

PolyAnalyst facilitates employee survey data analysis at EDS

DM Review's 2006 World Class Solution Award nomination

Entry category: Business Intelligence



Information About Company with World Class Solution

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1. Describe the business drivers for initiating this solution. Why was this initiative undertaken?

EDS is an IT services company with 120,000 employees operating in 60 countries. Under new leadership since 2003, the company is pursuing aggressive goals in four areas: account operations, product mix, financial performance, and organizational effectiveness.

As a services company, EDS people are the key element of the company. Whereas software, hardware, and systems companies offer value mainly through products, services companies like EDS serve clients through people. The knowledge, skill, and experience of employees are the lifeblood of the company. As such, all corporate goals have important workforce components, such as change management and continuous re-skilling. In addition, maintaining the values of the company is an ongoing workforce priority.

Central to maintaining an effective workforce, is employee feedback. EDS leaders use a variety of forums to engage in constant dialog with employees. One mechanism for feedback is the EDS employee survey program.

The EDS survey program includes an annual survey, the Voice of the Employee (VOE) survey, in which all employees world-wide are invited to participate. Additional surveys are implemented three to four times a year. Called Pulse Surveys, these additional surveys are sent to stratified samples of employees across the company.

Historically, employees were providing responses to scaled questions on surveys, which delivered quantitative results along several variables such as leadership, communication, and the work environment. This data was analyzed and interpreted using traditional tools.

Since 2003, open-ended questions have been added to employee surveys. Text generated from open-ended questions offers a broader, richer source of information than do scaled questions alone.

Unstructured text data, of course, presents new challenges as well. Initially, text comments from open-ended questions were processed manually. Teams of employees reviewed the text then coded each record into one or more topics. Inter-rater reliability was maintained by having several employees code a portion of the text, then comparing the results. After the coding process, summaries and examples were created and reported to EDS senior leaders for follow-up action.

While the value of text comments for improving organizational effectiveness was unquestioned, two problems persisted. First, the process was slow. Whereas survey reports of quantitative survey data were available a few weeks after a survey closed, text comment reports lagged by months. Moreover, the process at times involved more than a dozen employees. From a productivity standpoint, the slow, manual process could not be sustained.

Second, the manual coding process was difficult to adjust to varying situations. For example, if a topic became too broad to be meaningful (e.g. “unit-level communication”), a principled subdivision was difficult to achieve. At the other extreme, a single, widely-distributed comment (e.g. “many emails contain redundant information”) was difficult to link to higher-level topics.

By 2005, EDS survey analysts set three high-level goals for analyzing text comments. First, cycle time must be reduced to allow text and quantitative data to be reported at the same time. Second, the resource requirement must reduce from dozens of employees to one person. Third, the new approach must be scalable to a wide variety of projects.

2. Describe the solution (including time required to implement solution) and its scope (including information regarding users of the solution and project team).

The only viable solution that could meet all three outlined goals at once was identified to be an automated text mining system capable of quick and accurate processing of mixed textual and structured data. Upon reviewing available applications for text analysis, EDS selected Megaputer’s PolyAnalyst as the tool of choice.

PolyAnalyst carries out simultaneous analysis of free-text responses to open-ended questions and structured responses to scaled questions in employee surveys. The system performs linguistic and semantic analysis of free-text responses, identifies patterns and interdependencies in extracted bits of knowledge and calculates their correlations with values of structured variables. PolyAnalyst empowers

the user to generate interactive reports delivering key results of the performed analysis to decision makers.

Primary considerations for selecting PolyAnalyst to serve as an EDS employee survey analysis solution included the following:

- Rapid processing of unstructured text. PolyAnalyst conducts initial exploratory analyses, such as identifying key terms and concepts, then linking concepts to demographic groups, in minutes compared to several days using a manual process.
- Scalability. The EDS situation required a solution that can operate in a wide variety of projects. The annual VOE survey, for example, includes 60,000 to 80,000 responses and more than a dozen variables. Pulse surveys, however, often include only 8,000 to 10,000 responses covering 3 to 5 variables.
- Easy implementation. In EDS' situation, a desktop solution was preferred. Whereas server-based solutions are routinely implemented for enterprise-level systems, text analysis in EDS projects would initially be handled by individual employees. Although PolyAnalyst can serve a multi-user, server-based organization, the EDS situation required a desktop solution.
- Feature/function. PolyAnalyst provides excellent user interface and reporting functions. For some open-ended questions, a substantial amount of analysis has to be conducted to surface the richness of employee's comments, thus an easy-to-use interface is critical. In other cases, however, reports are generated immediately for predetermined topics, such as employees' perceptions of career opportunities, or preferences for mentoring relationships.
- Price. Employee survey projects are funded through the EDS internal Human Resources organization. In keeping with EDS culture of maintaining lean budgets for support groups, the annual license fee for a Megaputer solution was commensurate with budgetary constraints.

