

Working/Learning/Leading in the Exponential Age



The Game is changing – are we?
as business schools/ as leaders/as value creators

JOHN SEELY BROWN

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MR. BILL GLICK: Good morning, and welcome once again to Miami and to the International Deans conference hosted by the Association to Advance Collegiate Schools of Business (AACSB). My name is Bill Glick, Dean of the Jones Graduate School of Business at Rice University over there in Houston and chair of the AACSB International Board of Directors, as well as chair of this conference today. This morning our plenary speaker is John Seely Brown, also referred to as JSB, who will discuss that perhaps business schools need to rethink how to prepare students for a world of constant and increasingly rapid changes and disruptions. We're all aware that change is needed. Part of the challenge is how do you go further, faster and how do you convince everyone else that this rapid change is part of where we're going?

So, as a bit of background, John Seely Brown was the chief scientist at Xerox corporation until April of 2002 as well as the director of the Xerox Palo Alto research center until 2000. JSB is currently a visiting scholar and advisor to the provost at the University of Southern California where he facilitates collaboration between the schools of communication and media and the institute for creative technologies. JSB is also currently the independent co-chairman for Deloitte's Center for the Edge where he pursues research on institutional innovation and a reimagined work environment built on digital culture, ubiquitous computing and the need for constant learning and adaptability. His personal research interests include digital youth culture, digital media and the application of technology to fundamentally rethink the nature of work and institutional architectures in order to enable deep learning across organizational boundaries, in brief, to design for emergence in the constantly changing world. So, please join me in welcoming John Seely Brown.

[applause]

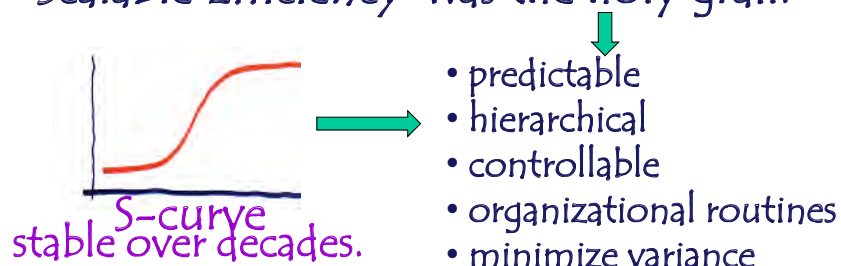
MR. JOHN SEELY BROWN (JSB): Good morning. Today I want to look at what working, learning, and leading is really like in this Exponential Age, think seriously about how much the game is changing, and ask ourselves at the end if we are changing as much as the game is changing. So, to start let's step back a moment and look at the 20th century. I'm going to call it the push economy, where the transportation and communications infrastructures of the 19th and 20th centuries had a tremendous impact on the organizational

architectures that we have all come to know and love over the last almost 100 years. Think about the steamship, the railroad, the telegraph, the telephone and similar revolutionary technologies that for the first time enabled large-scale transportation and communications industries. These technological evolutions emerged along an S curve, meaning that there were moments of punctuated evolution followed by decades of stability during which we could reinvent the work practices, learning practices and social practices that made us effective at utilizing these infrastructures. This is the world we've built our management practices around and the world we prepared our students to thrive in.

Push Economy of the 20th Century



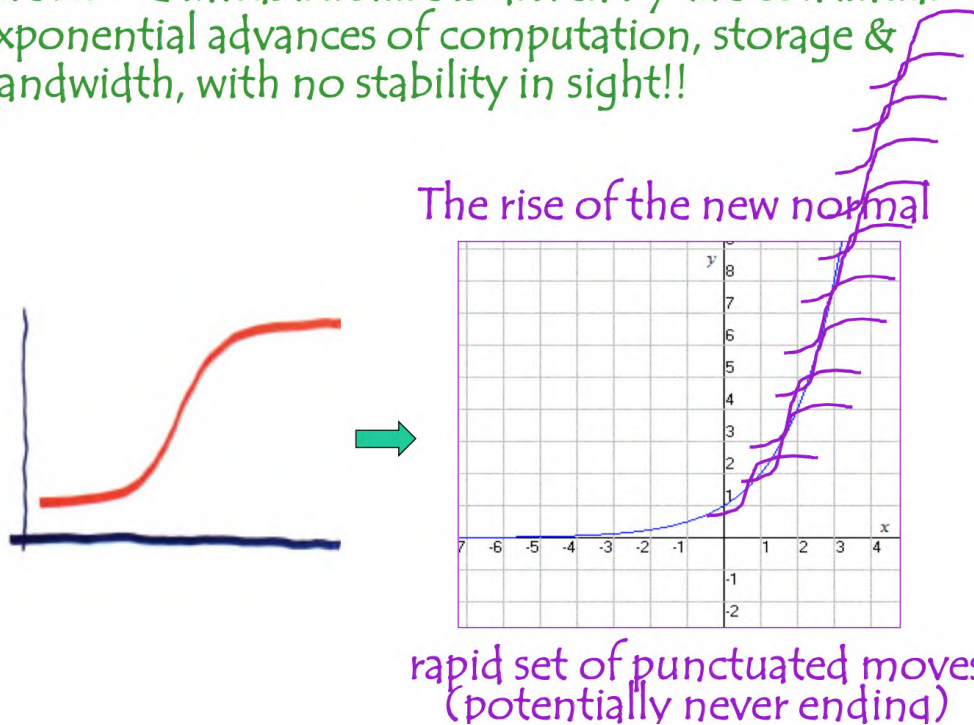
20th century infrastructure drove organization architectures where *Scalable Efficiency* was the holy grail.



In fact, I think it's fair to say in that kind of world, the Holy Grail was scalable efficiency; how to reduce costs as quickly as possible by producing the most possible. The bigger companies got, the more experience they accumulated and the more their performance improved. The 20th century infrastructure drove organizational architectures based on this particular kind of work environment. That is to say we have counted on the ability to have predictable patterns, hierarchy, control, and organizational routines to minimize variance. The question is, having built our practices around that world, are we now ready for what we call The Big Shift? The Big Shift is where we move from a traditional S curve to an exponential one, with punctuated

evolutions happening almost every 18 months. I'm going to argue that there's no reason to believe this is going to stabilize any time soon. Yes, Moore's law is running out of space, but we now know how to build 3D chips and do certain kinds of quantum computing that give me no reason to believe this momentum is going to slow down in the next 10 years.

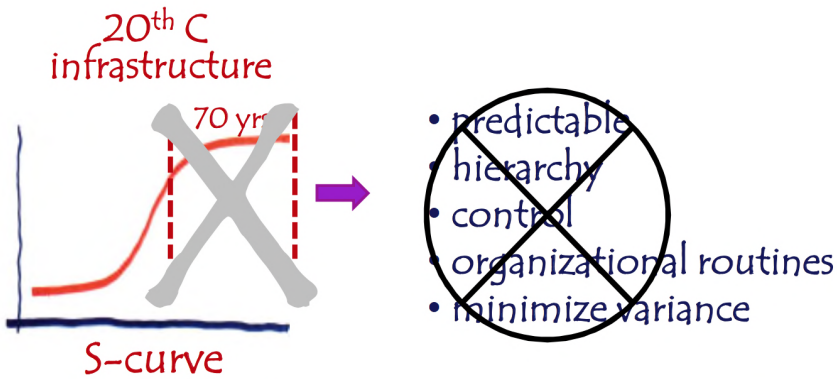
The 21st C infrastructure is driven by the continual exponential advances of computation, storage & bandwidth, with no stability in sight!!



What this really means is the fundamentals of how we worked, how we designed organizational architectures, and how we even built our schools is now up for grabs because so much of what we did depended on this notion of predictability. I could predict ahead of time what people needed to learn, train them in that and expect that knowledge to last for 10 years or more. In business I could fill my warehouses with products and then count on marketing to create constant needs for what I've already built.

Said simply, the game is now different. Corporations and how they need to work are different. Students and how they need to learn are different. Universities and how we need to teach are different. What does this mean? I'll walk through what this means for business, schooling and individual leadership in terms of this new kind of world. I'm going to call it a "white water world" and will explain what I mean by that later on.

yesterdays best practices
are rapidly becoming outmoded.



