

SSME: Productivity and Innovation

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Slide 1: Productivity and Innovation

This module provides an introduction to some of the inter-related aspects of services productivity and innovation. .

Slide 2: Objectives

Objectives

- Gain a frame of reference about productivity conundrums, develop a point of view and be able to discuss this with others.
- Consider how services measurements might be developed to be useful.
- Think about the “new economy” and these questions:
 - Why do services resist productivity gains?
 - Is services productivity an oxymoron?
 - What are some relationships between innovation and productivity?

Slide 3: The Paradox

Productivity is a measure of economic efficiency which shows how effectively economic inputs are converted into output.

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Advances in productivity, that is the ability to produce more with the same or less input, are a significant source of increased potential national income. The U.S. economy has been able to produce more goods and services over time, not by requiring a proportional increase of labor time, but by making production more efficient.

Productivity is measured by comparing the amount of goods and services produced with the inputs which were used in production. Labor productivity is the ratio of the output of goods and services to the labor hours devoted to the production of that output.

Output per hour of all persons is the most commonly used productivity measure. Labor is an easily-identified input to virtually every production process. In the U.S. nonfarm business sector, labor cost represents more than sixty percent of the value of output produced. (From US Dept of Labor, Bureau of Labor Statistics - see <http://www.bls.gov/lpc/home.htm> and follow the menus to access the current output per hour reports.

In 1967, the noted economist William Baumol diagnosed what has subsequently become known as Baumol's disease. He argued that most services were, by their nature, labor-intensive. Indeed, the perceived quality in service industries often depends on how much labor is involved.

No one cares how many workers it takes to build the cars we drive, but the teacher-student ratio is viewed as a critical determinant of the quality of our schools. Or to use one of Mr. Baumol's most striking examples: even after 300 years it still takes four musicians to play a string quartet.

As Mr. Baumol pointed out, this is bad news for economic growth. As economies mature, consumption shifts more and more toward services. If productivity growth in services is inherently sluggish, economic growth must inevitably slow.

Recently two Brookings Institution economists, Jack E. Triplett and Barry P. Bosworth, have been investigating productivity growth in the services industry and have reached a surprising conclusion: most of the post-1996 growth in productivity has come in services. "... the recent evidence ... shows that information technology may just be the cure for Baumol's disease."

They found that from 1995 to 2001, labor productivity in services grew at a 2.6 percent rate, outpacing the 2.3 percent rate for goods-producing sectors. Furthermore, this phenomenon was widespread: 24 out of the 29 service industries they studied exhibited growth in labor productivity after 1995, and 17 experienced accelerated growth.

Interestingly enough, the service industries where overall productivity did not grow were hotels, health, education and entertainment. These are all examples where customers tend to perceive that more labor is associated with higher quality, as Mr. Baumol had originally suggested...it's the fact that information technology has become so powerful and so cheap that led to it having such an important role in the productivity resurgence in services (Varian, 2004).

Slide 4: Economics

- Global services based economies
 - Increasing ever faster
- Measuring services is a problem
 - Data biases
 - Inaccuracies
 - Challenges
- New economy requires new economics?

The US economy has moved from manufacturing to being services based. Services are more than 75% of GDP and employment. The global economy resembles this as well, and developing countries are generally seeing the ratio of services to manufacturing or agriculture increase at an increasing rate.

Service industries have historically been characterized as low skill, low wage with limited opportunity for innovation, but things have changed. Services industries are now the predominant engine of US growth. For example, they have grown 2.6% per year between 1995 and 2001, and are the primary consumers of IT capital. By the way, IT is a major contributor to US productivity growth. Service industries are the most dynamic and innovative sectors today. (Triplett & Bosworth)

Cohen and Zysman's *Manufacturing Matters* talks about the service sector rising due to outsourcing parts of manufacturing (an accounting trick). They also discuss the dependency between service innovation and high technology innovation.

