# Data Warehousing Failures

Eight studies of data warehousing failures are presented.  They were written based on interviews with people who were associated with the projects.  The extent of the failure varies with the organization, but in all cases, the project was at least a disappointment.

Read the cases and prepare a one or two page discussion of the following:

1.  What's the scope of what can be considered a data warehousing failure?  Discuss.
2.  What generalizations apply across the cases?
3.  What do you find most interesting in the failure stories?
4.  Do they provide any insights about how a failure might be avoided?

## Case Studies of Data Warehousing Failures

### Auto Guys

Auto Guys initiated a data warehousing project four years ago but it never achieved full usage.  A initial support for the project eroded, management revisited their motives for the warehouse and decided to restart the project with a few changes.  One reason for the restructuring, according to the proje manager, was the complexity of the model initially employed by Auto Guys.

At first, the planner for the data warehouse wanted to use a dimensional model for tabular information.  But political pressure forced the system's early use.  Consequently, mainframe data was largely replicated and these tables did not work well with the managed query environment tools that were acquired.   The number of tables and joins, and subsequent catalog growth, prevented Auto Guys from us data as it was intended in a concise and coherent business format.

The project manager also indicated that the larger the data warehouse, the greater the need for hig level management support – something Auto Guys lacked on their first attempt at setting up the warehou Another problem mentioned by the project manager was that the technology Auto Guys chose for the project was relatively new at the time, so it was not accepted and did not garner the confidence that a pro using proven technology would have received.  This is a risk inherent in any "cutting edge" technology adoption.  The initial abandonment of the project was undoubtedly hastened by both corporate discomfo with this new technology and the lack of top management support.

A short time after dropping the project, top management felt pressure to reestablish it.  Because A Guys initially planned an enterprise-wide warehouse, they had considerable computer capacity.  It was p to use on a much smaller project that focused exclusively on a single subject area.  Other subject areas we due to be added once the initial subject area project was completed.  Auto Guys expects to grow the warehouse to two terebytes within a year or two and eventually expand to their projected enterprise-wide data warehouse.  The biggest difference between pre- and post-resurrection will be that the project will evolve incrementally.

Given his experience with the warehouse, the project manager made the following summary observations: (1) the management of expectations is critical to any sizeable data warehousing project; (2) proven technology, although not essential, does make the project easier to explain and justify; and (3) the

construction of a sizeable data warehouse should be treated more like and R&D effort instead of a typical project because of the time it takes to complete the project, the amount of money involved, and the short-term focus of top management.

**Government Research Laboratory**

The Government Research Laboratory (GRL) has a finance department in each of the fifteen nearly identical laboratories that report to its national home office. As a member of the finance team, Bob was familiar with the monthly financial reports required by the home office. Although the financial reports themselves were not complicated, access to the mainframe where the data was housed was necessary, and understanding of COBOL was needed to generate any report that differed from the standard. Once a month reports would be distributed in paper form and each member of the finance team would sort through them and file them away. If the reports required any alteration, then someone from IS, or one of two people from finance familiar with COBOL, was contacted.

Because of these reporting difficulties, an IS manager made the suggestion that the company's first data warehouse be constructed, and that the finance department be the primary beneficiary. Two people from IS began to work full-time on the project and a financial analyst also joined the group. The IS manager then offered a bonus to the IS technicians if they could get the data warehouse up and running by the end of the fiscal year which was just four month away.

Both the IS and the finance members of the team, firmly rooted in reality, knew this would be a difficult if not impossible task. But they resolved to give it their best shot and attempted a full transfer of all available reports to the warehouse. When it became clear that this was too ambitious, they cut out all of the detailed reports and focused on just the summaries, assuming the more detailed material could be integrated at some point after the initial deadline.

The team was successful and had all summary reports transferred to the data warehouse at the end of the fiscal year. The fact that the necessary tables were up and functional, however, was not an indicator of future success.

