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**The 2012 Guglielmo Marconi Lecture:  
“Now It Gets Interesting: Global Integration Act II”**

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Thank you, Ann. It is an honor to be invited to deliver The 2012 Guglielmo Marconi Lecture, and both an honor and a pleasure to be in such distinguished company.

I want to talk with you today about what I believe to be a new stage of global integration. It has some similarities to the so-called “flattening” of the world that has been underway for the past three decades. But it is also different in some major respects – and therefore holds important implications for the actions of both emerging and developed economies. In particular, I want to focus on some of those implications for public policy in the developed world.

As has often been noted, the world’s economy has been shaped since the early 1980s by three major shifts:

- An embrace of open trade
- The digital network revolution, and
- A striking increase in political stability.

Together, these forces leveled the playing field for markets, industries and nations, opening up a door through which vast swaths of the planet have entered the global economy.

For emerging markets, walking through that door was relatively straightforward. If you ended your civil war, or dropped your protectionist tariffs, or embraced digital IT, you grew. If you did some combination of all three, you grew fast.

This created enormous – I would say irresistible – incentives for investment, manufacturing and jobs to move all over the world. That has re-ordered industries and rebalanced economies. It has also lifted half a billion people into the middle class.

A decade ago, the world was proclaimed to be flat. That might have been premature at the time, but today, it is no longer controversial. We all recognize that our planet now runs on global supply chains – not just for products, but for services. It is increasingly difficult to characterize what is an import and an export, since so much of what is imagined, produced and delivered is done in many places around the world. There is no more – quote – “offshoring”... when there is no longer a shore.

So, does that mean that a stable regime of global integration has been put in place and that the path to growth and progress is now clear? Hardly. In fact, this is where things start to get really interesting.

The fact is that the developing world has reached the end of the easy path to rising GDP and per capita income. Some call this the “middle-income trap” – the idea that it is a lot easier to go from a low-income to a middle-income economy... than it is to jump from a middle-income to a high-income economy.

As if that weren't challenging enough, this shift is happening at the same time all around the world – as CNN's Fareed Zakaria explained during an IBM forum last year. Every market is now in a competitive race with all the others, which have also been sprinting for the last 15 years to arrive at this same spot.

This situation is new, and it is creating an intense competitive dynamic... on a scale that many people don't yet grasp. Simply put, these growth markets have plucked the low-hanging fruit of Global Integration Act I. Now, they face a radically more competitive arena, requiring higher degrees of regulation and higher standards, where there are higher expectations for everything – from product and service quality, to working conditions, to protection of intellectual property and the rule of law.

Notice – “higher,” not “lower.” In other words, to succeed in this new global economy, you need to take your game to a new level. The playing field may be flat... but it isn't at sea level. The game is moving to a higher plateau.

Conversely, this moment presents exciting new opportunities for the developed world. It may seem perverse to use the word “exciting” about Europe, North America and Japan these days, but many of the capabilities and skills for an innovation-based global economy are deeply engrained in the world's mature markets.

However, there is a catch. These economies – and in particular their government leaders – must also tackle some very big challenges if they are to compete successfully in the years ahead.

Before I describe the changes these leaders must undertake, it's important for us to be clear on what this flatter playing field actually is. It is not just about

connectivity, and it goes far beyond things like Facebook, Twitter, smart phones and the like. Those developments are wonderful, but they are just a part of something much larger – a world that has become pervasively instrumented, interconnected and intelligent, in which computation is being infused into things nobody would think of as a computer. This is the shift to what IBM calls a Smarter Planet.

Let me give you some idea of its scope. We're all aware of the approximately two billion people now on the Internet. This number is growing rapidly in every part of the world, thanks to the explosion of mobile technology. But there are also upwards of a trillion interconnected and intelligent objects and organisms – what some call the Internet of Things.

There are a billion transistors today for every human being on the planet. Intelligence is now embedded in the systems that enable services to be delivered... physical goods to be made and sold... everything from people and freight to oil, water and electrons to move... and billions of people to work and live.

All of this is generating vast stores of information. It is estimated that there will be 44 times as much data generated over the next decade, reaching 35 zettabytes in 2020. A zettabyte is a 1 followed by 21 zeros. And thanks to advanced computation and analytics, we can now make sense of that data in something like real time. This enables very different kinds of insight, foresight and decision-making.

That's the field we're all playing on now. And the developed economies ought to be in a strong position to do well in this game. However, they first have to step up to a set of major challenges. That's because, over the past three decades, something else was going on, in addition to global integration.

The world's mature economies were piling up massive deficits – not just financial, but also deficits of competitiveness. Their populations were aging. Their infrastructure was rusting. Their education systems were becoming increasingly out of date. Their laws and governments were not keeping up with the pace of change.

Now, the bill has come due – for all those deficits, at once. Just as all emerging markets are being hit at once by the middle income trap... so the developed world finds itself having to address all of its huge structural overhangs, and with urgency, thanks to the ongoing financial crisis.

