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DELIVERING THE GOODS: UNDERSTANDING THE ACADEMIC LIBRARY SUPPLY CHAIN

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Introduction

Library vendors, suppliers, and publishers are increasingly driven by the bottom line. In a world where corporate mergers and acquisitions are the norm, these companies are increasingly aware of the value of supply chain economics and workflow efficiencies. Libraries, however, are often ill equipped to effectively partner with our suppliers to increase the efficiency of our acquisitions and delivery workflows. By understanding the “product” we are trying to deliver to our users and the relationships between the members of our library supply chain, libraries can begin to refocus our processes in ways which increase efficiency.

A Working Definition of “Efficiency”

Efficiency means that an organization has maximized achievement with its allotted resources. Either the organization is getting the same amount of work done with fewer resources or is getting more work done with the same resources. When I refer to efficiency, “more efficient” means that an organization has lowered the cost-per-unit of production.

Peter Drucker has been quoted as saying that “There is nothing so useless as doing efficiently that which should not be done at all” (Drucker). And, this statement hones in on one of the tenets of efficiency: only do that which serves to move the organization forward in its mission. What is it that libraries should be doing? And, (maybe more important) what is it that libraries should stop doing?

Work is effective as long as it generates a product which is in line with the goals of the organization. Anything that doesn’t do this “gets in the way of our work” and should be eliminated. To create effective work, the goals of the organization have to be explicit.

This is particularly a problem in libraries. With such a broad understanding of what we do, almost anything associated with information fits under the umbrella of libraries. Delivering database content, holding Guitar Hero competitions, having the hottest novels on the shelf, and serving coffee are all examples of how libraries have embraced the place at which media and information meet the social public. Libraries have expanded their core services to include many things that might be better off in the hands of other organizations. The library supply chain increases the ability to rely on partner organizations to supply those things to users which might be secondary to the mission of the library and create costly inefficiencies.

Understanding the “supply chain”

One of the significant developments in business over the last 20 years is the understanding of how a company’s workflows integrate with the workflows of its suppliers, distributors, and the other organizations that work to make sure that their business runs smoothly. A business “supply chain” sees the integration of all of a business’ suppliers, internal operations, distribution, and customers with attention to the logistics that tie them all together (See Figure 1). This complex chain illuminates what Ling Li in her 2007 book on supply chaining calls - a “virtual organization” of “shared data, information, and knowledge” (Li).

Figure 1: The Supply Chain (Li)

For example, my father-in-law is the VP of sales at a honey company. To supply the honey company, they buy a wide variety of products -- honey from beekeepers from around the world, plastic bottles, labels, other ingredients (like molasses for some kinds of honey), boxes in which to pack and ship the bottles, and machinery for their packing line...and this is only the beginning.

Internally, the business runs on interlinked processes of sourcing, production, and distribution which are supported by the marketing and sales departments and the accounting and finance departments. And their honey gets distributed around the world, sold to dozens of food suppliers, restaurant chains, box stores, grocery stores, and more. They have honey stored in distribution centers, and they ship over 50 million pounds of honey a year. This distribution network gets the honey from their plant to the customer.

And, between these organizations that come together to get honey to our tables are the logistics that create the potential for these organizations to help each other produce. They need systems for communication, transport, accreditation, inventory management, order processing, and warehousing. For example, their bottles are produced at a company which takes their designs and manufactures them. To increase efficiency, they have made sure that their line equipment can be easily adjusted to fit the bottles. Both companies have agreed to specifications about lid size, bottle height, and bottle volume so that the work of one company compliments the other and increases its ability to quickly produce. But, they don't just buy supplies from the company; the honey company works with the bottling company to produce bottles which carry their specific branding identity in their very shape. The work of the bottle-making company increases the efficiency of the honey company's production line and marketing.

Efficiencies can be realized in any of these areas. If the honey company's box supplier creates a more cost-effective box then the honey company wins too. If they implement a new technology on their packing line, then they save money. If one of the grocery stores makes inroads into a new market the honey company wins too. And, if they implement new

communications technology to communicate with their sourcers, they increase their potential for efficiency.

While the examples above focus on the honey company as the center of this supply chain, the honey company is the customer and distributor in the beekeeper's supply chain. To the grocery store chain that buys their product, the honey company is one of many suppliers. The relationships represented here constitute an extraordinarily complex web of organizations that work together of which the honey company is only one small part.

Libraries often, instead of thinking of work in financial terms, justify processes and services with ideals like "sharing knowledge" or "freedom of information." But, library processes function much the same way as business processes. Even though library processes are generally in the non-profit sector (which changes their purpose), libraries and businesses are functionally very much the same. They have analogous supply networks, analogous internal production lines, and analogous distribution networks.

Interlibrary Loan as an example of a Library Supply Networks

For example, at K-State Libraries, our Interlibrary Loan department procures resources primarily from other libraries, but we also get them directly from publishers, vendors, our own shelves (warehouse), and free sources. Internally, we store resources, retrieve them, scan them, and ship them directly to our patrons or back to their owners. And, to distribute our resources, we use distribution networks. We rely on other libraries to get our materials to patrons when they borrow from us. We deliver some resources directly to our patrons (we mail materials to distance students). And we use our circulation counter as a place to deliver other libraries' materials to our patrons.

