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Re-Engineering Billing and Collections in an Oracle / Object-Oriented World

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Introduction

For companies to remain competitive and achieve strategic advantage over their competitors, the 1990's has seen many organizations re-visit the way in which they conduct their business activities. The 1990's have also seen a resurgence in companies wanting to better understand, track and manage their customer base. Adding value through improved customer ordering / service, invoicing, shipping and inventory management are several examples of success in the re-orientation of business towards the customer.

In terms of how to increase brand identity and customer loyalty, many companies have sought to implement a *Total Quality Management (*TQM) approach to achieve incremental gains in their business processes and customer service. Other, bolder companies have elected to turn to a blank sheet of paper and engineer *de novo* their business processes. This trend will continue and accelerate, especially in those industries undergoing deregulation and consolidation as is the case with the *Telecommunications Industry*.

To improve customer service and prepare for the coming battle for customers in the *local loop*, ***Bell Atlantic*** in 1994 undertook, with the assistance of Dr. Michael Hammer, an ambitious four year, $500 million initiative to re-engineer its customer provisioning, billing and collections processes. Named the ***expressTrak Program***, this initiative will impact over 40,000 employees in all parts of ***Bell Atlantic*** and 14 million end consumers throughout the Mid-Atlantic region of the United States.

To re-engineer any aspect of the enterprise, information systems must be the critical fulcrum. New information applications, distributed processing, data warehouses and end user tools must be developed and integrated into a seamless, error-free work environment.

The solution to the need for rapid development and deployment of new information applications is seen by many to be Object-Oriented Analysis, Design and Development.

Over the next several years, ***Bell Atlantic***, via the ***expressTrak*** initiative, will migrate from a mainframe-intensive, COBOL and 3270-based revenue process into a mixed mainframe-client-server world.

These changes will allow the re-deployment of significant number of employees from previously manual or low value tasks into positions / functions which more directly influence customer loyalty.

This paper will focus on how ***Bell Atlantic*** adopted, and is using, an Object-Oriented approach to re-engineer its billing and collections processes. It will:

- Briefly summarize the current, legacy environment;
- Describe the proposed new "Object-based" target environment;
- Discuss the Object-Oriented development lifecycle;
- Detail the project management approach selected to direct the initiative;
- Highlight systems development and other problems encountered and how they were resolved;
- Summarize process improvements / efficiencies enjoyed to date by ***Bell Atlantic***; and
- Offer "Coaching" and other suggestions for organizations planning to undertake, or in the middle of re-engineering initiatives.

The *Legacy* Environment

Bell Atlantic currently operates three different billing / collections applications in its seven state region. These applications consist of both large transaction volume batch systems as well as on-line customer order entry (called "provisioning' within the Telecommunications Industry) and customer service / inquiry systems.

All of these billing / collections systems are mainframe, COBOL-based applications. Two of the three batch billing streams utilize the IMS hierarchical data base to maintain customer and traffic information, while the third system relies upon flat files and a magnetic tape-based transaction processing system. The applications themselves (generally called CRIS by ***Bell Atlantic*** and other RBOC's) date back to the early 1960's.

The batch processes consist primarily of traffic processing, traffic rating / pricing, non-usage based charge calculation, bill summarization, discounting, invoice generation, invoice printing and remittance processing. Each billing system maintains its own separate and unique customer data bases and files.

The on-line systems are CICS-based and provide user access via 3270 terminals and single image workstations which emulate the 3270 environment.

The on-line systems provide customer service representatives with the ability to negotiate contracts / orders, sell tariffed products and services, respond to customer inquiries about bills or service quality and post credits or special charges to the invoice via a feed to Accounts Receivable. The on-line systems also support collections and dunning activities.

These legacy billing systems have been continually patched and modified over the last thirty years to support a non-competitive business environment. The purpose of many of these patches was to accumulate and process standardized data faster and faster as computer hardware technology improved. The mechanized processes which grew up around these billing applications were developed to replace manual process, with the intent of only improving the speed at which billing could be performed and not with an eye to how to achieve order of magnitude efficiencies and new levels of employee effectiveness. (For a more detailed systems view of the ***Bell Atlantic*** legacy environment, please refer to **Attachment A**.).