The first problem involved changes to the mainframe database which were initiated at the same time, but uncoordinated with, the data warehousing project. At the same time the foundation for the data warehouse was being laid, the planning system on the mainframe was undergoing modifications not captured in the data warehouse. In particular, changes in cost accounting standards within the organization changed the number of key summary categories from the standard five used in the past to seven, rendering the traditional five next to useless.

The second problem occurred when the goal to establish the data warehouse became the end goal. As the GRL financial analyst for the team describes it, the feedback and modification period he had anticipated after September never came. The preliminary fix became the permanent solution. The analyst later learned that IS had always intended to set the system up but only funded its basic maintenance. Modifications were not in the budget and the finance department, only minimally included in the warehouse project, never had a budget that would fund the inclusion of more data and alterations to the system.

Essentially, GRL found itself with a data warehouse that contained too little data and data that was outdated because of format changes in GRL's cost accounting standards. Also, neither finance nor IS budgeted for changes necessary to create a fully functional data warehouse. Those two problems alone would have killed most data warehouse initiatives, but the problems did not end there.

The data warehouse was supposed to solve two accessibility problems. One involved the need for COBOL language expertise whenever a report required alteration, and the other involved the sheer mass of printed documents being disseminated and archived. Instead of providing a solution, reports theoretically

available on a network were handled in much the same manner as the old reports. For one thing, the data access software installed on each user's PC was frequently incompatible with the mix of software already there. Many end-users, therefore, found access to the data warehouse difficult, and those who were able access the data warehouse had such bad experiences with the new system they just did not use it. Also, the small minority that did not experience accessibility problems simply printed hard copies of the reports, which was no great change from how things had been done in the past. Additionally, the programming barriers in existence when COBOL knowledge was necessary simply changed form. PowerBuilder, very much a programmer's tool, was selected to build the user interfaces. Ironically, IS only had one individual with PowerBuilder skills, thus creating more of a bottleneck than had existed with COBOL.

The situation remained the same, if not worse, for three years following the first warehousing initiative. Finally, another IS project manager became interested in the idea of breathing life into the old warehouse. He was motivated by the organization's solution to the Y2K problem, which involved abandoning the old mainframe system and transferring the old reports to the warehouse. Fortunately, his interest was accompanied by funding that allowed the enhancements anticipated at the very beginning of first project to finally be realized. Also, all users are able to access Web-based reports.

Several things should have been done differently at GRL: (1) The warehousing initiative should h been in sync with mainframe changes and other IT initiatives throughout the lab; (2) Planning and resour should have been projected much farther into the future; (3) A pilot should have been done which probab would have identified a number of technical and fine tuning problems; (4) Deadlines should have reasonable.

Still, given the most recent developments, GRL's financial analyst classifies his experience as a partial disappointment. "It could have been so much better," he explains. "It could have been done right…for the right reasons."

## Complicated Systems

The manager for Complicated Systems' IT client information center started her job three years ag That was six months after Complicated launched its data warehousing initiative that started with initial interest from the chief financial officer but shortly thereafter received its support from Complicated headquarters. A small group of people from Complicated's main office, possessing no experience with d warehousing, decided which data would be appropriate and which data access tools would be utilized. T set limits on the future of the system based primarily upon the types of reports corporate headquarters assumed everybody needed and their arbitrary selection of OLAP tools.

With corporate headquarters championing the effort and supplying funds, the project had a lot goi for it. However, end users were not brought into the picture even though they were the targeted beneficiaries. Information was immediately accessible to sales, service, marketing, and finance divisions around the world but it was not the right information.

Luckily for Complicated, certain things beyond strong corporate championing and finding worke Complicated's advantage. Extenuating circumstances included corporate's initial design decision, the appearance of new initiatives from the marketing division, as well as top management, and the turnaroun that the data warehousing project manager bought to the IS division.

First, an initial decision was made to Web-enable the database. This meant that although the information originally disseminated by the organization was of little value to those outside of top management, flexibility existed that would later allow the system to be put to use.

