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Implementing An Integrated Software Product at Northern Steel

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EXECUTIVE SUMMARY

This case describes the implementation of the payroll and human resources modules of an integrated software product in a large manufacturing organization. The firm is located in a large metropolitan city and system implementation took place following a major organizational re-structuring (from a public to a private enterprise) and downsizing (from 10,000 to 2,000 employees) effort. The extensive maintenance required by the existing legacy systems and the high cost of modifying them to address the year 2000 problem motivated the company to acquire an integrated software product from a vendor, and adapt it to the organization. Implementing the software took longer than scheduled and was 35% over budget. Some of the problems encountered include conflicts between the accounting and human resources departments, technical difficulties in building interfaces to existing systems, inadequate staffing of the project team, the IT director who left during the project, and a poorly functioning steering committee.

BACKGROUND

The Steel Industry

In 1997, the North American steel industry consisted of 96 companies (Standard & Poor's, 1997). Reflecting the particularities of the steel making process (see Exhibit 1), this industry is principally made up of two types of producers: integrated mills and minimills. Integrated producers such as USX, Bethlehem, and Dofasco make use of expensive plants and equipment to produce from two to four million tons of various steel products per year. In contrast, minimills such as Nucor, Birmingham Steel, and Co-Steel Lasco produce 400,000 to over two millions tons per year by melting recycled ferrous scrap in electric arc furnaces to make a limited number of commodity carbon steel products. Originally small-scale plants serving local markets for structural steel products, North American minimills have become major players in the 1990s and compete with integrated producers in most product areas (Standard & Poor's, 1997).

A wide gap in labor productivity remains between minimills and integrated producers. For example, in 1996 Nucor's 6,600 workers produced 8.4 million tons of raw steel, or 1,273 tons per employee. LTV, the United States' third-largest integrated steel maker, produced 8.8 million tons of raw steel with a work force of 14,000; this equaled 629 tons per worker.

Minimills have a labor cost advantage because they typically employ nonunion labor, whose compensation is often directly linked to production and profits. Integrated companies employ union labor which is more expensive over the course of the business cycle.

To survive in the long term, integrated producers need a technological breakthrough that will make them more competitive with minimills by reducing their labor and capital costs. Despite aggressive cost reduction and more flexible labor practices, integrated steel making remains more capital- and labor-intensive than minimill steel making. (Standard & Poor's, 1997).

The trends experienced by all players of the industry throughout the 1990s include the globalization of major customers (e.g., automotive, appliances), continued pressure from offshore excess capacity (e.g., Russia, Asia), continued pressure for environmental improvement, rapid and accelerating technological change, and the challenges of alternate materials in traditional markets (e.g., autos, bridge construction). Many firms have responded to these pressures by reinventing steel making through corporate repositioning (e.g., increased customer focus, cost reduction, organizational restructuring), by making large investments in technology and employee skills, and through increased collaborative research efforts (e.g., thin strip casting, process modeling, electronic sensors). (Bain, 1992)

Northern Steel

Established in the northeast as a public company over 30 years ago, Northern Steel was a money losing operation throughout the latter part of the 1980s and in the early 1990s. Employing a workforce of over 10,000 employees, it was sold to an international conglomerate and became a private enterprise in 1994. The new ownership immediately started a process of downsizing the company to improve productivity and increase its market share. Over the next couple of years, numerous facilities and divisions were either sold or closed, and the size of the workforce was reduced to around 2,000. By 1997, a much leaner and customer-oriented Northern Steel had only six facilities that manufactured and distributed around 1.5 million tons of steel products in North America (including sheets, slabs, weld pipes, billets, bars, rods, wires, and pellets). In 1997, Northern Steel's annual revenues were $900M, and more importantly, it had become profitable once again. However, the organizational culture developed over the past decades as a heavily unionized public company proved more difficult to change. The apathy of a slow moving bureaucracy and a nine to five mentality could still be seen rearing its head relatively frequently despite the privatization and the downsizing, and the strong pressures they entailed to improve productivity and to cut costs in all areas.