EDS PolyAnalyst for Text solution first implemented at EDS in the beginning of 2005, is a combination of Megaputer's PolyAnalyst data and text mining tool and EDS's survey analysis methodologies.

It took about two weeks to generate the first usable results from the analysis of employee survey data at EDS with the help of PolyAnalyst. The solution was intuitive and easy-to-use and after a two day training seminar data analysts at EDS were able to carry out data analysis and report generation with PolyAnalyst themselves without any help from outside consultants. The complete implementation of EDS PolyAnalyst for Text took about three weeks.

A single data analyst can carry out both survey data analysis and report generation in PolyAnalyst. At EDS, an HR analyst processing employee surveys is responsible for delivering reports of findings directly to upper management.

3. *How was the effectiveness of the solution measured (metrics, ROI, etc.)? Please provide a quantitative analysis of the benefits of the solution.*

The effectiveness of the EDS PolyAnalyst for Text solution is measured in terms of the original business drivers: reduce cycle time (speed), reduce resource requirements (productivity), and improve scalability (flexibility).

Cycle time for text comments now matches cycle time for scaled data analysis. A reduction from six to eight months to five weeks. Resource requirements have steadily reduced from over a dozen employees to a single person handling the majority of text analysis tasks. This corresponds to direct savings of about 85 man-months of highly skilled labor, which in dollar representation is roughly equivalent to \$500,000 of saved funds on each annual employee survey analysis project carried out by EDS. This is

not counting similar savings on processing data from quarterly Pulse Surveys. Given the license price of PolyAnalyst, the immediate ROI is calculated to be over 1,000%.

The dramatic reduction in the use of skilled labor for routine text analysis tasks is just one immediate benefit of implementing PolyAnalyst at EDS. Equally important is enabling managers to better understand the concerns of employees. With timely and accurate information in hand, EDS managers can make changes to continuously improve employee engagement and productivity. During the 2004 – 2005 survey period, employee ratings for feeling “respected and valued” improved almost 10% globally. Ratings for “choosing EDS despite a competitive job offer” improved 8% globally.

For example, PolyAnalyst helped EDS HR analysts timely discover and address two major issues:

- Workforce re-skilling. The importance of a company-wide program for re-skilling present workforce to better manage new challenges arising from outsourcing some operations to other countries. Many employees had questions and/or valuable comments regarding a newly implemented EDS University program introduced for addressing these challenges.
- Working from home office. Increased interest in working from home office and telecommuting to work due to continued growth of traffic congestion in large metropolitan areas. Employees were making numerous suggestions regarding the best way to address this new situation.

EDS PolyAnalyst for Text solution has also been used successfully for carrying out extremely diverse projects varying in objectives, data sources and size, and target consumers of project results. The solution is flexible in both project size and complexity.

For each business driver, EDS PolyAnalyst for Text solution provides an effective and affordable capability. Moreover, employee text feedback, as collected by surveys, can now be evaluated as a potential measurement data of other programs. Just as scaled questions are reliable indicators of many HR initiatives, data from open-ended questions can prove to be an equally reliable indicator of other variables.

4. What qualitative (i.e., “soft” or intangible) benefits has the organization received as a result of this solution?

Beyond meeting the original business needs, EDS PolyAnalyst for Text solution provides additional value for EDS. Employee feedback now has a broader influence on the day-to-day operation of the company. Employee surveys have long been a valued component of many high-tech companies. However, numeric survey results alone often give managers an overly simplistic view of employees’ perceptions. The addition of open-ended questions – analyzed and reported in meaningful ways – reveals unique dimensions of employees’ experiences. In some cases, data from open-ended questions provides a definitive interpretation of numeric data. In other cases, text data includes insights not available elsewhere.

The following qualitative benefits of implementing PolyAnalyst at EDS can be mentioned:

- Additional knowledge for better decision making. PolyAnalyst empowered the management to make more informed decisions based on concise knowledge derived from employee narratives expressed in their own words
- Objective uniform analysis. It was not an easy task for groups of analysts involved in manual analysis of survey narratives at EDS to maintain consistency of coding of text narratives. Upon the implementation of EDS PolyAnalyst for Text solution, text narratives are now coded objectively and uniformly across all data.

- Freeing skilled workforce. Human analysts previously involved in coding text narratives now have extra time to generate value for EDS by taking part in other important and billable projects.
- Increased employee loyalty. Better extraction and summarization of suggestions conveyed by scores of employees in responses to open-ended questions and shortened processing time allow EDS management to timely address the main discovered issues. This leads to creating yet a more comfortable and productive work environment and correspondingly to the increased employee loyalty.