The Organisation for Economic Cooperation and Development (OECD) Report on promoting innovation in the services sector emphasizes that business services, financial services, and IT services are the fastest growing. The report discusses the nature of innovation in the services sector. See recommended readings (Innovation in Services.pdf at www.oecd.org).

The measurement problem in services

Herzenberg, Alic and Wial cite statistics from the Bureau of Labor Statistics (BLS) and the Bureau of Economic Analysis (BEA). They state that both groups acknowledge that their measures are less than accurate for services. The BLS reports output per worker-hour (and/or output per worker).

The BEA acknowledges biases in its data. In some cases output is not measured at all, and then the BEA bases output solely on inputs (in which case productivity is zero!).

Some of the challenges they discuss are:

- Determining the value of the change in product attributes over time, for example, when cars are safer and pollute less, or when recorded music sounds like a concert hall.
- Determining the value of new products such as new or different hotel accommodations, cell phones, pagers, PDA's.
- Intangibles confound measurements.
- Determining the contribution of the customer to the transaction.
- Herzenberg et al assert that US economic performance in the last 20 years been mediocre.

The new economy

Pascal Petit, in the Gadrey & Gallouj book, writes that growth rates were modest in the 1990's. He employs the term "knowledge based economies" to represent the 'new economies'. Petit avers that the 'value' of a modern economy depends on the number and quality of people and activities connected. A modern economy in his view is one that is open to new technologies, external competition and massive education. He raises the notion that it could be worth studying the logic of social exchange of learning goods in order to understand productivity.

Slide 5: Productivity

Productivity

Labor productivity = (Output / Labor input*)

***Where labor input = people or hours**

Multi-factor productivity = (Output / Labor input)**

****Where labor input = expanded to include multiple forms**

Historically labor productivity was calculated to be the ratio of output per unit of labor input (persons or hours). Some statisticians / economic measurement bodies are using multi factor productivity (MFP) which is calculated as the output per unit of input (with input expanded to include labor, purchased inputs and forms of capital). MFP is thus a more comprehensive measure of efficiency of resource use.

Triplett and Bosworth note that aggregate productivity data reflect 2 types of forces:

- the direct contribution of particular industries and
- reallocation of inputs as they move between industries

Therefore they believe that attempts to reflect one industry alone will be misleading, especially in the short term.

Negative productivity growth

Certain industries have shown negative growth, often for long periods of time. It is possible that this could mean that they have been systematically measured incorrectly and biased downward. For example, six industries with negative LP for 1995-2001 were education, amusement and recreation, hotels, insurance carriers, local transit and construction.

These statistics may or may not be correct, Triplett and Bosworth suggest that one needs to use such figures only as a starting point and perform detailed examinations of industry specific trends, data issues, and so on in order to decide what might really be occurring.

To restate our earlier inquiry: if service industries were largely responsible for the post 1973 productivity slowdown and for the post 1995 gains, then why do they fluctuate like that? Or, why is productivity growth more stable in good-producing industries than in service producing industries?

Slide 6: Measuring services is a challenge

- History
- Productivity
- Quality
- Innovation

- New approach
 - Although productivity measurement should be part of services measurement, it should not be the major focus
 - Proposed: create a holistic multiple indicator/multiple stakeholder approach to services measurement

History

- Services measurement has been narrowly focused
- Much of the measurement has focused on aggregate productivity (total outputs divided by total inputs)
- Productivity measurement has many limitations [see Bosworth & Triplett, 2003]
- Productivity is a good national policy-level measure
- Productivity is a better measure for manufacturing than for services
- Productivity is not a good measure of overall services effectiveness
- Productivity is not a good leading or predictive measure
- Little research has been done on the drivers of productivity in services
- Productivity fails to account for intangible value delivered by service providers
- Business success requires a multiple indicator (balanced scorecard) approach
- The perspectives of all key stakeholders must be addressed

Productivity

- Ratio of valuable output to inputs
- Differentiate from efficiency
 - Productivity has effectiveness and efficiency components