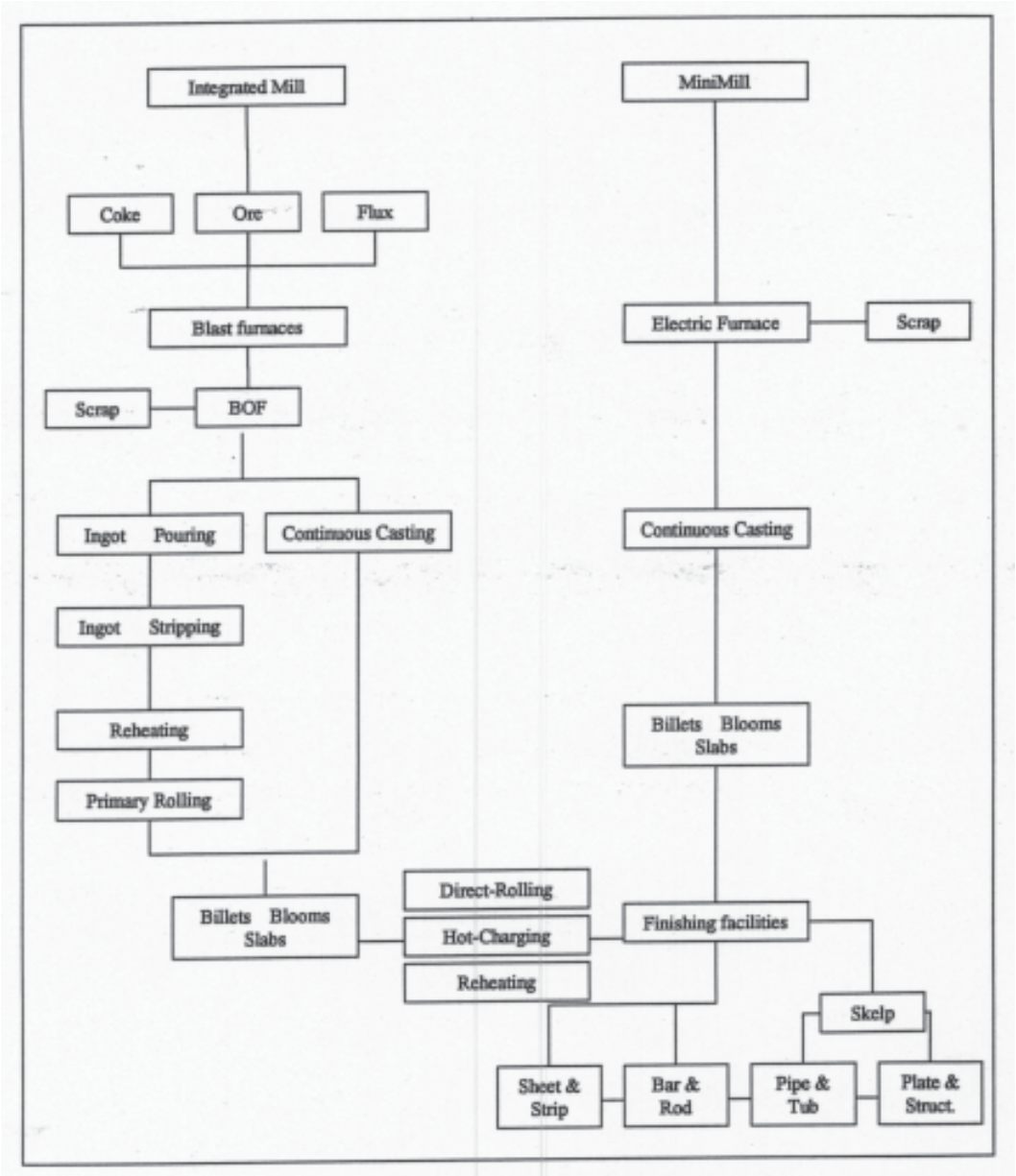
SETTING THE STAGE

IT at Northern Steel

Since the early 1970s Northern Steel had computerized its main transaction systems including its payroll and general ledger with most programs written in COBOL. With the introduction of microcomputing in the 1980s, many user departments started developing their own applications. Some of these were quite substantial. For example, one accounts payable application which handled over $50M had been developed by a user in the accounting department.

During the mainframe years, the IT department had a budget of around $3M and had a staff of 30. By early 1990s, problems in finding and hiring personnel having the requisite skills to maintain the legacy systems, and the constant difficulties experienced in servicing the old mainframe,

The Steel Making Process (Bain, 1992).



convinced Northern Steel to scrap its outdated hardware and to outsource the operation and maintenance of its mainframe systems to a large consulting company. The widespread practice of end-user development had also resulted in a decentralized IT structure. Thus, by 1990, Northern Steel's IT department was reduced to a staff of only five professionals who were responsible for telecommunications and network management, establishing company-wide software and hardware standards, and for approving their purchase. The remaining IT responsibilities were decentralized to the different manufacturing facilities and functional areas, with many former IT personnel working in, and reporting to, user departments. For example, the staff responsible for payroll systems worked in the accounting department and reported directly to the company comptroller. At Northern Steel, IT was frequently seen as a cost item. Many senior executives felt that, in general, the less Northern Steel spent on IT the better off the company would be.