It may be appealing to think that we can postpone that reckoning, but that isn't a serious option. The new "great game" of global competition will not wait to start league play while we get our house in order.

As daunting as this seems – and it can seem nearly impossible, if one looks through the lens of the media – I believe there is an opportunity to make a major breakthrough. I believe we can both put our societies on sustainable, long-term foundation *and* improve our ability to compete.

I would like to offer three broad ways in which the governments and economies of the developed world can – I believe must – change the way they operate.

*First, a society must both invest in the future and improve its competitive muscle tone.*

Debates rage today about austerity – and without question, we need to deal in serious, grown-up ways with our financial deficits, both public and private. But we cannot cost-cut our way to competitiveness.

In fact, winning on a flatter, higher playing field will require *increased* investments in key areas: such as infrastructure, education and deep research. For instance, the American Society of Civil Engineers estimates that the required investment in physical infrastructure over the next five years, for the US alone, is \$2.2 trillion.

As Mario Monti in Italy has said, we need a vision that includes *both* austerity and investment. He recognizes that Italy must address its debt problems through the former. But it cannot compete and win without also making Italy a place that creates value, attracts investment and has a growth agenda.

We had an interesting approach that was developed in the U.S. – the bi-partisan plan put together by the Simpson-Bowles Commission. I hope it gets revived. It represented the kind of mature, long-term balance we need between fiscal responsibility and investment for the future.

This is not just about technology. We must adapt our policies to nurture and promote an innovation economy. Our countries and cities must be able to tap into global supply chains, talent pools and collaborative relationships – and use them to create things of indigenous value, whether products or services. And that will require greater flexibility in how our economies operate, through smarter labor and trade regulations.

*Second, every economy must have a compelling value proposition – and it must be differentiating.*

How do you compete in a world where there is no “outsourcing” – because there is no longer an “out”? The answer is simple: You have to be better at something. That’s how free trade and comparative advantage work. So, cities and countries now have to address a basic question (one that businesses must answer daily): What is our unique value proposition?

I was on a panel in Washington DC a couple of years ago, and the moderator asked me, “Your companies have all this cash. Why don't you invest it in the U.S.?” So I said, “That’s the wrong question. Ask yourself, why *would* we invest it in the U.S.?”

He was silent. So I gave him the answer: “Highly skilled workforce. The rule of law. Protection of intellectual property. Fair capital markets. Great universities. Safe, livable cities.” What is that list? It's not some moral imperative. It's called a value proposition.

Now, going forward, those basic qualities, by themselves, will not be enough. They'll get you in the game, but they won't differentiate you. The cities, countries and economies that succeed will have clarity on the kind of economic and societal innovation they do *uniquely* well – the qualities of their culture and their knowledge base that make them stand out in the global competitive market for talent and investment.

At IBM, we ask ourselves four simple questions:

- Why would customers buy from us, rather than someone else?
- Why would someone invest in us?
- Why would someone work here?
- Why would society allow us to operate?

Our answers to those questions grow out of our core values – our shared sense of what IBM exists to do. And those answers, in turn, shape our strategies, our actions and our daily behavior as IBMers. How would your company, your city, your country answer those questions?

*Third, government itself must become smarter.*

People argue about bigger vs. smaller government. Again, I believe that's the wrong debate. Government, like business, must become smarter – and by that, I don't just mean digitizing government services or putting up departmental or ministerial websites. I'm talking about the need for deep subject-matter expertise infused into how government does everything it does.

Think about it. All of the services and functions that government is entrusted to provide to the public are now changing.

- Consider public safety. We used to measure our crime-fighting capacity by the size of our police forces and the state of the art of their equipment. But more and more police departments are fighting crime with data. New York City is now one of the safest large cities in the world. Why? Because it has embraced its data, learned to analyze it, and reconceived its mission and

skills around that. This approach to public safety is not taught yet in our schools – but it will be.

- Traffic management used to mean building more and wider roads, adding more trains and buses. Today, Helsinki and Stockholm are reducing congestion, lowering carbon emissions and increasing use of public transport by using real-time data to manage pricing and schedules. They don't teach this in schools yet, but they will
- How do we respond to emergencies? We have ample evidence of after-the-fact scrambling – from terrorist attacks to natural disasters.

But elsewhere, such as in Madrid and Tayside, Scotland, leaders are creating emergency response command centers that enable them not just to coordinate across public services in real time, but even to anticipate problems and head them off before they balloon. They are tapping into the power of predictive analytics. They don't teach this in city planning programs yet, either, but they will.

- Even take something as simple as handling influxes of tourists. Venice is using sensors and mobile phones to help visitors discover lesser-known parts of the city, to provide instant information on historical sites and to prevent “walking jams.”

The same applies to water, to food safety, to energy, to healthcare – to all the systems that make up the system-of-systems that is a modern city and a modern economy. Every field of science, business and society is changing, is being transformed before our eyes.

Government has to be at the forefront of those changes. We have to figure out ways for government to attract the world's deepest experts on these new kinds of economic and societal systems.

