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# **MANAGING THE IT PORTFOLIO**

**A Study in the course IT Strategic Management**

Masters of Science in Information Technology  
De La Salle University Manila  
MSIT-CIS771M

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**By: Jinno Ordonez**  
**Professor: Dr. Ruel Maningas**

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## The Advent of Change

### IT Doesn't Matter – Nicholas G. Carr

#### Arguments

- **Carr raises several great points in his article:**
  - Computing power and network bandwidth far surpasses business needs and demand.
  - Prices are dropping, which usually signals that something has become a commodity; and IT vendors are rushing to position themselves as commodity providers.
  
- **What do the previous infrastructure build-outs -- like railroads and electricity -- tell us about the ratio of risks to advantages in the current state of IT?**
  - In the early stages of the build-out, companies can get proprietary advantages because access remains limited due to physical limitations or patents or high cost. So companies begin to see them as ways to build advantage.
  - But the build-out happens so fast that the window to gain advantage is open only for a short time. Then the technology becomes a cost of doing business that all pay, and nobody gets advantage.
  
- **Isn't it possible that there will be another "big thing" in IT that's still unforeseen?**
  - That's possible, but we're already starting to see that the capabilities of the IT infrastructure are greater than the needs that businesses have.
  - It's always possible something out of the blue will change everything, but it's hard to imagine that happening the way you could five or 10 years ago.
  - Also, even if something like that happens, it will probably come out of the vendor community, not the user community. All companies will be able to buy the capability, so no company will get an advantage.
  
- **Should IT managers be looking for new careers?**
  - It depends on what kind of IT managers they are. Companies have increasingly bought into the assumption that IT is a strategic resource.
  - As a result, they have brought in CIOs who are conceptual, strategic thinkers about IT. I think there's less of a need for those types of individuals. But because expenditures will remain so high, there's enormous need for technically astute, hard-nosed business people who can really help companies to get the most out of IT spending.
  - I think IT management will get less sexy but remain just as essential in another way.

#### Consulting, not programming

"If you're only interested in deep coding and you want to remain in your cubicle all day, there are a shrinking number of jobs for you," said Diane Morello, Gartner vice president of research. "Employers are starting to want versatilists -- people who have deep experience with enterprise-wide applications and can parlay it into some larger cross-company projects out there."

Stanford listed 268 job postings in its computer science jobs database in the spring quarter -- roughly double the number from last year.

But that doesn't necessarily indicate a plethora of traditional tech jobs. About half of the new postings would prefer applicants who speak at least two languages and many were for

management-track positions, said Beverley Principal, assistant director of employment services at Stanford.

"When they're first hired at the entry level, just out of school, people can't always become a manager or team leader," Principal said. "But many employers see these people moving into management roles within two years. They need to know how to step into these roles quickly."

## The IT Portfolio

### 1. What's an IT Portfolio?

#### - Contains IT Assets and Resource Allocation

In practice, applications pose a serious dilemma for IT and client managers alike. The portfolio represents a large investment with which important future applications can be developed, but, at the same time, program improvements and enhancements are mandated by ever-changing business conditions.

Consequently, firms must spend increasing amounts of time and money to defeat depreciation, but in doing this they consume resources that could otherwise be used to capitalize on important future opportunities.

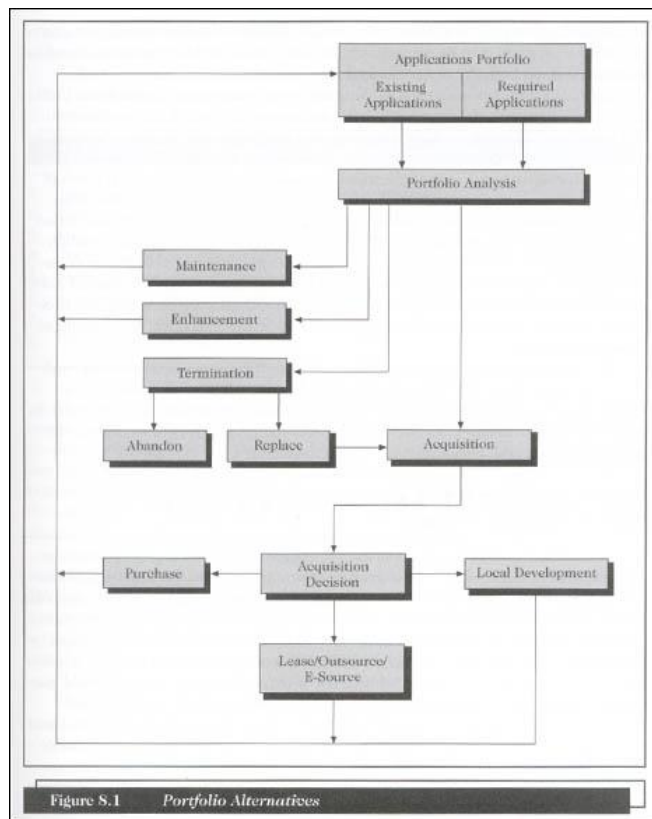
Because the demand for skilled people required to fuel a growing application asset base shows no signs of diminishing, most firms face difficult and important decisions regarding resource allocation.

