



Model Your Way to Better Business Performance

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Introduction

The basic mission of any commercial organization is to profitably convert resources (people, materials, machinery, equipment, facilities, etc) into products and services customers want to buy. The means of conversion encompasses all of the processes and activities required to make and deliver products and services and to run the business.

In a world where everyone has access to the same raw materials, labor pools, suppliers, machinery, and often the same technology, competition is fierce. In most industries, the only way to differentiate from competitors is in process productivity, performance, and innovation.

Models, in the context of this paper, are operational models designed to replicate the operations of a business, providing information and knowledge to those responsible and accountable for executing the business mission. The purpose of an operational model is to make better informed business decisions and to improve organization performance and profitability.

Operational modeling has been around since the mid-1980s. Driven by information technology, operational modeling has significantly improved in the last 20-25 years. Timelines for developing operational models are a fraction of what they were in the past and require fewer human resources for implementation. Generic but industry-specific operational models are readily available and significantly reduce the learning curve, time, and effort to develop a functional model. More than anything else, electronic data, the backbone of an operations model, has increased exponentially, providing truckloads of data and information that didn't exist in the past.

Benefits

All of the benefits of operational modeling lie in providing data, information, and analysis to decision makers and others responsible for the business in a manner that minimizes the need to analyze large amounts of low level data. Even the best operational models have no value unless management uses the information as a basis for decision making, process improvement, pricing, budgeting, planning, and running the business. To be successful, modeling efforts must focus on important aspects of the business at a level that is relevant to growing the business, decision making, improvement efforts, and performance management.

Growth and Revenues

For many companies, customer profitability analysis is a dominant need and requirement. Not all customers are equal, and it is not unusual for 30% of customers to generate 70% or more of the organization's profits. The problem for most businesses is that they don't know the names of the customers that make up the 30%.

A more accurate understanding of the resources consumed in meeting a customer's needs leads to a better understanding of customer profitability. Profits earned on customers and customer segments may be one of the most important strategic measures of organization performance.

The bottom line of any customer or customer segment profit and loss (P/L) statement represents the net exchange of value between the organization and its customers. Value to the customer is reflected in the selling prices that comprise revenues. Value to the supplier is reflected in the cost and profit (or loss) earned from the products and services provided. Add in the investment of property, plant, and equipment made on the customer's behalf, and the return on investment from the customer relationship can begin to be understood.

Decision Making

By linking costs to resources, resources to activities, and activities to products (or customers), a more accurate picture of cost and profitability emerges. With this more accurate information, managers and decision makers can choose which product lines to emphasize, measure the efficiency and effectiveness of making a product or delivering a service, determine baseline pricing, decide which products to invest in (by expansion, new machinery, etc.), and which customers and customer segments to focus on for growth.

Improvement Initiatives

Operational models drive improvement initiatives, regardless of acronym (TQM, BPI, 6 Sigma, Kaizen, etc.), and can be used to identify areas of improvement opportunity. Activity information can be used to determine which areas have more potential for improvement and where results can be realized most quickly. It provides a baseline for capturing an organization's performance before and after the improvement to measure the financial and performance impact of changes.

Performance Measurement

Operational models significantly improve performance measurement capability. Cost per unit of activity output, activity quality, capacity, utilization, and cycle time all measure the performance of activities. Product and service costs measure the overall performance of the organization in producing and providing their product/service offering. Cost-to-serve customers, level of service cost, channel costs, and customer profitability/lifetime value all measure the organization's performance in the marketplace.

Cost Reduction

For many industries, the need for cost reduction is relentless. Operational models identify high cost areas that can be targeted for reduction. They also identify waste, rework, and duplication, all of which are opportunities for cost reduction,

Product Service Profitability

Many organizations have limited visibility into the cost and profitability of their products and services because their existing cost methods and practices are inadequate or simply wrong in the way they allocate and associate costs to products and services. Operational models capture costs at a more granular level and provide more accurate methods and practices for capturing the real cost of products and services.

Innovation

Innovation is more important than cost reduction for long-term success. Innovation does not only apply in new products and services. Innovation in process improvement, service delivery, and product life cycles are also important. In the absence of innovations and differentiations between products, services, and processes an organization reverts back to the world of commodities—where low-cost, effectiveness, and efficiency are the only things rewarded.

Innovation is the combination of invention and imagination, a combination of the left side analytical and the right side creative portions of the human brain. Data, information, and knowledge feed the human brain and provide the raw material of human thought. Businesses continuously look for innovative ways to differentiate themselves from competitors and to improve product and service delivery to customers. Business operational data, information, and knowledge, can be of huge value in the areas of quality, productivity, customer experience, and new product/service innovation.

APQC research consistently shows that innovation programs with rigorous processes and structures fare far better than innovation programs with looser governance and processes. It's great to get creative minds going and coming up with ideas, but processes must be in place for the business to benefit from those ideas. Models go a long way to help an organization understand what is done with ideas once they are generated and provide direction for the creative people and others involved in innovation.

Planning and Budgeting

Operational models significantly improve an organization's planning and budgeting capability. Historical data and information has always been the backbone and basis for predicting the future. Operational models capture the historical cost of processes and activities, profitability of products, services and customers, measures of organizational performance, and the cost structure of the business, all of which enable predictive modeling, “what if” analysis, and in developing alternative scenarios of the future.

