Migrating Legacy Systems in the Global Merger & Acquisition Environment
Teaching Case

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ABSTRACT

The MetaFrame system migration project at WorldPharma, while driven by merger and acquisition, had faced complexities caused by both technical challenges and organizational issues in the climate of uncertainties. However, WorldPharma still insisted on instigating this post-merger system migration project. This project served to (1) consolidate the separated legacy MetaFrame systems from the three pre-merger pharmaceutical organizations into one globally managed system and (2) develop a global support team for the newly consolidated global MetaFrame system. This system migration project was aligned with WorldPharma’s IT strategy that aimed to streamlining its IT resources and enhancing system efficiency.

Keywords: Teaching Case, IT Project Management, Migration of Global IT Systems, IT Management

1. INTRODUCTION

After the merger and acquisition (M&A) that involved WorldPharma acquiring and merging with CB Medicine and PharmaTech (please note that we disguise names of the three pharmaceutical companies in this case to protect their identities), a new department – the Computer and Information Technology (CIT) department, was established to globally manage IT resources of the post-M&A WorldPharma organization. The CIT department initially served the main task of delineating migration and integration plan in support of various IT systems, including MetaFrame system, in this new organization.

The main goals of the global MetaFrame system migration project were to (1) consolidate every legacy MetaFrame system from the three previously separated pharmaceutical companies into one unified, globally managed system; and (2) develop a global team for supporting the new and centralized MetaFrame system. A new manager – Mr. John Collins, was hired to manage this MetaFrame system migration project. Since this project was entangled with technical complexity and organizational issues, Mr. Collins would have many obstacles to overcome (please note that we disguise names of the people mentioned in this case to protect their identities).
1.1 Definition of MetaFrame

Metaframe, a software product developed by Citrix Corporation, allows users to access the applications hosted on MetaFrame servers (running on UNIX or Windows operating systems). All applications are processed on these MetaFrame servers, enabling users with less powerful hardware to use resource intensive applications.

Figure 1 shows a centralized structure of a MetaFrame system that includes an Independent Management Architecture datastore (IMA datastore), a Zone Data Collector (ZDC), and several MetaFrame servers. MetaFrame servers run the applications and allow users to access and use these applications. IMA datastore is a database (e.g., Microsoft Access, Microsoft SQL Server, Oracle, IBM DB2) that keeps the information about the configuration of MetaFrame system.

A MetaFrame system could increase its performance by setting up zones that allow geographic sites to operate on their local computer networks and minimize network communication to the IMA datastore. The logical way of establishing zones is to set up one in every operation that has a high number of MetaFrame servers or has a low capacity network connection to the nearest IMA datastore. For each zone, ZDC maintains non-system configuration information such as server loads, active sessions, and disconnected sessions. ZDC also manages the communication within the zone as individual MetaFrame server will not directly query any other MetaFrame servers.

The IMA Datastore is the database (e.g., MS Access, MS SQL Server, Oracle, IBM DB2) that keeps the information about MetaFrame system configuration (not any business data) and tracks MetaFrame server farm information that does not change frequently (more static information).

A Zone Data Collector (ZDC) is the in-memory database that maintains zone specific data. ZDC receives incremental data updates and queries from MetaFrame servers within the zone. ZDC stores the information such as server loads, active sessions and disconnected sessions (i.e., the information that is not about MetaFrame system configuration). ZDC sends messages between zones. Individual MetaFrame servers do not directly query MetaFrame servers in other zones. One MetaFrame server in each zone is assigned the task of being the data collector for that zone.

MetaFrame server allows multiple users to log on and run applications in separate protected sessions on the server without interference from other users. Clients connect to these servers via the Independent Computing Architecture (ICA) protocol. This thin-client protocol uses very little bandwidth as only mouse clicks and keyboard strokes are sent to the server and only screen shots are sent back to the client.

Figure 1. MetaFrame Environment (centralized structure)
(Please note that Citrix Corporation had released several versions of its MetaFrame product, beginning with the first release titled “WinFrame” followed by “MetaFrame 1.8” and “MetaFrame XP.” During this migration project, Citrix Corporation released a new version titled “Presentation Server™” and also announced that the MetaFrame XP version would be supported until June 30, 2007. Because there was a great deal of expertise on MetaFrame XP and a substantial MetaFrame XP presence within WorldPharma, it was agreed that MetaFrame XP would be implemented during this migration project even though the newer version (i.e., Presentation Server™) had already been available. Thus, the MetaFrame mentioned in this teaching case would refer to the MetaFrame XP version.

Additionally, during the time when this teaching case was written (i.e., on February 11, 2008), Citrix Corporation changed the name of its “Presentation Server™” product line to “XenApp™.” More detailed information about MetaFrame product could be found at www.citrix.com.)

1.2 Existing MetaFrame Systems: Pre-M&A

Immediately after the M&A, a consolidation plan for various existing MetaFrame systems of the three legacy companies started to unfold. The first issue related to the difference in MetaFrame structures implemented in the three legacy companies. The legacy MetaFrame systems of PharmaTech and CB Medicine adopted a “centralized” MetaFrame structure (see Figure 1). In contrast, the WorldPharma’s legacy MetaFrame systems implemented a “siloted” structure (see Figure 2).

In the centralized structure, all users would access one large MetaFrame system environment controlled (logically) by the same IMA Datastore. For instance, a scientist in Sweden, an engineer in Japan, a manufacturing supervisor in the U.S., etc., would see and use the same MetaFrame system environment (please note that MetaFrame system environment could be explained as “a list of servers and the applications hosted on each server”).

On the other hand, in the siloed structure, each business unit (e.g., marketing unit in East Coast US, manufacturing unit in Midwest US) would build and maintain its own MetaFrame system environment. Thus, WorldPharma found itself a marketing MetaFrame system environment, a manufacturing MetaFrame system environment, etc.