### The Challenge in IT Portfolio

#### - Applications as Depreciating Assets

“The new era of developing: Short-term not Long-term”

#### Spending More May Not Be the Answer



Backlog – the backlog stem from many firm's needs to remain competitive via new applications and to keep the current applications portfolio functionally modern. In addition, the process for maintaining and enhancing applications is inherently inefficient because programmer productivity on these tasks tends to be low.

### **The Programming Backlog**

**The true backlog then facing application developers is the sum of the identified and unidentified outstanding work.** In many firms, the identified backlog typically varies from two to three years or more. Depending on the firm's dynamics, however, the invisible backlog may not only be large, but also harder to estimate.

Backlog =  $\frac{\text{Work to be accomplished in person-months}}{\text{Number of Persons to do the Work}}$

Ex: 2 programming tasks which requires 36-person-months of work, but it only has 3 programmers to do the work; the backlog then is 12 months.

Assumptions

1. There is no wasted time during the development cycle due to skill imbalances
2. None of the code is reusable

### **The Need to Prioritize**

Enlarging the programmer staff may actually reduce output because communication needs and overhead increase.

Managing the application backlog via prioritization processes is also important for other reasons. Because the applications portfolio develops over a long time and remains important some years into the future, it must be *managed as a strategic resource*.

In addition, the portfolio is an important source of management expectations. Consequently, expenditures on application development demand high-level consideration. IT managers need thoughtful, long-term development plans and processes for managing these strategic resources and the expectations that accompany them.

### **The Essence of the Portfolio: Applications as Depreciating Assets**

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Perhaps it's too early to claim victory in the struggle against missed schedules, budgets, and functional capability; however, business and competitive pressures, new methodologies, cultural changes, and new technologies encourage us to believe that the future is looking brighter for application developers.

In fact, in today's information age, some firms are defined by their information systems. The customers and suppliers of Amazon.com, for example, only know the firm through its information system. In most others, application programs are resources without which the firms cannot succeed.

**Obsolescence** – results from introducing business changes that reduce the appropriateness or value of current applications. For example, combining labor accounting activities with a manufacturing plant's work-in-process inventory system makes the previous labor accounting system obsolete.

### **Maintenance and Enhancement**

Programming effort and ingenuity must be applied to enhance software applications.

Most firms would never risk a near-term business failure, or even a disruption, by allowing valuable physical assets to deteriorate. Nevertheless, many companies fail to appreciate the enormous, sustained worth of application programs. As a result of this phenomenon, many businesses found themselves rushing to correct their in-house Y2K problem belatedly and at great cost. (It should be noted that some firms used the year 2000 problem as an excuse to rebuild or replace applications that were obsolete or functionally deficient for other business reasons).

### **Data Resources**

Generally, increasing in volume and detail, the firm's databases enable advances in the firm's application technology, like its advanced query and data mining activities. These data systems also provide the lifeblood that sustains the daily operations of the organizations. Consequently, these data resources, their database management systems, and the hardware on which they reside are vital and critical adjuncts to the applications portfolio.

Specific current and historic data from the firm's operations – along with documents, books, and emails – represent "explicit knowledge", a second type of knowledge that must be preserved and managed.

As data dispersion develops, the firm's information architecture also undergoes subtle changes.

