

UMUC Business and Executive Programs Podcasts
Essential Competencies for the 21st Century Manager

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Evanchik: Hello and welcome to the second in a series of discussions on the Essential Competencies for the 21st Century Manager. My name is Mike Evanchik, and I'm Chair of the Business and Executive Programs Department in the Graduate School of Management and Technology at the University of Maryland University College. I'm going to be discussing the first of the 10 competencies that underlie our MBA program and that is systems thinking.

Systems thinking is the ability to see the big picture, to recognize that problems can have complex origins. Too often, managers treat the symptom instead of the root cause of a problem, and the reason is simply that activities in any organization are interdependent. What happens in one part of an organization affects the entire organization. Systems thinking can help focus managers on the root cause of a problem. One approach that is particularly useful is outlined in a book called *The Goal* by Eliyahu Goldratt. He calls this approach the Theory of Constraints and I think it is a useful way to think about systems thinking. Well, let me recap this book. It's written as a novel. It's very interesting and easy to read. The focus is on a manager, Alex Rogo. He leads a manufacturing plant that is losing money. Customer orders are routinely completed behind schedule, a lot of expediting is taking place to satisfy specific customers, quality is poor--causing a lot of rework, and he receives a deadline to improve profitability or he's out of a job. Now why is Rogo in this situation? Well, first, most managers view the activities in their organization as a series of independent events. They believe if you optimize each activity individually, you should be able to raise the efficiency of the entire organization. The reality is that activities in an organization are interdependent. What you do to one activity is going to affect others. By trying to maximize the efficiency of all activities simultaneously, a lot of money is spent with little improvement to the bottom line.

TOC is a new way of thinking about an organization. There are five basic concepts: first, the goal of the organization; second, measuring the throughput of the organization; third, identifying the inventory and operating expenses; and finally, identifying the bottleneck--that resource constraint that prevents the organization from increasing its throughput to better achieve its goal. Well, let's start by identifying the goal of an organization. Well, simply for for-profit firms, it's to make money and to make more money tomorrow than the company is making today. For a nonprofit or government organization, the goal could be to increase the quantity of output produced or it could be to decrease the time required to complete the output. This output could be in the form of the number of projects completed in a specific period of time or it could be the number of contracts successfully negotiated. The point is that every organization has output. This output could be in the form of a product. It could be a service. But the point is every organization has output and the Theory of Constraints focuses on the ability of an organization to do a better job in producing that output. So, when it comes to the goal of an organization, it needs to be quantifiable and you need to be able to measure it. Those measurements could be in terms of dollars, as it would be for a for-profit; or in terms of customers served, which could be a goal for a not-for-profit organization.

After identifying the organization's goal, the next step is to look at the organization's throughput. Throughput needs to be measured in such a way as to help the organization achieve its goal. If

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the goal of the organization is to make money, then the throughput should be measured in dollars, but not just sales dollars. You would take your sales dollars and subtract the dollars required to produce the product or service. So, throughput actually represents the dollars that the company gets to keep. If the goal of a nonprofit or government organization is to increase the numbers of customers served in a day, then throughput would be measured as the number of customers served each day. Bottom line is that by measuring throughput, you have a way of achieving your goal. The throughput of an organization and its goal are integrally connected to each other.

The next elements are inventory and operating expenses. Inventory represents the resources that go into a product or service. This is consistent with the definition of inventory used in financial accounting. It's easy to identify inventory in a manufacturing firm. But in a service firm, such as a not-for-profit or government organization, it's much more difficult. It could be the supplies inventory, for example. But in such a situation, inventory typically is not nearly as important as it is in a manufacturing firm. Operating expenses, on the other hand, are relevant to all organizations and represent the cost of the resources used in production of that organization's output, be it a product or service. And this is also consistent with the way expenses are treated in financial accounting.

The final element in the Theory of Constraints is the bottleneck. This is the most important step in the process. You need to identify what the bottleneck is that's restricting the organization's ability to increase its throughput. This could be a resource that is not completely utilized and cannot do anymore work and therefore, to increase throughput, this bottleneck must be broken and additional capacity found for this activity. Once a bottleneck is broken, throughput will be increased and the organization can better achieve its goal.

The Theory of Constraints uses a five-step process to identify and to solve the problems of bottlenecks: step one, identify the bottleneck; step two, decide how to exploit the bottleneck; step three, subordinate everything else to the above decision; step four, elevate the system bottleneck; and finally, if the bottleneck has been broken you go back to step one and go through the process again, because typically the bottleneck will have moved. So let's use an example from the book, *The Goal*. In the book, a machine labeled the NCX-10 is identified as the bottleneck for the plant. How do they identify it? Well, inventory is building up in front of it. Processes preceding this machine are producing at a far greater rate than the machine itself could produce. So, inventory builds up. In a service environment, you can identify a constraint or bottleneck by paperwork backing up; this could be reports that need to be approved; this could be contracts that need to be reviewed; but there is a clear, identifiable trail that leads to the bottleneck.

In step two, you want to exploit the bottleneck. In the manufacturing example in *The Goal*, this was done by recognizing that the machine did not need to stop working during the work day. The workers were taking breaks. The workers were taking their lunch, and during those times, the machine wasn't working. They realized that if the workers split their break and split their lunchtime, the machine could continue and the bottleneck could be reduced. In a service environment, this might mean that there's no missing paperwork; that all of the attachments that are part of a letter that needs to be signed that are there and complete; that all the addenda, all the supporting documentation for a contract that needs to be approved is there in the package.

Now step three, subordinate everything else to the above decision. What this means is you want to make sure that the bottleneck is working at maximum capacity and doing the right things at the right time. What this means in the manufacturing example is that the machine and the parts

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coming to the machine were identified as high priority or low priority. So, the machine would work on those pieces that had the highest priority. And the same thing could be identified in the service organization with contracts that needed to be approved or paperwork that needed to be signed identified as being a priority. So those get the attention of that critical resource first.

Step four is to elevate the system bottleneck. What this means is to increase the capacity for the organization to do the task or the job that the bottleneck resource is doing. In *The Goal*, this machine had a limited capacity, even if it worked 24 hours, seven days a week. The need for the parts coming through that machine was greater than the capacity. So, what the workers did was to bring another machine online, an older machine. It didn't have the efficiency of the new machine, but it allowed the manufacturing operation to improve the quantity of parts that were moving through the system and smoothing the production flow. In a service organization, you might restructure the approval process. For example, there is certain paperwork that requires a specific signature. Perhaps there is other paperwork that someone else could review and approve. So, once again, the process continues to move forward and the paperwork doesn't back up.

And the final step is, again, to go back to step one once you've completed the process, once you've expanded the production through the bottleneck. And once you've done that, the throughput of the organization is going to improve and the organization is going to be able to do a better job in achieving its goal. So in summary, the objective of the Theory of Constraints is to increase the output of an organization without adding more people or other resources. And you do this by restructuring the flow through the organization to smooth the flow so as to increase the output.

This concludes my overview of systems thinking. The next episode will be on the competency critical thinking, which many people believe is perhaps the most important competency a manager can have. Thank you for your attention.

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