In this regard, the CIT department and Mr. Collins would need to make the decision about which MetaFrame structure would match the main project goals and best support WorldPharma’s needs in competing in the pharmaceutical industry.

2. PHARMACEUTICAL INDUSTRY

2.1 New Drug Development

Before a pharmaceutical company can introduce a new drug in the United States, it must receive an approval of a New Drug Application (NDA) from the Food and Drug Administration (FDA). As a document that may consist of over 100,000 pages, the NDA must provide enough information to permit the FDA to reach the following key decisions (www.fda.gov):

- Whether the drug is safe and effective in its proposed use(s), and whether the benefits of the drug outweigh the risks.
- Whether the drug's proposed labeling is appropriate, and what it should contain.
- Whether the methods used in manufacturing the drug and the controls used to maintain the drug's quality are adequate to preserve the drug's identity, strength, quality, and purity.

The process of bringing a new drug from the research stage to market takes many years and involves several phases (see Figure 3). After a chemical compound (i.e., a potential new drug) is synthesized, the compound proceeds to several years of preclinical testing, including animal testing and other testing (e.g., toxicology, pharmacokinetics) in the laboratories. The data generated in this preclinical testing provide the basis for the Investigational New Drug Application (IND), which the FDA must review and approve before clinical trials of the compound could begin.

The three stages of clinical trials involve testing, in humans, for safety and for effectiveness in treating a target medical condition. Stage 1 involves less than 100 patients; Stage 2 involves a few hundred patients; and Stage 3 involves a few thousand patients. If the new chemical compound still appears to be promising after Stage III, the pharmaceutical company assembles the data generated during the clinical trials and other supporting materials into the NDA, which the FDA must approve before the new drug may appear in the market.

After approval of the NDA, the pharmaceutical company is still required to monitor and gather safety data on the new drug. Reporting of Adverse Drug Reaction (ADR) data must be prepared for the FDA. The pharmaceutical company must report any “untoward effect that occurs in the course of use of a drug in professional practice” that is not listed on the drug label and that meets the definition of a serious ADR. If it turns out later that the new drug is not as safe as it was previously thought, the FDA may put strict requirements and limitations on the use of the new drug, or even revoke the right to sell it in the United States.

Additionally, in pharmaceutical manufacturing, the pharmaceutical company must monitor the production process. This involves the process in which production operators must fill out forms to record data describing the conditions for the manufacture of a particular batch of the drug.

Furthermore, the NDA is not a static document. Even after the FDA has already approved it, the pharmaceutical company may submit additional information for further review when seeking approval for a broader range of therapeutic indications or in other circumstances.

Finally, most drugs are on the market in more than one country, and the regulatory agencies of other nations must approve new ones before they enter overseas markets. Those agencies often have requirements for forms and contents that are considerably different from those the FDA specifies for documents submitted to it.
Pharmaceutical companies have prospered historically by discovering, developing, manufacturing, and then marketing their drugs. To maintain their historically growth rates, pharmaceutical companies are increasing the number of potential new drugs being tested. However, the cost of developing new drugs is rising. Despite a dramatic increase in investment in technology in drug research and development (R&D), the gross productivity of drug R&D does not increase proportionally (Wilhelm, 2001). The Pharmaceutical Research and Manufacturers of America (www.pharma.org) said that it takes an average of 12-15 years to discover and develop a new drug. Only 1 in 1000 potential new drugs makes it to clinical trials. And only 1 of 5 potential new drugs which make it to clinical trials actually makes it to market. This process makes the drug development cost be about $500 million for a new drug.

2.2 IT in New Drug Development
Because of the competition from a growing number of “me-too” drugs, the pharmaceutical industry is highly competitive. There are several major pharmaceutical companies competing for the same market. The company that can design, test, and market a new drug first receives a tremendous competitive advantage, both in financial payback and brand recognition. As the patents are issued before a potential new drug goes into clinical trials, the faster a trial goes, the longer the pharmaceutical company enjoys a monopoly until generic versions can be sold (Marwaha, Patil, and Singh, 2007).

Additionally, industry statistics highlight some other problems. An estimated 200 drug patents, (representing

Figure 2. Existing WorldPharma’s Pre-M&A “siloed” MetaFrame Structure

Figure 3. New Drug Development Process (Studebaker, 1993)
nearly $40 billion in annual revenue to the pharmaceutical industry) had expired by 2005. In 2003, the FDA approved only 17 potential new drugs, which was the lowest rate of approvals in 20 years (in 1996, the FDA approved 120 potential new drugs). To be successful, pharmaceutical companies must respond by accelerating and increasing drug development.

The clinical trial process is a key area that pharmaceutical companies are scrutinizing for efficiency and IT is critical to meeting this challenge. Pharmaceutical companies expect IT to improve data collection, speed up regulatory reporting, improve the targeting of physicians, and manage the process of clinical trials. To boost the productivity of clinical trials, pharmaceutical companies have introduced the Electronic Data Capture (EDC) systems, which allow patients, physicians, and researchers to prepare the Case Report Forms (CRFs) and enter their trial information directly in the online systems. EDC systems have substantially reduced the time required to gather data on clinical trials – to 2 weeks, in some cases, from 20 weeks (Marwaha, Patil, and Singh, 2007).

Regarding the FDA compliance, achieving cost-effective FDA compliance is one of the industry’s most significant challenges. The risks associated with non-compliance can be severe. A citation issued by the FDA for non-compliance can subject a company not only to large fines but also to a warning letter stating that if the infraction is not corrected within a given time period, product production will be curtailed by the order of the FDA. When a company has not properly documented changes to databases that store clinical trial data, the FDA has the authority to shut an entire production line down and/or withdraw products from the marketplace.

