

Seven Steps to acquiring Business Process Intelligence and Operational Excellence – A Case Study

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Abstract— An application or a system that is latest today would be a legacy few years hence. Legacy is not new to any CIO or Information Systems Director in all medium to large scale organizations. And is obviously one area each Information executive, has to cope up when driving towards leading edge technology horizons and operational excellence. Identifying the key business processes, and the prime factors that influence the business dollars help to narrow the parameters which influence the factors like efficiency or corporate credibility. The faculty of Business Process Intelligence talks about analyzing the parameters which influence the Information systems area, mine the metrics to support a process model or work on a process redesign. The following article is a case study of how we worked on the business process intelligence of an information systems setting and how we found astounding results of operational efficiency and business process redesign.

Index Terms— Business Process Intelligence, Electronic Data Interchange(EDI), Operational Excellence

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1 INTRODUCTION

An application or a system that is latest today would be a legacy few years whence. Legacy is not new to any CIO or Information Systems Director in all medium to large scale organizations. And is obviously one area each Information executive, has to cope up when driving towards leading edge technology horizons and operational excellence. Also because of the decreasing technology digestion cycle in the current world, technology deployment affects the way companies operate, and also contributes to the credibility of the corporation in the market. Added to this new technology deployment at times is forced by peer competition, naïve need for a kind of process/orientation (driven by a federal mandate), or for performance improvement or for providing professional service to customers. Bringing a new technology requires the need to validate its suitability to the system architecture at work, for deployment of a technology that doesn't suit a specific profile would result in astronomical losses and effects the way budgets are skewed in the subsequent years. Hence choice of the right architecture or technology - serves as a sales pitch for drawing more budget and in turn productivity and customer satisfaction. But decision about investment in a technology can be done effectively if we know the details of the existing system processes and the parameters that influence them. Knowledge of the key business processes and the influential factors, parameters affecting them can primarily be termed as Business Process Intelligence.

2 SEVEN STEPS TO BUSINESS PROCESS INTELLIGENCE

2.0 Summary

Here are seven steps towards becoming business process intelligent:

1. Identify the key business processes that influence the way business is done or those which contribute to the outcome of the nature of work - say customer satisfaction.
2. Identify the factors in the processes that influence business dollars that are invested into the system.
3. Identify the process activity details that can be calibrated and help to create metrics on the outcome of the key business process or work mentioned in the identified processes.
4. Gather the metrics that can gauge the process/system performance during each epoch of time.
5. Identify the parameters with in the system that can contribute to influence and change the factors.
6. Observe the variations in the process outcome for changes in the parameters and introduce the best changes that can derive the desired result in respect of performance and monetary benefit.
7. Continually analyze the existing processes and introduce any new factors that effect budget dollars and undergo steps 1 through 6 in an applicable manner.

It gives a great confidence to invest in a new technology or a having familiarity with the metrics of the key business processes than by the image given by the sales representative selling a specific technology.

2.2 Managed Care Scenario

A managed care environment is the insurance industry in the healthcare context. Managed care Organizations also known as Health Management Organizations (HMOs) enroll members through the subscriber's employers. Subscribers pay premiums to the HMO on a monthly basis. And the HMO pays healthcare providers like doctors and hospitals for services provided to its members during the course of a month or a year. The healthcare service providers do verify the eligibility of a specific member before they offer services to the member. At times a provider refers the member for services from a specialist and hence requests authorization. On providing a set of services, claims are sent to the payer for reimbursement of the amount. The insurance company remits the payment to the provider after processing the request. Providers do check the status of their claims, if they fail to get the payment after a reasonable amount of time.

2.3 Case Study Details

The following is about the implementation details of the above mentioned seven steps at a Managed Care Organization in Northeastern United States. The Health care payer in context is a \$2 billion turnover company with a membership of over a million. Evolving technologies have been deployed in the referred payer environment at different times during the last decade for various reasons. Healthcare providers in the neighborhood do business with the Payer by various channels like Electronic Data Interchange (EDI), Web and Interactive Voice Response (IVR) with no exception to the conventional methods of paper and telephone.