### **Internet Influences on Application Development**

In addition to making current systems obsolete, new e-business technologies also change the skill requirements of IT and use personnel. Although the completion of the year 2000 repairs freed many programmers for other tasks, most of them required training in new online systems, languages like Java and HTML, and technologies such as networked storage systems and server middleware. Hence, firms adopting new technologies and business models frequently require people with new skills in addition to new hardware and software. At the same time, these firms need to retain the important undocumented knowledge possessed by the firm's knowledge workers. *New difficulties occur when full employment, prosperous economy, and technology introduction across a broad front raise the pressure associated with unfilled IT jobs to new levels. Even with the slack economy that followed the dot-com meltdown, new IT jobs absorbed many IT workers who had critical skills.*

For some firms, it means that old and new systems must co-exist for some period and that this situation will be followed by difficult transitions from one system to another. As firms embrace e-business, these transitions are not only difficult, but expensive and wide-spread, sweeping through the heart of business operations and involving departments such as billing, ordering, shipping, manufacturing, and sales systems.

The important undocumented knowledge about the firm and its operations that is held by knowledge workers represent “tacit knowledge”, the third type of knowledge that must be preserved and managed.

For these reasons and others discussed later, application systems are undergoing profound transformations. Now more than ever, portfolio management is critically important. Options formerly rejected, avenues thought to be too risky, and dependencies considered unthinkable are now within reason as firms face new transitions. Technical leaders, project managers, and functional executives must think “outside the box” to succeed in this environment.

## **Managing the IT Portfolio**

### **Application Program Resources**

#### **Program and Data Resources**

A firm’s information system includes the applications portfolio, large databases, as well as the hardware, operating systems, and other programs required to support them, and the networks that transport this information to where it’s needed.

The most expensive: Program and Data Resources – representing a long-term accumulation of codified business processes and information. Managing these 2 are critically important to the firm’s success.

#### **Depreciation and Obsolescence**

**Depreciation** – depreciation is caused by accumulation of functional inadequacies due to gradually changing business conditions.

**Obsolescence** – results from introducing business changes that reduce the appropriateness or value of current applications. For example, combining labor accounting activities with a manufacturing plant’s work-in-process inventory system makes the previous labor accounting system obsolete.

## Maintenance and Enhancements

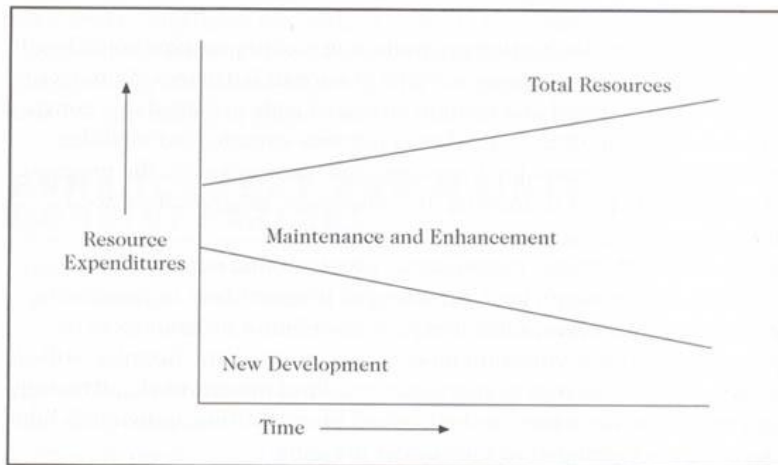


Figure 8.2 *Typical Expenditures on the Portfolio*

Programming effort and ingenuity must be applied to enhance software applications.

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## Maintenance and Enhancement Considerations

Vendors would assist firms in the transition from one hardware generation to the next by creating new operating systems with features that enabled old programs to run unchanged on new hardware. Firms gained cost and performance advantages by upgrading computer hardware; but they found that their important business applications were much more difficult to enhance. For many firms this meant that old, possibly outdated application programs were running on new, high-tech hardware.

### The High Cost of Enhancement

1. The programming techniques used in the original are obsolete.
2. Documentation is obsolete or missing.
3. Many uncoordinated modifications have been made.
4. The code was written in an old version of the programming languages.
5. Unskilled programmers made enhancements.
6. Architectural changes are required.
7. File structures need major changes.

## Trends in Resource Expenditures

### Typical Ad Hoc Processes

Many firms lack an organized and disciplined approach to the thorn problem of balancing new development with maintenance enhancement efforts.

To prioritize the work of the application programming team, they rely on one or more reactive methods instead of sound decision making. Some common but unsatisfactory approaches to prioritization of programming workload include:

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### **Enhancement and Maintenance Considerations**

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Example: IRS

Upgrading a CPU, adding new input or output devices, or even changing business conditions are relatively easy; upgrading application software is much more difficult.

