond the brittle office building and start using space in a way we never have? Airbnb is the beginning of this right. The notion of space as a service where any given room – any given bedroom is now something you can put on a network and use it. I can look anywhere around me in Aspen and find all of these spare rooms and spaces.

And this is starting to pull the freight into new models as well. This is an app that just started in Montreal called the Breather which is the notion that you know your spare bedroom doesn't necessarily have to be a place for someone to stay. That could actually become my office for 15 minutes. I could take meetings in your beautifully furnished apartment.

So rather than meeting in office at all I can basically work out of here. And you know and this is also evolving when it comes to social networks and space and time. So who here uses Tinder? Anyone? Come on I never get a show of hands here, I know there are people in

here on Tinder.

Does everyone know what Tinder is? No. All right, some people don't. Tinder is the hottest new thing among the kids these days. It's a proximity based mobile dating app. It's an app that shows you here are the cute people. But here are only the cute people within this pre-defined radius of where you are. And so if you swipe – help me here. I don't use it myself. I really do swipe left you are getting rid of them and right you keep them. Is that it? All right that's how it works. So yes, you basically can go through and in a moment you decide no, no, yes. No, no, no, yes.

Tinder starts at a point where we can really start doing, and Grindr, its gay equivalent, really start to point at what we can do with proximity based social networks. We now have visibility to find not just resources like bedrooms in the real time. We can now find people.

And so this is eventually going to evolve. We're eventually going to start taking all that rich data from relationship science for – or sensors on social metric solutions and we're going to start overlaying that onto apps.

So this is one that's trying to do this. This is called SocialRadar. That's basically attempting to tell you here's a stranger nearby and here's what you have in common and here's why you should get to know them. And all of the apps that I've tried here so far over the last two to three years really have basically failed. And the reason they failed is because they didn't have enough context. They didn't have enough richness to the data. They didn't understand what we might have in common that would cause us to stop dead on the street and be like I need to talk to you.

But I think the data is coming. I think the data is becoming available and eventually we'll be able to do that not just down to – not just down to strangers on the street but people in offices.

This is a company called LiquidSpace. It's doing this office space now so I don't just have to do Airbnb where I'm choosing to use a spare bedroom or a spare office building. I can actually go into the app

and say I want to sit next to this person today. I want to find this person. Can you show me where they're working so I can reserve the desk next to them? And that's how you can use it for.

It's a very, very short step to go from there to an app that can tell you maybe here's who you should sit today next to this person as I imagine in my own co-working space. And so this is eventually going to get you to more powerful once we can start getting into wearables.

I mean Google Glass I don't think Google Glass is the one and I'm starting to think that Google Glass is going to be remembered like the Apple Newton from 1992, right.

I mean everyone remembers how bad the handwriting analysis was on that. It was a joke and no one really used it. But the Newton defined the foreign factor of the devices that we're still using today in the form of the iPhone. And I think now the Glass exists we will never put that genie back in the bottle and its going to start leading to a whole notion of augmented reality where we are going to be able to see and use the city in real time in a way we never could before.

And this is not only powerful in the sense of we no longer need to build an office building that's two thirds empty when we can make better use of the buildings around us which is greener and more sustainable and energy efficient of course. But it also starts leading us to see the structural holes in our personal networks and our urban networks. And it starts bringing us together it starts accelerating the rate in which we can basically have serendipity. At least if you design the system right. It should be acknowledged if you design the system wrong you end up with Orwell.

But that is the case that we – the risk that we run, I suppose. And so the theoretical outcome of this, a city like this was first imagined by my friend Hitoshi Abe who is a architect at UCLA. In 1997 he tried to imagine what if you had – what if your home was a service? What if you ditched your house and joined the city as a membership club. He called it Megahouse.

So instead of having a home you would basically surf across the city and inside all these skyscrapers and buildings there would be red doors and you could basically sign up to use that door each day. And inside you would find your living room configured or you would find people you want to meet a whole city laid out there for you to use. And you know from an office perspective we're starting to see that – we're starting to see various models that happened in cities.

This is Gensler's London office, the architecture firm where they're trying to imagine a co-working space that really spans the entire neighborhood of Aldgate where it would be a mixture of you could work inside buildings or outside buildings. You can work on rooftops and in public space. A whole community that spans not just – not just working in a single office but someone you could literally run into on the street and designing the actual urban environment to actually enhance that.