From 20th C Push to 21st C Pull

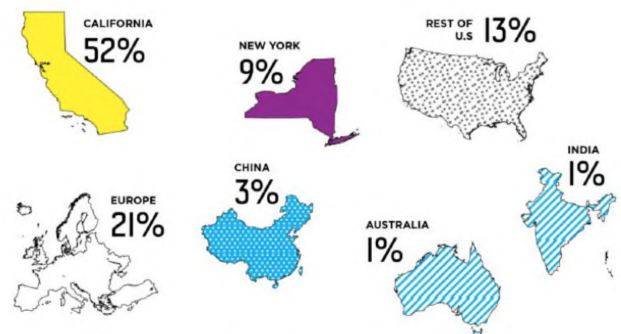
and in fact we don't even know how to price these new businesses as you can see in a lot of the ridiculous valuations for unicorn companies. However, most interesting to me is that this notion of the unicorn has captured the imagination of the business press and is now no longer uniquely situated in Silicon Valley. It is in fact all over the world, and I'm surprised and delighted to see the number of unicorns coming out of Europe and Asia right now. We tend to be very myopic in understanding where this kind of radical action is happening, but it is happening all over. It calls us to step back and realize this is a new game.

To start with a tiny example of this shift let's look at the West Coast, which we used to think of as the land of unicorns. In Silicon Valley, the time it takes to build a start-up that reaches a billion dollar capitalization is now shrinking in many cases to six months. It's hard to begin to think about what this means

MARKET CAP TO A BILLION



Geographical breakdown



Not just silicon valley!!!

On top of that, think about the speed at which markets now grow. The time it took to reach 50 million users on radio was 38 years, television was

13 years, Internet was 4, Facebook was 3.5, Instagram was 6 months and (unfortunately) Angry Birds was a mere 35 days! We now have the ability to distribute new things globally and have them catch on with simply blinding speed. Underlying this we have an emerging world driven by 10 to the third, 1000-fold increases in big data due to cloud computing, mobile first technologies, social networks, cognitive computing, deep learning, augmented reality, and more. In just the last six months the Internet of Things has grown in a very, very serious way. Not only that but these technologies are actually synergistic with each other so the net result is much more than just 10^3 . This is truly providing a new world that enables us to do things now that were unthinkable in the past.

Now add the speed of product deployments. Going back to my earlier point about predictability, organizational routines and so on, think about a bookstore company – maybe a little bit more than a bookstore company – called Amazon. Take a moment to guess the mean time between worldwide deployments for Amazon offerings. Anybody want to take a guess? Go ahead and guess.

AUDIENCE MEMBER: Three minutes.

JSB: Three minutes? What are you drinking? Another guess?

AUDIENCE MEMBER: A week.

JSB: Okay, a week. By the way I guessed three weeks. Well, here is the data. It takes an average of 11.6 seconds between worldwide Amazon product releases. Each deployment is viewed as an experiment. This brings up the interesting notion of how do we move from a world of stocks to a world of flows where new things are constantly coming out? This speed of product development is almost unimaginable in a world characterized by organizational routines, minimized variance, predictability and so on as I discussed in the beginning of this talk. It suggests that underlying this there is a fundamental shift occurring.

Speed of software deployments (each deployment is viewed as an experiment)



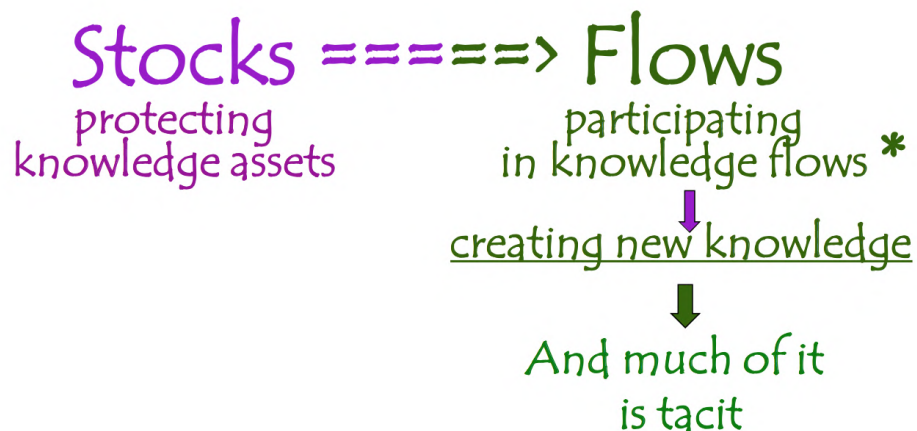
In terms of education, we used to think about building a set of stocks, protected assets or skills to embed in our student's minds. Now we are living in a world in which we are surrounded by new knowledge being created all of the time. Since this knowledge is constantly being created through action most of it has a strong tacit component. If knowledge is tacitly constructed, it is definitely not easy to capture and share. Think about how it is impossible to teach someone how to ride a bike just by talking about it. You have to get out there and do it yourself. You have to struggle with the balance of the bike and feel the texture of the road beneath the wheels. You have to interact with the world and see how it responds back to you. In learning by doing you may not necessarily know why something worked, but you can often use the scaffolding around it and go. Some explicit knowledge can eventually be distilled out of tacit knowledge, but that takes time.

This is why collaborative learning is so powerful. By reflecting with a group on a shared experience, we can extract learning from it. Think about surfers who share a wave, discuss what they experienced and exchange tips on how to navigate the next one. We're increasingly moving out of classroom learning and that needs to be complemented with learning through action and reflection. Sometimes the case method is used in business school as an attempt to bridge those two worlds, however, I'd challenge it's not enough. It's

very hard to teach how to be an effective leader, teacher, and politician and so on in the classroom. We need to create reflective practitioners and perhaps a new kind of community practice around group reflection in this world of exponential change.

So, we've now got an interesting issue where we're moving from stocks of explicit knowledge to flows of tacit knowledge. How do you really work in these types of flows? From the corporations I've worked with over the years, I tend to sense that the half-life of a given skill today is about five years. Think of what that actually means, a half-life of five years.

in a world of increasingly rapid change,
the half life of a given stock/skill is
constantly shrinking
(perhaps down to five years for many)



How do we constantly keep renewing those skills? Is there a new role for life-long learning? Is there a role that business schools can play in keeping their graduates constantly updated? This constant flow of picking up new skills is something that we have to look at very seriously whereas 10 or 20 years ago it was not that big of an issue.

So, I want to say that The Big Shift has taken us from a world of scalable efficiency to a world that needs scalable learning. How do we actually think about scalable learning at the rates we're talking about? Classical techniques aren't going to hack it. Part of our job is to invent new ways. So, what does this

mean for education? How is education itself changing? Let me give two quite daunting quotes.