- Efficiency is just about cost reduction
- Aggregate organizational productivity can be easily determined based on common outputs (e.g., revenue) and common inputs (headcount), but individual, project, team, etc. productivity is content specific.
- Examples of productivity outputs:
 - Sales revenue
 - Projects completed
 - Hour of training completed
 - New products developed
- Output must be linked with value to the organization, or else there is the danger of measuring efficiency, not productivity

Quality

- Customer/client satisfaction
- Value of the service: Is it worth paying for?
- # of defects
- Waste
- Price premium
- Process effectiveness

Innovation

- # of new patents
- # of patent applications
- # of new service ideas
- Customer perception of innovativeness
- Service customization

Other

- General ◊ Specific
- Key point: Measurement and specificity is good, but it should not constrain or reduce the scope of the project
- Larger issues ◊ Measurement Issues ◊ Measures
- Need to focus on actual service area business measures
- Short-term versus longer-term measures
- Leading and lagging indicators
- Major value drivers
- Implicit versus explicit measures
- Interrelationship charts (like “causal chains”) – “web of interconnected measures”
- Critical tradeoffs
- On Demand (focus, resilience, etc.) – Is it good for every company?
- Characteristics of services businesses; service characteristics

Slide 7: Many factors must combine to create a viable services measurement model

Diagram

Why are services measurements so important?

- We need to be able to forecast and predict how to make investments in services
- Measures help define different motivators for teams, groups, organizations (Makes levels of performance more apparent)
- They encourage innovation in order to find new and better ways to perform and offer services

- They empowers management to make educated decisions (i.e. where to invest new resources, where to reassign existing resources)
- They show the direct result of the investments in the organization's bottom line
- They increase understanding and knowledge of services discipline
- They enable the feedback process, which results in validation of any innovation in the field

Evolution of a measure

- Indicator: A potential measure
Measure: An indicator that has been operationally defined
Metric: A measure that has been validated and normalized

Possible indicators

- Revenue
- Market share
- Profitability (gross profit, net profit)
- Cost
- Productivity (with effectiveness and efficiency components)
- Quality
- Stakeholder satisfaction (for each stakeholder group)
- Morale (employees)
- Innovation
- Flexibility
- New market development
- Complexity
- Responsiveness
- Variability
- Focus
- Resilience
- Adaptability
- Accessibility
- Interchangeability
- Modularity
- Parsimony
- Optimization
- Trustworthiness
- Loyalty
- Risk
- Durability
- Potential
- Improvement
- Correction
- Capacity
- Resource levels
- Waste
- Transactions
- Communication clarity
- Persuasiveness
- Commitments
- Collaboration
- Quantity and quality of other social relationships
- Differentiation/commoditization
- Economic trends
- Unemployment
- Price/cost structures
- General economic well-being; sustainability of the planet
- Revenue growth

- Earnings per share
- Process metrics
- Practices
- IP/IC
- Social capital
- Skill level
- Motivation
- Knowledge
- Capability
- Tenure
- Recognition
- Value
- Outcomes
- Decision quality
- Shared meaning
- Sense-making

Slide 8: Anatomy of a measure

- What is measured
- Purpose of the measure
- Validity
- Reliability
- Instrumentation
- Precision
- Role relations to measure
- Time periods

Evolution of a measure

- **Indicator:** A potential measure
- **Measure:** An indicator that has been operationally defined
- **Metric:** A measure that has been validated & normalized

A key to services measurement is viewing measures from the perspective of the firm, as well as multiple stakeholders:

- Companies (service providers)
- Customers
- Employees
- Suppliers
- Shareholders/investors/lenders
- Debt holders
- Government – national, regional, international
- Society at large
- Complementors
- Partners
- Other stakeholders?

Anatomy of a measure

What is measured?

- What phenomenon?
- The thing itself?
- The manner of manifestation?

