

Jeff Raikes IW Forum Keynote

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From Outcomes to Output.

Redefining Economics for the Information Age

Welcome and Introductory remarks

Welcome to the first Information Work Forum. I hope you find the content presented today interesting and useful. This is a rare opportunity to have access to thought leaders from industry, academia and the government and I hope you take full advantage of the learning opportunities available during the Forum. I encourage you to connect with each other to explore your organization's specific issues around information work, productivity and measurement. Today you join or continue an ongoing conversation -- and debate -- about a topic of keen importance.

Before we get started I want to ask a couple of questions to provide perspective for today's discussion. These are a layman's economic questions – questions I ask myself.

What if cars were able to take a 40 mph collision in stride? What economic measure would reflect that improvement? We know life would be better – more productive – but I'm not sure that our economic measures would reflect the improvement. We would sell fewer new cars, fewer cars would need repair. Some might say it would slow our economic activity by displacing auto body repair people, automobile sales staff, insurance companies, etc. But could we detect the shift in the economic numbers and attribute them to this improvement?

Think about the move from an agricultural society to an industrial society in the late 1800s. People were worried about being displaced by machines. Our measurements were entirely focused on bushels and barrels and heads of this and that.

As much as people were aware of the shift from agriculture to industry, we absorbed it in stride.

Even though the shifts are evident, our ability to measure the implications of large changes in human capability or capacity lag behind the change themselves.

The industrial world prospered. Its cities and factories could not be farther from the agrarian life that came before. And it took decades of work for economists and government organizations like the Bureau of Labor Statistics to reflect the new mode of value creation: making things and the labor that went into their creation.

Quantitative change can lead to qualitative change. We can use a machine or a piece of software to do something better and better or faster and faster. But technology is also transformative, which means it leaves in its wake a qualitative disturbance that is hard to measure and hard to predict.

I am not an economist, but these kinds of questions help me frame the challenges that lead to the formation of the IWPC. What does it mean that information technology has replaced industrial technology as the driver of the economy? What measurements do we use to see the impact of information technology on the economy?

Economics is an exciting science. There is still important work, even fundamental work that an individual or a small group of individuals can do.

This is a polite way of saying that economics needs to find a better way to reflect the new values of the information age. It is increasingly evident that industrial age economics doesn't mirror processes that are more about outcomes than output—the kind of work done by information workers.

It is time to address this issue. Perhaps working through the Information Work Productivity Council, we can help leading academics and other researchers toward new modes of measurement that capture the value creation of the information age. This is a big challenge, and success is not assured, but we should not fail to try.

It all comes down to this...

We need to refine our economic models to reflect the impact of information technology.

That's the primary reason why we are forming the Information Work Productivity Council. That's why we're here, on a cold day in New York City, at the first Information Work Forum.

For many of you in the audience, this may be your first exposure to the Information Work Productivity Council and its work.

The IWPC spent its first year exploring the problems associated with information work, relying initially to a large extent on surveys of existing research. This is summarized in *The Information Work Productivity Primer*, which is available on the IWPC web-site.

Other work is ongoing. Right now there's a strong debate about a proposed meta-model that may end up being the one used to drive this year's measurement-related agenda.

Anybody who has been through a basic quality control course knows that if you can't measure something, you can't improve it.

When it comes to information work, our inability to measure it means we often resort to qualitative measures and surveys. We "feel" good about something and say that it is "better." We mistake change for improvement.

Right now we just don't have a methodology in place that supports our contentions.

What we do know is we need to move beyond intuition and anecdote to knowledge and fact when it comes to measuring information work.

Measuring information work will be an enormous endeavor.

At Microsoft we use stretch goals to engage our challenges. We know that not all of these missions will succeed, but we try hard when it is important.

We think that redefining productivity so that it reflects information work, and creating new ways to measure work, are important stretch goals. We need to go at them with enthusiasm and with intelligence.

Three Key Ideas

Our participation in the IWPC over the last year has reinforced three key ideas for me. I think of them as general goals that will need many perspectives in order to be understood, if indeed their economic underpinnings can be exposed.

First, industrial age economics do not reflect the new kinds of work being done in the information age and this creates questions about IT's value to the economy.

Second, the productivity gains from information technology require investments in information workers to maximize their potential.

Finally, the connected society has the potential for changing the relationship between information worker and employer, and between work life and personal life. This change will lead to new opportunities and new challenges for organizations and their workers as they grapple with finding a new normal.

To the IWPC colleagues these points are not news. To many of our customers these are not findings, but day-to-day frustrations.

Let me step through some thoughts on each one.

1. *Redefine productivity and create a framework for information-age economics.*

I've already shared my conviction that the economics profession can do more to understand and appreciate the role of technology in improving productivity.

Over the last couple of years a debate has been brewing about the role information technology has played in recent surges of productivity.