The Payroll System

In 1994, an IT strategic plan was prepared and it budgeted $25M to the updating of all legacy systems and their migration towards newer and more accessible information technologies. Among these, revamping the legacy payroll systems was given top priority in view of several considerations. The accounting department, responsible for Northern Steel's payroll, was quite anxious to update the legacy payroll system and applied continuous pressure to prioritize its implementation. The extensive modifications the payroll system needed in order to deal with the Y2K problem added considerable urgency to the problem. Moreover, the existing payroll programs mostly contained spaghetti code written by programmers many of whom had long left the organization. As a result, the payroll system was already costly to maintain and difficult to manage. Frequently, changing one of its parts introduced bugs to its other modules. Thus, making all the Y2K changes to the legacy system was, at best, a scary proposition. Finally, the fact that the employees of Northern Steel were represented by several unions each with a different collective bargaining agreement meant that the payroll system was already complex, and had to be modified every time Northern Steel signed a new collective bargaining agreement.

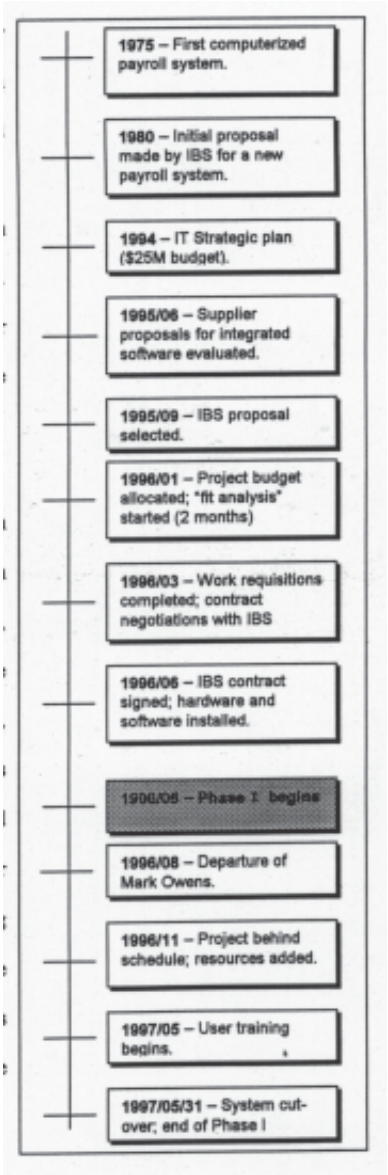
The idea to replace the existing payroll system was initiated in 1980, and a proposal was obtained from Integrated Business Solutions (IBS), a software development/consulting company. However, Northern Steel's lack of resources at that time had prevented the then public company from pursuing the issue further. Following the privatization of Northern Steel, and according to the 1994 strategic plan, alternative solutions to replacing the legacy payroll system were examined. Initially, outsourcing the payroll was considered. The available products promised improved payroll accuracy and up to 80% reduction in payroll preparation time and offered a wide range of options including tax filing and deposit services, automatic check signing and insertion into envelopes, unemployment compensation management features, and a variety of management reports. While such an alternative appeared satisfactory from a purely payroll perspective, it would do little to improve the existing human resource (HR) systems, many of which were also tightly coupled to the payroll system.

At this time, the director of the HR department suggested the purchase of an integrated software product to replace the existing payroll and HR systems. In his dealings with a large bank, he had observed Integrated Business Solutions' (IBS) software product being used, and had been quite favorably impressed by the bank's positive evaluation. Since Northern Steel lacked the necessary resources for in-house development, adopting an integrated software product to replace both the payroll and HR systems simultaneously, while initially more expensive and challenging, appeared as a better long term solution. Given the general consensus about the need to scrap the legacy payroll system and adopt an integrated software product, it was decided to prepare a request for proposal (RFP) and to send it to suppliers.

