

ENTERPRISE VERSUS DEPARTMENTAL BI: PULLING TOGETHER INSTEAD OF APART

By Wayne Eckerson

The ideal business intelligence program consists of a complex federated organization. When properly aligned, the BI program reconciles opposites: speed and standards, flexibility and consistency, and efficiency and effectiveness. It also spans business and IT staff, enterprise and divisional boundaries, and top-down and bottom-up BI. But achieving this type of BI nirvana is not easy. It often involves a long journey full of obstacles and hazards that test the mettle of any well-meaning BI professional.

EVOLUTION OF THE BI TEAM

Decentralized. The origin of every BI team is quite simple: A company starts doing business and then recognizes it needs to track how it's doing. Without a formal corporate BI program, most business units hire analysts to pick up the slack. These analysts create a bevy of reports using whatever low-cost tools they can find, usually Excel and Access. Business unit managers get quick answers to their questions, but at a high cost: Their analysts spend more time integrating data than analyzing it and end up becoming glorified data processing professionals. Moreover, the CEO gets frustrated by these siloed systems because numbers never roll up and he can't get an answer to a simple question, such as "How many customers do we have?" Meanwhile, the CFO sees a proliferation of spreadmarts and wants to consolidate redundant systems, processes and people to save money.

Centralized. Executives quickly come to the conclusion that they need to move reporting and analysis out of the business units and into a shared service organization that can deliver consistent data and economies of scale. This ushers in the era of the centralized BI team, which is charged with building an enterprise data warehouse and creating all reports for business units. Here the pendulum swings from a completely decentralized approach to managing BI to a completely centralized one.

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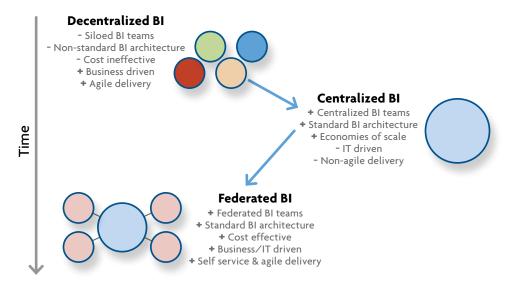




All goes well until the business units start to grumble that the new corporate BI team isn't meeting their information needs in a timely manner. Whereas in the past a business person could initiate a project by talking with an analyst in the next cubicle, now he needs to submit a proposal to the corporate BI team, participate in a scoping process, and then wait until the BI team decides whether or not to do the project. And this is all before a single line of code gets written. And once a project finally starts, the BI team takes longer to build the final product because it's now a step removed from the business unit and doesn't know its processes or data well enough to work efficiently or effectively. Given these circumstances, some business unit heads decide they can't wait for corporate BI to meet their needs and start hiring "analysts" to replace the ones they used to have and who now work on the corporate BI team.

Finding the Middle. By swinging from one end of the organizational spectrum to the other — from decentralized to centralized — the BI program becomes a bottleneck for getting things done. At this point, some executives throw up their hands and slash the BI budget or outsource it. Yet enlightened executives seek counsel to find a more nuanced way to structure the BI program so it delivers the nimbleness and agility of a decentralized approach and the standards and consistency of an enterprise approach. In essence, they find a middle ground that marries the best of both centralized and decentralized approaches. I call this a federated BI organization. (See Figure 1.)

Figure 1. Evolution of BI Organizations



The Federated BI Team

A federated BI team maintains a unified BI architecture that delivers consistent, accurate, timely and relevant data that makes the CEO happy. And it delivers economies of scale that make the CFO happy. Moreover, because a federated BI organization embeds BI professionals in the divisions, it delivers BI solutions quickly, which makes business unit heads happy. Finally, through cross-training and support provided by collocated BI professionals, business analysts finally become proficient with self-service BI tools, which makes them happy.