As deregulation swept over the Telecommunications Industry, it became quickly apparent that the legacy applications and processes could only support a customer population which grew only slowly and whose requirements evolved gradually over time in a predictable fashion. As a consequence, lead times for system / process changes were lengthy and new product introduction was stymied by antiquated systems, processes and work rules.

In summery, the "back-office" of ***Bell Atlantic*** faced a number of daunting constraints and limitations as it looked out into the future and saw the impending deregulation of the local loop and the need to compete with the newly freed AT&T (as of the writing of this paper, President Clinton has signed into law the Telecommunications Act of 1996 which will change forever the Telecommunications Industry as carrier competition rather than Public Utility Commissions is now seen as the best way to police the industry).

Specifically, the legacy billing / collections environment limited ***Bell Atlantic*** in a number of important ways.

- Inability to rapidly respond to competitor's new products and services (simple rate changes could take upwards of 6 months to code);
- Slow / non-existent introduction of new products and services;
- Inability to provide large business customers with a single bill, or even multiple bills in the same format;
- Customer provisioning errors which would be caught only by the downstream billing systems and not trapped / corrected at the time of order entry;
- Costly software and hardware maintenance costs;
- Design and code changes into three different applications rather than in just a single, region-wide application;
- Inability to level workload across the seven state region / 14 calling centers / 4 bill production centers; and
- Staffing and training issues, both for the IS organization as well as the lines of business.

For ***Bell Atlantic,*** the course ahead was clear, if not simple. The re-engineering of billing / collections had become a strategic necessity.

The *Brave New World*

To move into the brave new world of process redesign and re-engineering, ***Bell Atlantic*** employed a slightly modified version of the Hammer-Champy approach to the re-engineering process. Over a three phase cycle, ***Bell Atlantic*** will have:

- Examined the billing / collections function and devised a replacement;
- Built the infrastructure and systems (information, compensation, personnel, etc.); and
- Transitioned the enterprise to an entirely new way to bill customers and collect payments.

On a go-forward basis, ***Bell Atlantic*** will then move into a continuous improvement approach to billing and collections.

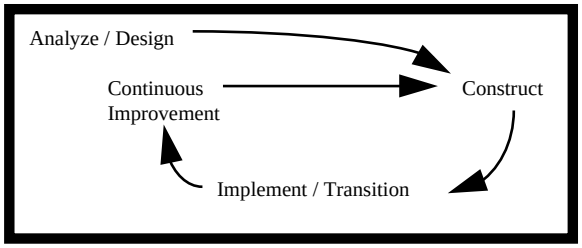

Figure #1

As a result of the first phase of re-engineering, ***Bell Atlantic*** re-assembled its billing / collections function into a set of 6 sub-processes, or component pieces.

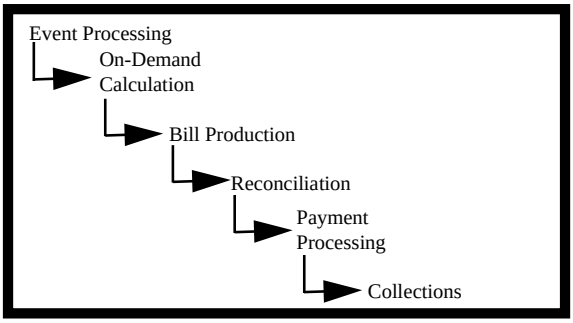

Figure #2

Once the new process had been mapped, the next step was to build the management systems to support the new manner of doing business.

Focusing on the Information Systems aspects, the new billing / collections platform had to be flexible, easily maintainable, scaleable (to meet expected system growth and demands), user friendly and cost efficient. The final application design called for a new customer order entry / provisioning system for National Accounts, an enhanced *mass market* customer order entry / provisioning system, a *Pricing / Invoicing Engine*, a Customer Inquiry system and a new Accounts Receivable System.

In terms of overall architecture, the new billing / collections application embraces a three tier structure. The desktop tier contains both presentation and on-line editing capabilities.

An Applications Server is used to maintain some program executables while the mainframe remains as both a data server (storing customer data in a relational data base management system for quick and easy retrieval to the desktop) and an application server, running the Pricing / Invoicing Engine.