### **Trends in Resource Expenditures**

There are many ways in which maintenance and enhancement activities can exhaust a firm's resources. It is therefore, important for managers to become familiar with why these expenditures arise and how they can grow.

### **Scenarios commonly lead to the trends**

Maintenance Programmers and Documentation  
Some maintenance effort is devoted to repairs  
Bridge Programs \*Read Multi-Agents  
Maintenance may also include Minor Rewrites  
Lastly, when the business changes or skilled programmers depart, organizations may find themselves unable to cope with the maintenance effort. In cases such as these, operational failure is a likely prospect.

*Firms experiencing the difficulties depicted in Figure 8.2 are in no position to develop and install the new infrastructures required by e-business models. – Turn to e-sourcing*

### **Typical Ad Hoc Processes**

Many firms lack an organized and disciplined approach to the thorn problem of balancing new development with maintenance enhancement efforts.

To prioritize the work of the application programming team, they rely on one or more reactive methods instead of sound decision making. Some common but unsatisfactory approaches to prioritization of programming workload include:

- Greasing "the squeaky wheel"
- Reacting to perceived threat of failure
- Recovering from embarrassing situations
- Adjusting to threats from competition

## Superior Portfolio Management

- See: "IT Investment Model Wins Converts", *Computerworld*, Aug 5. J.P. Morgan Chase, Johnson & Johnson, and Metropolitan Life uses this type of portfolio management.

**NOTE:** How do you propose a new system to see its relevance to the organization? The superior portfolio management can help you persuade the upper management.

A firm's applications portfolio represents significant long-term investments; it demands the attention of the firm's senior managers as well as that of its IT and user managers. The portfolio management techniques outlined in this section can enable the firm's senior managers, IT departments, and user organizations to combine their strengths in order to set a preferred course of action. *The methodology presented here focuses on business results. Because resources are always limited, it presents alternatives for managers to consider. Prioritization of alternatives requires intense communication among various players. This level of communication forces managers to consider the alternatives from the perspective of the organization's senior people. A general management perspective is necessary for prioritization because business results to be achieved are fundamental to the firm's welfare. For these and other reasons, this approach is likely to achieve superior results.*

Several factors are important in prioritizing the backlog of work that application development departments face. Among these are the firm's business objectives and the financial and operational benefits derived from the applications. Some applications have important, intangible benefits like perceived higher quality, and others, like e-business systems, may be state-of-the-art, technically important applications.

*Usually, depending on the firm and its industry, different relationships exist among and between these factors. It is not uncommon, for example that an essential business application fails to generate a positive financial return.*

This can be especially true when the application's non-financial benefits are substantial but difficult to measure or realizable only in the long term. Similarly, an investment that attains technological leadership may be valuable for competitive reasons but may not generate cash immediately.

These considerations make resource allocation decisions difficult. – THE STEERING COMMITTEE OF SENIOR MANAGERS

This text favors strong linkages between corporate and IT plans and application prioritization activities.

1. How is superior portfolio management accomplished in practice?
  2. What steps can the IT organization and other system planners and users take during the strategy and planning process to prioritize the programming work?
  3. What is an appropriate management system for carrying out these difficult and important tasks?
- Automated tools that help manage IT portfolios are beginning to emerge, but many lack maturity.

## **Satisfaction Analysis**

The satisfaction analysis focuses on attributes important to these organizations and quantifies emotional perceptions.

The results from analyses like these are used to reach a consensus (if possible) on which applications will and will not receive additional funding. When the organizations agree that certain applications warrant no additional investments, these applications are removed from further consideration.

*Although this first step is valuable, it does not provide sufficient information to prioritize the backlog completely. With this information managers cannot yet reach final conclusions. One key ingredient that is still missing is an understanding of each application's short vs. long term value.*

## **Strategic and Operational Analysis**

In strategic and operational analyses, application owners with help from IT perform the evaluation by taking into account the firm's strategic goals and objectives.

IT input should be obtained during the process, especially in relation to anticipated technology improvements. IT expertise is especially useful for emerging applications, or for those applications that are candidates for major enhancements.

The analyst must include new programs or systems, or important infrastructure components like database systems or middleware. Thus, the applications to be analyzed include new, unfunded requirements as well as those applications currently in operation.