In between all of these processes and organizations is an extraordinary network of systems including OCLC, metadata created by our catalogers, library holdings, Illiad, RAPID, e-mail and server technologies, various shipping organizations, and consortial agreements.

Figure 2: The Interlibrary Loan Supply Chain

Only a very small portion of this Interlibrary Loan process happens inside the unit. This process succeeds only with the support and functionality of a broad-based virtual organization. It is this network of libraries, companies, other library units, patrons, and logistical systems that allows the unit to function effectively. By participating in this virtual organization, the Interlibrary Loan unit extends its services to patrons not only within the walls of our institution, but through other libraries by serving our materials to their patrons.

Increasing Capacity through the Networked “Virtual Organization”

Supply chaining allows us to redefine collections and fully embrace the idea that our “collections” in libraries aren’t just what we can purchase and bring within the physical and virtual walls of our libraries. Collections can now be extended to include any resources that can be sourced through our virtual organization. That creates enormous potential for service and for the fulfillment of our Interlibrary Loan mission.

Also, supply chaining allows the library to stop focusing on the product we are serving because we can assume that the availability of the resource. We are free to start focusing on the network that creates the potential to provide product to our patrons. The supply chain focuses on the players in the resource-sharing process.

Looking at Interlibrary Loan in the center of the model of the supply chain is only seeing a small piece of the library’s massively networked virtual organization. We are looking at a snapshot from one perspective, relegating other participants to secondary roles in relationship to this particular Interlibrary Loan Unit.

The complexity of our libraries demands that we begin evaluating supply chains for all areas of our operations. Our reference desk services have a different but related supply network than ILL, and our newly formed Scholarly Communications Department will have a different one as well. Understanding our internal supply chain (how these operations relate to and serve one another) is as important as understanding our external one.

Using the Supply Chain to Develop Efficiencies

Efficiencies can be developed anywhere along this supply chain. One can look internally to the processes within the unit to increase efficiencies – one can look at suppliers and demand that they increase efficiencies in their operations – and one can look at the distribution systems and demand that they increase efficiencies.

The area with the most potential to increase efficiency is in the logistics – the spaces between our operations and other operations. For example, OCLC's work to create a better sharing network of libraries has created the potential for these entities to collaborate. In their participation with OCLC, libraries have all been brought under the same standard playing field with the same rules and the same expectations. It is in creating this common standardization that libraries have found the ability to share work.

This potential increases the ability to produce in extraordinary ways. When the network amasses more participants, more resources, or more customers, the potential increases dramatically. Mass participation increases the opportunities of the members. Members have increased trust in the system, the power to create our own solutions (a virtually extended work force), an increased availability of information, and an increased sustainability due to sheer momentum – the network is too big to fail.

An example of the effect of mass participation can be seen in WorldCat's recent exponential growth (Figure 3). Participation in WorldCat has steadily grown over the last ten years. WorldCat has tripled its member libraries from about 18,000 in 1994 to over 60,000 in 2007. The number of records available in WorldCat has also remained steady by tripling in that same time, growing from 31 million in 1994 to 88 million in 2007. But, the number that shows the amount of productivity is the amount of records added per year to WorldCat. The number of records added by member libraries hovered steadily around 2 million per year from 1994 to 2004 then those records shot up to almost 5 million in 2005, over 9 million in 2006, and over 18 million in 2007. In three years the productivity increased nine-fold.

Figure 3: WorldCat Growth, 1994-2007 (OCLC)

Supply Chains and Change in Organizational Culture

Not only is the capacity for productivity increased with mass participation, the perception of our organization changes. Our patron base is extended – we no longer just serve our local populations. We serve the local populations of our distribution networks. Our “customers” are often far away from our local service points.

Our collection is also extended. We are no longer reliant only on our local resources; the supply network provides a foundation for collection which we rely upon for our users. We have moved from a “just in case” collection mentality where if we do not own a resource, it will not be available to our users to a “just in time” collection mentality where we create access to content and rely on our ability to employ our supply network to get information to our users in a timely manner. This shift is a consequence of changing focus from organizing our processes around the resources we are delivering to a focus on the network where we assume a resource-rich environment. And this allows us to focus on developing the relationships and the tools to tap into the resources we need. Businesses have been making this same shift to increase efficiency by relying on their extended virtual networks.

Appropriate Library Services

Another consequence of this shift away from product-focused processes is that it allows for more variety of the scope and coverage of our services. In academic libraries, we are providing a multitude of services and “products” such as scholarly communications support – publishing, copyright, repository services; provision of collaborative work spaces; course content creation and embedded librarians; remote reference; technology infrastructure support and hosting; grant support; and information technology instruction and innovation.