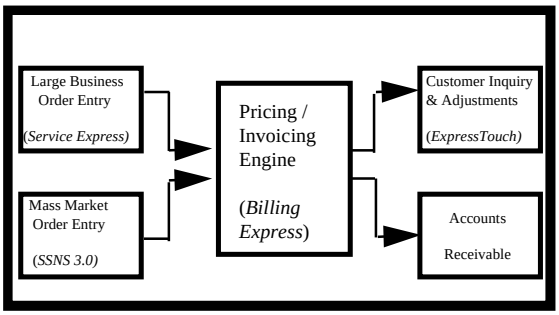

Figure #3

The new Large Business Provisioning System (called *Service Express*) is a custom-built, information system developed using 4GL tools, object-oriented analysis and design and supports both UNIX and Windows 3.x graphical user interfaces. The primary object classes are Customer, Product and Location.

Service Express is primarily resident on the desktop with some executables stored on the applications server. It accesses data maintained on the mainframe via SQL calls to a relational data management system.

SSNS is ***Bell Atlantic*'s** mass market (Consumer and Small Business) provisioning system. The existing system is custom-developed software which is designed in a two tier mode. UNIX workstations reside on the desktop and interconnect to a mainframe-resident application. Release 3.0 will migrate the application into a three tier architecture (similar to *Service Express*, but without adding a Windows 3.x interface) and its customer data into the same data base management system and structure as the Large Business provisioning application.

The "Core" of the new billing stream is the Pricing / Invoicing Engine. The *Billing Express* system rates and prices customer calls, determines no-recurring charges (e.g., installation charge), accepts and collates third party originated charges (e.g., long-distance calls from AT&T, MCI and Sprint), summarizes all charges, calculates taxes and generates the customer invoice in a variety of media (e.g., paper, CD-ROM, EDI, microfiche).

It also provides downstream feeds to Accounts Receivable, Marketing Data Warehouse, Commissions and Corporate Tax application. It also updates customer information and balances held within the mainframe billing data repository.

This system is a combination of two commercially available packages, the pricing portion licensed from a

software vendor and the invoicing piece licensed from another company within the Telecommunications Industry.

Both pieces of *Billing Express* were extensively customized in-house to meet ***Bell Atlantic***'s unique regulatory needs and new business processes.

Customer Inquiries and Collections activities will be handled by *expressTouch / expressView*. These systems, like *Service Express*, are custom-built software developed using 4GL tools, object-oriented analysis and design and supports both UNIX and Windows 3.x graphical user interfaces. It uses the same object classes as *Service Express.*

ExpressTouch / expressView is primarily resident on the desktop with some executables stored on the applications server. It, like the front-end applications, accesses customer and product information maintained on the mainframe via SQL calls to a relational data management system.

The new Accounts Receivable systems will be a custom enhancement to an previously purchased commercial software package. A graphical user interface and data sharing across the *expressTrak* family of systems are among the short-term enhancements to be implemented.

Although ancient (in computing terms), the decision was made to enhance the existing system due to the complex remittance and dunning requirements imposed by local Public Utility Commissions. No off-the shelf package was not available which fully met the requirements. However, this legacy system will be eventually replaced in its entirety with ideally a purchased package.

For a more detailed view of the "new" ***Bell Atlantic*** mainframe / client-server regionalized application environment, please refer to **Attachment B**.

Application Development Using an Object-Oriented Approach

Given development efforts which in the past have not been as successful as desired, and when combined with a dramatic shift to a new development life cycle and methodology, ***Bell Atlantic*** chose to move cautiously down the road to Object-Oriented Analysis, Design and Development. As a result, a number of techniques were adopted to minimize development risks.

A central oversight and issue discussion / resolution forum is mandatory. With any effort the size and scale of *expressTrak*, the need for close project management and direction becomes even more important than for normal systems development projects. In addition, because this was a process re-engineering effort using (new to ***Bell Atlantic***) Object Technology, both IS and the client community needed to be brought into the program. Lastly, the need to re-engineering billing and collections was deemed by the Office of the Chairman to be the number one strategic objective for ***Bell Atlantic***.

Thus was born the *expressTrak Program Office* as the vehicle through which client requirements, program / project management and linkage to enterprise objectives and strategies would flow for the billing initiative. (This point is so important that it will be examined in more detail in the next section of this paper.).