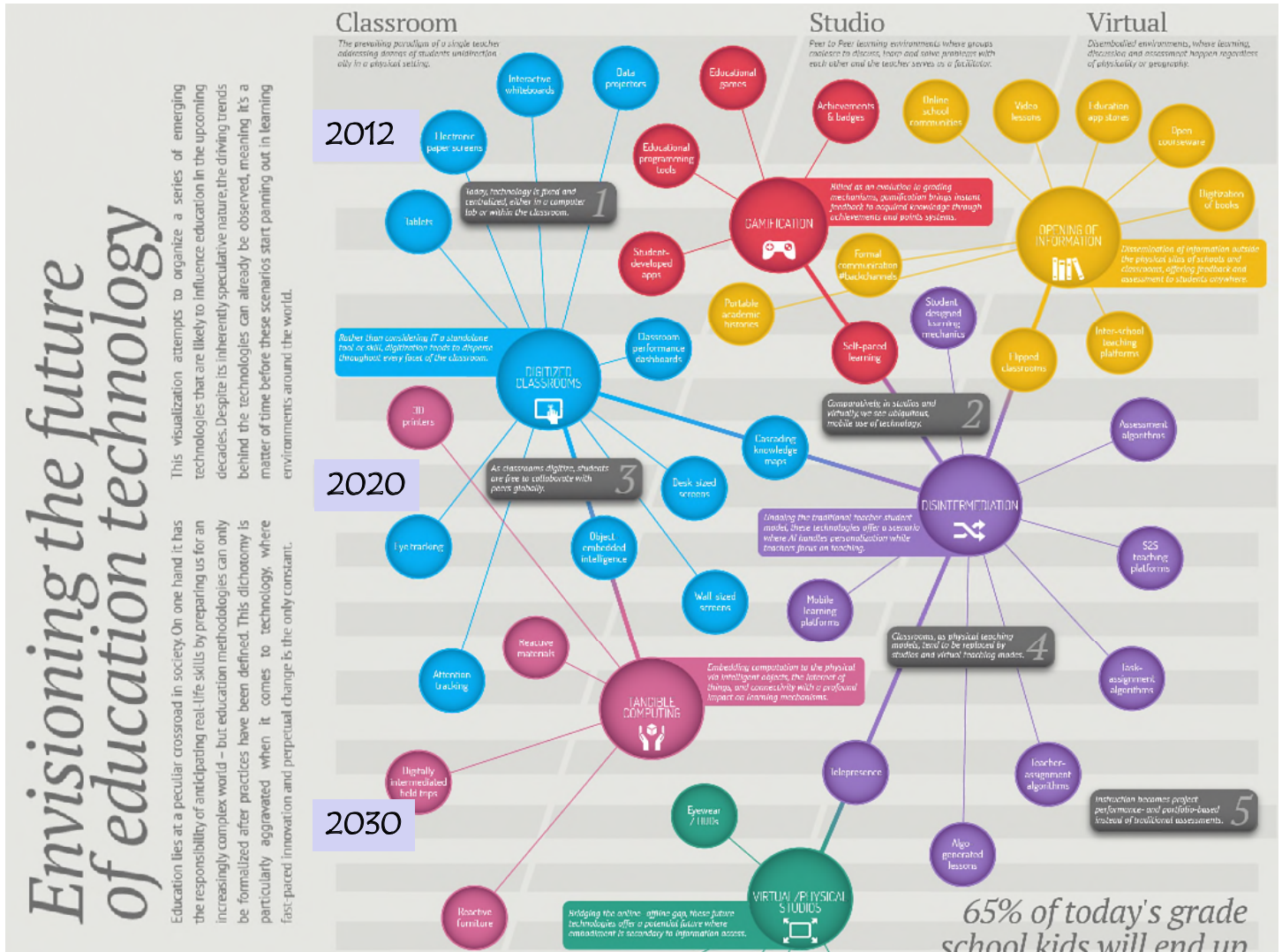
First, David Weinberger has a beautiful book called *Too Big to Know*. In it he says, “We used to know how to know. We got our answers from books or experts. We nailed down the facts and moved on. We even had canons. But in the Internet age, knowledge has moved onto networks. There’s more knowledge than ever, but it’s different. Topics have no boundaries, and nobody agrees on anything.” The context is constantly fluid. If that’s not bad enough, let me go over to Carla Hesse, professor of history at U.C. Berkley. She says, “In the future it seems there will be no fixed canons of text, no fixed epistemological boundaries between disciplines, only paths of inquiry, modes of integration, and moments of encounter.” I think there is a common spirit here between these two quotes and what you are all experiencing in your universities – disruptions galore. Consider this beautiful set of Encyclopedia Britannica’s put out on the street with a sign that says, “Free.” This simple image speaks volumes to what we are experiencing.

Disruptions galore.



But guess what? We do have new tools, new mechanisms and ways to constantly invent. This visualization below is just a set of things that have been pulled together by the virtual research institute Envisioning for the set

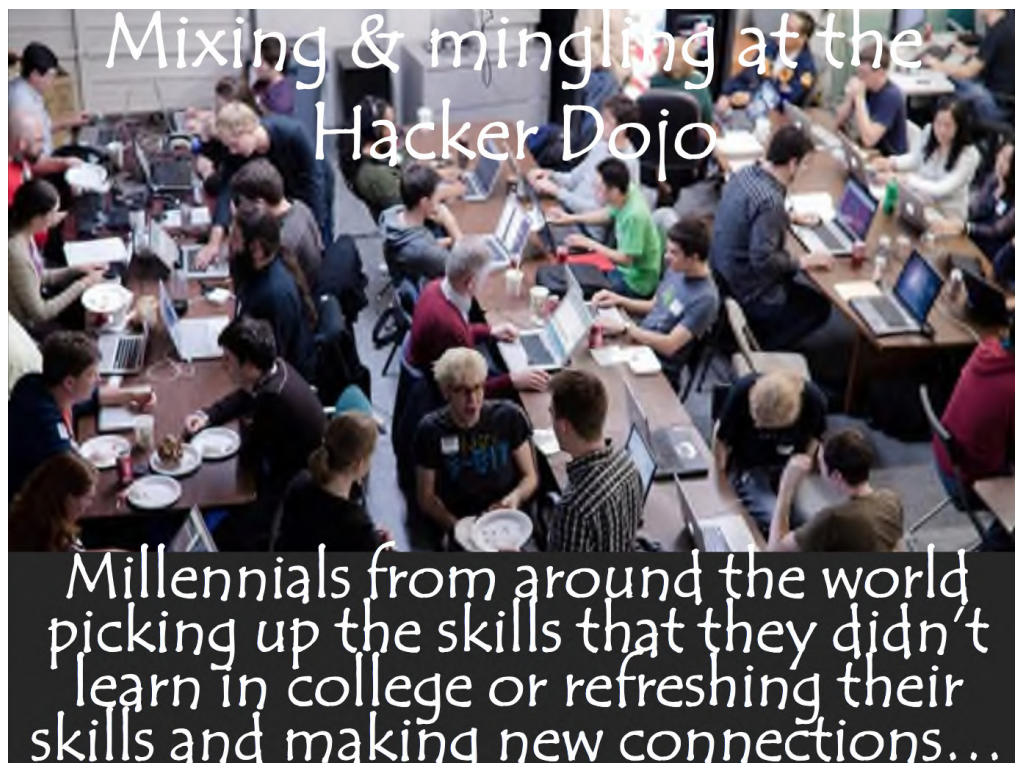
of technologies that have come up in just the last five years that are trying to radicalize methods for learning. There's no real surprise here, but to look at how many different ways there are and how they are intertwined is an interesting issue. Even more daunting is looking at the years 2012, 2020 and 2030.



This image helps us envision how the learning landscape is radically changing. It is worth looking at this in some detail, but please note that it is highly technologically centric and there is nothing here that most of us in some ways don't already know. It may actually be the volume and interactions of these new technologies in this landscape that matter most. So to be clear, these are some of the more semi-formal methods for dealing with this changing landscape. Let's also look at the informal methods that might actually generalize to being hybrids between the formal and informal, between what is in business school and what is outside, but with Millennials in mind.

Let me take you to a very interesting example that I stumbled upon some time ago called the Hacker Dojo. I've found that even the most recent graduates from the top tier schools in the United States are not equipped to handle the tools behind data analytics, cloud computing, cognitive computing and so on that many startups are using today. In order to up their skills, these twentysomethings formed their own network, called Hacker Dojos, where they come together every night to hack things and in the process learn a huge amount from each other. Then the next day they go back to their jobs at startups or Silicon Valley giants like Google or Facebook and put that new knowledge to action.

This is a new form of learning that I was completely unaware of until a couple of years ago. Then I walked into this place. The Hacker Dojo becomes a central place in, or rather a portal into, Silicon Valley. Now, many cities have things like this. These are not accelerators. Let me be clear. Yes, companies like Pinterest were started in this Hacker Dojo, but as soon as they got started they were asked to go to an accelerator. Dojos are learning platforms, not accelerators and it's very interesting to see the kind of passion and social learning, shoulder to shoulder, going on here.



Yet, how do you actually run hack-a-thons like these for the edge dwellers inside a corporation where you want to ignite them to think differently, especially if they are Millennials? I call attention to this because I do a lot of work in Asia, specifically in Hong Kong, and was working with AIA, one of the biggest financial services in Asia, as they were looking to reinvent themselves. I decided to run a hack-a-thon for them. They asked, “What do you mean?” I said, “Well, get me the people between 25 and 30 years old. Ask them if they want to spend a weekend working on a problem together.” They said, “Well, okay,” and I said, “Oh by the way, one more thing. I want them to meet in your boardroom,” because most of these kids never thought they would ever have access to see AIA’s amazing boardroom. So the call went out and both the COO and the CEO took me aside and said, “John, don’t get your hopes up. You don’t understand these kids.” I said, “Well, you know, let me suggest that maybe you don’t. Let’s give it a try, okay?” They agreed and so we started. By the way, we had pizza made by the executive chefs for the boardroom. Needless to say the chefs didn’t know how to make pizza. I suggested that they try to figure it out – a new kind of hacking! – and they did. It was not bad.



