



Fundamentals of Profit Improvement “Moving the Earth”

The Power of Knowledge

Every organization is obligated to seek answers to the question, “How can the organization maximize the value we generate for our stakeholders?” The most compelling answer, the one that is driving business today, comes from antiquity: “by leveraging knowledge.”

In 212 BC, more than two millennia before the Internet, the Greek mathematician Archimedes leveraged his knowledge of physics to defend the city of Syracuse from two vastly superior Roman armies. Archimedes used his knowledge of mechanical levers to create mechanisms through which others could exploit this knowledge. Many of the mechanical devices Archimedes invented to exploit his knowledge to maximum benefit continue to provide value. Among those are the pulley, catapult, convex mirror, battering ram, crane, and crossbow.

The decisive victory won in the defense of Syracuse, one of the greatest in history, stands as a testament to the power of knowledge. The implications are both obvious and profound. Even then, many centuries before the invention of electronic computers that would prove to be the ultimate tools for leveraging knowledge, Archimedes was fully aware that the principles demonstrated in the defense of Syracuse would forever change the world. He emphasized the importance of knowledge in his famous metaphorical proclamation, “Give me a place to stand and I will move the Earth!”

In light of Archimedes’ unqualified success, savvy organizations must revise their quest and instead seek answers to the question, “How does this organization leverage knowledge to maximize the value we generate?”

Principles for Leveraging Knowledge

Effectively leveraging knowledge depends on two factors:

- the availability of a standard language for capturing and sharing knowledge in such a way that all concerned have an identical, unified understanding, and
- creating mechanisms that can leverage knowledge for greatest impact.

These requirements provide the foundations for modern languages. This ability to communicate enabled mankind to control his environment and dominate the earth. The ability for a business to be able to communicate throughout its extended enterprise enables domination of a marketplace and is required for maintaining long-term profitability.

Profit as the Standard Language

Today, the need for a standard language for capturing and sharing knowledge is at least as significant as it was in 212BC. This is because a modern organization is, by definition, a global organization with a vast supply chain of interconnected business units and partners. No single individual has a comprehensive understanding of the entire organization that is sufficient to maximize the value it generates. Consequently, a language is needed for gathering and sharing knowledge about the organization such that an appropriate, comprehensive understanding can be developed.

The knowledge capture language must serve several purposes. It must allow an organization to capture dynamic information and knowledge about the status of the organization such as its current capabilities, constraints and commitments. It must also allow for representation of potential opportunities, emerging threats, and linkages and relationships between business units. It is critical for an organization to understand the linkages between business units because maximizing the value generated by the organization as a whole invariably involves operating individual business units in ways that appear to be less than optimal if viewed at a local level.

Far more important than its use as a tool for gathering knowledge, the language must support an organization in its efforts to share that knowledge. This is done by formulating strategic goals and objectives and then communicating these to the entire organization. This requirement is driven by a need to communicate the strategic goals to all business units in such a way that each unit understands its role and is properly motivated to work toward the operational performance that maximizes the value generated by the organization as a whole.

The challenge of formulating and communicating strategic goals is complicated by the fact that there is no universally recognized, standard language that is currently used to support these activities. This is the single biggest obstacle

faced by an organization. If such a standard language were in use, it would be an excellent candidate for capturing and sharing knowledge and for developing a comprehensive understanding of an organization.

Though no such language is currently accepted as a standard, there is an excellent candidate available – the language of “profit.” This language is already used as a standard for purposes related to financial reporting. It forms the basis for analyses such as Economic Profit (EP), Net Present Value (NPV), Economic Value Add (EVA), Real Option Valuation, Discounted Cash Flow (DCF), Balanced Scorecard, and others. For the purposes of leveraging knowledge and maximizing the value an organization generates, the language of profit would appear to be well suited for standard use.

An organization that uses profit as the common language for gathering and sharing knowledge will soon develop a comprehensive understanding of the linkages and relationships between different business units in terms of how they impact the organization’s profit. Combined with mechanisms to operationally leverage this knowledge, the organization will soon be able to maximize the value it generates for its stakeholders. This is true even for non-profit organizations. Even though they do not try to maximize profit, non-profit organizations and government agencies must operate within financial constraints that insure their viability. Such organizations strive to maximize the value they generate within these constraints.