And so they imagine these sort of typologies – there is a notion like actually building offices that would sit outside in parks. So you could sit there and work more effectively instead of on park benches. Again the sort of blurring between the public and the private going back to what we saw in Mumbai, where you sort of increase the number of interactions in people on the street and sort of densify it.

And you know this is already happening now, you can see organizations like 3Space, this is in London, where they take over buildings that are otherwise sitting empty and filling it with artisans and other sort of artistes and other sort of low cost, low revenue people who are working with ideas.

And the same goes in Australia. This is New Castle in Australia where it's the strategy to basically defeat blight in downtown New Castle which is sort of the – not the Detroit of Australia maybe the Cleveland. Where their downtown was lying empty because landlords basically realized it wasn't worth their time to actually allow people to use their office space. And so the organizer of New Castle who is a arts festival organizer basically figured out that he could use permits and other ways to get people into all these available spaces you could basically hack the city fabric. And again increase the density increase the number of people

on the street.

So I bring this up because it's not just a matter of technology, it's a matter of how do we change the urban fabric? How do we start designing it to increase the number of people there, to increase the serendipity at street level to actually again produce a vibrant city and produce all these vibrant uses?

And so sort of wrapping up here. There's a saying I found this on the Internet which I just love, the notion that in the future everything will be a coffee shop. That basically the future looks exactly like Samuel Pepys' coffee shop. In the sense of – in the future you will only really need the Cloud if you want to do work.

And so all you need is a very comfortable chair to sit in while you simply work in the Cloud. And then when you're not in the Cloud you basically want to be in a very comfortable space with a lot of cool people around where you can do a lot of different things. And that is urban nirvana. And so this goes from – this challenges the whole notion of what is architecture and what is city planning and how to think about the city.

Because you know I mean the traditional architect this is Rem Koolhaas who curated the Venice Biennale this year. And Rem in a sign that he may be out of ideas the whole structure of the show was elements of architecture. So instead of showing any new architecture, any new cities, he showed an entire wall of door knobs, an entire wall of windows, an entire, you know, basically elevators, and broke the whole thing down to show that they were losing track of how the city works.

And so this is an image they also borrowed that in the future figuring out how we should design cities for serendipity is – is the whole city itself is made of their famous blue foam (phonetic), instead of building new buildings we need to figure out how to design these environments so we can bring people together and make better use of the cities we have.

So with that, a final image I guess, a way of thinking about it. I mean, Luis will talk in a moment here and his chosen image is the star or the Sun. I guess I'm thinking about this in terms of synapses. How do we

take the cities we have and how do we increase the available amount of synapses, how do we make exposure so that therefore we can expose ourselves to new ideas, new people. How do we design these new structures that can allow us to find people better in space and time and better uses?

So with that, thank you so much for listening to this work-in-progress. And please – thank you.

(Applause)

So while you think of questions – while you think of questions can you pass the microphone over to Luis in the corner here. Because I'd like his – I like his thoughts on this first, and then second, as we were chatting this afternoon in sort of the mega cities, you know, Luis has done his work at the macro city scale. He is now trying to figure out the micro version. Can you mathematically model the sort of notion of serendipity in your life? How you go through life and having these encounters? And how it leads to these sort of outcomes? So Luis Bettencourt.

MR. BETTENCOURT: Hi Greg. Can you hear me? So it was great talk, and I learnt a lot. Particularly, at the end I wasn't aware of all these initiatives inside companies. Some I was, but not all of them in terms of trying to propitiate serendipity.

So I think that the sort of this tension all along, right, which is so interesting about how humans learn things and then how we create social things that are much bigger than any of us.

And so on the one hand that we need to set up the space to hide away, to learn things, to be specialists and then – but that's where the firm really sometimes works well. But then as you pointed out what's most interesting is how do you dissolve those structures and how you not create new things that really – the things that change societies and create economic growth and so forth.

So I don't know. I think it remains an open question. I think that the tension again is between the designer, as you pointed out, the

planner that would tell everybody who they should talk to. And sort of the propitiation of the conditions by which people actually will meet interesting people. But a lot of that decision is retained by them.

And by their judgment and how one thing leads to another. I think we shared some thoughts before this. And I think actually you can show that the (inaudible) the total engineering of your social life is just impossible. It's impossible also because it's like playing chess with a million pieces. It's just impossible even for the largest computer to consider all the possible social networks with all the different flavors of people and types of relationship, and end up with the best configuration.