So there is a lot to like with a federated BI organization, and very little to dislike. In essence, this approach creates a common charter that impels the business and IT to collaborate at a deep and more productive level. The only real challenge is managing the web of matrixed relationships and co-managed teams to maintain the proper balance between business and IT. We'll discuss these relationships in the final section of this paper.

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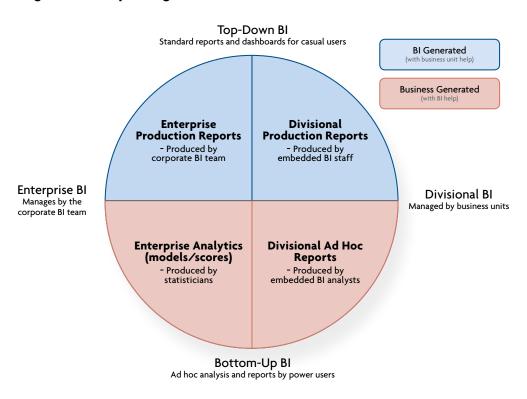
DIVISION OF RESPONSIBILITY

This federated structure is similar to that of the government of the United States, which is made up of federal, state and municipal agencies. The federal government handles issues of national concern, such as defense, immigration and commerce, while state and municipal governments manage local issues, such as policing, transportation and trash disposal. Often there is a fuzzy boundary between jurisdictions, requiring federal, state and local officials to collaborate to meet the needs of citizens. In the world of BI, the division of responsibility between corporate and business unit BI teams is fairly straightforward when managing data, but tricky when building reports and dashboards.

Data Management. On the data side, the corporate BI team manages all data that is shared across two or more business units. In other words, the corporate BI team builds and maintains an enterprise data warehouse (EDW). It also creates business unit views of data in the data warehouse, usually in the form of logical data marts, which consist of distinct sets of tables in the EDW database. The corporate BI team also facilitates data governance processes to create standard definitions for commonly used metrics, dimensions and hierarchies. Finally, the corporate BI team sets standards for technologies and tools. ²

Report Management. On the reporting side, the responsibility is shared more evenly. The BI Reporting Framework (see Figure 2) depicts this division of responsibility. The left half of the circle shows the reporting responsibilities of the corporate BI team, and the right half shows the reporting responsibilities of business units. These responsibilities are divided by the other axis, which represents top-down BI and bottom-up BI.

Figure 2. BI Reporting Framework



¹ In some organizations, the corporate BI team empowers business units with appropriate training to build their own data marts on the EDW platform using corporate BI-sanctioned extract, transform and load tools (ETL) and standard naming conventions. But this is an exception to the rule.

² In some cases, business units might purchase their own tools, if they make a strong business case and are willing to maintain and support them. However, many corporate BI managers complain that these business units eventually experience performance and scalability problems and ask the BI team to take over the management and support of these products at significant expense. So most corporate BI teams err on the side of standardization and limit the ability of business units to select their own tools. And if there are de facto tools already in place, the corporate BI team tries to persuade the business to adopt the corporate standard.

Top Down and Bottom Up. In top-down BI, the corporate BI team delivers standard reports and dashboards to casual users. The team gathers requirements, models and sources the data, and then loads it into the data warehouse. Developers then build reports and dashboards that dynamically query data warehouse data. In contrast, in bottom-up BI, power users query the data warehouse directly, in an ad hoc fashion. They explore, analyze and integrate data from various systems and then create reports based on their findings, which they often publish to departmental colleagues and executives. Basically, top-down BI delivers standard reports to casual users, and bottom-up BI enables power users to explore and analyze data and create ad hoc reports.

Enterprise BI. Thus, the upper left quadrant in Figure 2 represents the intersection of enterprise BI and top-down BI. This is where corporate BI developers (i.e., enterprise) create production reports and dashboards (i.e., top down) that would be difficult for any single division to create on its own. In the bottom left quadrant, corporate statisticians or data scientists (i.e., enterprise) who are aligned with individual divisions but not collocated explore and query data in an ad hoc fashion to create predictive learning models.