The 8.1 percent jump in the third quarter productivity, which leaps above the already impressive 5.4 percent gain in productivity over the last two years is the latest lightning rod for the debate.

Research from leading thinkers, such as Berkeley's Hal Varian, MIT's Erik Brynjolfsson and New York University's Baruch Lev, summarized in the IWPC Compendium, suggests that deficiencies exist in the way we measure productivity and that has profound implications for:

- How we perceive the economic health of the United States and the world
- How we measure the impact of investments in information technology
- Most importantly to our customers, how best to make choices between information technology investments based on their ability to influence the performance and profitability of an organization.

Our old measurements only capture the process and structure that is a part of an organization's work (physical counts off production lines, and the time spent to produce those item) They do not include other factors like:

- Higher quality decisions
- Higher quality products
- Faster response times
- And perhaps most importantly, knowledge creation and innovation, which do not necessarily lead to higher productivity, but often, do lead to entirely new approaches to process or business.

I think it is time to stop the debate on the value of IT. The issue is not whether or not IT provides a positive benefit. We all know it does. The issue is that current measures fail to capture the contribution of information technology to the economy.

Scientists in Canada who broke the genetic code for SARS just weeks after the disease first appeared said they couldn't have done it without the Internet. Working in Ottawa, they relied on rapid communication with scientists around the world. What was their collaboration tool of choice? E-mail.

As soon as the sequence of the SARS genome was decoded, the Canadians posted it to the Web, making it available to the global community of researchers and clinicians racing to develop a reliable test for SARS and a vaccine to prevent it.

Both the speed of the decoding and its dissemination were amazing. The first reports of the new disease came from China in November, and on March 13, cases were reported in Toronto and Vancouver. The sequences were posted on the net on April 15.

By contrast, it took years to identify the agents behind diseases like AIDS and hepatitis C.

Information technology has made a huge impact on medical research, in terms of coordination across geographies and the swift availability of information. I doubt that our labor statistics reflect those collaborative, rapid response, team-based reactions to events, especially when they cross country boundaries.

And even though the discovery of the SARS genome was a fantastic outcome that almost certainly improved the human condition, how was all this work measured when the outcome was not a refrigerator or an airplane, but rather a shared data model of a genetic sequence?

If you look at the “Biofutures Convergence” chart provided by the Global Business Network, you can see how the information technology, biotechnology and chemical industries are creating entirely new business segments by crossing boundaries.

Technology allows scientists to build complex models of chemical and biological interactions, store and manipulate huge amounts of data, like the human genome, and use technology to deliver health care with higher quality, more consistency, and lower risk by tracking patient history and correlating treatments. And technology allows businesses, investors and individuals to collaborate.

These interactions between businesses drive innovation. We are challenged then to find ways of not just measuring the products of our hands, but the products of our minds.

The new economic models need to take the form of new balance sheets that demonstrate the value of intellectual property by explicitly reporting on not just our inventories and physical assets, but our intellectual property, our investments in process and the knowledge of our workforce.

A shorthand way of saying this is we need to move from measuring outputs to outcomes.

2. Better understand investments needed to make information work successful

The second goal and belief is that we need to better understand what kinds of investments are required to make information work successful.

If the repository for intellectual property is a patent or copyright, the repository for knowledge is the information worker. If information work matters, then information workers matter. The U.S. Bureau of Labor Statistics estimates that nearly 70 percent of the 136 million employees in the U.S. non-farm workforce were engaged in some form of information work at the turn of the 21st century. Some current work with the Global Business Network puts the number at approximately 100M.

It is not a great stretch to anticipate a time in the not too distant future when virtually 100 percent of the work in developed countries involves information.

World wide information worker populations are nearly six times the size of those in the US and growing rapidly.

We owe those workers our best thinking on how to help them achieve their goals using information technology.

Technology is required to support a business process, and information technology usually supports people-intensive processes where content is created, discussions are held, and decisions are made.

Erik Brynjolfsson's work at MIT demonstrates that we often fail to make the necessary investments in human and structural capital that are required to support information workers and empower them to leverage technology with which they are provided.

We need to be cognizant of the shared responsibility between technology suppliers and their customers so we can guide those customers toward best practices and necessary levels of investment in social, structural, and organizational capital that will ensure successful deployment of our products.

As we refine our measurement frameworks, we need to think about how we capture those data points that indicate the health of the relationship between technology and those that use it.

What is the connection then, between information workers and productivity? For them, it is improved standard of living. If we improve productivity and real output, we improve the standard of living of our workforce and the countries in which they live.

I can't think of a better win-win for all of us.

3. Seek productivity in the opportunities and challenges of a connected society

The third goal and belief is that the connected society has the potential for changing the relationship between information worker and employer and between work life and personal life. This change will lead to new opportunities and new challenges for organizations and their workers as they grapple with finding a new normal.