Application and Use

The applications and uses of operational models vary between industries, businesses, and even within different divisions of a large diversified company. That's because the cost structures are different, the kinds of decisions are different, priorities are different, organizational cultures are different, and the ability of existing information systems to meet management's requirements are different.

In commodity businesses where the low cost provider prevails, applications are typically cost related, focused on process improvement, efficiency, and lowering the unit cost of the commodity. In other organizations where innovation and profitable sales growth prevail, application and use are associated with revenues, focused on introducing new products, entering new markets, and targeting new customers.

The organization's culture significantly influences the ultimate benefit from modeling efforts. Competitors in the same industry can vary considerably. An organization with a fact-based, data-intensive, and information-driven management culture is more likely to benefit from the model reports than an organization where the management culture makes decisions intuitively, requiring less information and data.

Organizations with inadequate or weak performance measurement systems will benefit more from operational models than those implementing incremental improvements to a part or portion of a good performance information system. An example of the latter might be an insurance company that already reports customer profitability but wants to improve the method for attributing operating costs to their customers. An example of the former might also be an insurance company, but one that doesn't currently report customer profitability and is looking to develop and report this information for the first time. The benefit and value of seeing customer profitability for the first time is significantly greater than the benefit and value of incremental improvements in information accuracy.

Whether it's a simple operational model for a single manufacturing plant or an enterprise-wide model reflecting all resources, activities, and services for businesses like banking and telecommunications, the fundamental requirements are the same.

The model for a single manufacturing operation would include the plant's sales, manufacturing costs, activities, activity outputs, products, and the customers that buy the products. At best, the model would be updated quarterly and support a couple of users. A simple model taking a month or two to develop may be all that is required.

An operational model for enterprise-wide application at a bank might include the revenues from all of its products, services, and customers; the entire cost structure of the business; and all significant organizational activities. This model would likely need to be run and updated on a more frequent basis to effectively serve many users. A more comprehensive system using specialized commercial software integrated with existing systems and data sources would be required.

Basic Requirements

Operational models have five basic components: resources, activities, cost objects, resource drivers and activity drivers. Almost all operational models will include a sixth component: sales and revenues (the primary exception being governmental entities). Sizing each of these components to reflect the business operations, cost structures, product/service offerings, and customers/customer segments being served is critical.

The total work effort required is a function of several factors which include the size of the organization, number of customers, product/service offering, channel complexity, frequency of use, and the number of users. Another important factor is an organization's level of process

management maturity. Some organizations have never defined their key and significant activities; others have detailed process flow charts and process documentation already in place.

Resources

For most organizations, resources (costs and expenses) are well defined in the general ledger. General ledgers are built on a hierarchy that includes some basic structure for cost collection like cost centers---each with categories of costs like salaries, rent, supplies, and raw materials. Cost centers roll up to departments or functions that, in turn, roll up to reported profit/loss results. Typically, cost centers and departments in the general ledger mirror the organization chart of the business. The level of detail, the number of cost centers, cost roll ups, and even the terms used to describe the hierarchy differ substantially between organizations.

Some general ledger structures are more “model friendly” than others. For example, some companies might include depreciation or rent costs in one cost center, never attributing these costs to functional areas. Other companies might include the total fringe benefit costs of employees as line items reported in the human resource department, again without attributing these costs to employees in the functional areas.

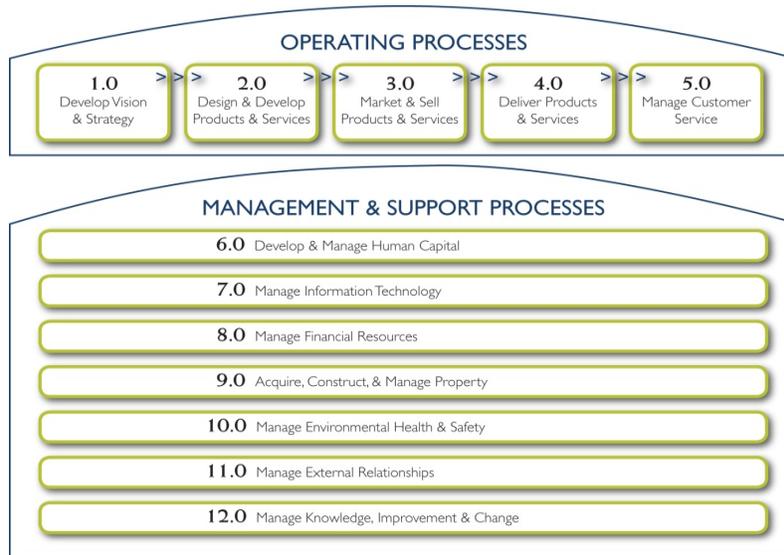
What’s important for operational modeling is to define resources in a way that minimizes any unnecessary detail and complication. General ledger costs and model resources are different. An operational model could define a resource as people and include all of the costs for salaries, benefits, and payroll taxes as a single resource. In a service company, where white collar workers make up a large component of cost, office equipment, telephones, and other things people require to do their job might be included as a combined cost of the employees and treated as a single resource in the model.

Activities

Unlike resources, many organizations will not have a predefined hierarchy of their processes and activities. Building the activity component of the operational model requires a hierarchy and structure reflective of the work (process and activities) used to convert resources to products and services. In an enterprise-wide model, the hierarchy and structure would include all of the processes and activities for the entire organization. The model for a single manufacturing plant might include just the processes and activities required to make the product(s) in that particular facility. The hierarchy and structures for the enterprise-wide model and the single manufacturing plant would be different.