An important aspect of the FDA compliance is system validation, which means that all IT systems in the pharmaceutical company must be configured and documented (on an ongoing basis if changes are made) in accordance with regulatory guidelines. The FDA has also recognized the benefits of an electronic NDA system and has mandated that all NDAs be done electronically with some mechanisms in place to authenticate the person and the time for creation of electronic records. To comply with the Regulatory Compliance for Electronic Records and Electronic Signatures (i.e. Title 21 CFR Part 11) imposed by the FDA, technologies for generating and verifying the authenticity of operator control and observation have been developed. EDC systems include these technologies to develop and implement a procedure for verifying and documenting an individual’s identity before assigning an electronic signature (Mlodozieniec, 2004).

In addition to the issue related to the FDA Compliance, another issue exists. Unfortunately, many pharmaceutical companies are not coordinating a number of clinical trials across their organizations. The lack of cross-trial transparency can create delays when different clinical trials compete for scarce resources. Many pharmaceutical companies haven’t yet embraced reusability by streamlining their approach to the design of clinical trials. Certain components of the forms that guide researchers in clinical trials could be shared and reused across a number of them (Marwaha, Patil, and Singh, 2007). Thus, in recent years, some leading pharmaceutical companies have begun to raise productivity by revisiting IT systems to transform clinical trial design from ad hoc planning to an integrated approach. In this integrated approach, IT platforms for enterprise project management would play a major role to allow pharmaceutical companies to manage a portfolio of clinical trials more efficiently across the whole organization (Marwaha, Patil, and Singh, 2007).

Finally, over the past decade, IT spending at most pharmaceutical companies has grown much faster than revenues, partly to meet the information needs of the business but mainly because the IT environment is diverse and highly decentralized (Marwaha and Van Kuiken, 2005). Most phases of the drug development are divided into different business units or groups across countries with different cultures, languages and regulations. The solutions to individual problems in drug development may be created or bought by individual groups. These have led to a highly fragmented and heterogeneous environment with several incompatible systems. In a typical pharmaceutical company, fiercely autonomous and well-financed divisions and functions make their own IT decisions. There might be dozens of different systems for Enterprise Resource Planning (ERP), finance, lab information management, and document management, etc. These layers and layers of fragmented systems make it very difficult for pharmaceutical companies to integrate and scale their IT resources to reach efficiency goals. This inefficiency is costly: more than 85% of the industry’s IT spending goes toward maintaining and supporting these disparate assets. In short, IT has become an impediment to rather than an enabler of better business performance (Marwaha and Van Kuiken, 2005).

3. WORLDPHARMA METAFRAME SYSTEM MIGRATION PROJECT

3.1 Initiation and Planning

For the CIT department, its main responsibility was to streamline IT resource management and save a significant amount of IT expenses on both equipment and personnel. WorldPharma’s IT resources would also include all existing MetaFrame systems from the three legacy organizations. After M&A, high expectations were poured onto the effort of consolidating all these existing MetaFrame systems into one globally managed system. Realizing the criticality and the benefits of the project, the executives at WorldPharma’s Global Project Management Office (GPMO) promptly approved this project. The GPMO also made an official announcement apropos of this project to all of its employees worldwide. According to GPMO, the project scope was pertaining to “... consolidate both local and regional MetaFrame systems into one globally managed system and to develop a global MetaFrame support team ...”.

After this official announcement, Mr. Collins, knowing that he would face an avalanche of challenges, wasted no time to refine the project scope, which encompassed the following project objectives:

- To consolidate all MetaFrame systems from the three previously separated companies into one globally managed system.
• To build fault tolerance for WorldPharma’s global MetaFrame system.
• To retire those redundant MetaFrame servers and/or applications.
• To employ standards (e.g., hardware components, operating systems) for every MetaFrame server.
• To develop a global MetaFrame support team.
• December 31, 2005 would be the project deadline (approximately 18 months after the official announcement).

The project was planned for the existing MetaFrame systems at eight datacenters of the post-M&A WorldPharma organization (two datacenters in Michigan, one datacenter in New Jersey, one datacenter in New York, two datacenters in Connecticut, one datacenter in Sweden, and one datacenter in U.K.).

In this project, there would be three major activities: information gathering, planning of the new MetaFrame system environment, and decommissioning and migrating MetaFrame servers at each datacenter. Mr. Collins would need to collect, as much as possible, the information about the existing MetaFrame systems at each datacenter. Based on the collected information, a plan of the new global MetaFrame system and its system environment would be developed.

Then, Mr. Collins, the existing IT and/or MetaFrame personnel, and the business units at each datacenter would discuss and develop a plan for the new MetaFrame system of the datacenter. This plan would include the decisions regarding:

• The applications that needed to be maintained on each MetaFrame server located at the datacenter
• The applications that needed to be shut down as users could be redirected to use the same or similar applications hosted on the servers located at other datacenters
• The number of MetaFrame servers needed at the datacenter
• The number of existing servers that did not meet the specified hardware and/or software standards, needed to be decommissioned, and then evaluated for potential rebuild

On deciding which applications and/or servers to be decommissioned, the first task required would be organizing all existing CB Medicine and PharmaTech business units to fit into the current WorldPharma governance structure. For example, when the legacy R&D division in PharmaTech was assimilated with the global R&D team of WorldPharma, it became relatively easy to decide which applications and/or servers needed to be decommissioned while dissolving the business units in PharmaTech (i.e., the R&D division).

Another criterion was the redundant applications. For example, WorldPharma, CB Medicine, and PharmaTech all had a document management application running on their legacy MetaFrame servers; under this circumstance, the redundant applications of CB Medicine and PharmaTech were usually decommissioned. Finally, any business units that would like to retain any remaining applications had to develop a business case presented to a steering committee and explaining why the applications should be retained.

After developing a plan of the new MetaFrame system for each datacenter, the existing IT and/or MetaFrame personnel at each datacenter would (1) define their responsibilities, (2) set up the project team, and (3) begin the migration process. In this process, new MetaFrame servers would be brought into the datacenter, retired servers and applications would be shut down, remaining applications would be migrated to other servers, and retired servers would be evaluated for potential re-build. A timeline was set up for the migration at each datacenter, including (a) the time frame when the new servers would be ready for application installation and testing, (b) the date when the old servers would be disconnected and the applications would be moved over to other servers, and (c) the anticipated date to decommission the old servers.

