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White Paper

Why Do Intelligent Managers Find Their Decisions Deliver so Little Success?

by:
Regis Betsch
Steve Bushnell

Velocity Pointe
(302) 351-8305
info@velocitypointe.com
www.velocitypointe.com

Introduction

The recent news has covered a stream of businesses which are in dire financial straits from what is in hindsight a series of extremely poor business decisions. "Never in my life did I imagine this could happen at AIG – Former CEO Hank Greenberg"[1] Contrary to common beliefs, "bad decisions" are not the result of unbridled greed. The simple fact is that no intelligent manager would make such horrifically bad decisions if they knew ahead of time the depth of the potential problems.

The root cause for so many problems in corporations today can be traced to fundamental flaws in the way we model and think about the entity we call a business. You cannot tactically manage stochastic (random) processes. To manage a business, you have to use some model that deals with the changes in inputs and outputs. Although businesses appear to be complex, on average they contain a large amount of structure and well defined processes. However, if your model of your business is flawed, your decisions based on that model will also be flawed. This paper addresses three of intuitive concepts, contained in the business models in use today, which can be proven false from first principles.

Flawed Assumption 1

The first flawed assumption is the belief that when we optimize the individual pieces of a business we achieve an overall optimization of the business as a whole. The most basic system engineering principles has always shown that the system optimum requires the subsystems to be at other than maximum or locally "optimum" settings. In his Theory of Constraints (TOC), Eliyahu Goldratt[2] has popularized this fundamental principal.

The reason we dearly want to believe in local optimization is because we have structured our businesses into functional silos such as Marketing, Sales, Manufacturing… This paper is not criticizing the existence of silos. The organization of any human endeavor into areas of supporting expertise creates teams which experience a major synergistic improvement as compared to a group of discrete individuals. From the people side of business, silos work.

It is easy to put budgets into place and create financial metrics that we can use to independently "manage" these functional silos. For now let's assume that the metrics we are using are valid as far as independently optimizing the operations of the individual silos.

The issue is that most of the critical processes within a business require participation by more than one functional silo. An excellent example is to look at a critical revenue generating process within a business. If a business sells products, Marketing creates sales leads, Sales books orders, Manufacturing makes the product, Distribution gets the product to customer, and Billing collects

[1] Cover Fortune, October 13,2008
[2] Goldratt introduced his Theory of Constraints (TOC) concepts in his book, The Goal, North River Press (1984)

the revenue. The functional silos interact with each other through critical handoffs which are required for overall success.

Local optimization of these silos would have Marketing meet its budget on schedule by placing advertizing according to plan even if the featured product was delayed (vaporware is an excellent example). Sales may be selling product to maximize bookings even though they are over-selling the lowest profit item in the mix and ignoring the hard to sell high profit offerings. Manufacturing will keep stamping out the product it can make without investing in new equipment for new products.

In a globally optimized business, Marketing promotes the right products at the right time. This means that they are strongly tied to R&D, Manufacturing and Sales. Ideally Marketing creates a balanced set of sales leads which will allow Sales to book the optimum mix of product for maximizing the profits from the real world capacities of manufacturing.

You can look deeper into this concept, but the clear message doesn't change. Revenue operations use a highly interactive system of core capabilities which need to be run as a "total system" in order to maximize revenue while controlling costs. In fact the optimum operation of a cross-silo process almost always requires the sub-optimum performance of some of the contributors when viewed by the local silo's goals.

Dr. Russell Ackoff[3], a renowned expert in Operational Research, focused on the question of how system thinking relates to human behavior. "However, by the 1970s he had become trenchant in his criticisms of technique-dominated Operations Research, and powerfully advocated more participative approaches."[4] So while Dr. Ackoff has been instrumental in applying the overall systems concepts to the people side of business, he adamantly avoided any system engineering concepts.

Unfortunately, Dr. Ackoff's popularization of "business as a system" completely avoids fundamental system engineering concepts and has handicapped the real world success of his methods. There are shining examples of Ackoff's successes, but there are as many cases where the difference never made it to the bottom line. His use of the overarching term "system" while only dealing with a subset of the methodology has created a cognitive disconnect between the huge encyclopedia of system tools and the subset Ackoff applies to business. This forces us to differentiate between Ackoff's "system" and our use of the term "system engineering" which we use in its fullest meaning. Our contention is that the combination of "system engineering" with Ackoff's "business as a system" creates a synergistic effect and allows one to both deal the human and mechanical operations of business with clarity.