But I think where the city and all these processes really live and what's so interesting about technology is that they start revealing some of the aspects of ourselves in this – that are external to ourselves in a way that we can propitiate sort of these matchings and you know sort of all the magic of social interactions of creating new things together.

So I think you have a best seller in your hands.

MR. LINDSAY: Yeah –

MR. BETTENCOURT: Thank you for being so inclusive of our work. But I think – I think it's a very interesting topic and it's the topic for our technology.

MR. LINDSAY: Also add to that the reason I use the phrase "engineering serendipity," and I mean it's not because John is there, John preferred shaping serendipity in his own work because of that organic feeling towards it. The reason I'm using engineering is because there's this attempt to hardwire the social network to binary – make it binary, and then again by these technology companies that believe they can somehow do it in their own office base. It's a real engineer's mentality approach to it which is what I find interesting.

So any other questions. I see I've almost gone over time here already. But please.

SPEAKER: Thank you for the great presentation. Can you talk about Silicon Valley and LA in terms of both examples of serendipity in social networks in contradistinction to their physical layout? So this is a bit of a paradox, the Bay Area, where I spent a lot of time, is arguably dysfunctional in public transportation, it doesn't really have. It takes two hours to drive the Valley. LA the same. Yet these are two of the world's most creative and ostensibly serendipitous places, yet the city doesn't seem to support that. How do you explain that?

MR. LINDSAY: Yeah, I think it's interesting. I once got into a discussion with Richard Florida (phonetic) about this, about whether – where would Silicon Valley form today because there's a whole movement now, the tech back to the city, Twitter moved downtown, Square is down there, and we're seeing technology companies move to the cities. I think both Los Angeles and Silicon Valley are classic examples of historical legacy where the networks that they've created are so super dense that there's – nothing can unseat them. They're not going to decay.

I think I was just reading – it was the creator of Breather actually that app that I showed you. I was reading an interview with him where he literally said you know that if you want as an entrepreneur to make it you should do a stint in the Valley because literally the serendipity is so intense that someone next to you at the coffee shop will know someone in a venture capital firm and you're in like that. And that's the value of the Valley. That's why people live in the equivalent of boxes in people's basements is because of the incredible social density is it can't be surpassed.

I don't think the Silicon Valley would form that way today in a suburban setting. I don't think it's happening now. We don't see any other great examples. And yeah, there's a classic study of – but for various factors of Boston's Route 128 Quarter.

At one point in the '80s Boston and Silicon Valley were real rivals in technology. And Boston failed, and one of the factors that keeps coming up in the research they were both similar typologies, was because Massachusetts had enforceable non-compete clauses. They basically killed all of the serendipity and social interaction dead because they

muzzled people and so you couldn't share ideas even when you found them.

So yes, so I guess in sort of a nutshell I think – I think the whole future of the innovation technology is in cities. I do think particularly since you know that now we're sort of clearing out a lot of the stock that was once devoted to factories and others. We're starting to see that and it leads to problems like we're seeing in the Bay Area.

Michael Kimmelman of the New York Times wrote a little piece like part of the housing shortage is being created by the fact that so many buildings are being converted to office space instead of residential as we saw in a lot of New York.

And New York has the opposite problem. New York is so rich now that office buildings are being taken into residential. You can't even afford to actually have a headquarters in mid-town anymore. So now we're seeing the tech busters going up in Dumbo, in Brooklyn and other places.

So I don't know yeah I mean there is this sort of legacy of that but I don't think we'll see another sort of suburban center of innovation rise. I think for the foreseeable future it's going to be cities for the various reasons, because of social networks, because of serendipity and the various urban economics that Ed Glaeser writes about. Other questions. I guess we'll come back up to here?

SPEAKER: Right. So I work at the energy space. And what comes up again and again and again is rather than having people transport themselves somewhere or build a new building or anything like that, instead you have video conference, you have teleconference, you have video presence some kind of online presence rather than actually interacting with people and you can sit at your house and work.

So do you think that that is not a viable option for the future? That there is always you need to have that presence with people, people you work with strangers things in general that that's just not a viable strategy for creativity and development?

MR. LINDSAY: Not for those two things. I think tele-presence certainly has a place. I mean – I came to this – it is funny, my whole – the whole thing that got me on to the sort of notion came out of my last book Erythropolis where I had to challenge the whole notion of well tele-presence will kill business travel. There's no reason to get on planes, which is doubly ironic considering – how many people in this room flew here?