Second, independent initiatives from marketing and top management at headquarters, as well as more vocal end users than had existed in the past, started the move toward making the data more accessib

and relevant to users. Specifically, marketing wanted access to valuable data already gathered. At the sa
time, corporate headquarters was experiencing difficulties it thought might have solutions within the data
warehouse. This further fortified the commitment of central management to their belief in the strategic
benefit of the data warehouse and elicited moral support that went beyond the dollar commitment already
made.

Third, and most difficult to assess, was the arrival of a new project manager to the IT client
information center. When she arrived, the data warehouse, intended to support 140 branch offices and
averaging four users per office, was going nowhere. The system contained data of little relevance to anyo
outside of Complicated headquarters and the end users identified by management were unimpressed.

Turning the situation around required: (1) informing management of the lack of practical applicati
of the warehouse; (2) obtaining adequate input from the end users to build a more useful system; and (3)
translating all the input from marketing and central management into a technical solution. The past three
four months, according to the project manager, have seen the emergence of a system much more open to
needs of users. They have opted out of OLAP, selected tools more appropriate to a changing reporting
structure, and bridged the communication gap between central management and the numerous branch
offices.

Complicated was well on its way to a complete data warehousing failure for two significant reaso
no user involvement in determining information requirements and a poor data warehousing tool selection
process. The situation is turning around, however, through the efforts of the data warehousing project
manager, the continuing need for a data warehousing capability, and the fortuitous early decision to Web-
enable the warehouse.

## North American Federal Government

A real-estate and property management unit in the North American Federal Government initiated
and co-sponsored a data warehouse with the IT department. The IT department wrote a formal proposal.
it, an architectural plan was specified, costs were estimated at $800,000, the project's duration was
estimated to be eight months, and the responsibility for funding and manpower was defined as the busine
unit's. The IT department never heard if the proposal was accepted but proceeded with the project assum
that there had been no problems with the proposal.

The project actually exceeded its eight-month schedule and lasted almost two years. Several facto
contributed to the extra time. One was that the business unit stretched the detailed data analysis from one
and a half months to nine months. Another was that the business unit kept expanding the planned user ba
Over a six-month period, the number of planned users grew from 200 to 2,500. Also, to acquire the right
technology for this project, a formal approval process of the Federal government took almost a year. Thr
weeks prior to technical delivery, the project was canceled by the IT director. The rationale was that the
business unit was actually several months away from accepting deliver. Yet, six weeks after cancellation
new interest in populating the warehouse emerged, but in the end, nothing was ever delivered and this fai
endeavor cost the organization approximately $2.5 million.

There were three main reasons for the failure of this data warehouse project. One was lack of foc
The business unit had a difficult time identifying the scope of the project. It provided an information
architecture and data framework but the details were defined very loosely. Also, the business unit kept
pushing back the milestone dates which gave the impression that the project was neither urgent nor
important.

Internal politics was another driving force behind this data warehouse disappointment. First, the
business unit leader prevented analysts on the project from talking to the ultimate end users, but the reaso

was uncertain.  Second, the business unit leader would go over the IT project leader' head and reassign st
to different tasks without informing the IT project leader.  This further led to ambiguity as to what was to
accomplished and when.  In the end, it was believed that the cancellation of the project was primarily
because the IT director feared supporting a data warehouse.  Staff and funding had recently been cut, and
such an endeavor would further drain IT resources.

In hindsight, the IT project leader would have done two things differently.  First, he would not ha
allowed the politics and overriding of authority to prevent inopportune and incorrect decisions as well as
lack of direction.  Second, the original plan for this data warehouse was to build a warehouse framework
with a common language and then spin off subject area data from it.  The manager believes that a better
approach would have been to start with data marts and them work toward a full-blown data warehouse.