Top-to-bottom client involvement in the effort. The *expressTrak* Program determined very early that one of the reasons why prior billing / collections re-engineering efforts had failed was the lack of client involvement and active participation. This resulted in IS-determined functionality and schedules.

Every aspect of the *expressTrak* program is client intensive. The Program's Executive Steering Committee is composed of six senior executives, only one of which has a technology background (***Bell Atlantic***'s CIO). The other members represent the end consumer (three of ***Bell Atlantic***'s Line of Business Presidents), internal customers (***Bell Atlantic***'s Treasurer) and other external constituencies (***Bell Atlantic***'s Chief Regulatory Officer).

Within the Program Office, close to half of the Project Managers have been drawn form the client-side. Client staff lead teams such as *User Acceptance Testing*, *Communications*, *Training*, *Regulatory*, *Policies and Procedures* and *Requirements Management*.

At the working / team member level, over 150 client staff have been removed from their existing positions and matrixed full-time to the *expressTrak* Program.

This degree of client involvement is the best means to ensure that what is developed actually meets the needs of the business. To do otherwise, is to knowingly waste corporate resources on an approach which may only produce unusable or obsolete systems.

Extension of the prototyping concept / approach to the external community. All organizations and stakeholders in the development of the new applications can, and have been, brought into the development process. This is only possible because Objects allow for rapid prototyping and easier re-tooling of coded software.

At ***Bell Atlantic***, we have sought to broaden our development to include not only internal, but many of our external constituencies as well.

Opinions and the needs of customers have been solicited through focus groups and town meetings. End consumers and regulators have been brought into the Invoice Design project team. Again, this increase in input and requirement can only result in a better, more robust strategic application. Only through the use of Objects could such as expansion of requirement gathering even be considered as feasible and beneficial.

Segregation of the IS organization into legacy and new development. It is necessary when moving down the Objects road to break with the past. Otherwise, focus on the new world will be lost. There will always be the reluctant, but even more importantly, the leaders driving the move towards Objects will always be drawn back into fighting legacy fires. Resources, too, unless legacy development is effectively shut down will be diverted from learning the new tools and techniques to put out production problems.

Solutions to these management focus and resource / staffing problems range from creating separate IS departments to the use of consultants to maintain legacy to the complete outsourcing of legacy application maintenance. ***Bell Atlantic*** has elected to pursue a segregation strategy in the short-term, with outsourcing seen as the eventual solution.

Having put these mechanisms in place, ***Bell Atlantic*** has proceeded to cross the Rubicon and attack the re-engineering of the billing / collections processes using object and project management methodologies.

The Program Office Concept

In addition to billing re-engineering, ***Bell Atlantic*** is pursuing another number of other initiatives, some of which have a distinct impact upon the re-engineering effort.

One of the more important emerging trends in the Telecommunications Industry is the move towards flattening traditional management hierarchies to achieve worker empowerment and (within IS) implementing *Centers of Excellence* to provide pools of talented, technical resources and *Subject Matter Experts* (SME's).

With the reduction in middle management, the intent is to look towards technology to provide much of the "business rules" and management control that has been the province of middle management. In addition, improved training, time reporting and project management tools are seen as the solution to addressing the evaluation of staff performance and staff development.

A program on the scale of *expressTrak* normally would have been placed under the control of a single executive (most likely within the IS organization) and surrounded with a cocoon of bureaucracy and support functions. A significant number of middle and senior managers would also have been involved in reviewing, approving and otherwise directing the effort. In the past, staff-side resources (composing up to as much as 50% of all employees working on the effort) would have overwhelmed the hands-on personnel on such a similarly sized project.

However, that traditional hierarchical management structure has all but disappeared within ***Bell Atlantic***. But the question of how to manage and provide executive direction to the *expressTrak* Program was still a very real concern.

Bell Atlantic quickly came to the conclusion that only a Program Office could serve as the mechanism through which such extensive business transformation efforts could be successfully managed and controlled.

At ***Bell Atlantic***, we have created the ***expressTrak*** *Program Office* to manage and provide oversight of our Billing / Collections initiative. The Program Office reports, and is only accountable to, a Billing Steering Committee comprised of six senior executives, all but one of whom is drawn from the business-side of ***Bell Atlantic***.