If we look at our business as a true system, we quickly find that the silos can be considered as subsystems. Any key process can be mapped as a set of operations involving the various silos. The important focus is the required sequence of activities and the handoffs (interactions) between silos which are necessary to achieve the desired output. Process flow charts are not

[3] Dr. Russell Ackoff's ideas are well represented in his book, Re-Creating the Corporation: A Design of Organizations for the 21st Century, Oxford University Press, USA (1999)
[4] A turn of phrase borrowed from Wikipedia's article on Dr. Ackoff

new, but what is being discussed here is the process flow which draws boxes around all activities within individual silos, and highlights the handoffs (interactions) between the silos. This is how we can create the subsystem map of a revenue generating system.

The reality is that all of the critical operations within business involve at least one handoff between silos, making it impossible to optimize the silos independently if one's goal is to optimize the process as a whole.

As an aside, once one adopts the simple system engineering view of business, it can be applied at any level within a business. The users of TOC and Lean can easily use a system diagram of Manufacturing to describe their process without affecting the use of their methodology's concepts. In manufacturing the subsystems are the work stations along the manufacturing line. The huge success of TOC and Lean in manufacturing across all industries has proven its ability to optimize a system. It takes very little imagination to see how one could apply these techniques to any business system once that system has been properly modeled.

None of the concepts discussed here are new – they are basic system engineering. In fact using system engineering, we can rigorously mathematically model any system consisting of interacting subsystems. This rigor is beyond the focus of this paper. System engineering concepts unequivocally demonstrate that the globally optimum business system is almost never achieved by running all the subsystems at their locally optimum settings.

The concepts of system engineering to optimize a system can be demonstrated by using the simple analogy of an automobile. The optimum fuel efficiency (power per gallon) of a car engine comes at a certain rpm where the best tradeoff of peak horsepower and torque are achieved. If one were to optimize the fuel economy of an engine, then you would always run the engine at this speed regardless if you are at a stop, or need to accelerate past a slow vehicle. Of course we do not do this, because we are interested in the overall system efficiency of maximum miles per gallon (mpg). It is impossible to calculate the mpg when only considering the engine alone, and when we consider the system as a whole it is the interaction between the subsystems which must be modeled in order to achieve the best mpg for the current road and traffic conditions.

This analogy clearly shows how critical the overall system view is when considering delivering the system-wide optimum operation.

Flawed Assumption 2

The ***second fundamental flaw in our thinking about business, "A business can be managed using financial information."*** Another way of expressing this is, "Cash flow is a valid operational metric for running an optimum business." There are two issues here. The first is the proper understanding of cash flow, and the second is whether the proper cash flow numbers can be used a valid system metric for optimally managing the business.

Although not new in concept, Goldratt has focused attention on the improper use of financial reports from standard GAAP reports[5]. Many attempts have been made to use cost-based accounting to manage and optimize a business. Using a cash-based language to manage a business has been repeatedly shown to be a completely bogus concept. In the first chapter of John Caspari's book[6], he shows four broad cases one may experience in optimizing a manufacturing line. In every case, cost-based accounting concepts always led to not only a wrong decision, they led to decisions that produced exactly the opposite effect as desired.

Jean Cunningham[7] of the Lean movement is in complete alignment with these accounting issues. The goal of GAAP is to document the size of the revenues and profits so that they can be allotted between, business reinvestment, the owners, and taxing agencies. These documents obscure the true difference between fixed and variable cost. Using the organization of standard financial reports, it impossible to determine a proper cash flow.

Goldratt's invented cash-flow accounting term "Throughput" captures the contribution of sales to the bottom line by subtracting out only the proper Variable Cost. In standard financial terms this is usually labeled "Contribution", but the classic concept of Variable Costs used to calculate Contribution includes labor. From a systems throughput view, unless you are instant-by-instant hiring and firing labor to meet the production needs, labor is a fixed cost or in financial terms part of the Operating Expense. Using labor as a variable cost is just one feature of cost-based accounting which is still used by many companies. As stated above, cost-based accounting in any form is completely at odds to a proper system view of a business, and is harmful when used to make decisions to optimize the business' financial output.

By considering Profit = Throughput – Operating Expense, Goldratt achieves what is in effect a system measure of the net cash generated by the business and the amount that is considered profits. Using the proper cash flow analysis of a business can be enlightening to most business executives.

Before we examine this financial metric any further, it is informative to recognize the huge difference between performance metrics and operational metrics.

A performance metric by its very nature is a historic or lagging indicator. It shows that the end results of actions which have already occurred. The score of a football game is an excellent example. Others are the average speed, or the average gas mileage resulting from a long trip. P&L statements from a business are also excellent examples of performance metrics.