Defining business process and activities is as much art as science. One of the stumbling blocks is definitional. The words process, activity, task, and step mean different things to different people. Some see tasks as composed of activities, and others see activities as composed of tasks. Still others might see processes composed of activities or steps. It would not be unusual for a variety of companies to use the words process, activity, task, or step differently in describing the same work and work sequence.

One way to visualize an enterprise-wide hierarchy and structure is with APQC’s Process Classification Framework (PCF), developed as an aid for collecting and categorizing best practices and benchmarks. This generic process framework was designed on an enterprise-wide level so that benchmarks and best practices would cover the entire range of business activities. The PCF, shown below, illustrates core or operating processes—which deliver value to customers and management—and support processes—which serve as the foundation upon which the “business of the business” is built.



The hierarchy suggested by the PCF starts with 12 categories of business processes (both operating and supporting) as the major units of work in an organization. The second level in the PCF hierarchy consists of the main groups of processes included in each of the 12 core and supporting categories. On the third level, the PCF identifies over 1,000 separate and discrete processes, each with an accompanying set of activities. While designed to collect benchmarks and best practice information, this is a great tool and starting point for developing a process hierarchy and framework.

Establishing a hierarchy of process is known as *functional decomposition* which identifies the activities performed by the organization. It yields a hierarchical representation of the work that flows through the organization. Operational models can be built for an entire business enterprise or for just a portion of an organization like a specific department. An example of the latter is an IT department, where the purpose of the model is to establish the cost of IT services provided and to charge back to the functional areas that use the services. Definitions of processes and activities included in the model should be specific to the part or portion of the business being modeled. Some models may need only two levels; others may require three to get to the level of detail and granularity required for the application.

Cost Objects

Like the resource and activity components of the operational model, cost objects (typically products, services, channels, and customers) also have a hierarchy and structure. Products can be specified in a hierarchy of product model, product line, product family, and product group. The hierarchy for the consumer segment of a financial institution like a bank might have a hierarchy of customers starting with individual customer accounts (e.g., checking accounts), then individual customer (e.g., all accounts and loans), and then household (all family members).

Unlike the activity and resource model components that might have hundreds of resources and activities, the cost object model component could have millions of customers and hundreds of thousands of products. B2C businesses, like utilities, telecommunications, and retail operations serving the consumer, have millions of customers and thousands of services and products. The combination of millions of customers, each with thousands of product/service options is staggering. Businesses selling to other businesses might have thousands of customers and hundreds of products/services.

Only within the last couple of years has commercial operational modeling software become capable of tracing activity costs to the individual customer or customer account and to individual product SKUs. Now that the software can handle this level of complexity, it should be leveraged to improve operations planning and measurement.

Drivers

Activity drivers and resource drivers (together with the business rules for use) form the web of operating data and information used to assign, trace, and allocate resources to the appropriate activities and cost objects. This foundation of operating data and information contains the logic and math for making the cost calculations and documents the causal relationship between resources, activities, and cost objects.

Some resources can be directly assigned to cost objects; no activity is required. An example is direct material and component costs of a manufactured product. The assignment is direct to the product. An example in a service business, such as an insurance company, is the direct cost of a paid insurance claim, assigned directly to products, customers, and even specific policies. No activity is required.

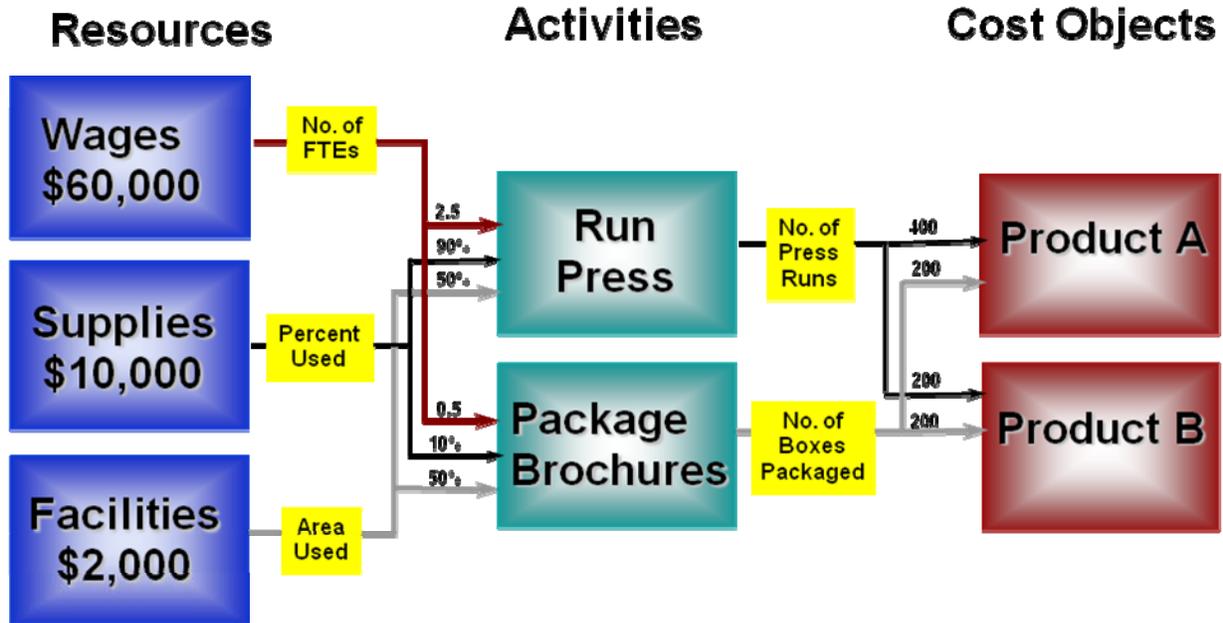
Revenues

Without revenues, no operational model can report any kind of profitability. Unless the operational model is being developed for a government entity or business use only focused on cost reduction and control, process improvement, and efficiency, revenues might not be a model issue or need. Even when the business issue or need is not focused on profitability it is a good idea to include revenues in the model. At some point, profitability will be important and it is easy to enter customer sales data into a commercial software system. Having the information