Purpose of the measure

- Track
- Manage

- Validity
 - Both
 - To what extent is it measuring the desired object of measurement for the right purpose?
- Reliability
 - How stable is the measure?
 - Instrumentation
 - How do we measure it?
 - Precision
 - Granularity
 - Countability
 - Mass measure
 - Flow rate
 - Role relations to measure
 - User of measure
 - Capturer of the data
 - Maintainer/owner of the measure
 - Analyzer of the data
 - Time periods
 - Time of capture (e.g., frequency)
 - Applies to current situation
 - Applies to future (leading)

Slide 9: Measurement of services

Diagram

Measurement of services enterprises centers on the concept of productivity, defined in the broadest possible sense (output / input)

Almost any services measure has an impact on the productivity numerator and/or denominator. Key questions for the measurement of Services Science relate to the impact of specific measures and their interdependencies.

Slide 10: The role of measurement in services sciences

- It helps define the new discipline (i.e. a set of important metrics will emerge, which will help structure Services Science).
- It tracks traditional metrics and identifies new ones that innovation in Services Science will bring about.
- As the discipline becomes more defined, it will help determine how well the expectations of stakeholders are being met.
- As the new discipline becomes more structured, business barriers-to-entry may become apparent

Validity of a measure

- To what extent is it measuring the desired object of measurement for the right purpose?
- To what extent is it affected by other factors?
- When measuring a service, the metric should be affected by the quality of the service as much as possible.
- If the metric can be controlled without effect on profit, it is undesirable metric.
 - For example, if productivity of employee is measured by # of emails he sends, he will send many junk mails.
- Holistic coverage of service quality

- Stable relationship with growth of profit
- Easy to understand the relationship of metrics and growth of customer's profit.
- Data gathering does not have privacy issue
- Content analysis of e-mails of employees has privacy issue.

Example

Services -- Software Providers – Key Indicators (Example Companies) and Metrics

- Quality (Model: Monster.com, eBay)
 - Reliability
 - Performance
 - Ease of Use
 - Brand Perception
 - # of Active Users
- Innovation (Model: Google – Ad Service)
 - Novelty (Sony, Microsoft with Online Video Game Networks)
 - Market Share Growth
 - Market Share secured from competitors
- Complexity (Model: Webex – Hosts robust teleconferencing services)
 - Barriers to entry
 - Market Share
 - Brand Perception
- Flexibility
 - Breadth and Depth of Service Offering (IGS or Computer software consulting firms like Sapient)
- Profitability (Important for all software services companies)
 - Net Income
 - EPS

Slide 11: Innovation and Productivity

Innovation and productivity

- *“In the networked economy in a world of ubiquitous connections where everything is connected to everything else scarce will be the person not connected at all, or the company not pushing ideas and intangibles. If they can interface with the economy without losing distinctiveness or value, they will be sought out and their price for their service will remain high. They’ll use technology to eliminate as much of the repetitive work as possible, leaving time to do what humans are good at – working with the irregular and unexpected.”* (Kevin Kelly)

Reorganizing work (from Herzenberg, Alic and Wial)

- *“But our already highly mechanized and organized world community, if it is to develop further and sustain an efficient common life, requires before everything else interested and participating workers”* --H.G. Wells, Experiment in Autobiography, 1934

If we believe that current trends indicate we can't count on performance improvements in services, then can we borrow from manufacturing? Producers of goods have reorganized to reduce costs, improve quality and increase adaptability to changing markets.

Some service sector firms have adapted innovative work practices from manufacturing. This works well in tightly constrained settings, with regard to aspects such as quality, and flexibility to changing demand. But services are more typically loosely constrained, limiting the opportunities for emulating manufacturing innovations (thus not good for continuous small improvements and such like initiatives).

Slide 12: Engineering model versus interpretive model for enhancing productivity

- Engineering model
 - Product design comes before process design
 - Process predictable, repeatable
- For services, sometimes the engineering model works but has limitations.
 - Human judgment required
- Interpretive model
 - Skills in understanding customer wants and needs
 - Process continuously adaptive

In engineering product design comes before process design. Improvements typically are initiated along nominally independent dimensions: product design, product conformance, cost or production. So, the engineering model for productivity focuses on changes to design or process. Performance improvements are mostly characterized by greater speed, greater variety, or a functionally superior outcome. This is also true of services productivity.

