What if the Most Important Question is: "Why?"
Ronald E. Thompson III

2008 Update:

Other than a few minor wording changes, I left this paper pretty much intact. I originally wrote this in 1993 for presentation at the International DB2 User Group Conference and the KnowledgeWare User Group Conference. This was around the end of the heyday of big iron and COBOL. Some of the technologies and terminology have changed -- IS has become IT. The battles are now about agile versus PMI or .Net versus Java. However, my concept is still valid – the most important tools are non-technical and simple. Many IT organizations are still chasing the latest and greatest technology, rather than making effective use of what is already in place by fully understanding the business problem.

I'm excited by much of what I see in the "agile" movement. My original paper may have led many readers to believe that I meant maintaining highly detailed models. (I most likely did mean that at the time . . .) In reality, the models should be "good enough" to promote understanding and provide a playground for product owners to experiment with the product. Every project should start from an understanding of the existing product or process, not start coding from scratch every time. While this is true of good project teams, it is not always true of those who don't fully understand agile and use it as an excuse to hack. My simple questions work well in the agile world. I still believe that most of the changes requested are not due to changing minds, but seeing what is there and shaping it to meet the original aim.

Summary:

Relational database, CASE, Object-Oriented, Client-Server, Open Systems... Each promises to deliver better systems, ease maintenance and reduce the backlog. If we believe the hype and build open, client-server, object-oriented systems accessing relational databases, designed with CASE (GUI of course!), we can eliminate our backlog. In fact, we can build systems the client doesn't even need ... hmmm ... Seems like we are doing that now! If we are to capitalize on the fact that **information** is much more important than **technology**, we need new tools. Two of the best are the simple questions "**WHY?**" and "**WHAT IF?**"

Author's 1993 Biography:

Despite my beginning as a DB2 "expert" and relational database bigot, I have evolved into a tormentor of anyone who will not evaluate the way they build information systems. I accomplish this by facilitating modeling sessions, consulting with project teams and helping define a corporate information architecture. Secretly, I enjoy working with technology.

I graduated in 1984 from Columbia University with a BA in Computer Science. The first six years of my career were spent with Computer Task Group, Inc. I spent my last year with CTG travelling the country, working for their national DB2 Consulting Practice. I have been stirring up things at Public Service for over two years now.

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> "If only it weren't for the people, the godammed people," said Finnerty, "always getting tangled up in the machinery. If it weren't for them, earth would be an engineer's paradise."
>
> From *Player Piano* by Kurt Vonnegut, Jr.

Information Systems organizations (IS) have a problem. Headlines like the following are becoming too familiar: Chief Executives ask "Where is the return on our IS investment?" IS has constant pressure to deliver more, cost less, speak business language, provide competitive advantage, stay out of the way, be more involved. With all the pressure and conflicting messages, I am amazed anything gets accomplished.

One day our architecture team, in frustration over the perception of the Information Systems organization, brainstormed this question: "If you could tell everybody what is true about information systems, what would you tell them?" We quickly filled a floor-to-ceiling white board with a list of items. When we stepped back and looked at the result, we were quite surprised. There were statements about having objectives, rewarding quality work, the importance of information, metrics, modeling, and standards. The only mention of technology was that we should aspire to "provide more information with less technology". There was one especially powerful statement - "Computers are a small part of information systems". We began to understand the source of our problem. We needed to change the attitude of the IS group if we were to be successful in changing the business perception of "that bunch of computer people". This paper is a result of that revelation.

Where are we?

When solving a problem, the first two questions should be "Where are we?" and "How did we get here?" Information Systems organizations are well established - providing hardware and software to the corporation. Most of the easy victories have already been won. Most businesses are automated and processes now run efficiently (poetic license?!). The corporation is now saying "Is that all there is?" It seems that much of the investment has been wasted because the benefits are not clear. The business people feel IS does not understand their needs (or doesn't care). Executives are now looking to cut the losses and either outsource or break up the IS monopoly.

How did we get here?

> Politicians [and technology vendors] are the same all over. They promise to build a bridge even where there is no river.
>
> Nikita Khrushchev

I believe there are at least four key reasons for the current state of IS:

- IS only provides technology
- IS builds systems for technological reasons
- IS is enamored with buzzwords
- IS confuses tools and processes

IS views its role as the provider of computer technology. It is the business people who need to worry about getting work done and pleasing the customer. We react to their requests, giving them new databases, workstations and more computing power. There is a strong belief that great new technology will solve any problem. We do not look for solutions to problems, but for technology to attack problems. As a result, many of our clients now "cut out the middle man" and just ask for specific technologies.