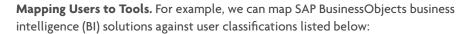
Divisional BI. In the bottom-right quadrant, business unit analysts in each division use self-service BI tools to analyze data and create ad hoc reports to display their insights. If executives and managers want to continue seeing these reports on a regular basis, the business unit analysts turn them over to the collocated BI professionals, who convert them into production reports (top right quadrant.) This handoff between analysts and embedded BI staff is critically important but rarely happens in most organizations. Too often, business unit analysts publish reports and then end up perpetually maintaining them. This is a job they aren't trained or paid to do and keeps them from spending time on more value-added tasks, like analyzing the business.

TOOLS

Organizations can use a single robust enterprise BI tool set to meet the needs of users represented in each of the four quadrants depicted in Figure 2 or several individual tools or some combination of the two. Obviously, a single well-integrated BI tool set is easier to administer and more easily configured to expose additional functionality as users change roles and need more or less BI functionality.

It's important that BI managers classify their business users by their style of consuming information and then map those styles to individual BI tools, modules or functionality. For example, BI developers need a BI authoring tool that enables them to build production reports and interactive dashboards for casual users. They also need tools for building a rich BI semantic layer and dimensional cubes that enable business users to explore the data warehouse in an ad hoc fashion.

Power users also need visualization tools that enable them to connect to and query any data source, link the result sets and run analyses against the combined data. They also need publishing tools that make it easy for them to share the results of their insights with other users in the form of interactive reports and dashboards. More experienced power users also need analytical tools that enable them to run statistical analyses and mining algorithms to tease out interesting patterns and relationships in the data.



Casual User Classifications:

- Class I: Viewer. Only views static reports and dashboards, distributed via paper, PDF, or static Web. Often, these "viewers" like to receive these reports via email or Web.
 - ightarrow SAP Crystal Reports (reports) or SAP BusinessObjects Web Intelligence (reporting)
- Class II: Navigator. Drill, filter, and schedule reports using BI tool functionality.
 - → SAP BusinessObjects Web Intelligence (reports) and SAP BusinessObjects Dashboards (dashboards)
- Class III: Explorer. Explore predefined data sets (e.g., a data warehouse or data mart)
 in an ad hoc fashion using the BI tool's semantic layer that maps data in the data
 warehouse to common business views and entities.
 - → SAP BusinessObjects Analysis, edition for OLAP, SAP BusinessObjects Explorer running against a Universe or direct connection

Power User Classifications:

- Class I: Explorer. Same as the casual user Class III Explorer above, plus basic knowledge
 of the business; basic analytical skills (create charts and tables), basic integration skills
 (create custom groups and hierarchies); and basic publishing skills (save and share views).
 - → SAP BusinessObjects Analysis, edition for OLAP, SAP BusinessObjects Explorer running against a Universe or direct connection
- Class II: Analyst. Uses the BI tool's ad hoc query capabilities to explore data in the data
 warehouse and combine with local data sets; plus good knowledge of the business;
 intermediate analytical skills (statistical analysis, root cause analysis, comparative
 analysis, and scenario modeling); intermediate data integration skills (link tables, fix data
 errors, transform fields using a BI tool or Excel); and intermediate publishing skills
 (assemble an interactive dashboard using the BI tool's ad hoc reporting and publishing
 features and predefined business objects).
 - → SAP BusinessObjects Analysis, edition for OLAP, SAP Lumira via direct connection
- Class III: Data Scientist. Explore raw data in operational systems, a data staging area, or external data using the appropriate tools (e.g., Hive for Hadoop data or SQL for relational data.) Plus deep knowledge of the business; excellent analytical skills (statistical and machine learning modeling and advanced visualization); excellent data integration skills (denormalize and transform complex source data, including semi-structured data; and pivot columns and create custom groupings using a data integration tool); and intermediate publishing skills (assemble an interactive dashboard using the BI tool's ad hoc reporting and publishing features and predefined business objects).
 - → SAP Predictive Analysis