## High-Tech Company

At a technology-driven firm in the Western United States, the marketing and finance departments
needed information such as trend analyses to make operational and strategic decisions.  Because this
information was vital, a separate department was generating reports solely to support this need.  Howeve
IT management suggested a warehouse solution which would provide the same information but at a lowe
cost.  The company decided to buy a packaged warehouse for a little over a million dollars.  While this
purchased solution was marketed as a data warehouse, it really only contained transactional data.  The en
result was not a data warehouse but an operational data store, and this data store did not provide useful, h
quality data.  So, after a year and a half, the project was scrapped.

However, IT believed the software purchased, not the idea of a warehouse, was the problem.
Therefore, IT proposed a second warehouse to upper management and this one was to be built with the
appropriate architecture.  The approach was to build compatible, independent data marts.  As satisfaction
within the company for the data marts increased, IT planned to integrate the different data marts into an
integrated warehouse.  A formal proposal was written which specified data sources, business questions, c
for a consultant, and the length of the project (four phases around three months in each phase).  What wa
interesting about this proposal was that IT did not want to highlight the costs of the project because the
previous purchased warehouse had cost so much and ended up failing.  Therefore, no money was formall
budgeted for extraction, cleansing, transformation, and loading tools.  The rationale was that once the fir
phase of the project was up and running, management would feel more comfortable with the endeavor an
want to commit additional resources to it.  Until then, the only other resources budgeted for were a
consultant and a small amount of IT staff time.  The IT employees were supposed to work on the project
only in their spare time.  Over the course of a year, the employees spent about six weeks worth of full-tim
work.  Moreover, the vice presidents of the business areas for which the warehouses were being built we
not heavily involved, so it was difficult to pull resources from those departments to assist with the projec

At the time that the first extraction for the warehouse was to take place, a change in the position o
vice president of IT occurred.  The new vice president had a warehouse project that was previously
established with its own project team, architecture, and tools.  So, the second project was dropped and the
newer project replaced it.  However, due to delays, unsuitable data sources, and another turnover in the
position of vice president of IT, the "third" warehouse never came to fruition.

In this company, three different warehouse projects failed.  The first was due to inappropriate
software; the second to lack of formal commitment from management and organizational turnover; and t
third to inappropriate data sources and, again, organizational turnover.

Despite these setbacks, this company is reviving the initial in-house warehouse project.  The new
vice president has hired a director to oversee decision support and warehousing, so resources from IT hav

been formally committed.  However, while the project is currently in progress, management commitment from other departments is still not very strong.  They are afraid this project will also be a failure.

In hindsight, one of the project team members said that the in-house data warehousing project sho have been proposed when the company was performing its budgeting.  This might have increased management commitment by formally budgeting resources (staffing and expenditures) for the project.

## North American Tax Agency

Senior management of the Compliance Department at a North American Tax Agency saw the potential benefits of a data warehouse.  They wanted to use it to increase voluntary compliance and the IT group of this agency was interested in helping the unit build the data warehouse.

A formal proposal was made that identified the specific applications for the warehouse, the benefi to be gained through the applications, and the overall cost that would be involved.  The project team took the proper steps in documenting the benefits of the project, specifically the short-term deliverables.  It wa an ambitious undertaking that was estimated to take three to five years to build at a cost of $25-30 million

The executive sponsor was informed of the incremental approach that the project team would be taking.  The project team also attempted to make the sponsor aware of interim benefits that the business u would receive as the warehouse progressed towards completion.  The project team believed that it had the strong support of the executive sponsor.  However, after the proposal was approved, the business unit partner's interest began to wane.  One reason offered was that the executive sponsor did not fully underst the time required to complete this project, the amount of funding that would be required, or the interim benefits that would be realized (that is, that at each stage in development, value was being added to the Compliance Department).

Another reason for the loss of interest may have been that the Compliance Deparment was asked take the lead from a corporate perspective (i.e., make decisions about data architecture and data issues).  Compliance Department was reluctant to accept this role and expressed a concern that perhaps this was in fact an IT group role.  As a result, they were reluctant to provide additional resources to the project team. The IT group developed the charter and performed all the tasks that they could with respect to identifying business requirements, but reached a point where they needed input from business experts, which was to provided by the Compliance Department.  Repeated attempts by the IT group to solicit business expert participants were made.  Ultimately, the IT group formally communicated to the Compliance Department that it could not continue without their support.  To date, no other communication had been received from the Compliance Department.