By 10:00 PM that night, everybody was completely engaged in self-organized groups that distributed talents across each group. Their goal was to use data analytics on social media to figure out what the world was saying about AIA, a topic that everybody loved including the top executives. With

their hooks into these social media data streams they were able to gather analytics, create information visualizations, and develop argumentation to present to the executive team. It was learning through concentrated diversity, mutual passion, social action and it was a fantastic success. It totally shocked the top management of AIA. These kids are capable of doing things we never thought of.

RocketSpace



[RocketSpace](#), the San Francisco co-working space for tech and new media startups, has attracted a strong set of tenants in the 14 months since it first opened its doors. [Uber](#), [Zaarly](#), [Giftiki](#), [Spotify](#), and [GeekList](#) are just a few of the more than 100 companies who have called RocketSpace home for a stretch of time in either in the past or present.

A final example – one that I think could come back in a very interesting way to business schools – is one of the best accelerators called RocketSpace in San Francisco. Two things are very interesting here. One, you have all kinds of start-up companies sharing exactly the same physical space, learning from each other, and helping each other, even if they are going to end up competing with each other. The learning going on here is astronomical, but guess what? Not only are these kids learning from each other, or these startups learning from each other, but now major corporations are asking for the ability to put people in to watch what is going on. Basically, this is a five-story building in downtown San Francisco where companies like Uber, Zaarly, Giftiki, Spotify and GeekList got their start. Now, many other major corporations are using this space to pick up the newest kinds of edge thinking going on. It turns out that observing people in RocketSpace is a very interesting way to sample the edge by being on the edge.

Some interesting precedents
to stimulate our imagination
around future schools of business.
Can we think more radically?

initially collected and analyzed
for designing the university in 2033

Shaolin Monks
World of Warcraft
Minerva

Ann Pendleton-Jullian

Let's shift a moment and look at some of the more formal methods for dealing with this changing landscape, particularly at some interesting precedents to stimulate our imagination, and ask if we can perhaps think even more radically. These precedents come from the ongoing work being done by Ann Pendleton-Jullian, who is re-imagining the university for the year 2033. Ann teaches this course, called *The University as a Design Problem*, with liberal arts students at Georgetown University and architecture students at Ohio State University. Among the many reasons that the course is revolutionary is that it takes on envisioning a new model for the university as a learning-focused ecosystem through the process of a humanities-based design studio. The year 2033 was purposefully chosen so that it wasn't too close to the present where we would be arguing about MOOC's or budget models all day long, but rather really leap out ahead, yet not so far ahead that somebody goes into the sphere of *The Matrix* saying, "Oh, just swallow a pill and you've got an MBA!" Instead of pulling tactical ideas from other schools and universities, the idea was to look around the world at precedents where specific ideologies or larger goals had led to interesting types of learning systems. The intention was not to copy these precedents as ways of learning but rather to let the ensemble resonate in students' heads to spark their imaginations, help them create new ideas, while 'seeing' more systemically. Three precedents in particular stand out in my mind: the Shaolin monks, *World of Warcraft* guilds and Minerva, which some

of you heard about at the Dean's conference a couple of years ago.



I could spend the entire time talking in detail about the brilliance of the Shaolin monks, but I'm actually going to look at the more straightforward precedence of Buddhism in general. Much of the learning in Buddhist monasteries is done through very engaged, continual, and constant debate. It is debate that is surprisingly physical and dramatic. In fact, any time you make a point to an opponent you make a gesture in their face. Dramatic is an understatement if you really see the final competitions of these debates. In debating they use a slightly different logic than we do but it still is a logic and basically all learning is done this way. Now, think about it a moment. This kind of debate is an interesting extension to the case method we use in business schools, but it is not a case method where the professor knows all of the responses to the case. This is dynamic. This is ongoing. This goes on ten hours a day, and it trains the mind, body and spirit in ways that I have to say have startled me. I have begun to see some of the consequences of training people this way over a five to ten-year period. Their ability to pick up new skills is simply astounding.

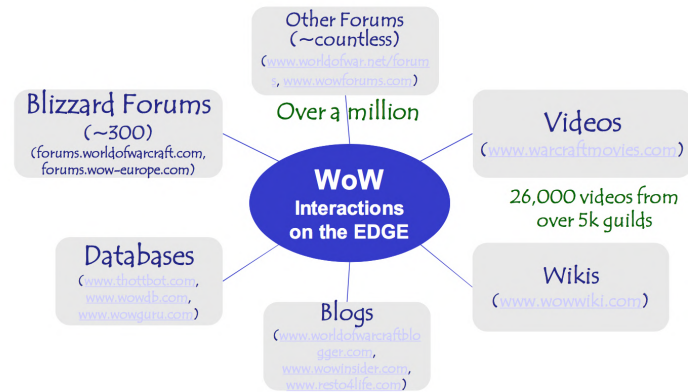
World of Warcraft

A massively multi-player online game : MMOG



What?? Are you kidding me?
First monks and now WoW!

WoW's knowledge economy/ecology –
help players gain & create knowledge faster



Now moving on to *World of Warcraft*, which probably most of you here don't know that much about. Unfortunately, I know too much about it. This is a massive global multi-player game and I bring it up because of the learning environment around *World of Warcraft*. Depending on the time, there are 12 to 20 million people playing. I didn't check last night, but virtually every night probably 10,000 new ideas are created for how to perfect your play in the game, specifically for succeeding at high-end raids. If you are going to compete in the high-end raids, then you have to be a member of a guild. Guild members work together to constantly seek out, refine and check all of the new ideas that have been generated. It is in fact a massive learning environment where participants are absorbing more information faster than in the tech world that I come from. It startled me to see the amount of learning that goes on in this world through the ability to constantly capture new things and organize them in scoreboards that are unique to each individual. Players build and tailor those scoreboards to measure their performance, the performance of others in raids and a plethora of other metrics. Think about if you want your guild to work really well together. What does the guild master – with no stock incentives, only intrinsic motivation – have to know in order to make that happen? You have to be able to create a vision that attracts people. You have to find, evaluate and recruit players that have a set of diverse skills that fit with your norms, which is critical. You have to create an apprenticeship platform for the newbies. Let's not forget about governance – governance in this game is very important because each guild operates quite differently. You have to be able to create, sell and adhere to the governance principles for the guild because you are always adjudicating disputes that happen. There's a very interesting thing going on here.

The Skills of a Guild Master

- ◇ Creates a vision and a set of values that attracts...
- ◇ Finds, evaluates and then recruits players that have a set of diverse skills and with fit with your norms.
- ◇ Creates a platform for apprenticeship - newbies
- ◇ Orchestrates group strategy and governance
- ◇ Creates, sells and adheres to the governance principles for the guild and adjudicates disputes.



Wow – aren't these the fundamentals of leadership.



Chief Of The Year

Think about that a moment and you have to say, “Wow, aren’t those the fundamental skills of leadership?” In fact, some of you may know that three years ago I made the outrageous statement that I would rather hire a level-70 guild master from *World of Warcraft* than a MBA from Harvard. The skills you pick up during play are surprising. In fact, one of the guild people I work most with is Stephen Gillett who the year before last was voted the most successful chief information officer in the United States. Many of his skills – I can guarantee you because I work with him very closely – were picked up through being a guild master. So, something is going on here. I’m not saying that this replaces things, but I’m just saying that this is an interesting learning precedent to dig into.