available enables profitability calculations and provides a vast treasure chest of data and information that can be used for predictive analytics, optimization, and simulation.

Model Example

A way to illustrate the basic components of an operational model is with a simple example that contains just three resources, two activities, and two cost objects.



The basic model costing components are complete because:

Resources are defined (wages, supplies, and facilities), activities are defined (run press and package brochures), and cost objects are defined (products A and B).

Resource drivers are defined (number of FTEs, percent used, area used).

Activity drivers are defined (number of press runs and number of boxes packaged).

The model is populated with resource dollars (\$60,000 for wages in the example), resource drivers (2.5 FTEs for run press activity and 0.5 FTEs for package brochures activity) and activity drivers (400 press runs for product A and 200 press runs for product B for the run press activity).

The model can now be run to make the calculations of activity and product costs. An illustration of the model math (calculation engine) is set forth below:

Description	\$ Amount	Run Press	Package Brochures	Product A	Product B
Resource					
Wages	\$60,000	\$50,000	\$10,000		
Supplies	10,000	9,000	1,000		
Facilities	2,000	1,000	1,000		
Total	\$72,000	\$60,000	\$12,000		
Activity					
Run press	\$60,000			\$40,000	\$20,000
Pack brochures	12,000			6,000	6,000
Total	\$72,000			\$46,000	\$26,000

Populating the costing model with revenues and sales provides all of the information necessary to report profitability of products, services, and customers. In addition to the total cost of each activity (including its resource components) and the total cost of each product (including its activity components), the model would also report:

- Cost per press run (\$100)
- Cost per box packed (\$30)
- Unit cost for product A and B (total product cost divided by number of units)
- Product profitability, average selling price per unit, and profitability per unit
- Profitability by customer or channel

For the simple example and for complex real-world models, the basic requirements are the same.

- Define the basic components of the model: resources, activities, and cost objects.
- Define other components of the model: revenues, performance measures, budgets, if applicable.
- Define the drivers, operational data, logic and business rules for the assignment and allocation of resources to activities and to cost objects.
- Populate the model with data.
- Validate that the model adequately and accurately replicates the operations of the business.

Information Technology

All the major management tools with a heavy IT component—CRM, TQM, supply chain management, knowledge management (KM), and operational modeling—have benefited from more powerful hardware and sophisticated software. Commercially available software is light years ahead of where it was even 10 years ago. It's like comparing the DOS operating system to Windows 7.

More than anything else, IT advances in financial system applications have made it significantly easier to develop operational models. Beginning in the late 1990s and driven by the Y2K issues at the time, most organizations substantially upgraded the capability and capacity of their financial systems. These improvements often included a single, worldwide, integrated, enterprise-wide solution. And these advancements significantly benefited operational modeling by standardizing financial systems, making electronic data more readily available, improving reporting capabilities, and introducing ETL (Extract, Transform, and Load) tools to organize and clean data. These advancements and tools significantly reduced the time required to build a model, the ongoing cost of model maintenance, reduced complexity, and provide more data in easy to access electronic format.

Commercial providers of operational modeling software like SAS, SAP, Procapo, Pilbara Group, Decimal, Bitech, and others have significantly improved the functionality, speed, capability, and capacity for operational modeling. These modern software products capture significant amounts of data and information and have the ability to use model information for optimization, simulation, and predictive modeling. These software products are capable of uploading an entire general ledger and transactions all the way down to individual line items on a sales order. Banks and insurance companies, for example, can capture costs and profitability down to the account or policy level or even for the individual transactions in the customer's account.

Transactional/account-level cost and profitability is powerful. Business exists because of the needs and requirements of customers. Sales orders, retail transactions, and service agreements with customers are a reflection of the continuing need for the organization's products and services. Costing at the transaction level is where the rubber meets the road, where organizational value is made or destroyed on a daily basis.

A good example of the power of transactional costing comes from a large global supplier to the oil and gas industry. At this organization, each sales order includes several products (sold or rented) and often involves trained service personal to run the tools. The sales order document includes more than 50 unique fields to capture customer name, customer number, job revenue, products purchased, services provided, sales person who sold the job, name of the oil field, specific well where the service was provided, length of the job, personnel assigned to the job, service area, and job type, just to name a few. Information can be extrapolated and analyzed against any of these fields. By driving costs to the sales order level, profitability reports can be prepared from individual sales orders to report profitability by customer, profitability of individual oil fields or regions, product and service profitability, and even profits generated by specific sales people. By calculating the cost and profitability of individual accounts at a bank, information can be rolled up by customer, by household, by customer behavior, by branch, by unit, or by account type.