While the reasons for the loss of sponsorship are not clear, the total cost and long project duration most likely contributed to weakened interest.  The interest in data warehousing at this particular organization is not completely dead, however.   A new sponsor from a different business unit within the t agency has surfaced.  This new business partner also realized that data warehousing could help them deal with lack of controls within their program.  Plans have been made to proceed with a smaller-scale data warehouse.

## Integrated Health

Integrated Health was formed almost five years ago from the merger of two other hospitals.  The merger was one step in many by Integrated Health to form an integrated medical delivery system.  Design to provide superior care and secure a better negotiating position in relation to local HMO's, the integrated system combined the efforts of seven community hospitals, a physician's network, and several hundred

community-based primary care doctors. Soon after the merger, however, Integrated Health realized that negotiating power and economics of scale were not the only results of the merger. The partners and senior clinicians soon felt unable to cope with the quantity and variety of data they were faced with. Specifically conversations between service chiefs to compare benchmark best practices and identify efficiencies were going nowhere. The underlying data systems were too different, restricting management to crude statistic analyses and only the most basic comparisons between processes and outcomes. For example, certain length-of-stay or cost differences could be identified, but underlying factors influencing those figures wer impossible to obtain. At this point, committee members from each hospital asked Integrated's CEO to fu a data warehousing project. A project manager was hired in early 1997 and a year's worth of funding wa approved.

The traditional rivalry between the two hospitals had created a competitive environment that survived the merger. Nevertheless, crucial support was obtained from senior clinicians at both hospitals. Data was gathered and combined to form a consistent data model that generated ten types of reports. Eve though these were relatively simple reports, they contained information that had been available to one hospital and not the other. It was the first time that Integrated Health was able to look at comparative quality measures. Even though the data integration did nothing to change the environment of suspicion a distrust, and did not eliminate the unique political and managerial challenges Integrated faced, it did prov a language common to both hospitals. This was an important precursor to the next phase of the project.

Six months of data from each site was placed in a database and a tool was selected for report generation. This let Integrated Health compare risk and case-mix adjustment data from both hospitals an permitted multiple runs through the data, regression analyses, and comparisons based upon accepted clini measures. Finally, the project manager purchased Web-based end user access tools and made the decisio to update the warehouse.

According to the project manager, the warehouse up to this point had been a resounding success. had been completed with the efforts of only five individuals at a cost of $1.2 million. Less that $.5 millio was projected for the coming years' updates and the final stages of warehouse completion were underway It was at this point, just before individuals most likely to use the warehouse were selected, that the projec was cancelled.

When budget negotiations for 1999 took place, the data warehousing project was not represented. Project supporters assumed that the project would survive any budget cuts based upon the project's past success and its relatively small budget, but they did not sit at the negotiating table. Additionally, Integrat Health's central management knew very little about the project and political tension between the two hospitals still greatly influenced behaviors and attitudes. The decision was made to discontinue funding o the data warehousing initiative.

The project manager made the observation that many things occurring in concert brought a halt to Integrated Health's data warehousing project. The first set of difficulties were corporate-based and roote in past practices and personnel. Mistrust and suspicion at the hospitals added difficulty to the data integration project. Significant disconnect existed between the two hospitals and Integrated's central management. Also, the lack of a champion at a level directly involved in the budgeting process eroded th effectiveness of the champion that did exist. Timing was a difficulty for Integrated Health since the proje was too old in the sense that it threatened certain parties but too young in the sense that it had not yet prov itself. Had the project been either a year younger or a year older, guesses the project manager, it would have survived the budget cuts. Data warehouses are also more prone to failure, says the project manager, because they require a lot of funding and take multiple years to fully realize their potential. This is a star contrast to corporate memory, which is short.