It is increasingly important to library efficiency that we have clarity of purpose in our product development. The supply chain is dedicated to providing support for the development and distribution of a specific product. Without clear definition of product and purpose, libraries stand to lose the ability to understand what “efficient” means. Peter Drucker’s admonition to stop doing the useless work of efficiently doing the wrong job resonates here. Libraries can assess the efficacy of our processes by defining their products and clearly understanding how those products fulfill their purposes.

To build efficiency in the workflow libraries need to

- clearly articulate a vision, mission, and purpose and understand them across the organization.
- adopt workflows which meet specific purposes and keep the work from straying away from those purposes. To put Drucker’s statement another way: if the work isn’t adding value to your product, then it is less than valuable – it is a drain on the organization’s ability to produce
- define the necessary inputs and outputs of the supply chain to create the right product, increase efficiencies, and deliver the product. Without understanding the product and how that product fits into the vision, mission, and values of the library, libraries are in danger of bringing in superfluous resources which do not add value to the product. This would be like the honey company buying thousands of lids which do not fit the bottles from the production line. Wasted money, storage, and energy with the added distraction of confusing the operation by adding in unnecessary elements.

Increase efficiency in libraries by eliminating processes which don’t add significant value to products or are not in demand by users. It costs us more than the price of our resources to deliver the wrong product to our users – it costs us the time, energy, and maintenance of the supply chain to feed that product’s production and delivery.

Increasing Logistical Efficiencies through Standardization and Proprietary Technology

An area of increasing potential for efficiencies in the library supply chain is in developing the logistics. These efficiencies can be developed between members of the supply network on a large scale by standardizing technologies and workflows. They are developed on a smaller scale between individual libraries and other individual members of the supply chain through the use of proprietary workflows and systems or by using technology to create customizable tools which integrate the diverse workflows of participants into more manageable systems.

The library community has made strong moves in the world of standardization in recent years. The development of SUSHI, COUNTER, Dublin Core, and other standards has helped move libraries past the silos of proprietary systems, tools, and procedures to be able to use and share data in ways we haven’t before. Standardization enables libraries to easily incorporate multiple suppliers or to switch from one supplier to another without significant changes in the workflows or systems employed in the transactions. As well, standardization creates shared language, skill sets, and training. Libraries and other participants in the library supply chain can begin to create workflows based on these shared understandings. For example, the COUNTER standard has helped create the potential for multiple platforms, libraries, user groups, and sources to all evaluate the usage of our materials with a common understanding. And from this, we have seen workflows being developed with COUNTER in the center.

However, standardization does create strong momentum in one direction which is sometimes hard to reverse. Libraries reliance on the MARC format has served the library community well, but as libraries have tried to push the description of materials further back in the supply chain, we are finding it hard to demand MARC compliance from the publishing and vending communities. Trying to create an alternative to the MARC format which serves the needs of all constituents in the library supply chain at the network level is a steep mountain to

climb. The investment in MARC has, in some ways, disabled the community from moving past it.

Standardization also has the potential to limit development as the one-size-fits-all approach means that individual entities must compromise to participate. This might mean sacrificing local conventions which might have been uniquely tailored to meet the needs and objectives of the institution and its collaborators.

Proprietary systems are useful in the supply chain. Many businesses develop standards which exist only between them and their suppliers. This helps the businesses capitalize on their innovation and market their unique solutions to their customers. The greatest benefit of proprietary systems is the ability for an organization to more fully integrate its workflows with those of the supplier. Unlike standardization, the proprietary system does not demand as many compromises based on the lowest common denominator of participants but, instead, promises a system which can be more fully integrated into individual workflows. Unfortunately, proprietary systems in the library industry often function as defacto standardization since most proprietary systems offered to libraries attempt to standardize workflows to the proprietary system.

Dedication to a proprietary system makes it hard to change suppliers or to retool workflows. The investment by a library to a proprietary system is often so labor intensive and expensive that changing systems is almost out of the question.

The siloed functionality of proprietary systems generally makes them hard to integrate with other systems and workflows. So, the proprietary systems stand on their own with little opportunity to mesh with other systems. For example, the ERMs on the market right now don't work well with other tools. The ERM at K-State Libraries does not even interface with the same vendor's ILS system.

A third alternative for libraries to leverage efficiency is to customize our own local tools to integrate the multiple supplier inputs. We have seen several recent attempts at this from the Worldcat Selection tool developed from Cornell's ITSO CUL system to SUNY Geneseo's GIST system which combines Interlibrary Loan functionality with acquisitions tasks. This kind of customization meets local needs and allows multiple inputs and outputs. However, it is extraordinarily costly and time-consuming to develop a system like this. As well, it has the potential of having a short shelf life as diverse supply chain participants change their systems and standards.

Conclusion

By looking at our workflows and being intentional about our work, libraries have an opportunity to define what we are producing and why. We can be more intentional about the relationships we establish to make and deliver our products. We have the opportunity to extend our virtual organization and use the potential of that extended organization to do things we couldn't do before. We have the opportunity to do the necessary work in new ways which increase our efficiencies. And, we have the opportunity to STOP doing things which aren't adding value to our products. But, to do these things we need to understand the tradeoffs of adopting shared workflows with standards, proprietary systems, and customized solutions.

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