A wealth of historical information resides in model calculations that has value to the future and is useful for predicative modeling, optimization, planning, budgeting, simulation, and predictive analytics:

Profitability of products, services, customers, individual customer orders, channels, marketing/sales campaigns, and even individual sales personnel
Capacity of plants, activities, and products, measured in output capability
Cost, quality, and cycle time of activities
Capacity utilization
Cost to serve individual customers and customer segments
Costs associated with customer behaviors like method of placing orders (phone, fax, and electronic)
Costs associated with marketing promotions and acquisition of new customers
Marginal costing/break-even analysis

Using the historical cost and profitability within the operational model provides a baseline and trends in profitability, costs, capacity, and capability. Historical product and customer profitability, together with the cost for developing new customers and the cost to serve existing customers, can be used to supplement and enhance an organization's ability to look forward and to forecast the future. The same operating data required to make good historical measurement calculations also applies to future projections. This is true not just for budgeting and for planning but for use in predictive analysis and "what if" planning as well.

Commercial modeling software is typically sold as a system that contains the modeling capabilities, a calculation engine, automated collection of data, integration with other software products, and the ability to report information in a useful format. These products can be integrated with existing IT systems and run in house on a laptop or offsite as a service via cloud computing.

Algorithms, look-up tables, and advances in modeling and reporting capabilities enable models and systems to process huge amounts of data quickly and eliminate the compromises in the past due to technical limitations. The modern operational model could contain in excess of one million SKUs and 50 million customers.

IT advancements also bring a new kind of user for the operational models. Leaders and managers today are skilled in the use of technology and systems. They understand the complexity of the global environment and the need for information and data. These new business users are analytical and require accurate, timely, useful, and factual data as basis for decision making and measuring performance. These new business users are also more likely to demand more functionality and expect the software tool to be flexible and useful for a variety of purposes including cost and profitability, forward looking and predictive capability, and balanced scorecards.

Getting Started

Designing an effective operational model starts with a strategic or operational purpose and need. If you don't know where you're going, any road will get you there. The organization must understand how the operational model will be used to address business problems, issues, and opportunities. Otherwise, what's the point? Next is a project plan to document the business

reasons for the initiative, application and use, goals and objectives, and expected outcomes. Issues to address in the planning stage include purpose, accuracy required, frequency of update, primary users, and relevance for the purpose intended.

Building an operational model is not particularly labor intensive nor requires an army of people to get it done. Initially the model build is largely a data collection and back room exercise to identify source data, data fields, and document a holistic overview of the organizations cost structure, processes, products, services, and customers. This holistic framework enables capturing large amounts of data for uploading to the model in an orderly and coherent manner. Even in large organizations, a small group of 4-6 knowledgeable and competent people can build a high-level, functional operational model in a couple of months. The work involving other sections of the organization comes after the initial model is built as part of the refinement and validation process.

The purpose of the initiative will dictate the level of detail needed and how often it should be reported. Process- and performance-related applications—such as process improvement, reengineering, project management, activity performance, and benchmarking—require a high level of detail and frequent reporting cycles. Decision-related applications—product costing, capital justification, new product development—may require less detail and less frequent reporting cycles.

The application and use of the model will generally drive the level of required accuracy. To attain a high level of accuracy, the model has to be designed to accumulate data based on hard facts rather than assumptions or misapplied costs that reflect tradition rather than reality. The requirements of data integrity and accuracy of operating data drive data input collection procedures by emphasizing upfront validation and suitability to the model purpose.

Any information system that uses polluted and contaminated data to produce inaccurate, or even misleading, information is useless or, even worse, destructive. Allocations, misapplied costs, assumptions, and incorrect coding that make source data unreliable plague traditional financial systems. Data from other operating systems can be equally unreliable. Estimates used to trace and assign costs to activities, processes, products, services, and customers, if nothing more than guesses, affect the data integrity and accuracy.

Building an operational model is a project. Like any project, there are requirements, deliverables, timelines, due dates, milestones, responsibilities, and assignments that must be managed to make the project a success. The project investment in software and outside services must be managed also.

Measuring the success or progress uses traditional project management metrics. Has the organization met the established milestones? Is the plan on track? If it is not, what caused the deviance? Is it on time; what percent of the project is complete? Has the project met budgetary goals, or did it cost more than predicted? Has the project been successful in delivering as planned?

A critical and often overlooked part of project management is the continuous flow of progress reports. Verbal and written progress reports keep management and users informed and are an important part of the transfer of operational model information and knowledge. Depending on the scope of the implementation, progress reports are often done weekly but no less often than monthly. The importance of project reports is often underestimated, especially by project managers that are reporting mostly on the progress of the project and fail to use this important vehicle for transferring knowledge and education.

A good project report provides the data to report and document how effectively the organization resources are being used, how that usage is benefiting the company, and the value of the information provided. When operating personnel are provided regular and adequate feedback on how the system is working and the benefits of the system, they are more likely to accept ownership of the initiative. Project reports also provide detailed documentation that will allow the organization to make recommendations for improvements, changes in the system, or answer questions regarding the accuracy of activities, business process analyses, and costing estimates, even before the model and project are completed.

Best Practices

It's fair to say that a good portion of the material previously written is based on best practices, and to a large degree, being familiar with the material is being familiar with best practices. The purpose of this section is not to review individual best practices but to identify and review a short list of best practices themes. It's an attempt to boil the best practice knowledge base down to a few key essentials:

- Link model information to everything
- Apply methodology consistently
- Use cost-efficient and reliable reporting systems

While not necessarily a best practice, per se, management commitment and leadership is a significant success factor. Operational modeling initiatives require a high priority and must be seen as critical to the success of the organization by senior-level executives, operations and line managers, and cost center or department managers. Grassroots, bottom up successes, although possible, are rare.