A show of hands. Exactly we paid a considerable price of time, money and energy to get ourselves here to have an encounter like this, which shows the tremendous value of face-to-face. And so what I found is you know in researching my book is that – you can call it the law of connectivity – every technology in communications has yielded the – same events and amount of travel.

So every message you send causes us to travel even more because of this need to meet face-to-face and do this and business travel is at all time highs. So I think there's a place for tele-presence but I think what the future is, is that yeah I mean – if you – if we basically never reported to the same office again, we're essentially freelancers. We don't belong to a company culture.

So I think what we're going to see is we're going to start seeing the whole organizational model of companies change where you go off into the world to discover new people, new ideas, new subsets, new partners, new things is when you leave the office. And then from that place you might check in with your co-workers via tele-conference.

I think we're going to see tele-presence used for very low value interaction on established relationships where you already know the person and you have trust. But you have to be face-to-face if you're going to build trust and be around other people. And so it's interesting. We could see the company basically in (inaudible) rather than having to go from your house to a hub we could see you basically desert the hub and basically have again a sort of neuron structure where everyone is trying to be a synapse bringing ideas back to the office and tele-presence could be a big help with that. Yeah.

SPEAKER: I just wanted to thank you, first of all for sharing this and giving us kind of a sneak peak on what you're working on.

MR. LINDSAY: Hopefully you all will hear more.

SPEAKER: And also I wanted to encourage, if you have time and for everyone here, there's kind of a micro example of this happening in the Valley. And I'm sure there are a lot of other examples, but one that I'm personally involved in it's called the Studio for Arts and Works down in Carbondale. And it's a collaborative space of independent artistes. And I am not a traditional artiste, but I run a film festival and we have our office there specifically for this purpose. Because we're creating an event and an experience, and there are a lot of other people with ideas that we want to be around – rather than in our own little space.

But my question for you is you mentioned the kind of evolution, you could say, of Manhattan, and how kind of the center of that is now kind of inaccessible for this. Is that a model you think will continue to happen, in different places? Is that in – a maturity that will happen or a trend?

MR. LINDSAY: That's a good question. I mean it's funny Manhattan seems to have multiple models in it right now. So I was at a conference last fall called the Digital City. We are basically looking at yes the fact that you know all of Jane Jacobs' spaces again. The classic you know I mean the – you know Greenwich Village and Dumbo and Chelsea where Google is were being inhabited by these technology companies.

The same typologies where – when Jane Jacobs is writing about garment manufacturers are now inhibited by – or inhabited by technology companies. So that seems to sort of repeat itself, which to me is – again I was referring particularly to the office cores. Like I mean the – so you know the 1980s Philip Johnson did the AT&T building right with – we know with the famous Chippendale in the roof. That became the Sony building and that today is being converted into residences because Sony could no longer basically afford to keep the building. It's more – it's better for them to get rid of it.

So it's interesting so I basically – I think we're seeing a sort of return to like much more granular spaces. We're seeing because of technology and various modes of interacting you know this movement away from high gothic buildings.

One thing I forgot to mention here which is what I talk about whenever I talk about office people is I think the smartest thing any single company can do with your office is to basically – if not open it up completely to strangers because of course there's IP issues.

But we have the technology and things like Airbnb and Liquid Space and some off the stuff I've shown. To basically drop a list of here's the 10,000 most awesome people in the world if they show up at your – at our desk invite them in. Have them come in here and use this. Because you could basically have someone who is a partner, a vendor, a supplier any of these things can come in there and basically use that in physical space.

And one thing I also again forgot to mention is – is that there's a disconnect between office space and how companies think about themselves. If you read any sort of cutting edge stuff on how corporate organization works and John writes half of it, you'll see that companies are thinking about themselves as ecosystems right. They're no longer just the firm they're part of this gigantic ecosystems with partners and suppliers and vendors.

But we don't work alongside any of them. We do business with them but no one actually works together and shares ideas on this. And so I think one thing we can do is we can start seeing offices start opening themselves up more, bringing the street into the office and do things like that which hopefully would increase the value of office space even more and allow offices to stay in the city.

Because otherwise we end up running the risk of – to me the worst case scenario that success that is failure is ending up like London and New York right now and Manhattan where we're basically taking valuable urban space and turning them into needle thin skyscrapers and

estates so we can convert riyals and rubbles into dollars and pounds. I mean – we're basically carving out our cities for foreign exchange purposes and money laundering.