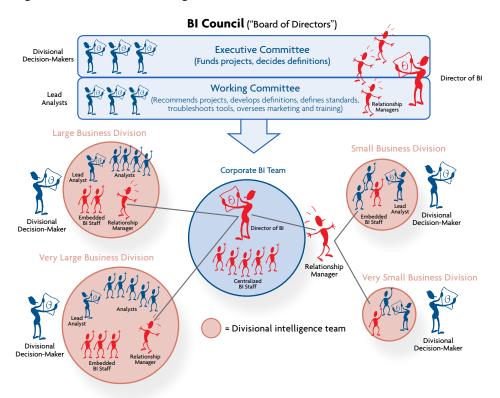
ORGANIZATIONAL STRUCTURE

Bridging the disparate worlds of top-down, bottom-up, enterprise and divisional BI is not easy. As mentioned earlier, it requires a common charter and a web of relationships that keep these polar opposites from spinning into separate, irreconcilable orbits. The structure that glues together these opposites requires both matrixed reporting relationships and a multi-layered governance body. (See Figure 3 on the following page.)



In a federated BI organization, report development happens as close to the business units as possible.

Figure 3. Federated BI Organization



Divisional BI Resources. In a federated BI organization, report development happens as close to the business units as possible. Each business unit has a divisional intelligence team (DIT) comprised of business unit analysts (e.g., sales analysts, financial analysts or operations analysts) and embedded BI professionals (e.g., report writers and possibly ETL developers). The team is managed by a divisional intelligence manager with help from an embedded BI relationship manager, who doubles as a requirements specialist. The relationship manager and embedded BI developers work on BI projects for the business unit, leveraging corporate BI staff when necessary to fill out their team. The divisional analysts, besides doing their normal analyst work, serve as subject matter experts for the BI team, helping with requirements, reviewing prototypes and testing results.

Corporate BI Resources. Meanwhile, the corporate BI staff consists of a variety of specialists who are loaned out to the business units as needed to complete divisional BI projects. Corporate BI staff includes BI and ETL developers with deep expertise in a single tool, data modelers, project managers, data administrators, quality assurance staff and systems administrators. The corporate BI team manages the data warehouse, the metadata repository and the BI semantic layers, and administers all the BI systems (i.e., database, BI server, ETL server and metadata repository). And while most development will happen in the divisions, the corporate BI team may sponsor its own infrastructure projects and work on projects that emanate from the project management office.

In addition, the corporate BI team has champions for each major BI discipline:

1) requirements (or relationship management), 2) report writing, and 3) ETL development. These champions facilitate knowledge sharing among specialists on their virtual teams, communicate standards and procedures, and make sure the specialists continue to upgrade their skills. These "communities of practice" meet briefly each week to discuss issues and share best practices. They also sponsor internal events or online forums for business users who want to improve their skills in a particular BI tool or process. The champions have input on hiring decisions and performance evaluations of the specialists in their area.

BI ROLES

Below is a deeper description of the various roles in a federated BI organization.

BI Director. At the center of the BI program is the director of BI, who oversees both the extended BI team (report and dashboard development) and the data warehousing team. The director's mission is to evangelize the value of BI and analytics and foster relationships with business units and IT partners, such as the project management office, the data center team and the data governance unit.

Relationship Managers. The BI director assigns a trusted, senior-level BI manager to each business unit to gather requirements and serve as an internal BI consultant who knows how to use data and BI tools to address business issues. By sitting in the business unit and attending business meetings, the relationship manager functions as a trusted partner who can help the business better harness technology to optimize business performance. Most relationship managers double as business requirements analysts.