In June 1995 the IT department prepared a relatively short RFP document that consisted of 14 points. These provided broadly described requirements (e.g., the modules needed such as payroll, workman's security, employee skills, medical etc.; the need for compatibility with the planned organizational platforms such as Unix and Oracle, and a client/server architecture; the possibility of modifying the product so as to fit Northern Steel's business processes) and guidelines concerning

what information the suppliers needed to provide (e.g., the estimated cost to Northern Steel of modifications that would be needed, the cost of maintenance services, the availability of support from the supplier). Suppliers of integrated software products were contacted and asked to submit offers. The evaluation of the submitted proposals was completed by the end of September 1995.

Whereas other competitors offered software that integrated several business processes, including HR and payroll, IBS sold a "best of breed" product that consisted only of an integrated payroll and HR system but its offer included considerable customer support and service. With strong backing from the HR department, the Selection Committee chose IBS's offer as being the most suitable for Northern Steel. However, this was not a unanimous decision since the accounting department did not agree that IBS's software was the one that most suited their needs. Despite opposition from accounting, the Selection Committee voted to go ahead with IBS and an estimated project schedule and budget was prepared. The budgeted amount included the necessary funds to purchase IBS's payroll and HR modules, including its employee benefits and compensation modules, and to finance a project for their implementation. IBS's pension module was excluded from the purchase in view of the fact that Northern Steel had relatively recently implemented a new pension system. The necessary interfaces between the existing pension system and IBS would have to be built during the project. The project schedule and budget were submitted to senior management for approval and the allocation of the requisite funds.



CASE DESCRIPTION

Senior management approved the Selection Committee's decision, and allocated the requested funds in January 1996. Based on the Committee's recommendation, Steve Collins was assigned as project leader. Working in the accounting department and reporting to the comptroller, Steve had been with Northern Steel since 1980 and was well-known across the company. Over the years, he had developed several accounting applications as an end-user and had gained experience as a project leader by managing several projects in accounting and other departments. Steve was quite excited about the IBS project. While this was going to be Northern Steel's first experience with the implementation of an integrated software product and Steve's first attempt at managing a large project team, he did not foresee too many problems: "With a package, all we have to do is implement it, and it should not take too long."

To oversee the project, a Steering Committee was formed. Its members included the IT Director, Mark Owens, an experienced and well-respected professional, and senior executives both from the accounting and HR departments. In addition, a five-member project team including two IT department staff and one representative each from accounting and HR was also created. The selection

of each was left to their respective departments.

The next two months were spent in a period of "fit analysis." During this time, a User Committee consisting of ten HR employees, two accounting employees and one IT staff was also created. This committee's mandate was to examine the IBS software and to recommend a list of modifications to be made to IBS so as to satisfy Northern Steel's payroll and HR information requirements. The modifications and additional functionalities requested by the User Committee were communicated to the project team in an informal manner, and at times, verbally. Examples of the type of changes requested from the IBS software included changing the paycheck format, incorporating the different overtime rate calculations, calculating payroll based on hourly salaries, and preparation of new reports. Based on the requests they received from the User Committee, the project team prepared a written work requisition and subsequently evaluated their feasibility and decided which IBS functionalities to keep and which ones to modify according to the work requisitions.

All too frequently, the modifications and supplemental functionalities requested by the User Committee appeared more like a wish list to the project team. According to Steve, users had difficulty understanding that certain hard to reconcile differences existed between the way things were done at Northern Steel and the way the IBS software was designed. As a result, the project team ended up discarding approximately half of the requests received from the User Committee.

By March 1996 a list of work requisitions was finally arrived at and submitted to the legal department for approval. These were approved in June 1996 and a contract for a two-phase project signed with IBS. Phase I of the project, scheduled for completion in February 1997, was started immediately following the signing of the contract. The objective of this phase was to implement the payroll module of IBS as well as parts of its HR system such as its insurance, accidents, and HR administration modules. IBS started to install the hardware and software environment (the network, the server, work stations, Unix and Oracle) and to train Northern Steel's IT staff in their use.

During the first six months of the project, little progress was made. All user members of the project team continued to work full time in their original jobs and so, could not devote much time to the IBS project. Moreover, the prevalent organizational culture meant that many users had little motivation to stay after hours for the sake of the project. In addition, replacing the old systems with IBS meant that a number of jobs would disappear from the HR department, creating some anxiety and lack of cooperation among the HR personnel. Another blow came in August 1996 when Mark Owens left Northern Steel. Up until then he had been one of the project champions and had been instrumental in resolving several conflicts that had arisen between accounting and HR. His departure also created a certain void in the Steering Committee. Its meetings were gradually held less frequently and eventually disappeared.