In services where outputs are well defined the engineering model works but still has limitations. In services, there is always a need for judgment, for example, the producer decides what's "good enough" and that is subjective. Another problem is that often the attributes of a service may be inseparable from the process of production (like a restaurant). In addition, when the customer is co-producer, but isn't sure what he/she wants. Therefore the design of the product in all these cases is part of the process of production, making the engineering model not as likely to result in predictable improvements. Indeed, some services vary too much with the situation to permit the application of the engineering model (education, child care).

New forms of work organization place a higher value on the skills and knowledge of workers than the older models associated with scientific management and the industrial engineering tradition. In Gadrey & Gallouj, Petit says that in professional firms, the pattern of knowledge flows was most productive for firms that had 2 processes – social niche seeking (selection of exchange partners in the co-workers network) and concentration of the authority to know in the advice network (through some kind of professional status competition). Hertenberg et al suggest a replacement for the engineering model - the interpretive model. The interpretive model takes as problematic what engineering takes as given (the prior definition of the product and the independence of the production process from the design of the product). In the interpretive model, workers develop skills in understanding customer wants and needs, they translate those into services they provide, and if the worker finds this is not producing the desired or intended effect then he or she modifies the service or method of delivery or even his/her interpretation of what the customer wants or needs. This occurs continually until the worker perceives that the services or delivery match the customer's wants and needs. An example of this is medical diagnosis and treatment.

Slide 13: The two models have different implications for performance improvement

Interpretive model concepts for improvements in services

Engineering model	Interpretive model
Design comes before process	Product and process intertwined, Product design emerges from the process, not specified in advance

Workers execute tasks	Workers interpret needs and execute tasks
Improvements come from changes to design or process	Improvements follow from improving worker's ability to elicit and interpret, respond to the situation to select work practices from repertoire or learn or invent new services

- Economies of depth
 - Make workers better at what they do through deeper understanding or greater skill
 - When lessons of experience can be passed on to others, benefits multiply

This is sometimes thought of as following best practices; or better, rethinking work practices and creating new ones. The transfer and sharing of knowledge hold considerable potential for performance gains. A pitfall here is the difference between “knowing that” and “knowing how”. Sometimes knowledge cannot be made fully explicit. An engineer can explain why you can balance a bicycle, but you can only learn by practicing riding it. Additionally, there is benefit to going beyond transmitting codified knowledge; and trading stories for context and working in teams.

- Economies of coordination
 - When people work in groups, coordinating their efforts, making adjustments and acting interdependently; input to one is the output of another
 - Workers in this situation need to understand what they can contribute and what they can't so that they know when to rely on others

This requires a greater degree of communication and joint decision making and there are corresponding opportunities for performance improvement both in terms of when workers in the same occupation cooperate, or when they work cross- functionally.

A recommendation by Hertenberg et al to achieve economies of coordination is to create teams that stay together so they can learn each other's strengths and weaknesses, develop a common interpretive framework and create shortcuts for anticipating what needs to be done. They indicate that knowing 'how' is a key to success:

- how to work with others
- how to act within the business culture (practices)
- how to hold context dependent communications
- plus the use of performance evaluations that hold teams accountable rather than individuals

The authors' conclude:

We cannot improve service sector performance by copying methods that worked in manufacturing.

Slide 14: Devolving (Kelly) – another view of increasing productivity

- Stuck at the top?
- To reach next peak requires
 - Going down!
- Change perspective
- Not a natural human inclination

Kelly asserts that a business at the top of its game is a stuck business. He maintains that the stuck business has to devolve in order to get to a higher peak; it has to first go downhill, becoming less adapted, less efficient, and less optimal.

This is a problem because organizations, like people, are wired to optimize what they know; to cultivate success- not throw it away. It's unthinkable to let go.