One of the drivers for me personally, is that the changes over the last 20 years are just a glimpse at what is to come.

Think about where we were 20 years or so ago. The typing pool was being emancipated, with their work moving to the front office. People were starting to gain control of their own content. The Apple Lisa brought out this funny thing called a mouse which, through the Macintosh and Windows, helped make computing more accessible. And then there is one of my favorites, VisiCalc, which transformed the way people looked at numbers, empowering individuals to explore all types of financial models, and even keep their lists neater.

If you look at this picture, you can see my life has changed a bit too.

As you can see, I'm quite happy with my Tablet PCs...

I always keep a couple of them handy in docking stations.

Since we are here to answer questions, I thought it might be worth showing the answer to: "In a world where there isn't as much paper, what's the purpose of a stapler?"

Sometimes your eyes can play tricks on you. If you look closely, you can see that one of my colleagues is apparently using a Tablet PC to take notes. Upon closer inspection, you can see he is using it as a clipboard for a standard pad of paper.

The more things change, the more they stay the same!

But we also hear stories of technology being used for things not imagined by the software suppliers, or the companies in which the technology was adopted. Instant messaging is a case in point.

We hear from some of our customers that their employees are saying things like: "If I can use it at home to communicate with relatives, why can't I use it at work to build better relationships with suppliers?"

Most companies are still trying to figure out how best to integrate instant messaging into their infrastructures and into their business processes. But their employees are using it to augment business processes and to stay connected in their personal lives while at work.

We have seen instant messaging change the profile of relationships in manufacturing between suppliers and buyers, and in finance, awareness and instant access have brought new possibilities for rapid response to trade requests.

Instant messaging is an example of how technology is reshaping the relationships between employee and employer. We think this may lead to choices in the arrangement of time that will allow people to work toward goals and produce meaningful outcomes while also actively participating in the lives of their children or caring for an elderly parent. The availability of technology gives people new choices.

I use these anecdotes and speculations because we don't have hard numbers to substantiate our beliefs. We don't know if instant messaging improves relationships and helps keep product pipelines more reliably filled or if it guarantees more accurate and timely financial transactions. We don't know if flexible work hours increase employee retention or improve productivity.

We need to find out.

We do know that the equations have changed and we need to get our arms and our minds around the impact of these new uses of information technology so we can see how they benefit productivity and improve the outcomes of our work.

We're not finished. We're just getting started.

Past and Future of Productivity

The evolution of work hasn't stopped. Productivity gains haven't stopped. We need to create the framework for measurement not just for today's work, but for tomorrow's work. We need to understand information work and its economic implications so we can help our customers make good choices about their technology investments.

Not only will technology continue to reinvent itself, technology will also continue to redefine work.

20 years ago the roles of web analyst, call center specialist, MRI technician, or digital cable guy weren't in the vocabulary.

If I look at emerging technologies like Wi-Fi, social computing, RFID, and sensors, I can bet that we'll see a myriad of jobs, many of which will have titles and skills we can't imagine today.

The IWPC can play an important role in the exploration of these issues, a place to talk about approaches that will allow our customers to help us better turn our inventions into their advantage.

We need to make sure we are engaged in the right kind of research so we can sense the influence of these new technologies and measure their impact.

The IWPC is entering phase II of its research. We hope that this year's research will move us beyond defining the problem, to applying well-founded methodologies that will test possible frameworks in the field.

One such effort is the IWPC work at Best Buy. Microsoft, Intel, and HP (along with Sony) will be working with Best Buy to measure the benefits of outfitting their executives with Tablet PCs. They will use established productivity testing models to measure increases in work productivity as supported by the Tablet PC platform.

Call to Action and Closing

I hope in the future we will be able to use IWPC research to inform our investments, and those of our customers, because the connection between investment and benefit will be clearer.

What we're talking about today needs to be an industry vision, one that helps us make the tough decisions between "good enough" and world class, between tolerating old models and creating new ones, between complacency and leadership.

We are the economic engine that fuels the world economy. Money is information. Entertainment is information. Our relationships are information. It is imperative that we understand the economics of information, as well as the impact of the technology over which it flows.

To succeed we must recognize our challenges and tackle them head on.

- We must redefine productivity and learn how to measure the results of information work
- We must find new and innovative ways to leverage technology in order to create new opportunities and new industries.
- We must invest in organization and management so information workers can realize their potential.
- We must be prepared for the opportunities and challenges of a seamless, connected world.

We have occasion here today, and an opportunity in the months and years ahead, to share our lessons and discuss ways to meet our challenges—including the challenge of how to make economic reporting more relevant and responsive to a changing world.

Henry David Thoreau said, “We must walk consciously only part way toward our goal, and then leap in the dark to our success.”

In that spirit, we begin the journey.

Thank you all for joining us today.

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