Embedded BI Professionals. Relationship managers oversee a team of embedded BI professionals in each business unit. These staff members are usually report writers, but if the business unit is growing rapidly and has sizable information requirements, they may also be ETL developers, data modelers or requirements specialists. The embedded BI professionals work closely with the business unit analysts (e.g., sales analysts, marketing analysts or operations analysts) whose ad hoc reports they convert into production reports. They also help business unit analysts become more proficient with self-service BI tools.

Divisional Intelligence Teams. DITs, as described above, prioritize the work of embedded BI staff and ensure a clean handoff of ad hoc reports between the analysts and the BI team. The team also resolves data quality and data governance issues and troubleshoots bugs in the BI tools and reports. The divisional intelligence manager, who oversees the DIT with help from the embedded relationship manager, hires embedded BI staff and business unit analysts, reviews their performance and ensures each team member receives the proper training and support.

BI GOVERNANCE: PUTTING THE BUSINESS IN THE DRIVER'S SEAT

BI Council. Successful BI programs are run by the business, not the corporate BI team or the IT department. The way the business asserts its authority over the BI program is through a governance committee called a BI Council, which functions like a board of directors. The BI Council has the final say on what projects to build, what technologies to buy, what processes to implement and what data definitions to use. An active and engaged BI Council is critical to the success of any BI program.

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The BI Council consists of two subcommittees: an executive committee and a working committee, both of which are managed and facilitated by the director of BI.

Executive Committee. The executive committee consists of business unit decision-makers, the director of BI and all BI relationship managers. The business representatives should be senior managers who have the clout to fund projects and approve data definitions. They also need to be close enough to the business to have a clear vision for how data can transform the business. They need to articulate a data strategy and approve a roadmap of projects to achieve their goals.



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Working Committee. The working committee consists of the divisional intelligence managers, the BI director, all BI relationship managers and a project manager. Unlike the executive committee, which meets monthly or quarterly, the working committee meets at least every other week, perhaps once a week at the beginning. Business unit members are not volunteers; they dedicate at least 25% of their time to conducting the business of the working committee, which manages the tactical aspects of running a BI program: aligning divisional projects, defining data elements, establishing standards for conducting BI projects, managing platform and technology issues, organizing internal conferences for DIT members, and planning training and marketing programs.

The primary task of the working committee is to ensure that divisional intelligence teams don't revert into information silos. When a division decides to launch a new project, the committee discusses whether it overlaps with existing or proposed projects. The committee might recommend expanding the project to include other divisions, merging it with another proposed project or scrapping it.

Together, the working committee and executive committee define the direction and scope of the BI program. The BI director provides ample input and guidance to the BI Council — regularly floating strawman proposals for the council to discuss and approve but ultimately, the BI Council decides the content and direction of the BI program. (Otherwise, we'd call it "IT intelligence" not "business intelligence.") The BI Council focuses the BI team on business, not technology, issues. With the business squarely in the driver's seat, the BI program should pay handsome dividends.

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CONCLUSION

Organizing a BI team is not a straightforward exercise. Executives need to understand the tradeoffs between decentralized and centralized approaches, and then try to blend the best of both worlds. A federated BI team harnesses both enterprise and divisional BI resources to optimally manage both top-down and bottom-up BI. Federation works when the corporate BI team embeds a BI relationship manager and BI developers into each business division. These collocated staff members work closely with the business units, learning the business and serving as partners who provide timely advice about how to harness information and technology to achieve business goals. Finally, a BI Council puts the business in the driver's seat, serving as a board of directors that oversees the matrix of relationships in a federated BI organization and aligns the BI program with business needs.

Wayne Eckerson is a longtime thought leader in the BI market. He has written numerous articles, reports and books, and is a sought-after speaker and consultant. He is currently an industry analyst at TechTarget and president of BI Leader Consulting, where he advises organizations how to optimize their BI assets. He can be reached at weckerson@techtarget.com or weckerson@bileader.com.