**Slovenian Insurance Company**

The management of Slovenian Insurance Company decided that the business needed a data warehouse. Initially, management was concerned about achieving two main goals: (1) minimizing insurance claims fraud and (2) investigating the profitability of insurance services provided.

The sponsor of the data warehousing project was a senior vice president who had seen some data mining tool demonstrations and felt that having such a capability would greatly benefit Slovenian Insuran. The company's systems/database administrator also supported the data warehousing project because programmers were producing an increasing number of individualized reports, thus increasing the load on OLTP systems. He believed that through the use of a data warehouse, the system would be able to produ all the required reports. To achieve these goals, Slovenian Insurance hired a team from a software development and systems integration company ("the data warehouse team") to build the data warehouse.

From the start of the project, both management and the IT department provided little guidance. T senior vice president believed that the job should be handled by the IT department, assigned responsibilit for the project to the IT department, and did not want to participate further. The company did not require that the data warehouse team prepare a business case. They did not identify who the specific users of the data warehouse would be. They did not provide a cost limit. Slovenian Insurance's lack of commitment the project was further exhibited through its disinterest in and lack of participation in the process. These factors led to waning enthusiasm for the project.

Initially, the company's management was most interested in the ability to analyze motor vehicle insurance claims in great detail. However, two main problems soon arose. First, when the team started t build the data warehouse, the company was in a period of transition. The company was changing its computing platform. As a result, the data warehouse team was not able to work with claims data. The te decided to continue with the data warehouse effort using data that was available to it. Next, the data warehouse team soon discovered that claims analysis would not be possible since the company's OLTP systems did not record the data needed for such analyses. Subsequently, the data warehouse data model I to be adjusted. Although management had envisioned a large data warehouse from the start, they soon realized that they could not incorporate all data into one large data model. Management decided that cert limitations should be made and that a smaller data warehouse would have to be built.

Even after the data warehouse was created, the data warehouse team was sill not sure who would it. The team then began working with two potential users after the first version of the warehouse was rol out. Changes were made to the data warehouse data model and to the load procedures to meet the needs these two user groups.

It took the data warehouse team over one year to build the data warehouse, although the team members felt that the project should only have taken about half of this time. One reason for the delay wa that the IT department was understaffed and overworked. As a result of time constraints, the IT staff had not been not willing or able to participate. The data warehouse team had also faced scheduling difficultie and had received conflicting information from the IT department, which increased the time needed to complete the project.

The company's vision for the project had been to use a data mining tool for detecting fraudulent insurance claims. In the end, however, this vision was never fully realized. The principle reason for this disappointment was the lack of a business case. From this factor, several other problems arose. First, sir there was no business case, it was unclear who would benefit from the data warehouse and who would continue to support it. Second, the company did not have a clear understanding of what would be involv in completing the project and what the expected benefits would be. Interestingly, it was only after the project began that the data warehouse team realized what the position of the company was. That is, the

company trusted the data warehouse team to complete the project and believed that the team, as implementers, would finish the project without its involvement. The company's corporate culture is one in which users are discouraged from making requests to the IT department under the assumption that IT knows what is best for the users. As a result, potential users were not allowed to participate in the data warehousing project, despite the repeated requests of the data warehouse team. In the end, the data warehouse team received little input from either the IT department or the users they were trying to help. Finally, the fact that there was a lack of detailed data available in OLTP systems and that the claims database and applications were unavailable, led to problems which might have been prevented had there been a business case prepared.

The lessons to be learned from this case are best expressed by the manager of the data warehousing team that worked on this project. When asked what she would have done differently, the team manager states the following, "I would definitely not start the project until a business case for the data warehouse was clearly defined, potential users were known and willing to participate, and I had a commitment from their department to participate."

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This assignment is based on Watson, H.J., J.G. Gerard, L.E. Gonzalez, M.E. Haywood, and D. Fenton, "Data Warehousing Failures: Case Studies and Findings," *Journal of Data Warehousing,* (Spring, 1999), 44-55.