It is important to note that using the language of profit as a standard for leveraging knowledge does not determine what an organization’s strategic goals and objectives should be. Rather, it means that strategic goals and objectives should be developed within a context in which their impact on both short-term and long-term profitability is understood.

It is useful to consider alternative languages. For example, consider the languages used in various reward systems that are used to establish goals and objectives for individual business units. These include the languages of “revenues,” “cost,” “quality,” and so forth. To a large extent, these languages determine the performance of the business units and divisions in which they are used. Many individual business units are managed to hit specific revenue targets, capacity utilization levels, efficiency levels and so forth. Unfortunately, none of these languages is suitable for use in developing the strategic goals and objectives of the organization as a whole. As the crash of Internet companies demonstrated, aligning organizational goals for the purposes of maximizing revenue growth, with no consideration of profitability, results in ultimate failure of the organization. Similarly, aligning organizational goals to eliminate cost would result in situations where the closure of the organization was the ultimate success – cost was driven to zero!

Worse still, organizations that attempt to communicate strategic goals and objectives in a language other than profits open themselves to a wide variety of abuses. As presented in "Why Pay People to Lie?" on the Op-Ed page of the Wall Street Journal on January 8, 2001, the lack of profit oriented management techniques open organizations to budget-gaming where managers' behavior is driven by goals and objectives that can have severely adverse impact on the bottom line. For example, managers ship product into distribution channels in one quarter in order to meet revenue targets for that quarter, only to have the product returned in the next quarter. If the bonuses of those managers were instead tied to the long-term profitability of the entire organization, their goals and objectives would be aligned with those of the organization. They would not ship product that they knew would be returned at great expense to the bottom-line.

In summary, to maximize the value generated by an organization, the common language for capturing and sharing knowledge must be the language of profit. Using profit as the common language for gathering and sharing knowledge enables the development of a comprehensive understanding of how decisions throughout the organization affect profits. Given such an understanding, decision support tools can be used as mechanisms to leverage knowledge and maximize the value generated by an organization.

Operational Mechanisms for Leveraging Knowledge

Archimedes succeeded because he was able to develop mechanisms that allowed others to exploit his knowledge of mechanical leverage. To accomplish this, Archimedes translated his knowledge of physics into an intermediate language (mathematics), then translated that representation into physical objects such as catapults that allowed others to use his knowledge. In the business world, a similar transformation must take place in order to leverage the power of knowledge. Simply put, decision support tools that are integrated with organizational knowledge can provide the same kind of strategic advantage that Archimedes gained from the use of catapults.

After adopting profit as a standard language for gathering knowledge and developing a comprehensive understanding of the relationships among business units, an organization can successfully communicate its strategic goals and objectives. Still, mechanisms are needed to allow managers to leverage the comprehensive understanding, i.e., knowledge, to achieve the strategic goals and objectives. Doing so will maximize the value generated by the organization. Something analogous to Archimedes' war engines is needed to achieve this.

The required mechanisms will be used by managers to make better decisions -- to make decisions that are aligned with strategic goals and objectives. In practical use, these mechanisms help managers understand the critical success factors within their business unit and how various decisions will affect the profits of the organization. More specifically, these mechanisms help decision makers

determine which investments to make, which products to produce, how to price those products, what raw materials to buy, and so forth.

Because of the scope of a typical organization, it is necessary to rely on computer-based mechanisms. Effectively leveraging a comprehensive understanding of a modern organization will involve analyses and computations so complex and numerous that it is beyond the capability of any one human being.

There are many readily available mechanisms that are candidates for use in leveraging knowledge and enabling managers to make better decisions. These mechanisms are based on well-known, proven decision support techniques such as mixed-integer, linear programming and constraint propagation. Many of these mechanisms are available in a typical spreadsheet application.