Electronic Data Interchange (EDI) technology at the payer site in reference was deployed with an objective to hasten the claims processing from weeks to days and decrease the dollars spent on providing informational processing services to providers like eligibility and claim status information. This technology has also facilitated to decrease administrative time taken to serve the customers (providers) from days and hours to minutes and seconds. This is particularly in the area of:

- Specialist authorization
- Claim status information
- Eligibility information of the members

Over the last few years the management of the EDI department, of the Information Systems Division was posed with a few critical problems. They were as follows:

- Inconsistency in data going back to providers via various channels
- High response time to inquiry transactions like member eligibility information
- High resource utilization for validating and fixing existing issues.
- Preparation for the federal mandate of Health Information Portability and Availability Act (HIPAA) compliance
- Migrating away from Legacy architecture and work towards a better Enterprise level application integration model.
- Ability to deploy a necessary architecture for performance improvements.

Added to this with the technology digestion cycle around the world going down the expectations of the providers started going up day after day. Hence it was imminent of the executives to keep in pace with the market. However executive decisions to make any changes to the existing technology demanded a warranty on the return on investment and customer satisfaction. However conclusions derived about the business processes based on observations were bound to be fallacious and needed precision for bringing in investment. Hence the above quoted seven steps have been executed to acquire business process intelligence and sold the data to the executive members and achieve remarkable performance improvements.

2.4.1 Step-1: Identify Key Business Processes

The EDI system in place at the payer site promises health care information to providers in a timely manner. And the healthcare information processed can be categorized into near real time transactions and scheduled time transactions. The later were also called as batch transactions. The near real time transactions viz. member eligibility, claim status inquiry and specialist authorization were expected to send response back in less than a minute. The batch/scheduled time transactions constitute claims, remittance and enrollment. The budgeted dollars for a year would go into the effective maintenance of the near real time and scheduled time transaction related processes. Lack of good response time, on the inquiry transactions and high availability of the EDI systems also affected the credibility of the department.

2.4.2 Step-2: Identify prime factors that effect business dollars

It was observed that the majority of the budget going into maintenance of the existing systems went into the human resources and little into infrastructure support. And human effort in turn went into the following categories:

- Fixing the service interruptions caused during a week due to various reasons like:
 - upgrades and new installations
 - inconsistencies between test and production environments
 - Reproducing and fixing data discrepancy issues reported from that received from different channels like Web, EDI and IVR
 - Lack of process for handling changes done to the existing processes
- Monitoring and setting up providers coming on board
- Monitoring and support of claims processing - particularly ftp failures across systems.
- Supporting messaging gateway server and related software
- Development work related to developing applications that do transaction processing for HIPAA and corporate initiatives.

Hence an effective EDI architecture would have:

- Lower response times for real time transactions and lower processing time for scheduled or batch transactions
- Fewer service interruptions and higher availability to internal and external customers
- Little maintenance for processes - like lower system monitoring time and creating processes that self recover
- Ease of adaptability to handle higher volume of incoming transactions
- Lower cost of processing the claim or an inquiry transaction for dollars invested
- Ability to integrate into possible future evolutions like
 - Integration with some kind of an extranet to serve providers coming on board by providing necessary resources and
 - Integration of the system with a high technology backend claims processing engines

These were all considered as the key factors that have to be targeted and will influence budgeting for the next year.

2.4.3 Step-3: Identify process activity details that help calibrate Key Business Processes

Based on the influential factors mentioned above a count of the following details was understood to give a feel of the EDI system operating conditions:

- Service interruptions to production systems
- Service requests from providers that relate to issues reported in the nature of problems encountered.
- Inquiry transactions processed in a day
- Claims processed in a day
- Time taken to process each real time transaction
- Time taken to process a day's worth of claims

2.4.4 Step-4: Gather the relevant metrics that can rate the current performance of the Processes

- Issues related to service interruptions effecting internal (other IS departments) and external customers (providers) are tracked using a Lotus Notes database and funneled through a specific human resource for better tracking.
- Preparation to effective maintenance of inquiry transaction related processes was done by creating scripts for counting the load of transactions processed, usage of operating system level processes, disk and other hardware parameters and alert any anomalous behavior at the application level.
- Scripts were also created to get metrics on the key batch transaction, claim to identify the count of these by submitter like clearinghouses, direct submitters. Time taken to edit the claims, load into database and generate reports was tracked with a view to decrease the processing time for each of the specified activities.
- Macros were written to load this data into spreadsheet and create graphs of the variation in response time, claims processing time.