Link Model Information to Everything

Processes and activities are the central nervous system of any organization and represent what the organization does to create value for its customers and stakeholders. Competition is based on the performance of products and services in the marketplace, and market performance is driven by the processes and activities used to create, make, sell, market, and deliver them. In part, competitors ultimately compete at the activity and process level.

A properly designed operational model feeds the measures of organizational cost and performance and provides cost calculations for products/services, customer, and profitability reporting. It provides performance information for products, services, customer/customer segments, processes, and activities. It's this information best-practice organizations link to everything and use to improve decision making and measure organizational performance. That's why operational modeling is a foundational tool: it provides information and data at the business foundational level, where the rubber meets the road.

Process Improvement Initiatives

Whether known as Six Sigma, Lean manufacturing, Total Quality Management, business process reengineering, just-in-time, Kaizen, or benchmarking (to name just a few), every organization must continuously improve its processes and activities to remain competitive. Linking the model information to process improvement is a natural. Regardless of acronym, process improvement initiatives all require measurement and feedback. Measurements are required to document the "as is" and to provide feedback on the improvement effort.

Operational models support improvement initiatives by providing basic and fundamental activity information and data that people can use to measure the progress of improvement initiatives to judge the result of effort. Using model information and data to compare or benchmark activity performance is another way to support improvement initiatives.

Activity information can also be used to prioritize and select those improvement opportunities with the highest probability for success. For example, activities could be evaluated against a set of criteria such as total activity cost, potential for improvement, contribution to strategy/goals of the organization, and importance to the customer as basis for selecting high-payback process improvement projects. Criteria can be added, deleted, or weighted; are organization-specific; and can be applied at the department level, unit level, or even organization-wide.

Strategic and Operations Planning

Strategic plans are prepared to identify long-term threats and opportunities, evaluate strategic alternatives, and to select the best alternative to create value over the long term. Operating plans represent a more detailed set of objectives, actions, responsibilities, measures, resources, and priorities to be executed in the short term. Budgets are established to assign resources and responsibilities for executing the operating plan. Activities are the work required to accomplish all that has been set forth in strategic plans, operating plans, and budgets.

Another way to link model information to strategy and operations planning is with core capabilities. Core capabilities are important and include the ability to deliver quality products, operate on a global basis, be a low-cost provider, manage knowledge, develop new products, respond quickly to the business environment, speed products to market, and serve customers in a way that provides the organization with competitive advantage.

Operational models provide information to strengthen core capabilities by identifying those activities critical to each capability. Investment can then be targeted to those activities. Focus can also be placed on activities with the greatest potential impact to fulfill core capabilities.

Compensation and Reward Systems

Operational model information and data, when linked to compensation, provide a pay-for-performance model of compensation and reward. In many respects, compensation has always been linked to activities. Employees are paid to perform activities, and most have job descriptions with specific activities and tasks to be performed. Paychecks are compensation for performing and completing the work activities and tasks. Activities that require significant or specialized skills have always been compensated at higher levels than those activities that require minimal skill or knowledge. People pay attention to matters and measures that are visible, given attention by management, and affect their paychecks.

Operational model information can also be linked to gain-sharing and profit-sharing plans. By sharing performance gains, employees are incented to improve performance. Paying for performance improvements requires a high level of satisfaction that the gain or improvement is real. Best-practice organizations link model information to these kinds of programs and use the information as the basis for measuring the dollar savings and improvements being shared.

Consistent Application of Methodology

The use of standard and accepted terms facilitates understanding and improves communication. The terms and definitions in the CAM-I Glossary of Terms were developed to unify and standardize business terminology and have been widely accepted by the business and academic communities. The CAM-I Glossary provides a common and integrated vocabulary, eliminates the confusion resulting from multiple definitions of the same terms, and is widely accepted by the business community, research organizations, and software developers.

Best-practice organizations consistently apply generally accepted methods, procedures, terms, techniques, and practices. Examples include consistent use of the CAM-I Cross, common activity dictionaries, and process classification frameworks. Best-practice organizations emphasize consistency and comparability in report design, including the consistent use of data collection techniques and methods. Collection and analysis of cost from multiple units is done systematically. They make investments in common definitions, common coding, and consistent application of cost assignment methods to ensure comparability.

Consistent application of modeling methodology includes the use of an activity dictionary to help communicate and document business activities. An activity dictionary will generally include definitions together with activity outputs and measures. Activities are typically defined in a verb (preferably an action verb) and noun format using an adjective when necessary for clarity. Activity dictionaries provide a common language and mutual agreement about exactly what is meant when talking about a particular activity. At an early planning stage, best practice organizations develop, define, publish, and maintain activity dictionaries.

Cost-Efficient and Reliable Reporting Systems

Best-practice organizations place emphasis on the systems, procedures, and methods used to collect and report information. There are several reasons to place emphasis on systems and reporting. For many organizations, the first reason would be data integrity and system security. Another reason is cost. Systems that are not integrated and linked to existing financial and operations systems can be difficult and expensive to operate and maintain. Timeliness is also important, and linkage and integration with existing systems ensures that reports are available at the same—or nearly the same—time, as other financial and operating reports. Operating models are more effective, both from a productivity and cost perspective, when they are fully integrated into the overall operation of the organization.