People who were good at building up are typically no good at taking down. Creative destruction requires a diametrically opposed temperament. "There can be no expertise in innovation unless there is also experience in demolishing the ensconced" (Kelly)

He infers then that the problem at the top is not too much perfection but too little perspective.

Great success blocks a longer view of opportunities. Presently, success is highly interdependent upon networks of vendors, customers and even competitors. A firm needs to explore widely and contrarily and outside of their current position to attain the new peak.

Kelly's view is that technology is the prime mover today. He believes technology dictates to rank opportunities before efficiencies. For any individual, firm, or country the key decision is not how to raise productivity by doing the same better but how to negotiate among the explosion of opportunities and choose the right thing(s) to do.

Slide 15: Move away from studying manufacturing

- Another point of view
 - Service associated with goods
 - Knowledge
- Study services innovation

A supporting view about researching innovation

Ian Miles', in Gadrey & Gallouj's collection, makes the point that innovation studies are currently manufacturing centered, and should be looked at from a third (tertiarization he calls it) point of view. He indicates that it is important to study not just services specifics and service similarities, but also services activities associated with producing goods, and how knowledge-intensive services business (KIBS) play a role.

Traditionally the focus of such innovation studies has been products and processes. Miles thinks that another view is needed and asks us to accept that services innovation should be considered as an intrinsic and revealing part of innovations studies. Some studies reveal that certain elements of services innovation can be understood in conventional terms, but that they also point to neglected themes and topics. He believes that we should adopt instruments and tools from innovation studies into the services field as well as the modifications of such methods to take into account issues highlighted in the study of services innovation itself.

Slide 16: Phases of how a company views its people

Diagram

Some final thoughts

Terrill and Middlebrooks are of the opinion that service companies are very different from product companies. The mantra of most leaders today is "better, faster, cheaper" to achieve success. They say that this thinking limits the possibilities and that service companies should look for ways to deliver new value or special benefits to the customer. So, instead of "productizing" a service (which is usually when customers make choice solely on price) "if you are a service company... then *be* a service company".

While the title of their text indicates they are advising us on strategy, it turns out that except for the chapter on definitions and one on leadership, every part of the book talks about innovation! There is a separate module on strategic management we will not repeat here. What I would like to bring to your attention are some of the thoughts about innovation, which I hope you believe is directly linked to productivity.

“Being better” is a trap to avoid. Rather, find ways to make your customers see your service as different from the rest, and choose the best opportunities for growth. Avoid the tendency to standardize offerings as standardization creates a commodity experience which in turn leads to decreasing profit margins. The authors recommend finding ways to continuously innovate:

- To be unique in the eyes of the customer
- To foster an entrepreneurial spirit
- Encourage risk taking by employees.
- Keep your customers close and collaborate
- Continually create new offerings that customers value

The key in this book is about “putting people back into the equation”. “People are the primary source of market leadership during the delivery of services.” Over-engineered employees know that they need to be satisfied at work, and they know that doing things that make a customer happy using creativity and skills can fulfill that need. Today most service organizations have tried to eliminate all variability by automation, process and controls. This kills innovation and leads to poor morale and further decline.

Slide 17: Bonus topic

Company	2003 profit (\$M)	Employees	Revenue per employee	Profit per employee
AT&T	1,865	61,600	560,536	30,276
Apple	140	10,912	617,760	12,830
Cisco	3,779	34,000	582,912	111,147
HP	2,754	142,000	526,042	19,394
IBM	7,583	355,167	250,955	21,351
Microsoft	8,878	55,000	623,109	161,418
SBC	8,505	168,000	243,113	50,625
Sun	-1,446	36,100	310,139	-40,055

Source: <http://www.networkworld.com/>

IT enabled productivity and thoughts about knowledge worker productivity (By David Singer, IBM Distinguished Engineer)