I will tell you that today in the United States, the best students simply don't want to work in government. And that is a serious problem, at a time when we need the most intelligent experts in the world working to ensure that our society's systems are smart and sustainable.

Perhaps we can't do much in the short term to counter the increasing polarization of our electoral and legislative processes. But there are other ways to tackle this expertise deficit in government. What about adopting a new model of the familiar public/private partnership? I'm talking about a collaboration among business, academia and government to nurture, share and attract this kind of expertise into the public arena.

So, that is the *what*. What is the *how*? I believe we will have to move on two fronts.

The first is to come together across the boundaries of the old “estates” to tackle these three imperatives at a whole-society level. The Europe 2020 vision is a very strong start, especially its plan for supporting innovation, the so-called Horizon 2020 program which was launched by Commissioner Geoghegan-Quinn. I wish we had such a smart and grounded consensus in the United States.

The second front is that we will need to develop and empower new kinds of leadership and leaders. And the truth is, they are in plentiful supply – if you know where to look. At IBM, we see it every day in our work with clients.

That may be surprising to you. So many pundits describe a global crisis of leadership. However, in cities, countries and industries around the world, when you talk to entrepreneurs, mayors, commissioners and community leaders, you don’t encounter complaints and frustration. Instead, you see energy, imagination and a kind of pragmatic optimism.

As the cyberfiction pioneer William Gibson observed, “The future is already here – it’s just not very evenly distributed.”

These new leaders exhibit three fundamental characteristics, which I believe begin to define a new model of global leadership.

1) First, they embrace the new technological capabilities. They are hungry for data, and for the technology that can unlock its insights. Europe happens to be in a strong position here, in large part thanks to the initiatives taken by Commissioner Kroes within the framework of Europe’s Digital Agenda, including the Connecting Europe facility launched last Autumn. Today, Europe has five of the top six nations in the worldwide Digital Economy rankings, as measured by the Economist intelligence Unit, and 28 out of the top 50 spots.

2) Second, they think in terms of systems. Take Rio de Janeiro. In order to deal with the catastrophic mudslides that strike during rainy season, Mayor Eduardo Paes and his colleagues could have focused on just one element of the challenge – for example, applying new, high-resolution weather technology to pinpoint where a tropical storm will strike. Or they could have built a smarter solution for emergency response by police. Or they could have linked healthcare services and providers to the local community. Any of those would have been ambitious.

But Rio went much farther. They looked at their city as a whole system, and built an Integrated Operations Center. It coordinates information from more than 30 city, regional and national departments for real-time visualization, monitoring and orchestration of response to incidents across the entire city.

The Integrated Operations Center is a different way to see and manage the entire city, in all its rich complexity. As such, it will serve as a foundation for Rio's competitive position... as a leading global city over the next century.

Rio is a stellar example – but it's not alone. Today's leaders are not just responding to emergencies, they're building systems – systems that will serve them for the long term.

3) Third, these leaders are pragmatic, not ideological. You find this especially at the city level. If you're a mayor, or a police chief, or the head of an urban school system, you don't have the luxury of ideology. The decisions you make are immediately visible in people's lives. If these city leaders do share an ideology, it is this: "We believe in a smarter way to get things done."

So, I urge you to learn from – and invest in – your cities. People rightly celebrate Silicon Valley and Bangalore as crucibles of innovation. We have also heard a lot recently about the manufacturing hubs that are arising in China. But none of those is as intellectually or culturally rich a petri dish for innovation as the cities of Europe.

Invest in them as incubators and accelerators of a smarter future. Importantly, seek out and learn from your forward-thinking leaders down at the local level, who are pioneering not just what to build, but how to build it, how to build constituency for it, and how to govern it once it is built.

The issues we face today are challenging – but they are solvable. The new capabilities at our disposal allow us, for the first time in history, to tackle entire economies and societies at a systemic level. The conditions now exist for a single, prosperous, progressive global economy that includes all the geographies, sectors and people of our planet.

The key will be leadership. Shame on us if we do not move aggressively to seize that opportunity. Shame on us if we allow yesterday's battles to cloud our vision of tomorrow's promise

I am optimistic – not because I expect human nature to change, but because we now have at our disposal an enormous new natural resource. I mean the gusher of data that enables us to literally see and understand our world as never before.

What the discovery of the Western hemisphere was to the 15<sup>th</sup> century, and the discovery of steam power was to the 18<sup>th</sup> century, and the discovery of electricity was to the 19<sup>th</sup> century, the explosion of data will be to the 21<sup>st</sup>. Its economic and societal value is almost incalculable.



If we seize upon this new resource, I believe future historians will look back on this moment, not as the start of a so-called “new normal” of lowered expectations, nor as a bifurcation of the world into old and new, nor as an era of growing gaps between haves and have-nots. They will see it as the dawn of a new golden age – of innovation, of widely shared economic growth and of global citizenship.

The EU is off to a great start with Europe 2020. I look forward to discussing with you what this new age can be, and how we can accelerate our work together to build it.

Thank you.