3.2 Potential Risks

It was such a relief for the CIT department and Mr. Collins to learn that this MetaFrame system migration project received unwavering support from the executives at WorldPharma. The policy distributed to every WorldPharma business unit worldwide stipulated that the unified, globally managed MetaFrame system was one of the major objectives of WorldPharma’s IT strategy and that every business unit at each datacenter had to accomplish its MetaFrame system migration by December 31, 2005. Under this policy, potential risks related to project resistance and funding were mitigated.

However, with high expectation from top management, the pressure to perform fell on Mr. Collins’ shoulders. “I must pull this off”, Mr. Collins murmured to himself as he realized that the main potential risks of this project were technical-related risks. Because the existing MetaFrame servers hosted critical applications for business units’ daily operations (e.g., EDC, document management, financial management, supply chain management), a thorough testing would be required to ensure compatibility and minimize any potential problems. Mr. Collins was also fully aware that a contingency plan would be needed in case of any migration failure.

Another problem that Mr. Collins anticipated was that the project could suffer from a lack of information regarding some applications hosted on existing MetaFrame servers. Because of the M&A, some employees from virtually every business unit had already left WorldPharma. Unfortunately, several of these former employees were the individuals who were responsible for some of the applications hosted on MetaFrame servers. In one incident, an employee who was about to leave the company had not yet finished documenting one of the applications. When approached and asked by Mr. Collins’ assistant, that employee just shrugged his shoulders expressing that he did not care. Amid the chaos, Mr. Collins tried to stay above the fray and thought about how to motivate those departing employees to finish their assignments before they left.

Mr. Collins was also seriously concerned with the possibility of not having enough IT and/or MetaFrame personnel to complete the task of MetaFrame system migration on time. As one of the expected benefits from this project was saving significant amount of IT expenses on equipment and personnel, the number of IT and/or
MetaFrame personnel in the company would eventually be reduced. Thus, some IT and/or MetaFrame personnel had already left WorldPharma to pursue other opportunities elsewhere and many others were looking for their new employment opportunities as well. Unfortunately, some of these former IT and/or MetaFrame personnel had built and maintained the legacy systems in the three previously separated organizations. Mr. Collins must devise a plan to ensure that there would be sufficient IT and/or MetaFrame personnel to finish the project on time.

3.3 Global MetaFrame Support Team

At the beginning of this MetaFrame system migration project, all existing MetaFrame personnel continued to support the applications and servers that they had supported before the M&A. However, as the migration continued and some servers and applications were relocated, the support and responsibilities were delegated to MetaFrame personnel based on geographical location. For example, if a server in Michigan was relocated to Connecticut, the MetaFrame personnel in Connecticut would become the primary support for this server even though majority of the server’s users were still in Michigan and would move to Connecticut in six months or a year later.

Interestingly, Mr. Collins noticed that cohesiveness among the existing MetaFrame personnel emerged as a result of this assignment. As the servers and responsibilities were relocated, the existing MetaFrame personnel had to start exchanging more information in order to keep up with the increasing demands being placed upon them. They got to know each other better and had a chance to learn about various systems built around the world. “I am glad that they see eyes to eyes”, Mr. Collins gladly told his assistant as he realized that this was the first step for the MetaFrame support team to become truly global.

Mr. Collins knew that member selection of the global MetaFrame support team would be based on several criteria including personality, documentation skills, technical and business knowledge, etc. However, there were still many decisions he had to make about this MetaFrame global support team. In global settings, users from different geographical locations and time zones could access the same applications at virtually the same time. Thus, for the support team to become truly global, Mr. Collins had to decide how many members of this global support team would be needed, where each team member should be located, and how this global support team should be managed etc., in order to effectively provide the 24/7 support for WorldPharma’s MetaFrame system regardless of its users’ geographical locations or time zones.

4. RESULTS AND THE NEXT STEP

In June 2006, approximately two years after its official announcement, WorldPharma’s MetaFrame system migration project was completed. It was about six months later than its expected completion date (i.e., December 31, 2005). Additionally, total project cost was approximately 10% higher than its original budget of $3.0M (including hardware and software, but excluding human resource compensation). Mr. Collins and his team had consolidated all existing MetaFrame systems (from the three previously separated companies) with multiple servers running the same or similar applications into one globally managed MetaFrame system. The benefits of this MetaFrame system migration project were apparent. It was estimated that the costs of system hardware and software were reduced to approximately half of those previously spent by the three legacy companies combined. Additionally, the number of MetaFrame support personnel was also reduced from approximately 30 people to 13 people who are current members of the MetaFrame global support team.

During 2006-2007, WorldPharma maximized the value of its global MetaFrame system by expanding the number of enterprise applications that were delivered using this global MetaFrame system. Similarly, in an ongoing effort of streamlining costs within WorldPharma’s IT organization and addressing the issues about infrastructure flexibility, the CIT department planned to deploy this global MetaFrame system for WorldPharma’s operation in several other countries. For example, WorldPharma previously implemented multiple servers running client/server applications across China. In an attempt of reducing the cost of updating and maintaining hardware for WorldPharma’s operation in China, the CIT department planned to consolidate the distributed servers in China into one MetaFrame system located in Beijing. The new MetaFrame system in Beijing would connect to, be an additional part of, employ the same copy of IMA datastore, and share the same system environment with the global MetaFrame system.