It would seem that all the necessary components are in place to allow organizations to leverage knowledge. However, the remaining problem is to establish a specific language as a standard and to integrate it with computerized mechanisms that recognize this language and allow managers to operationally leverage knowledge. Given the potential benefits that would be generated, the availability of a solution to this problem would certainly, “move the Earth.”

Leveraging Knowledge to Improve Profits

To understand our proposed solution to this problem, it is necessary to answer the question, “Why isn’t such a universally recognized language already in widespread use?” Such a language would be used by organizations across all industries to formulate strategic plans that could be shared, reviewed, revised, and so forth. All this would be done with a precise and consistent interpretation that would allow the organization to efficiently communicate properly aligned goals with everyone in the organization. Furthermore, this language would allow decision makers throughout an organization to exploit existing mechanisms to make better decisions and operate the organization in such a way that the value generated by the organization would be maximized.

The simple answer is that, until now, this was not technologically feasible. This point is easily seen if one considers that until only a few years ago, all corporate financial reports were prepared entirely by hand; and the data was in many cases weeks or months old by the time decision makers received it. Even today, many organizations lack even primitive capabilities to gather knowledge such as estimates of the cost of production processes. Thus, the dream of a common language that could be used to develop a comprehensive understanding, formulate and communicate strategic goals, and drive mechanisms to implement an organization’s goals was an impossibility. Instead, every organization was left to develop its own, jury-rigged solution.

Fortunately, as a result of recent developments, the dream of a universal language, the language of profits, and the incredible value it enables, is within the reach of virtually every organization. The realization of this dream has been made possible by advances in computer software and processing capability that permit business processes to be modeled with high-fidelity, including non-linear relationships and complex, interrelated system constraints. With such a business model, employees in specific business units can recognize how to contribute to achieving the strategic goals and objectives. Moreover, it is possible to reward them for doing so.

The knowledge required to make this possible, even effortless, has been captured in decision support tools that are both interactive and intuitive, and which focus on the use of a single language for capturing and leveraging knowledge - profit. One such tool is River Logic's Enterprise Optimizer[®] (EO).

River Logic Introduces New Modeling Approach

The concept of this new modeling approach is simple. Using Enterprise Optimizer[®] (EO), business processes are represented in flow-chart fashion using the five basic icons. A sample EO model is shown in Figure 1. Organization specific information is entered into data tables underlying each icon. EO then automatically translates the representation into a constraint model using an embedded understanding of the language of profit. In other words, EO contains knowledge bases that allow it to understand the relationships between components of the model and how the linkages and relationships affect the profitability of the organization. This knowledge includes engineering knowledge of specific production centers, accounting rules for inventory management, industry specific business rules and practices, and so forth.

Once translated to a set of mathematical constraints, EO uses a variety of analytical mechanisms to assist managers in making decisions that are aligned with the organizations strategic goals and objectives. For example, EO includes mathematical optimization mechanisms that enable an organization to determine its critical success factors. These may include its ideal product mix, inventory management strategy, and capital investment strategy. In general, EO provides a comprehensive view of the entire organization and identifies decisions that will optimize its profitability.

A user of EO does not need to understand the theoretical principles or operational details of the mechanisms used to leverage knowledge. Nor does the user have to interact with the underlying data or understand any of the specific organizational knowledge captured in a model. Thus, a purchasing manager is not required to know anything about production process to leverage knowledge of those same processes. That knowledge and the mechanisms for leveraging it are transparent to the user.

EO allows an organization to capture the knowledge of all the factors that impact its profitability. Because it is so intuitive and easy to use, this knowledge capture, and the subsequent sharing, can be done by the organization. EO makes it simple for users to communicate strategic goals and objectives and to collaborate on management strategies that maximize the value the organization generates for its stakeholders.