GAAP financial information is not only a good performance metric of corporate success, it is required by law. Thus the language of money provides an excellent discourse for analyzing the

[5] The Financial Accounting Standards Board (FASB) is a private, not-for-profit organization whose primary purpose is to develop generally accepted accounting principles (GAAP) within the United States in the public's interest.
[6] John Caspari , Management Dynamics: Merging Constraints Accounting to Drive Improvement, John Wiley and Sons, 2004
[7] Jean E. Cunningham and Orest J. Flume, Real Numbers: Management Accounting in a Lean Organization, Managing Times Press, 2003

performance of business. We shall see that it is completely inadequate when used as an operational metric.

Operational metrics need to be leading indicators so that one can make informed decisions on how to run the business on a moment to moment basis. Examples of operational metrics include: the down and yards to go during the football game; the instantaneous speed of the car and the sharpness of the curve ahead; and the number of sales leads created by marketing, and the current sales bookings for each product used as input to manufacturing.

For a business, effective operational metrics are rarely financial. Sure you can estimate a projected cash value for a set of sales leads, but sales needs the detailed information about the leads, and the current manufacturing capacity to decide where to put its sales efforts. That answer will be significantly different than one which blindly maximizes projected income while being ignorant about the other constraints of the business.

The language of finance is wholly inadequate and often inappropriate to the operational management of an optimized business. Operational metrics need to measure the activities which will deliver maximum revenue. Profitable companies are in the business of capturing the Value Proposition of the customer and transforming that into services and products for which the customer is willing to pay cash.

The initial concept of Value Proposition came from Michael Porter[8]. The implications of this concept are immense. A company is in the business of capturing the customer's Perceived Value with respect to a particular need and then delivering a product or solution to meet that need. The Value Proposition is only valid if the customer is willing to pay cash to have their need resolved. This means that, contrary to every MBA school out there, a company is NOT in the business of making money but rather is in the business of reaping the benefit of delivering value to the customer. Only after this primary most difficult task is completed, will the customer to be willing to pay money.

An improper Value Proposition results in delivered value for which the customer is unwilling or unable to buy. Customers do not buy just because a business believes that it has captured the value need. Creating the proper Value Proposition is not trivial, but defining it in terms of cost is even further from any viable solution.

No revenue exists until after ALL of the effort is expended, the product/service delivered, and the customer is billed and has paid. So any financial metric of the interim activities can only accurately model the cost of the processes, and NOT the revenue. This argument is the foundation of why the approach of managing finances fails to optimize the value transformation processes. Financial metrics cannot represent the complexity required to describe the proper handoffs between functional silos to optimize the efficiency of transforming the "statement of need" into the delivered Value Proposition.

The proper discourse for optimizing a business' operations involves recognizing the value propositions you are addressing, and then creating metrics specific to the process required to

[8] Michael Porter, Competitive Strategy, Free Press, New York, 1980

transform the concept to a tangible product or service. This is impossible to achieve using a financial accounting discourse. The good news is that this is easier in practice than it looks at the outset.

First, one does nothing more than create the system diagram identifying the subsystems required to transform the Value Proposition. We are not concerned with the within subsystem activity other than to determine that once given the inputs from the other subsystems, the output can be independently generated by that subsystem.

The inputs and outputs between the subsystems constitute the handoffs which need to be managed to optimize the overall process. The simple task is to then determine how one measures the amount and quality of the handoffs at every step of the process. These metrics are the operational metrics of the system. In processes which have been organically grown, there are often many handoff's which delay and confuse the management of the process. Using the systems view of the process one can almost always streamline the number and complexity of the handoffs and drastically improve the value delivery of the process.

The process of optimizing a revenue generating operation using a systems model creates key insights into the management of that operation. Optimization results in the subsystems working in a balanced manner at any given time. In real businesses, this translates to some of the subsystems working below maximum capacity in order for the overall system to run optimally.

This concept is not new. The huge improvement in manufacturing capability that has occurred using TOC and Lean methodologies are based on the concept that at any instant of time, the right amount of work performed at any part of the system is dependent of the system needs, not the maximum output capacity of that piece of the manufacturing line.

In the recent case of the financial market meltdown, it is obvious that the financial metrics in use were insufficient to warn the management of the magnitude of the problem they had until it was too late. The operational metric discussion clearly identifies the fact that the operation of their business required metrics which were not in place. The financially driven control models they used had to be fundamentally flawed, or they would never have exposed themselves to such a level of risk. Finding the proper operational metrics would first require the development of a better system model of the business. Not trivial, but a must to discover the proper operational metrics.