The niche IS occupies is a direct result of building systems for technological reasons. The list of conversions driven by IS and technology could fill a glass house (and has!). We spend more time searching for the opportunity to use the latest technology than looking for innovative ways to solve business problems. It is little wonder the rest of the business is looking for a way to shed the IS organization. An analogy to our situation is a group within an electric utility company that constantly builds new power plants because there is a new technology that works better than that which the company is now using. Either the group, or the company, would be quickly out of business. This may be an exaggeration, but it is standard operating procedure for many IS organizations.

Building for technology is related to the love of buzzwords. The only thing an IS professional fears more than death is falling behind the technological edge. Making effective use of the new technology comes a distant second to being able to add the latest and greatest to a resume and to converse coherently for the one hour interview. Technological buzzwords, like the jargon of any profession, give us power over the poor client who only knows their own business.

The fourth reason for our current situation is an obsession with finding the perfect tool to solve all our problems, the Silver Bullet, as Brooks[1] calls it. This is much easier than examining the building process and making improvements. Why be introspective and expose weaknesses in our methods when we can buy a ready-made solution? It matters little that it has not worked the last (insert almost any number here, except zero) times: THIS IS THE RIGHT TOOL!

Where do we want to be?

> If you don't know where you want to go, any path will do.
> Cheshire Cat to Alice in *Alice in Wonderland*

Any vision of the future Information Systems organization will need to include the following characteristics:

- Corporate information guide role
- Builds systems for business reasons
- State-of-the-art users of technology
- Use of tools to support good processes
- Responsibility placed in the correct hands

Corporate Information Guide. On the surface, this title appears very bizarre. When you look deeper, however, it begins to make sense. What role does a guide play? If we think in terms of a trek through the Alps, a guide points out paths that have worked for others. They call attention to dangerous situations and provide expertise when new paths are needed. IS should provide the same skills to our corporations.

We must continually remind ourselves to *build systems for business reasons*. "Computer technology must be integrated into the firm's mission and goals, from initial planning through product delivery and service".[2] We have to stop thinking about "working with the business" and start thinking "we are part of the business". IS is as important to the success of our corporations as any other business area. We must look at the mission and objectives of the corporation for our direction, not the newest technology.

Success will depend on becoming *state-of-the-art users of technology*. The difference between that and becoming users of state-of-the-art technology is more than a rearrangement of words. We need to wring every ounce of value we can from a technology before throwing it away. This may mean skipping over some of the advertisements in *Computerworld*, but it will get us closer to meeting corporate objectives. The alternative is that our corporations will become leading-edge outsourcing clients!

In the future we should be *using tools to support good processes*. A good tool combined with a good process creates a powerful synergy. A bad tool with a good process merely creates a few headaches while doing a good job. A good tool with a bad process enables us to elegantly do the wrong thing and cause problems faster. Many of us are probably still using bad tools with bad processes!

In my vision of the future, *responsibility will reside in the correct hands*. We need to give the consumers of information the ability to create their own information from the data available (see the definition of information on page 5). The way IS controls information today is like staying home and having the guide send us pictures of the Alpine trek. We are not going to be happy because we missed the experience and the pictures are going to be from somebody else's perspective. Compare that to the way reports are created in most corporations and user unhappiness becomes clear!

How do we get there?

> Computers are useless. They can only give you answers.
> Pablo Picasso

In the following list not one item is a tool or technology. These are fundamental changes IS (and our corporations) must embrace. To make Information Systems a powerful, positive influence on the corporation we must consider doing the following:

- Look inward and understand ourselves
- Embrace objectives
- Build models and keep them
- Ask "Why?" and "What if?"

IS professionals often complain that they are misunderstood by the rest of the corporation. To clarify this misunderstanding, we must first understand ourselves. The first step in this process is to define the terms we use (and misuse) every day. Words are important. If two people have a different understanding of the words used in a conversation, communication is at best ineffective or non-existent, and at worst destructive. Throughout the rest of this paper, I will propose definitions for words we use every day. I hope to trigger thought and promote discussion (violent disagreement is perfectly acceptable).