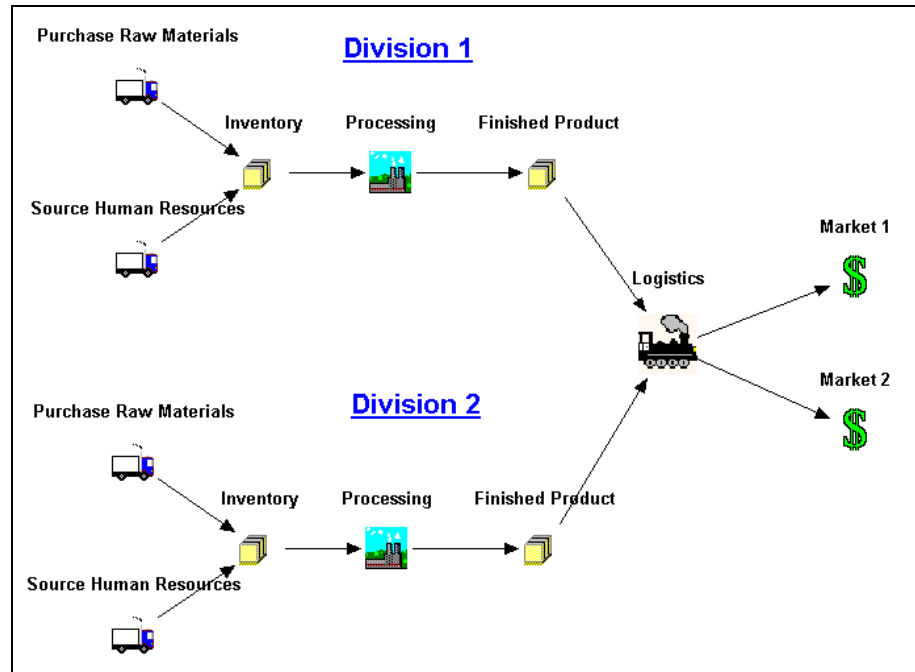


Figure 1. Sample Enterprise Model

Because EO is based on the language of profit, users can interact with it through standard reports such as a P&L Statement, a Balance Sheet, a Cash Flow Statement, a Manufacturing Cost Summary, a Purchasing Report, etc.—all of which contain the exact structure and semantics of the organization’s corresponding reports.

EO leverages knowledge in a variety of ways. As previously mentioned, EO will identify the decisions that will result in optimal profitability for the organization. In addition, EO automatically generates a series of reports, some of which can be displayed graphically, indicating where profits can be improved, where constraints exist, and so forth. EO also quantifies the potential benefits and costs associated with changing any variable in the organization.

In effect, EO tells a user, "Here is the best possible profit for your organization. Here are the keys to more profit, and what each of them is worth. Here's a picture of the system so you will understand. Any questions?"

Return on Investment

Leveraging knowledge and formulating a comprehensive understanding of an organization requires a substantial commitment. It is natural to ask, "What is the effort worth?" Based on actual cases using Enterprise Optimizer, quantified

improvement from this undertaking, as expressed in terms of the standard language of profit, typically range from a minimum 2% of net sales and often as much as 8% when significant strategic opportunities are uncovered. This improvement can be achieved within a three-month period.

The initial improvement in enterprise profitability can be reinforced and extended. We have only begun to explore these possibilities, but it is clear that leveraging knowledge through the language of profit enables organizations to significantly increase the value they generate. For example, enterprise models based on the language of profit enable enhanced supply chain coordination with vendors and customers, allow discovery of critical factors, efficiently support the organization's leaders in "What if?" brainstorming at the strategic level, and much more. Once implemented, the enterprise models are constantly being improved, fine-tuned, and modified for changes in marketplaces, capital resources, technology, and regulatory environment. As a consequence, integrating a model with a source of high quality, trusted data can provide significant value to an organization. Enterprise models are also improved in response to the ongoing learning they enable. Each minor model improvement leads to greater insight into how the pieces of the organization fit together.

Users are currently pursuing the following opportunities:

- tactical and operational improvements
- marketing initiatives
- risk assessment and measurement
- strategy development
- incentive and compensation structure
- extended supply chain management projects

As the use of a common language becomes widespread, opportunities for cooperation between customer and supplier, outsourced resources, and substitute or alternative products will be naturally integrated into enterprise-wide decisions, creating yet another round of profit improvement from the same fundamental approach: everyone in the organization should share in the same global view.