5. ASSIGNMENT QUESTIONS

1. What are the advantages and the disadvantages of implementing MetaFrame software system in WorldPharma?
2. What are the advantages and the disadvantages of the “centralized” MetaFrame structure vs. the “siloed” MetaFrame structure in WorldPharma’s IT environment? Which one of these two structures should be implemented in this project?
3. As the major stakeholders of this project, what were the main concerns of the business units, the existing MetaFrame support staff and other IT support personnel, and the CIT department (especially Mr. Collins)?
4. Identify potential risks related to human resources in this project and provide your suggestion about what WorldPharma may do to manage these human resource risks.
5. As MetaFrame servers hosted critical applications for business units, to shut down any old MetaFrame servers and put them into decommission process, it was necessary to have a consistent and comprehensive controlling procedure. Additionally, a contingency plan was required in case of any migration failure. Provide your suggestion regarding the procedure to shut down any old servers and the necessary contingency plan.
6. Do you consider this MetaFrame system migration project a successful project? Provide reasons to justify your evaluation of the success or the failure of this project.
6. REFERENCES


Migrating Legacy Systems in the Global Merger & Acquisition Environment
Teaching Note

1. SYNOPSIS

This teaching case exemplifies the technical problems and the organizational issues encountered in managing a system migration project in a global M&A environment. The technical problems and the organizational issues include:

- Advantages vs. Disadvantages of different IT infrastructures in pharmaceutical companies
- Stakeholders and their concerns
- Project risks and needs for contingency plan
- Human resource planning
- Global IT support team

The case is written to enhance the understanding of managing IT projects and managing IT resources for both undergraduate level (junior and senior) and graduate level (first-year). This is a discussion case that demonstrates a real system migration project of a pharmaceutical company after its M&A. This case allows students to portray themselves as the project manager, analyze the various technical problems and organizational issues encountered in the project, and provide their suggested solutions for these problems and issues.

2. CASE OVERVIEW

As a result of the merger with CB Medicine and the acquisition of PharmaTech, WorldPharma became the world’s largest pharmaceutical company. To manage IT resources after this M&A, WorldPharma set up a new department – the CIT department. The first task of this newly established department was to develop a migration plan for various IT systems of the post-M&A WorldPharma organization, including the MetaFrame system. Additionally, a new manager – Mr. John Collins, was hired to manage the MetaFrame system migration project.

The main goals of this project were to consolidate every legacy MetaFrame system from the three previously separated companies and to develop a global MetaFrame support team. Based on these goals, a refined project scope was developed including six project objectives:

- building one globally managed MetaFrame system
- building fault tolerance
- retiring redundant servers and/or applications
- implementing standardized installation
- developing a global support team
- project duration

Then, the first issue discussed in this project was that the three legacy organizations installed different MetaFrame structures – centralized vs. siloed structures. Thus, Mr. Collins needed to analyze the advantages and the disadvantages of each structure and decide which structure the new globally managed MetaFrame system should implement.

During project planning, three major project activities were identified, including information gathering, planning of the new MetaFrame system environment, and decommissioning & migrating MetaFrame servers at each datacenter. Additionally, technical-related problems were recognized as one of the main potential project risks. As MetaFrame servers were hosting critical applications for business units’ daily operations, minimizing user downtime was strongly required. Thus, it was necessary to carefully prepare the detailed planning of each activity and the contingency plan, especially for the server decommissioning & migrating activity. Furthermore, to effectively plan and manage this project, it was essential to understand the concerns of all major stakeholders of this project.

In addition to the technical-related problems, Mr. Collins anticipated that the project could run into another serious problem related to human resources. After the M&A, employees from virtually every business unit, including some IT and/or MetaFrame personnel, had already left WorldPharma to pursue other opportunities elsewhere. Besides, many other employees were looking for their new employment opportunities. Thus, Mr. Collins would need to have a plan to ensure that there would be sufficient IT and/or MetaFrame personnel to finish this migration project on time.

Finally, as one of the objectives of this project was to develop the global MetaFrame support team, Mr. Collins would need to decide how this global support team should be arranged and managed in order to provide effective 24/7 support to WorldPharma’s employees regardless of their geographical locations and time zones.

3. PEDAGOGICAL OBJECTIVES

This case serves several teaching objectives. First, the case accentuates the technical problems and the organizational issues encountered in a system migration project after the M&A of leading pharmaceutical companies. The case can be used to illustrate the issues encountered in managing IT projects and in managing corporate IT resources. Students are required to analyze the situation and the various technical problems and organizational issues encountered, and then suggest the potential solutions for these problems and issues. After completing analysis of this case, the students will effectively learn and better understand the following topics:

- The tradeoffs between different IT infrastructures supporting IT requirements of pharmaceutical companies
- The importance of project’s stakeholders and their concerns
• Potential project risks and the needs for project planning and contingency plans
• Tactics in system migration

Second, this case can also be applied to introduce the five project management process groups (i.e., initiation, planning, execution, monitoring and controlling, and closing) as described in A Guide to the Project Management Body of Knowledge (PMBOK) by the Project Management Institute. These five project management process groups are used to organize and describe the work of a project. The case is valuable for the teaching of IT Project Management as it vividly presents the activities conducted to manage an IT project based on some of these five process groups.

4. TEACHING STRATEGY

This case can be covered within a single 60-90 minute session. It is suitable for students who are taking an IT Project Management class. The case can be used with topics such as IT infrastructure, project management process groups, identifying and performing stakeholder analysis, identifying project risks and defining risk strategies, and human resource planning.

This case covers the work of managing IT projects and the potential technical problems and organizational issues encountered in a system migration project after the M&A of leading pharmaceutical companies. The case should be distributed at least one week ahead of class time. Then, at the beginning of class, the instructor can open class discussion by having students describe the activities conducted to manage this project and link these activities to some of the five project management process groups. For example:

• Initiating process includes defining and authorizing a project (Schwalbe, 2006). In this project, the Global Project Management Office (GPMO) at WorldPharma made an official announcement apropos of this project and of Mr. Collins’ appointment as the manager of this project. Additionally, GPMO also issued a preliminary project scope specifying the main project objectives.