5. *How does the solution adapt to changing business requirements and deliver long-term sustainable value?*

With a process for analysis of text from open-ended questions implemented, the EDS employee survey program is being revised to capitalize on the new capability. The annual VOE survey, for example, has been reduced from forty to twenty-five scaled questions. The scaled questions, now defined as ‘core questions’, are tied to specific indices, industry norms, and long-term trends. Open-ended questions cover a wider range of topics. Due to the flexibility of open-ended questions, survey questionnaires can now collect a wider range of opinions capturing extra valuable and actionable information using a smaller set of questions.

Megaputer periodically provides EDS with upgrades to new versions of the system, which contain yet more powerful and flexible analysis and reporting capabilities. At such times, Megaputer analysts offer additional training and analytical consulting services to help EDS HR analysts efficiently utilize newly available features of the solution.

In the long run, EDS PolyAnalyst for Text will adapt to changing business requirements due to the following characteristics of the underlying technology:

- Scalability for handling growing volumes of data. PolyAnalyst scales to millions of data records, thus allowing EDS to collect longer narratives without sacrificing the speed of the analysis, as well as to utilize text mining in other areas of application involving the analysis of large volumes of text.
- Application to other areas within the company. The success of a text mining solution for employee survey analysis at EDS paves the way for the introduction of the text mining technology in other key areas, such as the analysis of customer surveys, call center communications, repair notes, patent analysis, incident report analysis, and competitive intelligence. A pilot project with another EDS group utilizing PolyAnalyst for incident report analysis is currently underway.
- Server version for enterprise-wide implementation. As more groups at EDS start utilizing text mining tools for the analysis of large repositories of data, it might become necessary to migrate to a server-based version of PolyAnalyst. When running on powerful hardware, PolyAnalyst server can support numerous end users on a department or enterprise level.
- Reusable analytical scripts. Similarly to many other data analysis tasks, survey analysis frequently involves performing the same sequence of data preparation and analysis steps in order to process new batches of data in accordance with a previously developed methodology. PolyAnalyst allows the user to visually create reusable analytical scripts and apply them on new batches of data. This allows data analysts to re-utilize their previous work thus saving many man-hours of the analysis time on every project.
- Flexible reporting capabilities. Typical consumers of analytical project results are not data analysts themselves but decision makers. They who do not have time to follow all steps of the performed analysis but need to have reports capturing key results of the analysis in an easy to

comprehend form. PolyAnalyst empowers data analysts to create re-executable report templates providing business users with up-to-date custom interactive reports summarizing the results of the analysis.

6. *Why should this solution be considered a World Class Solution? What makes it innovative, unique and groundbreaking?*

PolyAnalyst represents a groundbreaking solution based on the following considerations:

- New way of performing survey analysis. Until recently, survey analysis primarily involved processing structured responses to scaled questions. Associated text narratives, frequently holding over 80% of the important information, were manually coded by human analysts in order to be included in the analysis. This process was time consuming, inaccurate and inefficient. PolyAnalyst provides a new methodology for timely analysis of large volumes of free-form narratives. This allows organizations to start utilizing previously untapped sources of valuable information.
- Joint analysis of structured data and text. Majority of business applications, such as the analysis of surveys, incident reports, and call center notes, require simultaneous analysis of structured and text data. PolyAnalyst offers full support for joint analysis, interactive visualization and report generation on both types of data. This capability of the solution is of significant value in EDS employee survey analysis projects.
- Easy to implement, learn and operate solution. Even powerful analytical solutions might be considered unacceptable for a business environment due to their complexity. In contrast, EDS analysts were able to install PolyAnalyst on their systems and were running meaningful survey analysis scenarios immediately upon completing a two-day training course and a short pilot project under the supervision of a Megaputer Intelligence analyst.
- Outstanding ROI supplemented by many qualitative benefits. PolyAnalyst provided ROI of over 1,000% during the first year of its operation. In addition to that, the implementation of PolyAnalyst helped improve by 8% employee loyalty indicators at EDS.
- Improved timeliness of processing surveys. The reduction of survey processing time from six-eight months to five weeks due to the utilization of PolyAnalyst for the analysis of employee survey narratives allows EDS to timely identify key issues and address these issues without delay.
- Global influence across the company. Thorough analysis of employee surveys helps the company learn about potential issues directly from people carrying out day-to-day operations. Virtually all employees participate in surveys, and results of the analysis of these surveys might affect various areas of operation and have a company-wide impact on the effectiveness and loyalty of employees. Survey analysis results generated by PolyAnalyst are being reported directly to EDS senior management.
- Enterprise-wide applicability. PolyAnalyst text analysis capabilities are flexible enough to be applied with minor modifications to other analytical tasks within the company, such as the analysis of customer surveys, call center communications, incident reports, patents, and competitive intelligence materials.
- Report templates for decision makers. A frequent problem of standard analytical solutions is that the obtained results are locked inside the system and cannot be shared with decision makers. PolyAnalyst overcomes this problem by offering an innovative system for generating re-executable report templates capable of delivering interactive up-to-date reports to numerous business users across the company. This capability helps unlock the true value of the analysis of textual and structured data.