So that's a round about way of answering it. But I think there's really interesting ways of how we can basically make the city more permeable and more porous to allow more things like that to happen and keep the city a preserve of new people and new ideas.

SPEAKER: One more question.

MR. LINDSAY: She was very patient here.

SPEAKER: Thank you. My question really revolves around office productivity. So you talked about large open spaces, meeting at coffee bars, et cetera, and so the one example I'd like to give because it'll help me frame my question is, I used to work not at but with an ad agency in Los Angeles. And it was spherical. They had a tree house space where you could crawl up literally the ladder and go into the tree house to start meetings.

They had the mini Central Park that had indoor trees and benches and that kind of –

MR. LINDSAY: This was Chiat\Day?

SPEAKER: Yeah maybe, yeah. That's exactly what it was. So what was interesting is whenever I was there as a client I never really saw anybody in those spaces. And so I really wondered – and they were very much ahead of their time and known for doing this. But in the end, have any of those types of companies or agencies pulled back a little and said look maybe the ping pong table every 20 feet is just not the way to go. I'm just kind of curious about that.

MR. LINDSAY: Well, its interesting you raised that. So all right, so I don't know if you're under some sort of NDA there. But she's talking about the famous – the current LA office of Chiat\Day the ad agency TBWA\Chiat\Day, which again is an office laid out like a city.

There's streets, there's actual signposts there where they're attempting to use this, and Malcolm Gladwell wrote about that, you know, 15 years ago when he was looking at the fact that office designers were reading Jane Jacobs instead of – urban planners weren't reading her, office designers were.

Have companies pulled back from that? The most famous example was actually before that – was Chiat\Day in the mid-'90s where they implemented something similar where I'm talking about where they basically took out all the desks and enforced it under like a tyrannical regime under Bill Chiat himself – Jay Chiat I should say.

And so basically in the 1990s where you didn't have cell phones and you had very rudimentary laptops, there were bread lines every morning. You didn't own your phone. You had to check in and get a mobile phone and you didn't have a desk, and so by the end of year two it was basically (inaudible), where creative directors were taking over conference rooms and vowing not to leave unless they were fired.

People had filing cabinets in their cars. They would go out to the parking lots to find this, which I think is interesting. I'd be curious to know if they did really good work then. Maybe the chaos was good for them. But they blew that all up and went back to something more conservative. But in the modern context, to answer – we're actually seeing more and more firms start to go towards this.

So if you go to Australia where this is a really, really active way, you know Macquarie, which is a infrastructure bank, total, what they call activity based working where no one has a desk. Everything is completely unassigned. And they ask you – whenever you move, clean up your desk space so everyone can merge interactively.

And then Commonwealth Bank, which is the largest retail bank in Australia has done the same thing. And it is Google squared when it comes to – Alice in Wonderland, and they're bankers. And yet it seems to have worked and there's no cultural rejection. So I'm starting to think we're starting to see more and more penetration of people doing this in terms of the fact of having an office that is sort of optimized for interaction.

But this goes back to – and this goes back to my larger point about the office and the city. Once you've designed an office it doesn't have a desk for you to do real work and it's designed for peer collaboration. Why do you even need that office at all? Why are you forcing me to come there five days a week? Why not just come there two days a week or three days a week and then spend the rest of your time in other spaces around?

And so this is a question that I'm working on right now with a couple of friends – Ben Waber who does the devices, the various sensors. We're writing a piece for Harvard Business Review arguing that the whole way of thinking about offices has to change. Like today they're still managed as productivity per square foot. Like really they run offices where supposedly where we are supposed to come up with all these new ideas and they're being run as if like the best way to do that is to cut as much office space as possible.

We can shrink as many people into as small a space as possible; we can save all this money. What we're not thinking about is how do we design environments for ideas and do that? And so that's one of the areas we're exploring is – are there ways you can use sensors in a way that's passive enough to not freak people out. But start understanding who is really working together and where and then start changing the space for them to do that.

So you know an office that's actually optimized for you rather than you forcing yourself to work in a cube or an open plan or something else. I don't know it remains to be seen, we're still waiting to see if that'll happen. But I definitely think that like this whole notion of the sort of interesting more active environments is going to happen because the technology to support it in the backend is there.

It's just the question of how do we find the right person for the right task at the right time. And that's a social institution problem not a technology problem. So we will see.

I guess we're out of time. But thank you so much for coming. I

am happy to answer your questions.

(Applause)

*   *   *   *   *