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Coming OWIC events:

December 8-11: [How to Dry Lumber for Quality and Profit](#)
Corvallis, OR

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Business Systems Innovation in the Forest Industry

This category of innovation is not focused on developing new products or services but includes a wide variety of innovations related to the internal and external operations of the business. Business systems innovations include the development of new markets, marketing methods, administrative processes, staff development programs, organizational structures, business models, and management approaches.

The industry has seen a tremendous transition in its competitive focus away from low costs to being more customer or market orientated. This transition in itself is a business systems innovation – creating a “customer-facing” organization.

Some specific examples are:

- Mass customization – in essence, a compromise between mass production and customized products. Manufacturers retain the efficiencies of mass production while providing customers the ability to purchase customized products. A good example of this is in the automotive industry. Automaker websites allow potential buyers

to choose from a list of standard models, then customize by selecting body color, wheels, interior color, engine, sound system, etc. Similarly, in the wood products industry, many cabinet companies use mass customization to allow customers to create a ‘custom’ kitchen spaces by choosing among a set of styles/designs, wood species, etc. This ability to mass customize is said to be one reason the U.S. cabinet industry has been more resilient against foreign competition than the furniture industry.

- Customer relationship management – this is not a new phenomenon, but many companies are organizing themselves differently to facilitate enhanced customer support, especially for larger or more important accounts. For example, many sales staffs have changed from focusing exclusively on geographic regions to a hybrid structure including strategic or key accounts. These structural changes are an attempt to better manager the relationship with the customer, increase customer retention, and maximize value-added.

- Lean manufacturing – a philosophy and set of tools focused on eliminating waste (e.g., work-in-process inventory and non value-added activities such as excessive movement of materials) in all its forms from a process. Lean manufacturing originated as the Toyota Production System and is often considered synonymous with ‘just-in-time’ (JIT) manufacturing. However, JIT is only one component of lean manufacturing. Common tools and techniques used by firms that are striving to ‘go lean’ include value stream mapping, one-piece flow, cellular manufacturing, set-up time reduction, 5S (sort, set in order, standardize, shine, sustain), kanban, and a ‘pull’ system for production. The last item is key in that in a lean company, inventory (both finished goods and work-in-process) is not seen as an asset but as a liability. Thus, orders from customers result in ‘pulling’ production through the factory so that products are made when they are needed, and not before. More information on lean manufacturing in the wood products industry is on our website at <http://owic.oregonstate.edu/lean/>

Baseball Bats Meet Medical Science

Ash has been the wood species of choice for baseball bats for many decades. However, starting in the late 90's, more and more bats are being made from maple. In fact, Hillerich & Bradsby (maker of Louisville Slugger bats) reports that over ½ the bats used in the major leagues nowadays are made of maple. But, of course, this hasn't been without controversy. Part of the challenge with maple bats is the different way they break compared to ash. Some have described ash bats as cracking or splitting whereas maple bats 'explode.' Several injuries to players, coaches, umpires and even fans have been reported as shards of bat are sent flying. This has led to suggestions that maple bats be banned in the major leagues.

So, from a wood science & technology standpoint, what are the differences between ash and maple bats? Well, sugar maple is a bit harder than white ash. Hardness is one property that has led to the increased popularity of maple - although Barry Bond's 73 home runs in 2001 us-

ing maple bats surely helped boost maple's popularity!

Maple is also a bit heavier than ash. And since many players like lighter weight bats, bat manufacturers look for lighter-weight maple to make bats. Since strength is strongly correlated with density, it's not surprising that the lighter-weight materials would break more easily. Another factor could be aggressive drying schedules that lower the toughness of the maple and/or allowing the bats to become too dry and thus brittle.

A major factor, however, is the difficulty in identifying the grain direction in maple. The old adage with swinging a bat is to turn the label so that it faces up - this ensures that the ball will hit the radial face (parallel to the growth rings) rather than the tangential face of the wood. Ash is a ring-porous hardwood - the earlywood portion of the annual growth ring is comprised of large vessels (pores) and the latewood is comprised of distinctly

smaller vessels. By contrast, maple is diffuse-porous - the vessels are much more uniform in size throughout the growth ring. As a result, it is much harder to see the growth rings in maple and thus to properly orient the bat so that it is striking the ball at the optimal angle to minimize the risk of breakage.

So what's the solution? Well for both ash and maple, there has been a tendency towards smaller handle diameters; some experts have said that increasing the handle diameter alone will reduce the problems with breakage. Whether or not maple bats will be banned is still being debated.

Alternatively, how about a CT scanner, as commonly used in hospitals, for bats? Universal Medical Systems recently introduced portable, battery-operated CT scanners for bats. These devices would be used in dugouts to scan bats for internal defects after about 10 hits.

Business Systems Innovation cont.

- Six Sigma - a philosophy and set of tools focused on eliminating variability. Many of the tools and techniques used in Six Sigma such as statistical process control, design of experiments, and quality function deployment are not new; these tools have been in use for decades as part of quality engineering and TQM programs. However, what is new with Six Sigma is the focus on financial measures of success (as opposed to quality metrics such as defect rates), involvement from top management

(particularly in the selection of projects that fit the company's strategy), and the structured approach to project management. Six Sigma uses the DMAIC (define, measure, analyze, improve, and control) approach to quality improvement projects. Many firms are combining Lean Manufacturing and Six Sigma to capture the benefits of both - eliminating waste and variability in an effort to improve competitiveness.

- Environmental management - societal focus on environmental issues has driven business system innovations. For example, many manufacturing operations in the industry have pursued ISO 14001 environmental management system certification. On the customer side, companies pursuing creation of green buildings via building programs such as LEED (Leadership in Energy and Environmental Design) or Green Globes represent important business systems innovations.

Business Systems cont.

• Branding – with the transition to being more market oriented, the industry is increasingly using brands to communicate with customers. Pick up any trade publication and brand proliferation is easily seen. Possibly the most noted example of branding innovation in recent years is Weyerhaeuser's consolidation of brands under the iLevel® umbrella.

• Cooperatives – collaborative approaches to organizing have been widely embraced in agriculture, electrical utilities, and telephone service, but their use in the US forest industry has been quite limited. A cooperative business model serves to link independent entities in order to enhance buying and/or selling

power. In Scandinavia there are several woodland owner cooperatives that play a major role in the forest sector. Some are vertically integrated with paper and wood product manufacturing operations.

These are just a few of the many business systems innovations being implemented in the industry. Often these innovations are highly interrelated with, for example, lean manufacturing principles being used to assist in mass customization efforts. To be successful with Mass Customization, a firm must have a flexible production system, the ability to make rapid set-ups and changeovers, and reliable machinery, to name but a few. Inventory control is a critical

component to these approaches, so just in time and vendor-managed inventory – a system by which the supplier of a product is responsible for maintaining the inventory levels of its products at the customers' location – have become more important.

As to the future of business systems innovations, the field is wide open! The forest industry in particular has much to gain from this kind of innovation.

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