Cost-efficient and reliable reporting systems maximize data use and minimize manual processing. Historically, operational models required a significant amount of manual effort to build and maintain the model. Electronic data in organizations have grown exponentially over the last decade and can be easily captured in today's technologically sophisticated operational modeling systems. With vast and detailed data readily available in the modeling system, most of operational benefits referred to earlier can be achieved, thus making the operational model more useful and cost effective.

Cost-efficient and reliable reporting systems provide reports, reporting capability, and access to information contained in databases. Given the state of the art in technology, users are accustomed to friendly, intuitive, and visual software systems with practical interfaces. The standards and expectations for systems and reporting are high. Reporting information online to users is a best practice. Online presentation naturally entails the use of visual displays to supplement column/data-intensive reports. It also requires intuitive, user-friendly graphical interfaces and attention-grabbing formats using color and visual effects to highlight information. Practical and innovative system displays illustrate important aspects of reports.

Summary

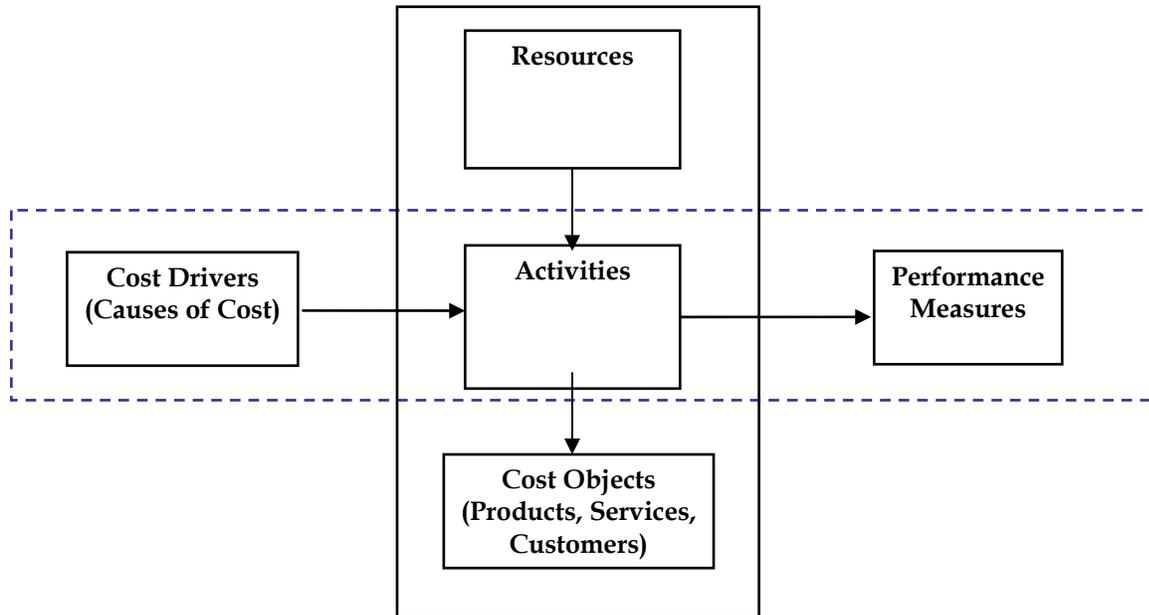
Operational models are a fundamental and powerful tool to improve an organization's performance management capability. By replicating the basic mission of the organization (to profitably convert resources to products and services customers want to buy), decision makers and others gain a significantly better understanding of the business and a tool to improve performance and profitability.

Commercial modeling tools have never been more powerful and affordable, and enough knowledge and experience exists to support a successful implementation. The risk is small, and the reward substantial.

Exhibit A

CAM-I Glossary of Terms

The basic components of business operational models are best illustrated with the CAM-I Cross. Originally published in 1988, it is included in the business school curriculum and textbooks of all major universities.



The CAM-I Cross
CAM-I (Consortium for Advanced Management-International)

Elegance and simplicity are inherent in this powerful illustration. The vertical column of the CAM-I Cross is the cost assignment view of operations modeling which mirrors what the organization does to convert resources to products and services. The driving principal of cost assignment is that cost objects—like customers and services—consume activities and activities consume resources. By assigning resources to activities and activity cost to cost objects, this tracing methodology is far superior to traditional allocation and assignment methods. The result is more accurate and provides significantly improved visibility in the cost of activities and the profitability of products, services, and customers.

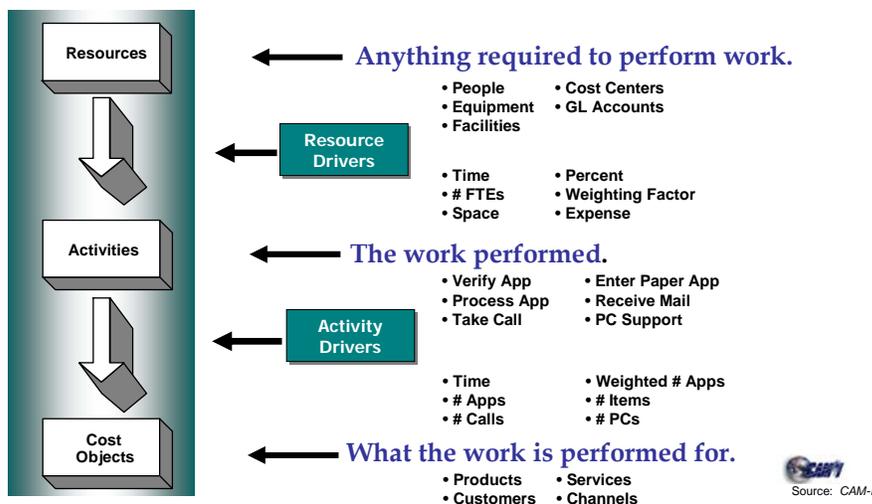
The horizontal column represents the process view where the focus is the management and improvement of activities by identifying measures of activity/process performance, activity capacity, and the drivers of cost. The common denominator, *activities*, resides at the intersection.