Next let me take an example that you all may have encountered in the past. Minerva is a great example of how to create pedagogy within the 21st century context. Their new concept for curriculum aims to teach habits of mind and foundational concepts that allow students to continue learning throughout their lives. The Minerva platform was developed explicitly for Socratic style seminars but it also facilitates communication among professors on what each student is struggling with. It is virtual, but active learning. Courses are taught via the platform but students live together in residence halls based in seven cities throughout their four years, allowing them to become part of an international network. It is a stunning platform. Everything is taught as a rhetorical and Socratic dialogue. The maximum class size is 18. It does look like it’s going to be scalable, and the founding dean Stephen Kosslyn, is evolving a very serious science of learning. Now, there are a lot of

places around the world doing some pretty serious science of learning, but Minerva is interestingly focusing on habits of mind. If we think about that a moment, habits of mind – relative to fundamental skills – may be exactly the things that matter in a changing world. How to foster critical thinking, build a core curriculum and so on and so forth are important too, but to address this Minerva has laid out 39 habits of mind and fundamental core competencies relative to those habits of mind. The primary focus in the first year is to make sure that the students absorb those habits of mind and core competencies, because if students can get that, Minerva claims, they can pick up almost anything.

What is new (especially in USA)

Evolving a science of learning

focusing on habits of mind
and related core principles and mechanisms
and putting them into play systematically
In a highly instrumented way.

Stephen Kosslyn

That kind of claim is fairly close to what the Shaolin monks are also saying by the way, but they don't say it in a way that we would ever understand. These are the kinds of examples that, if you suspend disbelief for a moment, pull our imagination. There is something interesting about these precedent examples in relation to The Big Shift.

The world we are moving into is different in a pretty profound way. I'm going to claim for both my parents and myself that there have been three quite different eras. My parents grew up in the era of steamships, basically a steamship set course, in which they powered through everything and stayed

on course. If you became a captain of this steamship, you were there for life. So there was a certain way of thinking that fit the industrial age very well.

Then in the first decade of the 2000's, we entered the digital age that was more like the metaphor or analogy of a sailboat. How do you actually play with the winds? How do you play with those forces and learn how to tact or pivot? If you play out that metaphor of a sailboat, that is what many of us here, myself included, grew up with. I want to suggest that starting around five years ago, a new dominant metaphor has come forth and that was whitewater kayaking. In a whitewater kayak you have to be able to skillfully read the currents and the disturbances of the context that you are embedded in. How do you read that context to understand the underlying forces at work? How do you interpret the flows and what they reveal about the deep structure beneath the water? Then how do you leverage those flows for accelerated action?

Three quite different era required quite different learning strategies & ways of leading

Industrial Age



Digital Age



Emerging Networked Age



If you can do all of that in today's networked world, then it is not so surprising to see the speed of those unicorns or the speed that Amazon actually operates on. This is a shift from reading *content* to reading *context*. It also involves reading the ripples on that context, using the surface to interpret the depths and being able to play those forces to your advantage. It's very much the way that Amazon thinks about the world and many others who

are successful in the fast-paced world of today. So something is interestingly different here in terms of being a whitewater kayaker rather than a sailboat or a steamship. Yet, the steamship is a model for a lot of our schools still. So, what I want to suggest is that given this relentless pace of change and disruptions, maybe even scalable learning and incrementalism may no longer suffice.

Leadership skills for a white water world

A whitewater kayaker,
skillfully reads the currents &
disturbances of the context around him
interprets the flows for what they
reveal of what lies beneath the surface
and
leverages the flows for accelerated
action.

Given the relentless
pace of change & disruptions.

Scalable learning & incrementalism
may no longer suffice!
Now, we must also be willing to
reframe &
reground our conceptual lenses, often.

Now, we must be willing to re-grind our conceptual lenses, to re-frame and re-imagine the world, but re-framing is decidedly not easy. I want to claim that the grand challenge we really have is how to change our own belief structure and how to change an institution's belief structure. How do you actually talk about that? In some ways getting deans together was a lot easier than getting a dean together with his or her professors. How do we bring about real institutional change? Yes, technological innovation is hard, but it's nowhere near as hard as institutional innovation. I'd claim that we need to be more engaged in re-thinking institutional innovations than almost anything else.

The Great Challenge

changing { one's own
an institution's } beliefs



brick wall

That is not a simple game. So, I want to take a dramatic example that, for somewhat bizarre reasons, I happen to have stumbled into because of my colleague Ann Pendleton-Jullian. This situation really opened my eyes to just how much institutional change is really possible.

I want to talk about when retired General Stan McChrystal took over the Joint Special Operations Command (JSOC) in the Middle East. When he landed in Iraq in 2003, the group that was running JSOC before him was running approximately ten operations a month. Two years later he had radically transformed the JSOC to running an average of ten missions a night against a quicker and smarter enemy. The question of interest is how he pulled off that kind of transformation in one of the most rigid and hierarchical organizations, the United States military. This is what happened.

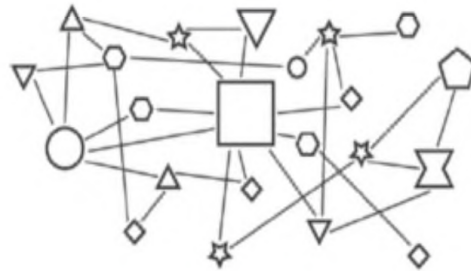
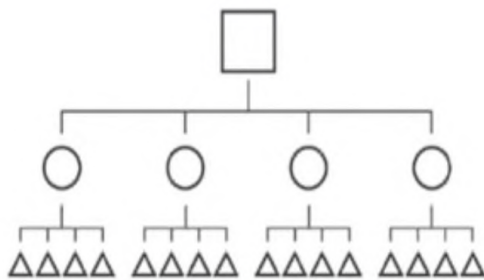
JSOC in Iraq in 2003 was
running 10 operations/month
Two years later, he had radically transformed it
to running 10 successful operations/night



When he first arrived in Baghdad, McChrystal went out with two Black Hawks to survey the area and in that first flight one of his Black Hawks was shot down. It's not easy, by the way, to shoot down a Black Hawk with the kind of devices that rebels typically carry. That was an ah-ha moment for McChrystal – one that caused him to radically re-assess what they were doing and how they were organized. He suddenly recognized that there was a new game at play. JSOC, the military in general, and most corporations are designed

for the hierarchies that we all know. What he realized was that the enemy they were facing had transformed itself into a network – a network that was fluid, agile, and mobile. On top of that, they were using sophisticated technological devices. Against both of these JSOC was at a strong disadvantage. You cannot use a hierarchy to fight or compete with a network. A radical organizational reframing was called for.

What happened?

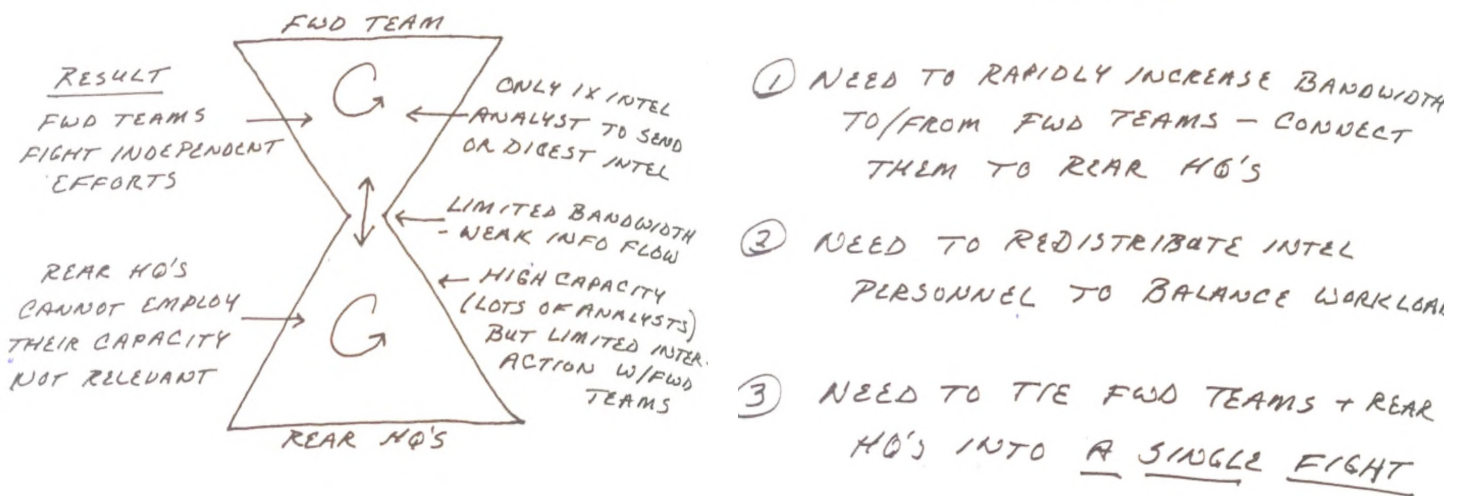


What we were
designed for

What we were
facing

It is interesting to me what McChrystal did when he came back from that fateful first flight. He looked at what was going on and realized, yes, ten missions a month was expected when they would go out, run the special mission, collect intelligence, ship it to Washington to be analyzed and then bring the analysis back into the operating theater in Iraq. Well, if you know the insurgency game – or if you know how we compete with unicorns or why Amazon made it down to only a few seconds between global product releases – you know the shelf life of this kind of information is approximately six hours. If the shelf life is six hours a day, then sending intelligence to analysts in D.C. is a guaranteed loss. So McChrystal realized that, with the operators on one side and the analysts on the other, they were passing information through this narrow funnel and that this whole strategy was fundamentally flawed. They could never compete with the pace of change that the insurgents operated on. So what he did was bring the intel guys – the geeks – and operators together in