- *“Knowledge workers are believed to produce more when empowered to make the most of their deepest skills; they can often work on many projects at the same time; they know how to allocate their time; and they can multiply the results of their efforts through soft factors such as [emotional intelligence](#) and [trust](#) (Francis Fukuyama, Manuel Castells). Organisations designed around the knowledge worker (instead of just machine capital) are thought to integrate the best of hierarchy, self-organization and networking rather than the worst. Each dictates a different communications and rewards system, and requires activation of knowledge-sharing and action learning. A basic pattern rule of human systems is that when you mix them you will get the worst of each unless you contextually and carefully attend to connecting the best.”*

- *“To make knowledge work productive will be the great management task of this century, just as to make manual work productive was the great management task of the last century.” [Peter Drucker, 1968]*
- *“The most important, and indeed the truly unique, contribution of management in the 20th century was the fifty-fold increase in the productivity of the MANUAL WORKER in manufacturing. The most important contribution management needs to make in the 21st century is similarly to increase the productivity of KNOWLEDGE WORK and the KNOWLEDGE WORKER.” [Peter Drucker, 1982]*

Measuring productivity is typically written “Productivity = output / input”.

Measuring enterprise productivity is similar. At the enterprise level, “Output” is measured in dollars and “Input” is measured in employees:

Take a look at the table on the slide..

But...

- What do you measure: **revenue** or **profit**?
- This is a lagging measure
- This is an aggregate measure
- We don’t know how to directly affect this measure

And...

- What is the output of a knowledge worker?
- It’s not as simple as counting lines of code

Measuring individual productivity

- We distinguish between
 - “Output”, which is anything a knowledge worker creates
 - “Outcome”, which is the value a knowledge worker adds
- And we **rewrite** the equation for knowledge workers as:

Productivity = outcome / input

Where IT comes in

- An increasing amount of knowledge workers’ effort is mediated or driven by IT systems:
 - Creating deliverables (code, sales pitches, etc.)
 - Collaborating
 - Searching for information and people
 - Dealing with virtual paperwork
 - Administering systems
- The traditional focus of the IT shop has been on:
 - System and Network Performance and Reliability
 - System and Network Cost
 - System and Network Security
 - Hardware Deployment
 - Tool and Application Deployment
 - Help Desk

We need more focus on people

Some questions to consider

These might prove suitable topics for an essay or a discussion.

1. What does productivity mean to you?
2. Are our notions of “value” changing? Now? Constantly?
3. Would our ideas about productivity change if we change what we value?
4. What are the four best measures you have experienced in services and why?
5. What are some unintended consequences brought about by measurements?

Essay topics

1. How do you think services productivity should be measured? Why?
2. How does services productivity turn into value to the customer; to the service provider?
3. What circumstances prevent a service provider from providing the ideal service?
4. How can service providers and their customers co-produce improvements?
5. What's the balance between automation, process engineering and the human ability to deal with complexity?

Group discussions

1. Discuss service blueprinting (see management module) and the likelihood and extent of its effect on services productivity.
2. Discuss the limitations of adapting productivity improvement (engineering model) techniques from manufacturing to services. Consider the interpretive model in your discussion.
3. Consider "economies of depth" and give two examples from your experience that illustrate it. Use the example of "knowing that" versus "knowing how" to assist you in collecting your examples. ("Knowing that", for example is the fact that a scientist can explain the physics of why a bicycle balances using math or words while "knowing how" is a skill that cannot be made explicit (Herzenberg, et al).
4. Cohen and Zysman's *Manufacturing Matters* discusses the dependency between service innovation and high technology innovation. Debate whether or not this dependency exists.

Summary

This module began to present some of the things we need to think about while striving to achieve value for our customers and good business results for our stakeholders. Sam Palmisano asserts that the only way to drive economic development while cutting costs is through innovation.

Readings (retrieved August – September 2005)

<http://www.brookings.edu/views/papers/triplett/20000112.htm>
<http://www.brookings.edu/es/research/projects/productivity/productivity.htm>
<http://www.bizstats.com/emprodprof.htm>
http://strategis.ic.gc.ca/sc_econmy/sio/cis41-91proe.html
<http://econpapers.repec.org/paper/cprceprdp/4428.htm>
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