I will start with definitions for words common to any system developer: data, information, information system, analysis, requirements, and design.

Data is defined as: facts or figures that are known or assumed. An example of a piece of data is twenty-five cents. Data can be transformed into ***information*** or data that has been aggregated, given context or assigned value. "The cost of a candy bar is twenty-five cents" is a piece of information. An ***information system*** is a set or arrangement of processes, people, data collections, hardware, and software which provide the capability to convert data into information - or store data for later use. The main reasons for creating information are to gain knowledge (combination of information, experiences and education) and to reduce risk. Using a billing system as an example, its true purposes are to gain knowledge about the customers and reduce the risk of late payments - not to bill the customer!

Armed with a definition of our work product, the information system, we can explore the activities involved in the building process. ***Analysis*** is the act of separating a business system into its parts with an examination of these parts to find out their nature and interrelationship. When we apply this name to a "phase" of the system development life cycle, we overlook a valuable part of the process - building models of the requirements. ***Requirements***[3] are defined as statements of business policy, expressed in terms of information, which hold true over time. Requirements have nothing to do with technology. A requirements model contains all business policies that must be enforced, with or without technology. Before computers, business people had requirements and used processes to transform data into information. Computers have given us a more efficient way to process large

amounts of data; understanding requirements gives us an effective way to do the same. Technology becomes important when creating a design. A ***design*** is a blueprint that shows the use of, control over and interactions among selected components of technology, chosen to support a requirement. Using these definitions we can be more precise in our understanding of the activities involved in building an information system.

A second fundamental change is embracing objectives as a way to focus systems efforts. First, I will define four terms: Vision, Mission, Principles and Objectives. ***Vision*** is a shared mental picture of how we see ourselves and how we want to be seen by others. Vision gives an organization something to rally around. The word "shared" is important, everyone must share the vision; it is the property of everyone in the organization - not just the executives. (This also implies that a powerful vision can come from anyone in the organization). ***Mission*** is a one line statement that sets a direction for the work to follow. A mission is usually evident if there is a strong vision. The mission statement provides a quick reference point for deciding whether an activity should be performed. ***Principles*** are the fundamental rules upon which all of our decisions are based. Principles link mission with objectives by highlighting accepted and valued behavior. ***Objectives*** are statements of business result (or effect) described in measurable terms, as of an instant in future time. Objectives force us to concentrate on the outcome of our efforts - not the methods or deliverables. Today we tend to concentrate on deliverables specified in the methodology and assume the finished system will be correct. An eye towards our objectives will enable us, instead, to evaluate everything we do against the desired outcome. We can no longer build a system and be happy because the "new database is working very well, the users just don't know how to use the system". If we do not meet the objectives - the system has failed.

An analogy that ties together mission, objectives, requirements and design comes from the 1960's. When John F. Kennedy said the United States should put a man on the moon and bring him back safely by the end of the decade, he put forth a clear, powerful objective. This objective supported the United States' mission of being the world's technological leader. One system requirement was the ability to support an astronaut’s life throughout the duration of a space flight. A technical design decision based on that requirement was whether to use pure oxygen or a mixture. The power of a mission and objective was demonstrated when Neil Armstrong took his step onto the moon. Business systems may not capture the attention of the world, but we can benefit from clearly stating our mission and objectives before launching any information system work.

A third required change is to build models - and keep them. This will take a major shift in our view of modeling. Today we build models in an attempt to produce a system. When the system is complete the models are often discarded or ignored. The models have little value once the "important stuff" is done. "The goal of enterprise modeling should be to acquire knowledge about dynamic organizations, not merely to assist in building relational databases"[4] If we model for knowledge of the business we can't afford to throw away the models - they are too valuable. We would be discarding knowledge about our corporation - as if an accountant tossed the general ledger into the trash after month-end closing or an architect destroyed the plans for a building once construction was complete. We will know this emphasis shift has taken place when we transform modeling from a project phase to a way of life. Modeling is an ongoing activity that enables system-building efforts, and also learns from them to further increase a corporation's knowledge

about itself. Good models allow us to select the highest priority items to work on. We can extend our capability to convert data into information while following a master plan. Project teams often ask "Isn't all this modeling effort a waste of time, can't we start designing and coding?" The response is yes - if you throw away the models. If you keep the models and continuously improve them, your time is not wasted - you have created something that will be used many times!