the desert of Iraq. Working shoulder to shoulder, they looked at the same data. The geeks looked at it one way – with their eyes in the sky – and the operators looked at it another way – from their experiences on the ground in operations. Through that joint operation they picked up each other’s practices. Any problem they faced with the intelligence coming in became a boundary object that led to a negotiation between these two radically different practices that were not able to effectively communicate before. This whole sense of being shoulder to shoulder is a way to absorb tacit knowledge. It’s easy to share explicit knowledge, but sharing tacit knowledge and practices is decidedly non-trivial. My point is that this ability to share tacit knowledge and amplify informal learning practices is key for the whitewater world. Still, that only begins to touch on what McChrystal discovered from his time there.



Eventually, McChrystal left the military and started his own consulting firm called the McChrystal Group. Building off of his experience with JSOC, McChrystal works with a type of endangered species; corporations that are rigidly reductionist mechanical beasts, rendered too slow to survive – going back to David Weinberger’s opening quote – in the current speed and interconnected nature of the world today. In the last chapter of McChrystal’s book with Tatum Collins, David Silverman and Chris Fussell called *Team of Teams: New Rules of Engagement for a Complex World*, he explains how he began to view effective leadership in this new environment more akin to gardening than to playing chess. All of the training that we give our military leaders is based around chess strategy. When McChrystal took over JSOC he realized that those conventional tactics no longer worked. Instead of leading by moving

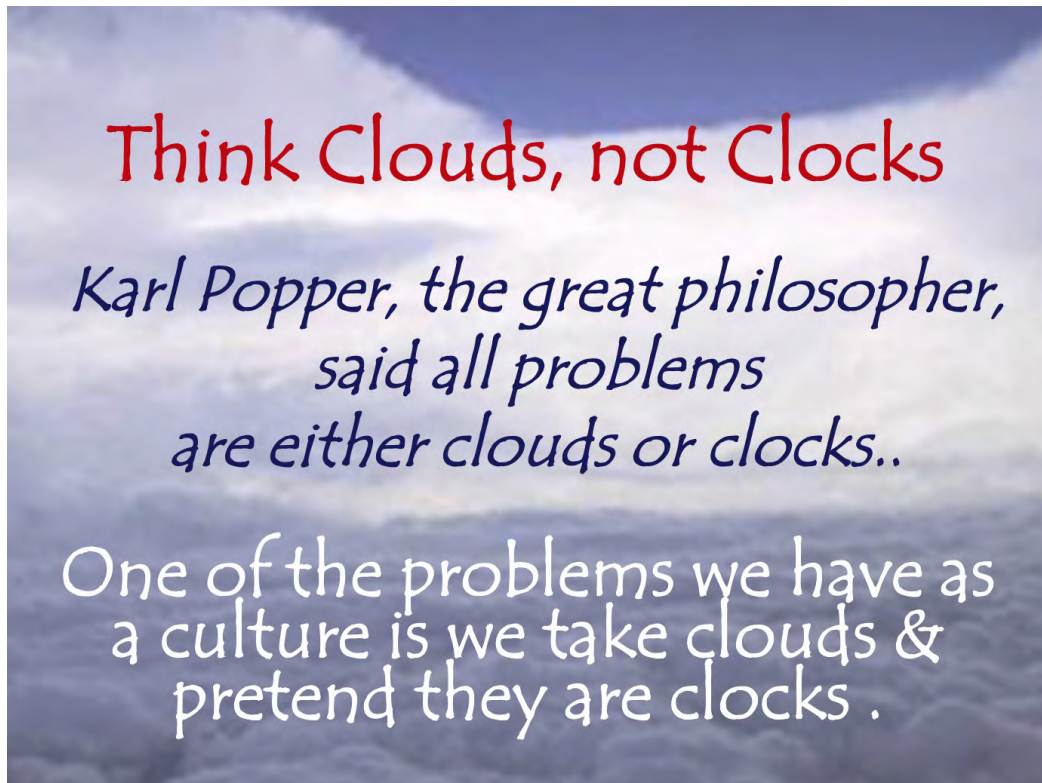
pieces on a board, it was more effective to shape and tend to the ecosystem. I can imagine that it was not easy for McChrystal to make the mental transition from heroic leader to humble gardener, but that's the kind of leaders we now need. It requires shifting to not just understanding a network of networks, but also the interactions and exchanges between those networks as a rich ecosystem. Thinking ecosystemically is the new lens needed for understanding the whitewater world we are living in.

"I began to view effective leadership in the new environment as more akin to gardening than to chess"

See, McChrystal understands the world of complexity. It's important to understand that complexity is not the same as complicated. Complicated is the way that most of us think about the world, but this is very different from understanding complex, adaptive systems. In the world of complexity, everything we do alters the system because of intricate interdependencies. You cannot learn about the problem without action, without actually creating probes to better understand the contexts in which the problem occurs. No significant problem is an island unto itself and the unintended consequences of an action can often overwhelm the intended consequences. In essence, we have moved from the world of *complicated* systems to *complex* systems, densely inter-connected and totally entangled.

In fact, I want to argue with this lens of complexity, we have to think about clouds, not clocks. The great philosopher Karl Popper once said that all problems are either clocks or clouds. To understand a clock you can take it apart, break it down to its individual pieces, study the pieces, and understand how the clock works. You can put it back together again and it usually works.

A cloud? You can't take apart a cloud. A cloud is a dynamic system. A cloud you can only study as a whole and that really says that the epistemological approaches that we have been using for complicated systems won't work for complex systems.



One of the problems we have as a culture is that we take clouds and pretend they are clocks. How many of our wicked problems today – unemployment, education in general, on and on – do we pretend we can understand as mechanistic systems without understanding the emergent properties for how they actually work? Just think about seeding a cloud and how, if you understand the emergent structure of the cloud, making a small, intelligent change can bring about a radical evolution.

So, I want to suggest that in an era of complexity and wicked problems, we need to move from problem solving with an engineering approach to working ecosystemically. If you really want to think about the major challenge facing business schools, it is in how we move from thinking about mechanical systems to taking an ecological perspective, and that is not an easy transformation to make. Ecosystemic intelligence is alive. A mechanical system – a clock for instance – is divisible while an ecosystem is indivisible because of well-developed interdependencies and complex exchanges.

ECOSYSTEMIC INTELLIGENCE ecosystems are alive

Because ecosystems are indivisible, they are environments where all work feeds back into the system, affecting the entire system.

With the kind of toolsets we have today – big data, cloud computing, social, cognitive computing and so on – breaking frame and re-imagining what might be possible by us and by our students is in fact now our golden moment. The toolsets that we have today enable us to approach complexity in ways that we never could before. Chess masters to gardeners are the leaders we now need, but gardeners who are ecologists, not just tenders of plants. The schools that we now need are able to scaffold the emergence of these types of leaders and that, I think, is our deepest challenge.

Chess Master To Gardener: The Leaders We Now Need.