*Although the scoring for this analysis is similar to satisfaction analysis in that a 0-10 scale is used, the data is processed and interpreted very differently.*

## **SUMMARY OF THE 2**

Individually, each of these analyses provides some useful information but is not sufficient for decision making. Used in conjunction, however, these two analyses draw a clearer picture of which applications are candidates for resource development.

Together, they also build a base for the final crucial step: cost-benefit analysis

## **Costs and Benefits Analysis**

The cost and benefits analysis quantifies the value of the actions proposed for each application financially and completes the prioritization process.

To be useful for program prioritization, the analysis must include the cost of failing to do the works and the benefits of intangible results.

To reach final conclusions, however, highly refined data are not necessary in most cases. In other words, most analyses can proceed if the costs and benefits are predictable to within approximately 20 percent. (Additional refinement may, however, be required to resolve close decisions). This type of analysis must also incorporate the time value of money to ensure financial integrity. Elementary texts on financial accounting provide examples of various methods that can be used to perform a suitable cost-benefit analysis.

- *See Carl L. Moore, Robert K. Jaedicke, and Lane K. Anderson, Managerial Accounting, 6<sup>th</sup> Edition. Computerworld, Feb. 17, 2003. Series of 13 articles describing various return-on-investment analyses.*

Upon completion of this analysis, sufficient information is available for making thoughtful decisions.

Eric Clemons says, "Even when it is not possible to compute explicit, precise values associated with embarking on strategic programs, it may be possible to estimate, with enough accuracy, to rank alternatives."

- Eric Clemons, "Evaluation of Strategic Investments in Information Technology", Communications of the ACM, January 1991, Volume 34, Number 1.

Using the factors revealed by this analysis, the management team can prioritize the list of applications requiring resources from high to low. Combining their judgment and experience with the data, the members of the team can debate the order of the list until they reach a consensus or make a decision.

This process puts decision making at the management level where it belongs and reduces over-commitment by IT or user groups. The list of work items is closed when the sum of resources required equals the sum that's available for these applications.

- For an interesting discussion of a similar approach for prioritizing IT activities, see Steave Huff, "It's All in the Planning," Computerworld, July 29, 2002, 35

The prioritization process indicates what will be done and, just as important, it also itemizes what will be done. Best of all, the firm, at the end of this process, has a committed, achievable plan for its application programs.

### **Additional Important Management Factors**

- The prioritization process gives each senior member of the review team a clearer understanding of the firm's business needs. If top individuals establish the proper environment, the firm will be well served.
- Eliminates the proliferation of small, *ad hoc* deals between individuals at lower levels in the organization, and this helps optimize the firm's overall efficiency.
- This methodology sheds light on the complexity of the resource allocation problem. Because the process foster organizational learning, it leads to a much better informed organization and also, of course, improves the firm's use of information technology.

Executives can now begin to the task of identifying strategic opportunities. With so much valuable information about their application programs at their fingertips, executives' vision of future possibilities has probably improved; thus, this is a good time to search for new strategic opportunities.

The prioritization methodology presented in this chapter provides an ideal starting point from which to begin the search for strategic information systems opportunities. In fact, all the conditions necessary for sound decision making are in place while this methodology is being implemented: the right people are present, the timing is right, and a decision-making process has been established. Consequently, this prioritization scheme not only helps allocate resources for applications portfolio management, but it also provides opportunities for introducing and developing new strategies.

### Satisfaction Analysis

Focuses on attributes to these organizations and quantifies emotional perceptions.