An added difficulty which slowed progress stemmed from the technical challenges encountered in building interfaces between IBS and the existing pension system. Moreover, during this period Northern Steel was in the process of negotiating a collective bargaining agreement with one of its large unions. Preoccupied with this process, many senior executives were unwilling to spend too much time on the IBS project. For example, when Steve tried to discuss the project with the director of the HR department, the response he got was "Listen, I am trying to negotiate salaries for the next five years and we're talking over a billion dollars here, so don't bug me."

By November 1996 the project had fallen behind schedule by several months and Steve was quite concerned with the slow rate of progress. He finally convinced senior management that remedial action was needed and this resulted in the addition of two more members to the project team, one from accounting and one from HR. In addition, all team members were now assigned to the project on a full time basis. These changes improved the situation considerably, and the project started to advance at a more rapid pace.

The next six months were spent with making the necessary modifications to the IBS software and developing its database. While this activity was IBS's responsibility, all data being converted had to be validated by the users concerned. Their input was necessary since they knew all the compensation and benefits rules and procedures that were being incorporated into hundreds of tables in the new database. However, this process took longer than anticipated. The old payroll and HR systems consisted of numerous poorly structured files some of which contained over 200 fields.

Cleaning them up and making sure all the data they contained would be conserved in Oracle's relational tables was in itself a challenging task. According to Steve, an added difficulty came from the user representatives in the project team who had problems grasping elementary database concepts and needed a lot of help with the design.

Moreover, the user members of the team were frequently unable to decide without consulting other users. During these consultations it became clear that many of the work requisitions discarded earlier in the project were actually needed. For example, at Northern Steel, salaries were calculated on a daily basis but the IBS software determined paycheck amounts by first converting these into hourly rates which were then summed up over two-week periods. This process sometimes resulted in rounding errors of one cent. However, during consultations it was discovered that not only any such deviations were totally unacceptable to the users (and to the unions) but that paychecks had to be exact to three decimal points. This meant that there was no choice but to make the necessary changes to the IBS software to satisfy this particular requirement. Numerous such requirements re-surfaced as Northern Steel's business processes were once more passed under scrutiny. As a result, many previously discarded work requisitions had to be re-integrated into the modifications already made to the IBS software. During this period, Steve frequently felt frustrated by the lack of flexibility exhibited by the user departments who approached the whole process with a "Today we are at this point and we won't go back" attitude. In addition, the project was being delayed further and since all budgeted funds had been spent, additional funding had to be requested from senior management. Steve felt the pressure mounting.

Nailing down all the requirements, completing the database design, writing and testing more than the thirty data conversion programs needed to populate the IBS tables took the project well into May 1997. At this time, preparations to cut-over from the old systems to IBS were undertaken. The accounting and HR personnel were trained over the first three weeks in May through a 3-day training program that was repeated to groups of users. Those who participated during the project were trained first, and in turn, they trained the other users.

While running the old and the new system in parallel was considered as an option, it was discarded due to the approximately twenty additional personnel and the associated expenditures it would have required. All the data from the old systems had to be converted and transferred to the IBS databases rapidly and without error. This requirement was mainly due to the unions who were quite inflexible with regards to potential delays or errors in the issuing of worker paychecks. Despite firm promises that all errors would be eventually corrected, they refused to accept any delays or mistakes in the paychecks. This meant that the all conversion and cut-over activities would have to be completed over a weekend, putting additional pressure on the project team.

The cut-over took place during the last weekend in May. Tests were run first with one employee, then with 50, and finally with all employees. During these tests, both the old system and IBS had to be run in parallel and this turned out to be more complicated than anticipated. In addition, some of the conversion programs were found to contain several errors, all of which had to be corrected on the fly. It all made for a very stressful Sunday. However, by late Sunday night all modules were working properly and IBS was up and running.

After a four-month delay from its scheduled completion date and at a cost that was 35% over budget, the IBS system was put into use at the end of May 1997. During the year that followed it has functioned without any major problems. The users have no major complaints regarding functionality or ease of use.

CURRENT CHALLENGES

In August 1998, Steve was wondering whether or not to start the second phase of the IBS project. During Phase II, scheduled to take six months, the remaining HR modules of IBS which include the medical, workman's security, and employee skills systems were to be implemented. These modules were considerably more complicated than those installed in Phase I and Steve was not yet sure that enough time had elapsed to allow everyone to catch their breath and to get used to the IBS software.

ENDNOTE

[1] In order to maintain confidentiality, the name and geographical location of the companies concerned as well as the names of the individuals involved in the case have been disguised.

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