The mission of the *Program Office* is fourfold:

- Ensure that this initiative remains a Process Re-Engineering effort (i.e., changes the manner in which ***Bell Atlantic*** conducts its business) and not devolve into simply yet another information systems implementation project;
- Enforce business leadership and management

of such a *technology-intensive* project;

- Marry the structure and discipline of Program / Project Management to s*tate-of-the-art* information systems development;

and

- Use automated project management tools / techniques to ensure the successful delivery of such a large-scale and strategically important effort.

The Program Office brings together once a week, for a rigorous status and issue view, all of the client representatives, the IS Release management group, the IS Application Development Directors and project managers involved in the *expressTrak* initiative.

For a more detailed look at how ***Bell Atlantic*** has implemented the Program Office, please refer to **Attachment C**. In addition, **Attachment D** provides a sample of the in-depth project reporting which is the hallmark of the Program Office approach.

The *Bad News*: Difficulties encountered in Re-Engineering using Object-Oriented Development Techniques

As is the case when a new, *state-of-the-art* approach or technology is embraced by an organization, there is never a seamless, smooth transition from the old world to the new. ***Bell Atlantic*** proved not to be an exception to this truism. In our effort to re-engineer our billing / collections processes using object methodologies, we, too, encountered obstacles along the road.
Object-Based Analysis / Design / Development is not a replacement for understanding the business. It is not fair to single out Object-Oriented techniques and technology here. The panacea which is promised by objects today is no different than that offered by client-server a mere five years ago, or relational data base concepts proposed back in the 1970's. As the old saying goes:

> *A fool with a tool is still a fool;*
> *A fool with a more powerful tool is simply a more powerful fool*.

With the new tools and methodologies it is easier to build applications and in a more timely and scaleable manner. However, developers still need to be guided by the needs of the business. Ensuring that the client organizations are involved from project initiation through conclusion is essential. As mentioned before, ***Bell Atlantic*** sees the primary role of the Program Office providing this leadership and direction.

Resistance to the move to Object-Based Methodology is most visible within the IS organization, not the lines of business. Just like the Luddites (as opposed to the end consumers) were craftsman protesting the replacement of their, high quality, hand-made products with lower cost, machined products, so, too, the hardest hurdle to overcome in moving to an Object-Oriented approach is the IS Department. Clients love objects, because for once, technology and client requirements are being expressed in business terminology. Everyone understands what a customers, bill or product is.

However, typical comments heard from IS organizations include:

- Just the latest *Flavor of the Month*. Wait a year and we'll all be onto the next set of *buzz words*.
- It can't work. Development can never be that easy or fast.
- Objects demystify software development.
- I'm an old dog. I don't want to learn new tricks. I'm happy with (choose one) COBOL, C and ALGOL.
- Learning to develop using Objects is hard!
- Developing quicker, cheaper, faster results in budget and staffing questions I don't want to deal with.

In fairness, some of these concerns are valid, particular the one about job security. However, the key to survival (and hopefully success) in the new global economy is the ability to deliver new products, services and functionality to end consumers faster than the competition. Those enterprises which get to market first will reap the rewards, with little if anything left for the *Johnny-come-latelys*. IS organizations must be enablers, not hinderers. Objects do hold out the promise of "better", "more robust" applications which can be delivered sooner than in the past.

Selection of the appropriate Migration path from Legacy to Objects is critical. *C++, Smalltalk* and *Object COBOL* are three possible migration paths for IS organizations as they move away from traditional procedural, 3rd generation development languages. Which option is selected, and committed to, will directly influence not only how soon the enterprise begins to realize gains from Objects, but also staffing and budgetary decisions.

Each of the "new" languages have their strengths and advantages. Smalltalk is generally viewed as the purest of the object languages and the one with the most flexibility in creating objects and messages. It is also deemed the cleanest, and most complete break with the past as well as offering the most "power" in application development.

However, studies have estimated that it takes the "new" Smalltalk programmer roughly 18 months before they reach their comparable 3GL productivity levels. This is in comparison with C++ or Object COBOL learning curves of approximately twelve months. Also, as extensions to existing 3GL programming languages, *C++* and *Object COBOL* allow the developer to utilize both Objects and traditional procedure calls and functions. These two languages also permit the gradual transition from procedural world to Objects as well as not immediately devaluing the organization's existing stock of production applications.

