LEADERSHIP

Governance of Information Technology: Avoiding the Tragedy of the Commons
Bob Brown

A "commons" is any resource used as though it belongs to all. In other words, when anyone can use a shared resource simply because one wants or needs to use it, then one is using a commons.... A commons is destroyed by uncontrolled use — neither intent of the user nor ownership is important.[1]

Resources as Commons

Biologist Garrett Hardin coined the phrase "tragedy of the commons" in his 1968 essay in *Science*.[2] Hardin chose the word "tragedy" carefully. In his essay, he quotes Alfred North Whitehead: "The essence of dramatic tragedy is not unhappiness. It resides in the solemnity of the remorseless working of things." Here, in Hardin's words, is the classic example of the tragedy of the commons:

The tragedy of the commons develops in this way. Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy.... [T]he rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another.... But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit — in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.

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The concept of the tragedy of the commons is clear in Hardin's example of a pasture. Other resources may also be "commons." Hardin gives the example of a Massachusetts town that covered parking meters to provide free parking during the Christmas season. The city fathers of Leominster converted an already scarce resource into a commons.

So, natural and man-made resources may be commons. Peter Senge tells us that human resources may also be commons. "Individuals keep intensifying their use of a commonly available but limited resource until all individuals start to experience severely diminishing returns. Classic examples: ... divisions in a firm that share a common salesforce and compete for the use of the sales reps by upping their sales targets until the salesforce burns out from overextension."[3]

It is clear that corporate resources may be commons. A resource that is "used as though it belongs to all" is a commons. Often corporate service resources are set up as commons.

When Commons Succeed

Resources managed as commons succeed when there is some limit on demand. Sometimes the limit will be a natural limit. "Once a [medical] system has been in use for a while, users will begin to identify ways in which it could be improved. If the system is implemented solely in hardware (an instrument) users will not expect these improvements to be effected. Indeed, they may even forbear to communicate them to the maker of the instrument."[4] Embodying a system as an instrument serves as a limit on demand for change. If the same system is implemented solely as software, no such constraint on demand exists.

At other times, the limit will be organizational or definitional. A maintenance department can succeed as a commons provided the definition of "maintenance" is sufficiently narrow. If the maintenance department is also expected to do construction, for example, it cannot succeed as a commons.

Information Technology as a Commons

It is not unusual for organizations to establish the information technology function as a commons. Anyone can request IT services, and it is incumbent upon the information technology department to deliver. This approach can succeed in a relatively small organization, just as Hardin's herdsmen were able to share a pasture until social stability allowed the herds to grow without bound. The very size of the organization serves to constrain demand.

As the organization grows, demand for IT resources also grows. At some

point the size of the organization becomes such that the demand for information technology resources becomes practically infinite. At that point, an information technology department that is used as a commons is doomed to failure. When anyone can demand services from the information technology department, some of those demands will necessarily go unmet. The result is general dissatisfaction with the performance of the department, no matter how good a job is being done on those demands that are being met. This general dissatisfaction causes management and staff turnover, low morale and poor quality work. In short, failure.

If demand for information technology is finite in (most) small organizations, how can we argue that it is practically infinite in larger organizations? The answer lies in the mathematics of queuing theory, which tells us that when the number of *sources* (potential demands for service) becomes large, it is effectively infinite.[5] Beckman gives the example of an automobile repair shop in a large city. If the shop has no customers, the potential customers are all cars in the city. If the shop has five cars in for repair, the number of potential customers remaining is not significantly reduced. For this shop, the number of potential customers is effectively infinite. (The repair shop is not a commons because the customers expect to pay in proportion to the required work.)

Information Technology in Healthcare

Healthcare is in a class by itself when it comes to information technology because of the complexity of the business. There are parts of healthcare that are managed like other businesses with respect to information technology. General accounting, human resources, and payroll are

examples. Most of healthcare is highly specialized and very information-intensive. Furthermore, there are two facets of healthcare that are nearly equally complex: delivery of care and financing of care.

It is clear that the delivery of healthcare is complex and information-intensive. Consider the number of different computing systems involved in ordering a CAT scan, performing the scan, capturing the images, transcribing the radiologist's reading, delivering the results to the attending physician, and permanently storing both the images and the transcribed reading in an accessible way. Now consider that similarly intensive processes are required for dozens of ancillary services in a medium-sized hospital.

The financing of healthcare — billing and getting paid — is as complex in terms of information technology as the delivery of healthcare. No other industry has so complex a relationship among supplier, customer (patient), and payer, nor one that is so highly regulated. Dealing with this complexity requires substantial support from information technology.

No Easy Solutions

Some have argued that using resources as commons provides "the greatest good for the greatest number." This is a fallacy. A finite resource subjected to infinite demand must fail. It is also mathematically provable. Hardin refers to the work of von Neumann and Morgenstern to show that it is not mathematically possible to maximize for two or more variables at the same time.

Hardin also tells us that the problem of treating scarce resources as commons has no technical solution. He first demonstrates that there exists a class of problems for which there are no technical solutions, then shows that the problem of infinite demand

on finite resources is such a problem. Increasing staff or changing the organizational structure may stave off failure for a time, but they do not solve the problem.

The Importance of Governance

For information technology to succeed in a large organization, and especially in healthcare, it cannot be managed as a commons. There must be a formal mechanism for controlling demand. In most organizations, including healthcare, the information technology function started out as a commons, often organized in the finance department because that department historically was the largest consumer of information technology services.[6] Changing information technology from a commons to a service with managed demand requires a cultural change in the organization, but such a change is absolutely necessary if the information technology function is to succeed.

There are many governance models that can serve to limit demand for IT resources. These include charge-back systems, budgetary controls, governance committees, and outsourcing. Selecting a suitable governance model is beyond the scope of this paper, and a model suitable for the culture of one organization might not be suitable for another. What is absolutely critical is that there *be* a governance model that everyone understands and respects.

Without suitable governance to control demand, the information technology function succumbs to the tragedy of the commons as inevitably as Whitehead's solemn, remorseless working of things.

About the Author

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References

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