2.4.5 Step5,6: Identify system parameters that can effect the performance of the business processes and utilize the observed variations to derive best performance

The Near real time transactions:

The response time of an inquiry transaction and the authenticity of information sent back tremendously affected the credibility of the payer at the outset. Hence this was taken care by:

- Increasing the number of threads of applicable components and upgrading components of messaging gateway, to process inquiry transaction faster.
- Upgrading the Unix boxes to high end systems and by installing multiple processors for better performance and maintaining the software and hardware at higher boundaries of the system requirements

- By re-architecting the inquiry transaction related database query application go against single Oracle database than going against three different legacy databases.

The above changes fixed issues of inconsistency of data that came from different channels and decreased the speed of processing from 30 seconds to 2 seconds.

Claims processing:

The healthcare claim is a very important transaction around which the whole of managed care payer budget and profit spins. As claims processing is one of the key processes of the company, resources were devoted to monitoring it. With the payer in question claims processing was done on a legacy system whose processing speed is about 20% of Unix systems. Hence effort was taken to migrate the reporting part of the claims processing schedule to a Unix box.

The above changes made the total time taken for processing a day’s worth of claims from 6 hours to 1.5 hrs. That is a 400% improvement in processing time.

Interruptions:

Service interruptions were decreased to half

- by creating maintenance windows for upgrades and
- by creating Production, Development and Test environments.

The changes made down time more predictable to providers. Also it facilitated ease of handling issues that would ensue the changes (or installs).

Service Requests:

Service Requests were brought down by training the staff in standard coding practices like proper error handling logic and self recovery abilities(human inefficiency)

The changes brought about a 25% decrease in the requests over the previous year.

Availability:

To facilitate higher availability of the EDI systems the flow of the transactions was routed through two different Unix boxes with a view facilitate making one box available during disaster.

2.4.6 Step-7: Continually analyze the existing processes and introduce any new factors that effect budget dollars and undergo steps 1 through 6 in an applicable manner

The Count of service interruptions, Volume of transactions processed, Time taken to process each transaction particularly real time resulted in taking various decisions like migration to Oracle, 1600% improvement in response time and 400% improvement in claims processing time and also facilitated downsizing redundant architecture.

However with deployment of new technologies and evolving architectures make new processes, factors and parameters come to surface. Hence the activity mentioned in the first 6 steps will continually be executed to evolve into a high performance system. In a nutshell Business Process Intelligence facilitates taking better decisions and helps to evolve into, a high performance architecture. Please refer the Figs. 1,2 for results

Fig 1.

S.No.	Area of Improvement Addressed	% Change
1	Realtime Transaction Response time improvement	1500%
2	Claims Processing Time improvement	400%
3	24X7 Availability	100% (New)
4	Interruptions decreased to (than previous year)	20%
5	Service Requests decreased to (than previous year)	75%

Fig 2.

S.No.	Process re-engineering area results
1	Migration to Oracle DB (Migration from Legacy Technology – Allbase etal.)
2	Deployment of second Unix box for failover

Conclusion

The process of Business Process Intelligence Acquisition involves identifying key business processes that influence the operational efficiency or credibility of the corporation. The various parameters of these business processes that facilitate good values like better service turn-around time and improved performance are articulated and metricized. This results in various plusses like improved response time on real-time transactions, quicker claims processing, decreased service interruptions, decreased count of service requests and improved availability of systems. The seven steps to acquiring Business Process Intelligence is an authoritative and credible approach to work towards achieving efficiency and operational excellence. Please refer Figs. 3,4 for results.

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