• Planning process includes devising and maintaining a workable scheme to ensure that the project addresses the organization’s needs (Schwalbe, 2006). In this project, Mr. Collins refined the detailed project scope, defined project activities and their sequence, identified project risks, and prepared risk management planning and human resource planning. All of these are examples of activities in the ‘planning’ project management process group.

• Executing process includes coordinating people and other resources to carry out the project plans and produce the products, services, or results of the project (Schwalbe, 2006). In this project, activities in the ‘executing’ project management process group would include planning the new MetaFrame system of each datacenter, defining responsibility of IT and/or MetaFrame and business unit personnel, setting up migration team, and starting the migration process.

• Monitoring and Controlling process includes measuring and monitoring progress to ensure that project objectives are met (Schwalbe, 2006). In this project, any business units would like to retain any applications hosted by MetaFrame servers would need to submit a business case, to the steering committee, explaining why the applications should be retained.

Additionally, at the beginning of class, the instructor can also ask students to describe the IT requirements of pharmaceutical companies. For example:

• Effective data storage and management – Pharmaceutical companies must handle very large amount of data generated in synthesizing chemical compounds for potential new drugs, conducting preclinical and clinical trials, monitoring the production of each batch of any drugs, and collecting safety data on drug uses. As pharmaceutical companies operate in a highly regulated industry, these record-keeping, documentation, and data archival are critical and IT would play a significant role to facilitate these tasks.

• Improving the productivity of clinical trials – In addition to effectively storing and managing data collected in clinical trials, pharmaceutical companies expect IT to speed up regulatory reporting, improve the targeting of physicians, manage the progress of clinical trials, and coordinate a portfolio of clinical trials across the whole company.

• Achieving FDA compliance – As the risks associated with non-compliance is severe (e.g., shutting an entire production line down and/or withdrawing drugs from the marketplace), FDA compliance is one of the most significant challenges for pharmaceutical companies. Thus, all IT systems in any pharmaceutical companies must be configured, documented, and validated in accordance with regulatory guidelines.

• Reaching efficiency goals – The layers and layers of fragmented IT systems in pharmaceutical companies make it difficult for the companies to integrate and scale their IT resources. This is costly as more than 85% of the industry’s IT spending goes toward maintaining and supporting these disparate IT systems. Then, the instructor may continue with a question related to MetaFrame software system. That is, the instructor can bring up the first question – “What are the advantages and the disadvantages of implementing MetaFrame software system in WorldPharma?” In discussing this question, the instructor should emphasize how these advantages and disadvantages are related to IT requirements of pharmaceutical companies, especially in drug R&D. Additionally, the instructor may also provide discussion on the “fat client vs. thin client” computing (e.g., Connolly and Gabel, 2004; Hall, 2006). This section should take 5–10 minutes and would nicely lead to the next following question.

The next question would be “What are the advantages and the disadvantages of the “centralized” MetaFrame structure vs. the “siloed” MetaFrame structure in WorldPharma’s IT environment? Which one of these two structures should be implemented in this project?” When discussing this question, the instructor should relate the advantages and the disadvantages of the centralized and the siloed MetaFrame structures to how the final decision to implement the centralized MetaFrame structure in this project would better match the project objectives (e.g.,
building fault tolerance, employing standardized installation, developing a global support team). Additionally, it should be emphasized that, in this project, effective communication between the project team and the business units was critical. Business units needed to be engaged at various stages of the project. Thus, the liaisons and the regular meetings between the project team and the business units were arranged to ensure that the consolidated MetaFrame system would be configured to best support the needs of different business units in WorldPharma and to help WorldPharma increase its productivity, especially in drug R&D.

For the next 5-10 minutes, the discussion should focus on the main concerns of each major stakeholder of this project. In this section, the instructor may also provide more detailed discussion about the differences among project manager vs. project sponsor vs. project champion vs. functional manager (Schwalbe, 2006).

Based on the discussion about the main concerns of WorldPharma’s existing IT and/or MetaFrame personnel, students would realize the potential human resource risks in this project. That is, this project may not have sufficient IT and/or MetaFrame personnel to finish the project on time. Thus, the instructor should spend the next 10 minutes to discuss what WorldPharma may do to manage and prepare for the human resource risks in this project.

Then, the instructor may spend the next 10 minutes to discuss the technical-related risks in this project and some tactics prepared and used to manage the technical-related risks, including procedure to shut down any old servers and contingency plan in case of any migration failure.

After discussing both the human resource and the technical-related risks of this project, the instructor may conclude that projects are unique undertakings which involve a degree of uncertainty and are inherently risky; that is, project risks are inevitable (Baccarini, Salm, and Love, 2004; Czuchry and Yasin, 2003). Additionally, the instructor may emphasize that, for IT projects, risk factors are mainly caused by the structure and the rate of changes in both organization complexity and IT complexity (Murray, 2000; Xia and Lee, 2004).

If there is time remaining, the instructor may discuss the effect of M&A on corporate IT. For example, the effect of M&A on IT expenses, managing diverse IT infrastructures, controlling IT activities, IT investment, etc.

5. ANALYSIS OF THE ASSIGNMENT QUESTIONS

5.1 What are the advantages and the disadvantages of implementing MetaFrame software system in WorldPharma?

Implementing MetaFrame software system would create a centralized IT environment for WorldPharma. This centralized IT environment could provide WorldPharma several advantages. First, as the risks associated with non-compliance can be severe, achieving FDA compliance is one of the most significant challenges for pharmaceutical companies. All IT systems in WorldPharma must be configured, documented, and validated in accordance with regulatory guidelines from FDA. In the centralized IT environment, application software would be installed on the controlled servers and only authorized personnel would be allowed to change this installation or any other system configurations. Thus, WorldPharma does not have to worry about users being able to install other applications that may invalidate the FDA compliance.