Thus, the IS organization is presented with the usual trade-off: immediate productivity versus longer-term capabilities and flexibility.

Bell Atlantic has decided to break fully with the past and has begun to standardize all new application development on the purer forms of the object languages. However, both paths offer power and productivity gains over current methods.

Objects are not appropriate for all applications and / or projects. Strategic and other applications which require near-real time enhancement and modification are the best candidates for the Object World. But what about the infamous payroll system?

As in any undertaking, one must exercise common sense and good judgment. In times of leaner IS budgets and demands for increasing productivity, the enterprise must invest its scare resources in migrating only those applications which will return the highest return in customer satisfaction and profitability.

Payroll and HR systems, if they haven't been already replaced with off-the-shelf packages or handed over to outsourcers such as ADP, should be targeted for *triage* as soon as possible. There is no strategic advantage to be gained from possessing the world's only Object-Oriented HRIS application.

Lack of project-related metrics / controls / management standards and guidelines. The Object World is still evolving. It is very similar to the Client-Server World of several years ago, when there was much scratching of heads and gnashing of teeth by IS and clients as everyone struggled with network management, remote access, application splitting and information security.

However, since then, tools, techniques and project management approaches have grown up to make the management of distributed processing environment and multi-tiered architectures easier and simpler.

The same will be true for Objects. Over time, *best practices* will develop which will improve the organization's ability to manage and estimate project length and developer effort. In the interim, the solution is not to mindlessly apply the old techniques, but rather recognize that Object technology represents a loosening of the constraints over both developer and client. So too must the old practices be loosened in recognition of this new paradigm. This does not mean abandoning all project management controls and practices. Rather, much like spiraling and RAD / JAD sessions have replaced six month requirements analysis documents, so too must shorter project plans, smaller releases and closer client involvement be used to replace the multi-year, seven level deep project plans and voluminous project status and staff utilization reports.

The *Good News*: Program Success to Date

In March 1996, ***Bell Atlantic*** will introduce its new billing / collections processes to customers, regulators and employees. The new manner of conducting business will be implemented for a select group of Large Business customers in West Virginia in a controlled pilot. The pilot will last 90 days and will allow the verification of the new internal policies, procedures, training and systems. It will also allow ***Bell Atlantic*** to gauge the impact upon customers and validate the estimated improvements in customer service and value added through billing / collections.

Specific changes expected, and benefits to be realized, as part of the March pilot include:

- Customers will now receive a full-page invoice (7.5" by 11") versus the old "small" bill;
- Customers will begin to test EDI and CD-ROM billing, management reporting and remittance;
- Customer provisioning, inquiry and service will be managed via ACD technology and point-and-click capabilities on the desktop;
- Calling Center staff will begin to be re-deployed towards more customer oriented activities; and
- Improvements in cash flow from paper / mailing cost reductions and targeted collections activity.

These successes are only the first tangible, albeit small, step in realizing the potential order of magnitude gains in employee productivity and customer satisfaction offered by business process re-engineering. Continued conversion of Large Business customers will run throughout 1996 and 1997, with the goal of converting the vast majority of customers in West Virginia, Maryland, Virginia and the District of Columbia by the end of 1996.

Rollout of the new billing / collections process and systems for Consumer / Residential and Small Business customers is targeted for pilots in West Virginia in September and October 1996 respectively. Rolling conversion of these customers will begin in earnest in early 1997.

Lessons Learned

As a result of ***Bell Atlantic's*** move into an Object-Oriented approach to re-engineering its billing and collections, a number of issues have been surfaced, and lessons learned. Going forward, a number of rules will be factored into the planning and staffing of any new efforts in Object-Oriented Development and Business Process Re-Engineering.

First, Project schedules / timelines have become iterative. Unlike development projects in the traditional world of IS, there are no fixed break points in the systems development lifecycle. There is no requirements checkpoint, design review / sign-off and loose constructs around Systems-Integration-User Testing. Instead, in the Object World, a project spirals through a consolidated Project Definition-Requirements-General-Detailed Design Phase. Functionality is prototyped, with immediate feedback from the client community.

This is all well and good, and generally allows the developers to deliver code faster, but the result is that the traditional set-in-stone project schedules and plans of record effectively disappear. No one can accurately predict how many times a prototyping cycle can and will be repeated. The stock answer is "until the client is satisfied."