"Why?" and "What if?"

> Some men look at the things that are and ask why; others look at the things that never were and ask why not?
>
> Robert Kennedy

So far, I have written about IS problems and solutions. Now I need to answer the question: "Why does this paper have such a strange title?" The answer is: I strongly believe the best tools available are the very simple questions "Why?" and "What if?" These three words will become very powerful in both the corporation and the IS organization.

"Why?" This one word is the key to identifying the desired outcome of any action, especially constructing an information system. Its constant use is the only way to produce good objectives. By asking "Why?" we increase our ability to meet requirements and concentrate on the most valuable targets. Quite often we build a system, only to find that it is "not what the client needs". This is seldom the result of designing incorrectly or the client changing their mind; it reflects a need for clear objectives and understanding of that which the client is trying to accomplish. The newest buzzword "Business Process Re-engineering" is a glitzy way of saying "I want to look at every process and ask "Why do we do this?"". Studying our models helps identify areas which need explanation.

"What if?" It takes two words but this question can be as powerful as "Why?" "What if?" is like asking "Why not?" It lets us explore outside the context of our experience. We can mentally investigate new situations and inexpensively try new ideas. This is an invaluable tool in exploring requirements. Too often we are constrained by the existing environment. However, "technology constrains solutions, not requirements"[5] "What if?" allows us to break these self-imposed constraints, dictated by technology, and uncover true requirements. It provides a safe place to "color outside the lines". Models allow us to test new requirements uncovered while exploring different ideas. "What if?" is another integral part of business process re-engineering. One way to create breakthrough ideas is by exaggerating objectives and brainstorming the implications. Without this tool, we are constrained by our objectives because we never look beyond them.

"Why?" and "What if?" will only allow us to be successful if we view all rules as an opportunity to ask questions. The primary rule for every corporation should now be: "Every rule here can be challenged except this one"[6]. Information systems have a minor relationship with computers. Today we ignore the most important aspects - reducing risk and making the business effective - in favor of technology considerations. We must be willing to examine all of our business processes (IS processes included) and seriously question them. When any rule or process becomes

"untouchable" we slide back into the comfort of keeping things the same. Liberal use of "Why?" and "What if?" will enable us to identify areas that can benefit from effective change. Effective change only springs from having a complete understanding of the business and how things can be made better, not from change for change's sake.

Creativity must be valued over maintaining the status quo. No business has the luxury of sitting back and letting the profits roll in. Everyone in the corporation must actively seek new, better, more effective ways of doing things. IS must step up to the challenge and become a part of the business, not an independent service organization. To be an information guide, we must become an integral, value added part of the corporation - not a servant. We must demonstrate that we are ready to assume our new role. If we continue protecting our devotion to technology, we will never be taken seriously, and the value of IS investment will always be in question. We can be involved in business process re-engineering without flashy new computerized tools, high-priced conferences and grand new methodologies. We just need to use "Why?" and "What if?" more than "How?", "When?" and "What platform?"

> The real difficulty in changing the course of any enterprise lies not in developing new ideas but in escaping from old ones.
>
> John Maynard Keynes

I would like to thank my co-workers and III for listening to my ideas and bouncing the good ones back - usually with a slightly different spin!

Endnotes

1. Fredrick P. Brooks, Jr. "No Silver Bullet: Essence and Accidents of Software Engineering" in Software State-of-the-Art: Selected Papers ed. Tom DeMarco and Timothy Lister (New York: Dorset House Publishing, 1990), Chapter 2

2. Joseph E. Izzo, The Embattled Fortress: Strategies for Restoring Information Systems Productivity (San Francisco: Jossey-Bass Inc., Publishers, 1987), p. 3

3. Thank you to III for his definitions of requirements, design, mission and objectives (plus the NASA example)

4. Richard Due, "Enterprise Modeling: Still in Pursuit," Database Programming & Design, November 1992, p. 63

5. Thomas Bruce, Designing Quality Databases with IDEF1X Information Models (New York:Dorset House Publishing, 1992), p. 39

6. Roger von Oech, A Whack on the Side of the Head (Stamford, CT: U.S. Games Systems, Inc., 1983) p. 59