Flawed Assumption 3

When we take this validated set of ideas into the rest of the business, ***the third falsehood of business intuition is highlighted, "Maximum output occurs when everybody is working at 100% efficiency."*** This idea is built into our DNA and the idea that one's instantaneous idleness could be beneficial to the overall system is unthinkable to all of us. The reason that we have this belief is due to the lack of an overtly obvious system model showing how a given worker impacts the overall output of the system.

If optimum operation of a business requires that we must have parts of the business running at less than 100% output at times, this means that individuals must be working at less than 100% efficiency at times to deliver maximum output of the system. We have already proven this in manufacturing processes. In TOC, the throughput of any station on the production line cannot be more than the total throughput of the line or else one quickly generates piles of work–in-progress.

An excellent example of the misuse of workforce utilization comes from the Enterprise Project Management world. Typically people are assigned additional tasks on additional projects until all of their time is allocated to project work. The common belief is that an idle worker is an opportunity to either assign more work, or, if no work is waiting, to reduce the workforce.

The belief that you can balance the workforce by limiting the available resources to an exact balanced number of resources, eliminates the excess capacity needed to respond to any change in the overall loading of the shared resources. The result is that the non-constrained upstream resources will now have times where that their output results in the constrained resources being starved for work, and the downstream resource's being unable to start the next step on time, leaving the critical constrained resource's output to collect dust. Anyone experienced in TOC or Lean would recognize this as a lack of necessary capacity in the non-constrained resources.

Tony Rizzo[9] has spent more than a decade helping businesses maximize the output of their projects in the Enterprise. He was the first person to implement a TOC project management system. Using the TOC and Lean concepts along with the systems thinking of optimization, Tony has doubled the project output while simultaneously halving the average duration of projects using the existing staff. He changes two policies: replace workforce utilization with project output rate as the driving metric, and eliminate concurrent task assignments.

By eliminating maximum workforce utilization as a policy, many of the improper behaviors in knowledge work can be avoided. By making the project throughput the primary metric, the same positive dynamics we see in TOC manufacturing are now possible in project management.

One last critical mistake made by managers trying to maximize worker productivity is to demand concurrent progress on multiple tasks by a single worker. This concurrent task assignment is similar to using too small a batch size in manufacturing station and then repeatedly switching between two products. There is nothing wrong in sequential task assignments for multiple projects. The damage comes when progress requires work to be multiplexed in time across each of several projects. This delays each project according to the number of concurrent task assignments. Splitting the time across three tasks may still take the same total number of working hours, but the calendar time to complete the tasks is tripled.

[9]Tony Rizzo delivers his project management training and consulting solutions through his company, Project Development Institute (www.pdinstitute.com). He is also one of the founders of Velocity Pointe (www.velocitypointe.com) which delivers executive support for turning strategies into positive financial results. He is also a partner of Spherical Angle (www.sphericalangle.com) which provides the Microsoft Project add-ins ccPulse and ccMPulse which allow for the TOC/Lean Enterprise Project Management.

For proponents of Lean and TOC, the elevation of their concepts, from manufacturing to the overall operation of the business, are obvious when a system engineering model is employed. For TOC, the trivial question is to ask which handoffs between silos are the constraints in a revenue generation operation. Experienced TOC consultants can map the overall cash flow of a business unit, and then map the primary revenue process onto the functional silos to create a systems model. With this information it is now trivial to identify the constraint in the revenue generation process, and the use classic TOC concepts to increase the revenue throughput. The elegance of this exercise is that one can select from hundreds of candidates the one that will produce almost immediate revenue growth.

Conclusion

This paper has just skimmed the surface in the application of system engineering principles to the design and operation of a business. The fun starts when management understands that there may be a better way to model how they think about their business. Once shown a viable model of their business the average senior manager can immediately see areas where they can make simple fast changes to the existing operations. These changes can directly impact the ability of the business to increase the bottom line while improving working environment, and enhancing customer and vendor relations.

So in conclusion, by applying a simple system engineering view to work within a business we see that the throughput of projects, and processes (including manufacturing) can be significantly improved even while the workforce utilization of individuals at any time may be considerably less than 100%. Lastly to maximize revenue and profits, you do not manage by cost control, but rather by value delivery rate.

These three concepts discussed here may sound reasonable, but theoretical. They can be made believable by living the results of the changed polices and metrics. Tony Rizzo has designed his high-energy experiential TMx workshop to deliver just that, and the universal response from seasoned subject-matter-experts to executives is "Now I get it". The TMx Workshop is available from Velocity Pointe and PD Institute.