In addition, without the proverbial tome of user requirements to point to, how does one sustain an audit trying to determine how much time and dollars were spent to provide a certain set of functionality? Even more importantly, without a traditional requirement analysis or design spec, how are adequate and comprehensive test plans developed.

All of these factors pressure a constant re-evaluation of schedules and timelines with only the next "upcoming tasks" assigned definite, hard dates. Needless to say, this increases the important role of the Program Office in bringing together the many disparate project team level plans and adequately managing schedule dates up the management chain.

Project timelines have been meaningless. For development projects in the traditional development world, there are a number of methods which have proven successful over time in providing estimates of a project's complexity, level of effort required and timelines. These include function points, lines of codes, I/O and screens counts, etcetera. However, none of these really lend themselves to Object-Oriented Development.

Unlike traditional project management, where the intent is to move from A to Z in the straightest possible line, in the Object World the developers meander via prototyping towards the eventual client requirements. Ensuring that meandering does move forward and stay within confined boundaries (instead of tracking actual hours versus plan) becomes the trick to successful management of Object Development projects.

Only a Program Office can ensure proper management and business control of programs. This is the appropriate forum where clients and developers are brought together as a group to evaluate progress, re-examine priorities and requirements and set short-term / short-duration objectives within the overall charter given to the program by executive management.

The program must be multi-year funded . A large-scale program is almost always, by definition, multi-year in duration. However, many corporations and

government agencies still force all expenditures through an annual planning and budgeting cycle.

This is even more true of development projects using a "new" (and therefore "suspect") methodology and approach. The program must receive at its inception sufficient funding and resources to match its expected duration. Once begun, it is fair to measure programs against interim milestones, including financial ones, but the program budget must be, at all costs, protected from the annual search by the accountants to do things cheaper, faster or more efficiently.

Finally, the move to Objects must occur. For all of the reasons discussed in this paper, and more, IS organizations must begin the move towards Object-Oriented Analysis, Design and Development. The only question is what is the rate of adoption of the new disciplines and how quickly a company can (or wants to) leave behind its legacy systems and heritage.

However, if there still remains some doubt about moving to Objects, consider the lessons which can be drawn from a similar scale of movement, from hierarchical data base management systems to relational ones. The early adopters of relational data bases gained immeasurably from their courage. As a result of their eagerness, these organizations realized two main benefits:

- They were able to influence the direction of the wave rather than merely ride it, or paddle in a vain attempt to catch the wave.

- They moved their staffs down the learning curve so that as the technology matured, they were well-positioned to take advantage of the power of relational data bases and gain business advantage.

The early embrace of Objects appears to offer these same potential benefits.

Conclusions

This paper has attempted to outline some of the dramatic changes in both the business of ***Bell Atlantic*** and how it builds information / technology solutions to our business problems.

The paper has discussed how ***Bell Atlantic*** had no choice other than to undertake a radical re-engineering of its billing and collections functions and embrace the concept of object-oriented analysis, design and development.

In addition, this paper has described the manner in which ***Bell Atlantic*** has sought to achieve development gains while still retaining program control through the use of JAD teams, a combination of business and IS project managers, a common compensation / bonus plan and most importantly, the creation and institutionalization of the Program Office.

Lastly, a number of problems, successes and lessons learned by ***Bell Atlantic*** as it has pursued the Object path have been shared with the reader.

In conclusion, moving to an object-oriented methodology and embracing business process re-engineering can be a daunting task. However, in a borderless world where competition is measured globally and process cycle times are measured in days, there is no alternative but to adopt objects and process improvement / business re-engineering. To do otherwise is to concede industry leadership and victory to another before the contest is ever joined.

About the Author

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Previously, **Mr. Robleski** has been *Senior Manager / Project Manager* in *System Engineering* with ***MCI***, *Director, Planning and Budgets* at the ***Federal Home Loan Mortgage Corporation*** ("Freddie Mac") and *Finance Divisional CIO* at the ***International Telecommunications Satellite Organization*** (INTELSAT).

He holds a *BS* in *Economics* from *Boston College* and a *MBA* in *Finance & Information Systems* from the *University of Chicago*. He is also an active member of the ***Project Management Institute*** (PMI).