Second, the IT systems in a typical pharmaceutical company are diverse and highly decentralized (Marwaha and Van Kuikken, 2005), especially for a post-M&A pharmaceutical company like WorldPharma. The highly fragmented and heterogeneous IT environment has led to higher IT spending for maintaining and supporting the disparate systems. Thus, by carefully planning and implementing MetaFrame system to create its centralized IT environment, WorldPharma could eventually reduce the maintenance cost for its IT systems.

However, these advantages do not come without their costs. Integrating MetaFrame into an IT infrastructure adds another layer of complexity. It requires well-trained system administrators. These system administrators will need to have a firm understanding of both the MetaFrame and the operating systems (e.g., UNIX or Windows server) on which the MetaFrame is installed.

5.2 What are the advantages and the disadvantages of the “centralized” MetaFrame structure vs. the “siloed” MetaFrame structure in WorldPharma’s IT environment? Which one of these two structures should be implemented in this project?

The main benefit of the centralized MetaFrame structure is its consistency. All users would use and access the same MetaFrame system environment controlled (logically) by the same IMA Datastore (see Figure 4). For instance, a scientist in Sweden, an engineer in Japan, a manufacturing supervisor in the U.S., etc., would see and use the same MetaFrame system environment. This makes supporting users much easier. However, the downside of the centralized structure is that it can get very large and very complex.

On the other hand, the main advantage of the siloed MetaFrame structure is that business units get the environments configured in exactly the way they want. This usually means a number of smaller MetaFrame system environments configured for various business units as shown in Figure 2. However, it would make large scale support very difficult because only those people who built the environments know all the miniscule details of why things were configured the way they are. In addition, the siloed structure may lead to duplication of effort as different business units often need similar applications (e.g., document management system). This problem could be seen in the legacy WorldPharma MetaFrame environments that there were many underutilized servers running similar applications for different business units.

Furthermore, the siloed MetaFrame structure may present redundant support personnel for its various MetaFrame system environments. For example, each MetaFrame system environment of the legacy WorldPharma (e.g., MetaFrame system for manufacturing unit in Midwest US, MetaFrame system for marketing unit in East Coast US) had its own support personnel. In contrast, at PharmaTech and CB Medicine, their legacy systems that adopted the centralized MetaFrame structure employed only one team of MetaFrame support personnel.
The GPMO at WorldPharma had announced that the main objectives of this MetaFrame system migration project were to “… consolidate both local and regional MetaFrame systems into one globally managed system and to develop a global MetaFrame support team …”. Thus, the centralized MetaFrame structure would best support these project objectives. Figure 4 shows the planned MetaFrame structure of the post-M&A WorldPharma. This plan would implement the centralized MetaFrame structure.

However, as the pharmaceutical industry is highly competitive, different application software would need to be configured to best support the needs of WorldPharma’s different business units in order to increase WorldPharma’s productivity, especially in drug R&D. Thus, Mr. Collins and his project team needed to work closely with the business units at WorldPharma in deciding:

- which applications would be needed for each business unit
- how each application should be configured
- where (i.e., at which data center) each application should be installed (in order to minimize network traffic as employees of each business unit may be in many different locations)

Fortunately, it was relatively easy to decide which applications needed to be decommissioned. After the business units of the legacy PharmaTech and CB Medicine were assimilated to fit into current WorldPharma governance structure, the redundant applications from the business units of the legacy PharmaTech and CB Medicine were usually decommissioned. This preliminary migration plan was presented to every business unit to determine which parts of the plan needed to be adjusted to best support the needs of each business unit. Additionally, any business units that would like to retain any other applications could develop the business cases presented to a steering committee and explaining why the applications should be retained.

In this project, ongoing and effective communication between the project team and the business units was required throughout the project. Business units needed to be engaged at various stages of the project (e.g., planning, establishing timelines, testing) to ensure that the end results met their requirements. Thus, Service Delivery Managers (SDMs) were assigned (from some IT personnel) as the liaisons between the CIT department and the business units. Similarly, for larger and more complicated applications, project liaisons from the business units were assigned as well.

SDMs would arrange weekly meetings with the business units. At these regular meetings, SDMs could keep the business units up to date on the project progress. These meetings would also provide the business units the opportunities to adjust various requirements and/or be reminded of any major events.

In addition to these weekly meetings, numerous phone conferences were arranged. In these phone conferences, any IT and/or MetaFrame personnel, SDMs, and representatives from the business units could participate. These phone conferences would allow any business units to see what other business units were doing and to exchange questions and information with each other. This helped the business units to identify potential issues they would not have otherwise known about.
5.3 As the major stakeholders of this project, what were the main concerns of the business units, the existing MetaFrame support staff and other IT support personnel, and the CIT department (especially Mr. Collins)?

The main concern of the business units that used MetaFrame servers to host their application software was to have the stable working systems that would be supported by both the CIT department and the software vendors. These business units would have a great deal of influences on the migration process of this project. Because of their daily operations, business units would define their system requirements, set the migration schedule, and could postpone or refuse to decommission their old systems and cutover to the new systems.

The existing MetaFrame support staff and other IT personnel were those people who built and maintained each legacy MetaFrame system and provided supports of other IT services (e.g., helpdesk, network engineer, database administrator). Many of these existing support personnel held the knowledge and information about the legacy MetaFrame systems. Additionally, these existing support personnel would be a part of the project team who would migrate the legacy servers. However, because of the M&A, job security was the main concern of this group of stakeholders. Many of the existing support personnel were not sure about their future in WorldPharma after M&A. Some of them had already left WorldPharma and many others were looking for their employment opportunities elsewhere.

Finally, the main concern of the CIT department, especially Mr. Collins, was the challenges that they would face in working with the business units and the existing MetaFrame and other IT support personnel to accomplish the various objectives of this project.

5.4 Identify potential risks related to human resource in this project and provide your suggestion about what WorldPharma may do to manage these human resource risks.