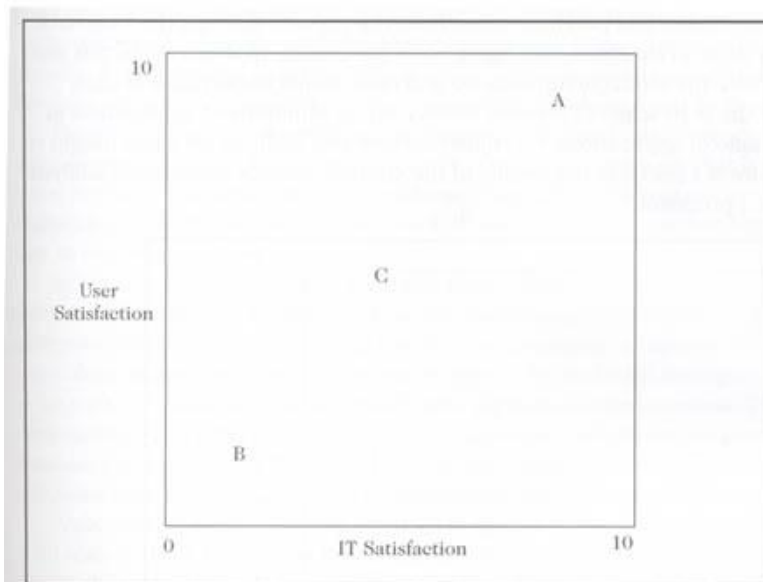


Figure 8.3 *A Graphical View of Some Satisfaction Analysis Results*

### Strategic and Operational Analysis

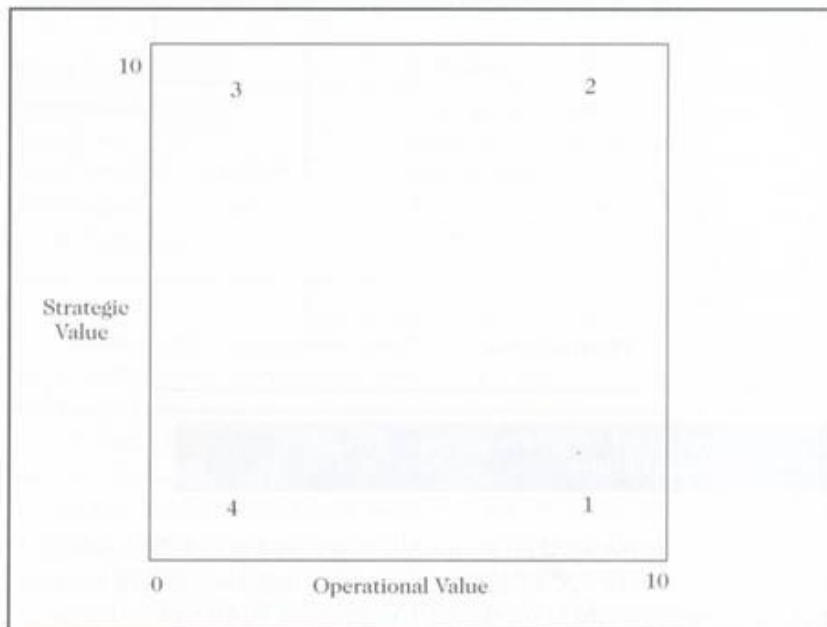


Figure 8.4 *Strategic vs. Operational Value*

Application owners with help from IT perform the evaluation by taking into account the firm's goals and objectives. Application owners with help from IT perform the evaluation by taking into account the firm's goals and objectives. Application owners with help from IT perform the evaluation by taking into account the firm's goals and objectives. Application owners with help from IT perform the evaluation by taking into account the firm's goals and objectives.

## Cost and Benefit Analysis

**Table S.3** *Compilation of Program Ratings*

Program Name	User Satisfaction	IT Satisfaction	Strategic Importance	Operational Importance	Costs	Benefits
prgm 1	8	8	1	8	10K	14K
prgm 2	2	3	1	3	30K	40K
prgm 3	7	9	8	4	100K	200K
prgm 4						
prgm 5						
etc.						
*						
*						
prgm 2,000	...					

Quantifies the value of the actions proposed for each application financially and completes the prioritization process.

## The Challenges we face

### IT Advancement & Managing IT

- Managing Data Resources
- Prioritizing E-Business Applications
- The Value of This Process

### What experts had to say

John Seely Brown and John Hagel III

Extracting value from IT requires innovations in business practices

IT's economic impact comes from incremental innovations rather than "big bang" initiatives

The strategic impact of IT investments comes from the cumulative effect of sustained initiatives to innovate business practices in the near term

### A SYNTHESIS

The challenge we are facing today, is that our way of living is simply trying to cope up with technology advancement. We have developed ahead of our time, and more and more are being conceptualized and developed and there is no slowing it down. The problem is 'New Development' is not finding enough satisfaction and acceptance to accommodate its development which is as of now still very costly and very customized – there is a need for better methodologies for standardization of the complex processes of application development.

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McNurlin, Barbara C. & Sprague Jr., Ralph H. "Information Systems Management in Practice, 5<sup>th</sup> Edition". Prentice Hall, 2002.