The process view of the organization represents the work people and machines do to make and deliver products and services to customers. A big chunk of Business Intelligence is knowledge about the cost, performance, capability, capacity, and scalability of the core activities and processes of the organization. Cost drivers (causes of work and costs) and performance measures (quality, time, cost) illustrated in the CAM-I Cross are just two examples of attribute information that can be built into the model and used in decision making and in improving performance.

Operational models can be built at different levels. One could build a business model for a specific portion of a company (Human Resources for example), a individual plant or facility, a standalone business, a division or business unit of a large New York Stock exchange public company, or, for that matter the entire operation of the NYSE itself.

Definitions

There are five basic terms used in business modeling. These five basic terms are illustrated in the diagram below, followed by the CAM-I definition.



Resources

“Resource” is defined as *an economic element that is applied or used in the performance of activities. Salaries and materials, for example, are resources used in the performance of activities.* “Resource” can also be understood as anything an organization purchases or spends money on, including facilities (rent and utilities), raw materials, supplies, travel, and depreciation. Resources are typically the expense categories listed in the general ledger and include all of the types of expenses deducted from sales to calculate the organization’s operating profit.

Activities

CAM-I defines “activity” as *work performed within an organization and the aggregations of actions performed within an organization that are useful for purposes of activity-based costing.*

Process is defined as *a series of activities that are linked to perform a specific objective. For example, the assembly of a television set or the paying of a bill or claim entails several linked activities*

While not included in *The CAM-I Glossary*, a task could be defined as a series of steps that are linked to perform a specific activity. Process, activity, and task are a hierarchy that links the work done in an organization. An example of a process is Market and Sell Products and Services. Examples of selling activities might include sales calls, price negotiation, and account servicing. Examples of tasks for the sales call activity might include preparing a quote, presenting the quote, and sales follow-up.

Resource Drivers

A resource driver is *a measure of the quantity of resources consumed by an activity. An example of a resource driver is the percentage of total square feet of space occupied by an activity. This factor is used to allocate a portion of the cost of operating the facilities to the activity.*

Resource drivers are represented on the CAM-I Cross as the arrow pointing from resources to activities. Resource drivers are what drive cost (resources) to activities. The resource driver for salaries and wages could be the time percentage, headcount, FTE’s, or some other measure to assign people costs to activities. The resource driver for rent might be square footage and assigned to activities based on space occupied. Resource drivers quantify how the business activities consume the resources

Cost Objects

A cost object is *any customer, product, service, contract, project, or other work unit for which a separate cost measurement is desired.*

In practice, commercial organizations are most interested in the profitability and cost of their products, services, and customers. Many are also interested in understanding the profitability of marketing and sales channels. It would not be unusual for a commercial organization to define customers, products, channels and services all as cost objects. Government entities are interested in the cost of their products and services and define cost objects accordingly.

Activity Drivers

CAM-I defines “activity driver” as *a measure of the frequency and intensity of the demands placed on activities by cost objects. An activity driver is used to assign costs to cost objects. It represents a line-item on the bill of activities for a product or customer. Sometimes an activity driver is used as an indicator of the output of an activity.*

Just as a resource driver assigns costs to activities, an activity driver assigns activity costs to cost objects. Properly defined activity drivers have a high correlation to the products services and/or

customers that consume the activity. Activity drivers most often are operational data such as the number of outputs for an activity and which products/customers consumed the outputs.

Activity Attributes

Activity attribute is another important term in operational modeling. Activity attributes are *characteristics of individual activities. Attributes include cost drivers, cycle time, capacity, and performance measures. For example, a measure of elapsed time required to complete an activity is an attribute.*

Two important and useful attributes, performance measures and cost drivers, are displayed to the right and left side of activities in the CAM-I Cross.

Performance Measures are defined as indicators of work performed and the results achieved in an activity, process, or organizational unit. Performance measures may be financial or nonfinancial. An example of a performance measure of an activity is the number of defective parts per million. An example of a performance measure of an organizational unit is return on sales.

Cost Drivers are defined as any factor that causes a change in the cost of an activity. For example, the quality of parts received by an activity (e.g. the percent that are defective) is a determining factor in the work required by that activity, because the quality of parts received affects the resources required to perform the activity. An activity may have multiple cost drivers associated with it.

Activity attributes are helpful when organizations begin to examine their processes and make decisions to reduce cost, improve productivity, or increase customer satisfaction. Attributes tag activities in multiple ways:

- Primary or secondary (a department's or organization's main or supporting activities)
- Core, sustaining, or discretionary (absolutely required for a product or service, benefits the organization at large, or important but not necessary activities)
- Strategic (critical to achieving the organization's strategic mission)
- Value added and non value added
- Primary and support, fixed/variable, and potential to improve.