Similar to many other system migration projects after M&A, the major expected benefit of this MetaFrame system migration project was the lower IT cost. By consolidating various separated legacy MetaFrame systems into one globally managed system, WorldPharma would require much less resources (i.e., hardware, software, and support staff) and would significantly save its IT expenses. That is, eventually, WorldPharma would eliminate many existing IT and/or MetaFrame support personnel. Thus, all existing IT and/or MetaFrame support personnel from the three legacy companies were not sure about their future with WorldPharma. Some of these IT and/or MetaFrame support personnel had decided to take their new opportunities in other organizations and many others were looking for their employment opportunities elsewhere.

However, the migration team who would build the new MetaFrame system would be the existing IT and/or MetaFrame support personnel at each datacenter. Therefore, this MetaFrame project faced a serious human resource risk that there might be insufficient personnel for the project or some project team members might resign in the middle of the project.

The approach that the CIT department applied to minimize this potential human resource risk was to offer term-contracts with benefit packages to existing IT and/or MetaFrame support personnel to motivate them to stay with the company until the end of their projects. That is, the CIT department assessed human resource requirements of each planned IT project and evaluated each existing IT and/or MetaFrame support personnel based on several criteria (e.g., skill set, experience, education). From these results, the CIT department identified those IT and/or MetaFrame support personnel who would retain with WorldPharma and those who eventually would be let go. Then, the proposals were prepared for each IT and/or MetaFrame support personnel. For those who would retain with the company, the proposal included job duty, compensation, and benefit, etc. For others who eventually would be let go, the proposal included term-contract schedule and benefit package that the employee would receive if the employee stayed with the company and effectively performed the assigned responsibility until his or her term-contract schedule arrived.

In pharmaceutical industry, term-contracts are often used for short-term employment (e.g., up to 2 years), even for the scientists in drug R&D. Some pharmaceutical companies preferred to use term-contracts and also argued that such arrangements offered a way of investigating particular research areas and/or personnel without making a long-term commitment (Jones, 1996). Fortunately, the Human Resource department at WorldPharma was familiar with the term-contract arrangement. The Human Resource department worked closely with the CIT department in arranging the term-contracts with very attractive benefit packages. These were offered to IT and/or MetaFrame support personnel to motivate them to stay with the company until the end of their projects. With this approach, the CIT department was able to put together the required personnel for each IT project, including this MetaFrame system migration project.

5.5 As MetaFrame servers hosted critical applications for business units, to shut down any old MetaFrame servers and put them into decommission process, it was necessary to have a consistent and comprehensive controlling procedure. Additionally, a contingency plan was required in case of any migration failure. Provide your suggestion regarding the procedure to shut down any old servers and the necessary contingency plan.

In this project, for each legacy server to be shutdown, it would require a shutdown date specified and signed off by the system owner (i.e., the business unit); then, this sign-off document would be submitted as a service request to the helpdesk (who would forward it to the project team for decommission process). This procedure would require that the system owner be identified. Additionally, before signing off the service request, the system owner would have to confirm that all applications and users had already been migrated to other servers or that the applications were simply eliminated.

To provide the contingency plan in case of any migration failure, the project team decided to set up a parallel system called “swing servers”. The applications would be installed on these swing servers (i.e., the new MetaFrame servers). Once the applications on each swing
server were fully tested, users would be given access to their applications on the newly tested swing server and the decommission process of the legacy server could start.

In the decommission process, after the system owner had signed off and submitted the service request to shut down the legacy server, firstly the legacy server would be merely disconnected from the computer network. The legacy server disconnected from the computer network would be left intact, sit in a one-week “quiet period”. This legacy server would serve as a contingency plan for the new server as the legacy server could be easily brought back by reinserting its network connection. Additionally, on several occasions, this “quiet period” alerted the migration team that there were some users of the applications who were unaware of the migration as these users complained that the applications on the legacy server became inaccessible.

Setting up the parallel system is one of the smoothest ways to migrate applications, while at the same time, minimizing user downtime. In the event of unforeseen problems, users can be immediately redirected back to the original systems. However, the downside of this approach is the increased cost of hardware since running parallel systems typically requires the project to double its hardware requirements.

5.6 Do you consider this MetaFrame system migration project a successful project? Provide reasons to justify your evaluation of the success or the failure of this project.

In IT projects, users want “happiness;” while project managers are interested in staying within budget and on time (Wateridge, 1998). Similarly, two different perspectives of IT project success were identified (Agarwal and Rathod, 2006) – internal perspective linking to time, cost, and scope that underlie the value of project monitoring and control processes; while external perspective focusing on customer satisfaction and system quality. In sum, three criteria measuring IT project success include (Schwalbe, 2006):

- Meeting scope, time, and cost goals of the project
- Satisfying other needs of customer or project sponsor
- Delivering certain project objectives

When WorldPharma finished this MetaFrame system migration project in June 2006, although the project was finished later than the planned project deadline, the company fulfilled several project objectives including:

- Consolidating all MetaFrame systems into one globally managed system
- Employing standards (e.g., hardware components, operating systems) for every MetaFrame server
- Building fault tolerance (i.e., the Replicated IMA Datastore at each datacenter, see Figure 4)
- Developing a global MetaFrame support team.

Additionally, although the project was approximately 10% over budget, the executives at WorldPharma were pleased with the result as, in long term, this project would help the company save costs of its system hardware, software, and maintenance. Finally, this MetaFrame system migration project served as a pilot project to streamline costs within WorldPharma’s IT organization and to address the issues about IT infrastructure flexibility. The consolidated MetaFrame system delivered by this project also served as the foundation for other systems supporting WorldPharma’s global operation.

Therefore, we would consider that this MetaFrame system migration project was a successful project.

6. REFERENCES


AUTHOR BIOGRAPHIES

Albert L. Harris is a Professor . . . Authors are required to submit brief biographies and a black and white passport type photo for inclusion in the journal (approximate size shown on the left). Author biography and photograph (head only) are printed at the end of the article but before any attachments or appendices. Pictures should be in .jpg format and 1.25” wide by 1.5” tall. Each author's name is to be in bold type.