How do we begin to develop these types of leaders? It starts with authenticity. Like a whitewater kayaker navigating the rapids, interpreting

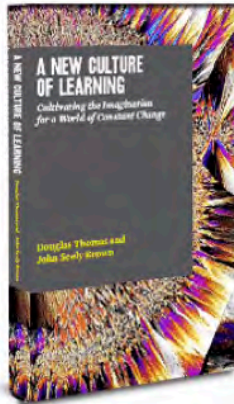
the ripples and understanding what they reveal about what lies beneath the surface, we must live in an ongoing conversation with the flows and changes happening around us. This requires living totally in the moment, experiencing the immediate at-hand circumstances of actions and quickly analyzing information using all senses. When a strong rapid pushes the kayak off balance, or even flips it over, what keeps a kayaker afloat or what helps him roll back to the surface is his center of gravity. It is the axis of balance that gives him the confidence to take on the whitewater and increase his levels of risk-taking. In this metaphor, the line of balance is analogous to authenticity and integrity. Authenticity is simply the capacity to know yourself, your core strengths, weaknesses, values and motivations, and to work from and for them. In a radically contingent whitewater world, decisions and actions critically need an authentic place to work from. That is your base of operation.

We're now operating in a different world – a world where skills matter, tools matter, but expertise and authenticity are also required. It's a world with powerful tools galore and immense opportunities available only if you are willing to unleash your imagination and invoke your skills. So, I have a little book out called *The New Culture of Learning* that talks about the “entrepreneurial learner.” What we are trying to produce there is somebody who sees change as an adventure. If we can create leaders that see change as an opportunity to learn and see that as an adventure as opposed to something to run from – like many faculty do – then we have a chance at shaping our futures.

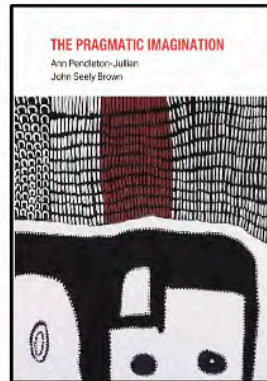
My colleague Ann Pendleton-Jullian and I discuss this further in our upcoming book called *Design Unbound: Designing for Emergence in a White Water World*. We have a singleton (small book) out of one of the key chapters called *Pragmatic Imagination* that goes into further detail on how the imagination can be instrumentalized to turn ideas into action, to address the unknown, and to navigate this rapidly changing, radically contingent world. In these and many more yet to emerge ways, we think working, learning and leading in The Exponential Age will be both very different but very doable as long as we look at learning and unlearning as an adventure. Thank you.

[applause]

Thank You



Douglas Thomas & JSB



Ann Pendleton-Jullian
& JSB

Q&A

MR. GLICK: Thank you very much, John. We really appreciate your presentation and insights, and as I look across the room I realize we've got a bunch of business school deans who are sitting in institutions that started in the monastery and really haven't changed all that much over the years. Now what we are facing is a really daunting level of change going forward and I think it's particularly tough in terms of lifelong learning and the level of interaction required between business schools and our participants, whether they be large corporations or small network operations. That transformation will be pretty radical and I was thinking as you were talking about the hierarchy versus the network. We are in the process of moving from the lecture and the classroom to much more experiential learning as part of what we do as business schools. Thinking through that overall transformation is rather daunting to many schools. So, I'm going to ask you the tough question of how are we able to make that kind of transition going forward? How are we going to be able to shift the field in business schools so that we are tied to our participants, not just the 18 or 19-year-olds but lifelong learners? How are we going to engage them in the broader sense of developing the leaders for the

future, recognizing simultaneously that the leaders of the future will not be homogeneous but will be very heterogeneous?

JSB: I think this goes back to authenticity and integrity. Looking at two extremes – the first is Stan McChrystal’s group, the Navy SEALs in particular, and the second is the Jesuits – it is very interesting that for both groups, at opposite ends of most spectrums, the role of authenticity turns out to be so fundamental. For JSOC, they’re constantly under so much pressure that they need to have a collective consciousness. The Jesuits, similar to the Shaolin monks, seek a profound understanding of the self. I do a lot of work with Jack DeGioia, president of Georgetown University, and this came up recently in a challenge from Jack to both Ann Pendleton-Jullian and myself. What we discussed, going back to the metaphor of the whitewater kayaker, is that to navigate change and to teach our students how to navigate the exponential age, we have to know our center of balance. You have to know who you are because you don’t have time to think. At the scale of both the individual and the institution, it’s interesting that if you really understand how to live in the moment and know yourself and know your own strengths, some of these things that seem so daunting actually become something that becomes almost habitual. I think that the sense of authenticity in this whitewater world actually plays out in extremely powerful ways and I think we have to get our faculty to really think more carefully about what that means.

MR. GLICK: Thank you, and now we have some questions from the audience.

DR. SRI ZHEER: Hello. I’m Sri Zaheer from the Carlson School of Management in the University of Minnesota. I was fascinated by your description of the qualities needed in leaders today as the qualities of a gardener tending an ecosystem. Now, being a gardener myself, the thing about gardening is it requires extreme patience. It is a very slow cultivation process, during which you must be very aware of what is happening around you, and you have to just do things and wait. I don’t see the world that Amazon inhabits as being patient at all. It’s an extreme and the pace is so different that I don’t know that gardening skills are going to work in that kind of environment. What is your view on this? How do we deal with pace? Because my concern is that society as a whole has become so fast-paced that we just do not have the kind of

patient nurturing that is needed anymore.

JSB: Two comments on that. First, as you know, for the kind of gardening you are talking about you must engage in a new type of deep listening. You actually have a conversation with the chemistry of the ground, the plants, and so on and so forth. You listen differently, you listen through action, so the skills that a good farmer or gardener have are grounded in this deep, active listening. That is the key property I'm talking about: deep listening through action. Second, Amazon in fact has a simply unbelievable ability to listen and, just so you know and are not surprised, I am a bit biased because I am on the Amazon board. Still, I know a little bit about how these rollouts happen, what they learn from each one and how the machine intelligence systems used can condense that information to make actionable sense out of it. In sum, it's the spirit of deep listening, living in the moment, and knowing how to intelligently probe the system in order to understand the response structure of the system that are key to these wicked problems. There is a lot more here than meets the eye for how to do action-based deep listening that resolves some, but not all, of the paradoxes that I think you are correctly calling our attention to. It is a very important point because this is not normal gardening, but this is also not normal listening. I think we can combine these things together because the speed of things happening and the flow you get – just like in whitewater – requires reading the ripples. If I can listen to those ripples and understand the context in the moment, then there is a sense of embodiment and learning through embodiment that is at stake here, as much as anything.

MR. GLICK: Next question?

MR. STEVE FERRIS: Steve Ferris at University of Missouri. General McChrystal was successful because he was able to change the organizational structure of JSOC. Universities are very hierarchical and even in business schools we know how departments are very jealous of their own prerogatives. So, how does a hierarchical, traditional organization like the university respond to these network threats?

JSB: So as you can well imagine, there is no simple answer, but generally speaking change in the military is harder than change in the university. I mean

it is more hierarchical and more rule-bound, and – to reveal some more of the challenges of McChrystal – he didn't always jive well with the White House, but he decided to just push the system to the extreme and then produce measurable results. In a lot of cases in the university, we can't specifically say that just one change made a big difference. In McChrystal's situation it was easier to measure what was really happening. I think the catch here is how, in the world of complexity not just complicatedness which a university is, how do small moves smartly made start to let things unroll and change? That is part of why I did the hack-a-thons at AIA, a huge worldwide corporation that doesn't think it needs to change that much. Once they began to say, "Oh, I see, John you want to work on the edge." I said, "I want to work on the edge where the rebels live. Find me the rebels in your organization. Let me work with them." We have now created a center for the edge of rebels. Provide them the right kinds of tools and let them use these tools to start to show how small moves smartly made can start to go viral. So there are small indications that we can actually change very complex organizations.

Now, the university, you know, is admittedly more complicated than corporations. Five years ago I would have said it was impossible. Now, I think we can start to show new ways to do things that start to produce dramatic and wonderful results. There are new business models and learning environments that become bidirectional; as organizations help employees or students pick up new things in different stages of their lives – often every other year given the half-life of skills – the organizations themselves also learn in the process. Ecologies are exchanges not one-ways. If we think of this as a push model, we're dead. If we think of it in terms of ecologies of exchanges, there may be new ways to play this in the fundamentally new business models that are at stake. That could really make a huge, huge difference.

MR. GLICK: Another question?

AUDIENCE MEMBER: Thanks, John. I would like to pursue a little bit the diffusion of a new perspective into organizations. We've been doing research recently on who is more stressed out – senior management or middle management – from the volume of change and it's not senior management. Senior management sees what goes on quite well, but it is the diffusion of

change into a system that becomes the challenge. And, just to follow up on an earlier point, I think that in higher education it is even more difficult because you are not the boss of your institution really. You are a cog in the system of the higher educational landscape that has accreditation and rules and research and systems. Even when we create new stuff at the edges, old systems still break back in. So what does it take to really re-orient a big system? Given what Stan McChrystal has managed to do in Iraq, whether temporarily or permanently, I would just like to hear any other examples that you have seen where something has been changed for the better from something that was pretty highly bound at the beginning.

JSB: By the way, I'm not willing to argue that McChrystal's changes are still in force. I'm not well enough connected to that part of the intelligence community to really know. Reading some of the reports, I'm not sure they didn't fold back to certain old ways. I have got to find that out. But I think again the catch is in how ideas go viral and how people begin to see that, in many ways, it is more fun to just take action and see what happens. When I ran Xerox PARC, we worked on the edge and would try to push wonderful new ideas into the core of the corporation, but what we underestimated was how the immune system of the core could quickly consume our ideas and spit them out as trash. Today I flip the equation and I say, no, I'm going to build up the edge. With cloud computing and other technologies today we can accomplish unbelievable things worldwide without any capital expense. I can now start doing things on the edge that then have real impact. People see that and the edge starts to attract the core to the edge. That is a powerful thing.

So it is a shift from *pushing* to the core to *pulling* to the edge. Then the question is how much of that might actually work in the university world? You know, part of it has to do with restricting your organization to only working with companies that are the most interesting. Take a look at Apple and look at the people running their internal training program, Apple University. I've got to tell you there are more interesting ideas there than I see in most business schools. We have to push ourselves to look around and find really great models. This gets to how do we collectively learn? What are the unconventional precedents for what we're trying to accomplish? Great precedents inspire and once inspired we have tools of unbelievable force

available today with which we can start building. We can build courses that completely transform how we think about design studios and the fundamental mechanisms for learning at the university level like Ann's *University as a Design Problem* course. We can build nano courses, for example, like Udacity that have a whole different dynamic to them. Whereas previously you may have had to wait two to three years before putting something you learned into action, you now have learning on demand. You now know the context for why you're learning something and how you're going to apply it. Knowledge comes alive. It's learning in the moment, for the moment. That is the only way to do it since the game is changing so fast and there is so much to learn as well as unlearn.

There are a lot of things like this that I think we can play with, but even more important is what unleashes passion in the faculty? It may be different than you first realize. I'm surprised by the amount of universities that I go into and, when talking about a problem that a company is having, the number of people that say, "Oh really? Well, if they knew this new idea I have...could you connect me up?" and I say, "Let's just get connected first and see if you can do some joint learning." Going back to exchanges as ecologies, it starts to create a new dynamic. We have to change the dynamic. One of the things that I have seen in the regional accrediting group on the West Coast is that they are demanding each school outline the steps of innovation that they are going to do in the next three years. You tell me the innovation you want to do, not what you want others to do. All of a sudden you become a powerful force and they are held responsible for actually executing on new ideas. So it is kind of an interesting role for an accreditation.

MR. GLICK: Another question?

MR. SEAN COLLIN: Sean Collins, dean at California State University at Monterey Bay. Just following through on that last comment you made, when you are looking at exponentials, it's the knee of the curve that matters, so you are saying we are probably at the knee or past the knee and the insurgents are coming. But who are the insurgents really? If indeed the singularity is near, what role is machine learning playing in this revolution taking place?

JSB: So this comes back to one of the questions we had earlier about middle management. Middle management actually has a reason to be a bit paranoid. They are the learning agents of a company. If they can see themselves that way and amplify that then there is more hope, but the fact is, as you know, machine learning is actually getting to be exponentially better. It is hard to really understand how good it can be and very hard to factor out the hype from the non-hype. I think if we are turning out students from business schools that do not deeply understand what we can do realistically with machine learning, then we are assigning them to death because the new people coming out are expected to know this kind of stuff, and let me tell you it's quite hard because there are very few people that can teach it. So we've got a little bit of a paradox there and that is part of what the Hacker Dojo is actually trying to compensate for by the way, but not all that well. I think that these shifts are fundamental for the way we are going to be running companies and what we want middle management to be able to do.

This really is a new game and what I wonder about is how the university is honestly keeping up with these changes. There is another beautiful book that was actually written by Richard Tedlow, one of the new people running the Apple University, called *Denial: Why Business Leaders Fail to Look Facts in the Face – and What to Do About It*. It is amazing how profoundly individuals and institutions alike are capable of massive denial. So I think we have to become aware and actively help faculty to get them to try something different. I would take that book, ten faculty members, sit down and have a book club. Let's really talk through the forms of denial that we, ourselves, each one of us, actually has and ask, "How do we work on these hard problems?" There is a set of things that we could actually ironically bring from the business school to reflect back on and use with the university faculty. So we are beginning to understand more of these fundamental forces that you might not realize at first. We don't know how to explain them yet. We don't know how to engage in them yet, but I think there is hope.

MR. GLICK: Let's go to a question in the back here.

AUDIENCE MEMBER: First, I probably need to go back and apologize to my son for all of the harping I did on him about *World of Warcraft* and all the time

that he was spending, but my question, and you started to address it I think, is can you talk a little bit more about the interactions and inter-relationships between a new faculty member and somebody else who is maybe a little more seasoned, a little more senior? There may be knowledge on how to improve from somebody coming straight out of school, maybe not, but how do you create those inter-relationships and balance some of the dynamics between folks?

JSB: You know, don't laugh but a technique that I end up using in a lot of corporations is something I call reverse mentorship. That is how I get the CEO or the C-suite to actually be mentored by some of the youngest people coming into the company and, of course, it can be both a mentorship and a reverse mentorship. I often come back to ecology and exchange, not one-way interactions, but here I am talking explicitly about reverse mentorship. For example, I talk about a lot of crazy things. Often CEOs, you know, think, "What have you been drinking, John?" I say, "Look, do you have a son or a daughter, 15, 16, 17, 18?" They say yes. "Great," I say, "Go back and ask them the same set of questions you asked me." The next day they come to me and say, "Oh my god, I didn't realize how much these kids are different than me, what they really understand, the tools that they are using..." and so on and so forth. It is all too easy to think that texting and all of these modern things are a joke, but you actually begin to see what happens when you weave them together. There's something going on here, a new kind of fabric that is being constructed such that knowledge gets created and shared in new ways that we never thought about previously. So I think that I do two things. One, I take reverse mentorship seriously and the second is I have a mantra to top executives, and this would work for middle management as well, that is how often do you get out of your own comfort zone?

I have studied a guy named Jack Hidary who has actually made it a practice every year to spend three or four days getting explicitly out of his comfort zone by attending a multi-day conference on something he knows nothing about. How does he attend that conference? He has built his own social protocol. His social protocol is, on the first day, he sits in the room, listens, takes notes, and picks up the flow of the ideas, the words, the epistemological claims and so on. He is actually a hedge fund trader, so

he picks up things pretty quickly. The second day he hangs outside in the coffee room and what he's actually doing is observing how people interact. What are the social protocols for conversations around coffee? What are the terminologies and so on? Then on the third day he actually enters the conversation. He puts himself at risk. He can look like a stupid fool, but at least he has picked up the genre of interactions and the language in order to actually start to have real conversations. It is interesting to me that he has invented this protocol himself in order to expand his own vision, recognizing that he becomes all too easily engaged in tunnel vision and that it requires explicit work to open that aperture. Now, I would like to see us document all kinds of examples like this. This is kind of what I mean by how do business schools collect these evidences themselves from people outside of the university? It speaks to reverse mentorship as well, in terms of how do you learn from other people and what are those interactions like? How do you start to compile all of this into very interesting stories about new types of social protocols for new forms of interaction?

MR. GLICK: Thank you very much, JSB, we really appreciate your wonderful comments.

JSB: Thank you.

MR. GLICK: Please join me.

[applause]