

ONLINE INFORMATION SYSTEMS FOR TODAY'S FOREST INDUSTRY

Brandon Martin; Earl Kline; Steve Prisley; Rien J. M. Visser
Virginia Tech; Blacksburg; USA; rvisser@vt.edu

Abstract

The Internet and its capabilities has become a powerful information tool for all members of society. Now more than ever, the internet is allowing important business information to be shared and gathered faster and more efficiently. Critical financial and business decisions are made on a daily basis, based on the information that is obtained through websites and online communication. A variety of informational resources are available to those with internet access. Some websites offer information at no cost, while others have a charge or membership fee to access pertinent information. The information gained through such websites is now being harnessed by forest industries, allowing many landowners, foresters, and forest businesses to make important business contacts more efficiently; while also gaining knowledge about current market trends and future wood supply and demand outlooks.

Our purpose is to review some of the more common types of informational websites related to the forest and wood products industry and evaluate the data that these systems provide to the participants in the wood supply chain. This paper evaluates just a few of the many rapidly emerging websites available, with a focus on Virginia, USA. The main concern was to explore the different types of information available through the internet from a stakeholder perspective in the forest industry supply chain.

1. Introduction

Traditionally, the availability, quality, and sustainability of U.S. forest resources have been major drivers behind the nation's wealth. The value added by the U.S. forest industries is \$300 billion (US Census Bureau, 2005). Approximately 8 percent of value-added in US manufacturing begins in the forest. Over, 50 percent of this value ends up in some form in the building and furnishing of our homes such as structural components, windows, doors, cabinets, and furniture (see Figure 1). However, this wealth generation engine is facing increased challenges now within an emerging global economy.

In past decades, the forest industries' value stream has changed, largely due to changes in demand and in global competition. No longer are there the simple linear supply chains from forest to consumer. Gone are the days when a tree is harvested from a nearby forest, cut at a local sawmill, manufactured into finished goods by local industry, and sold to the local community.

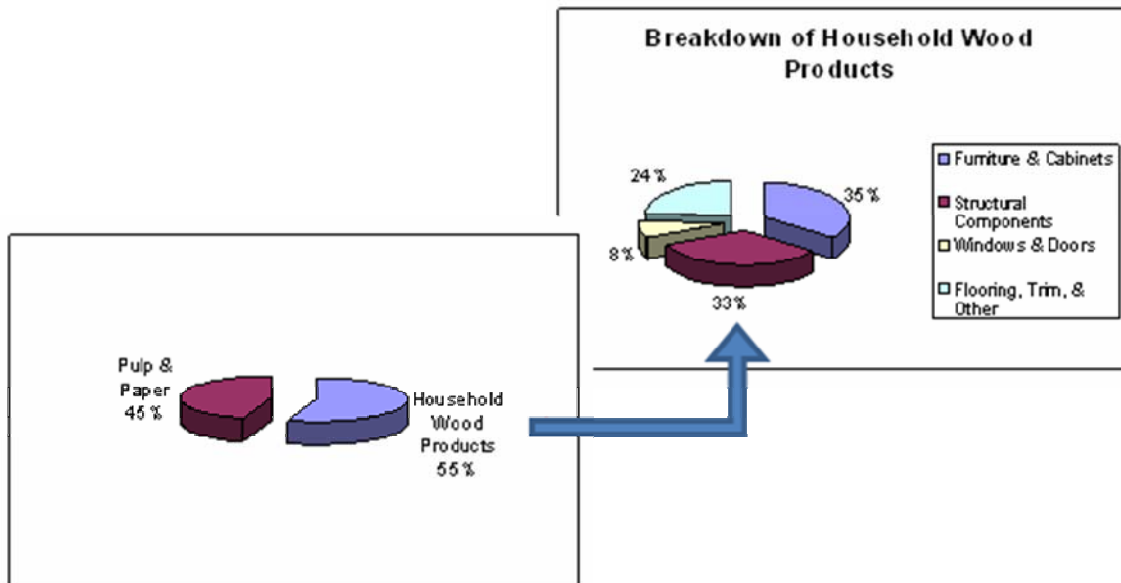
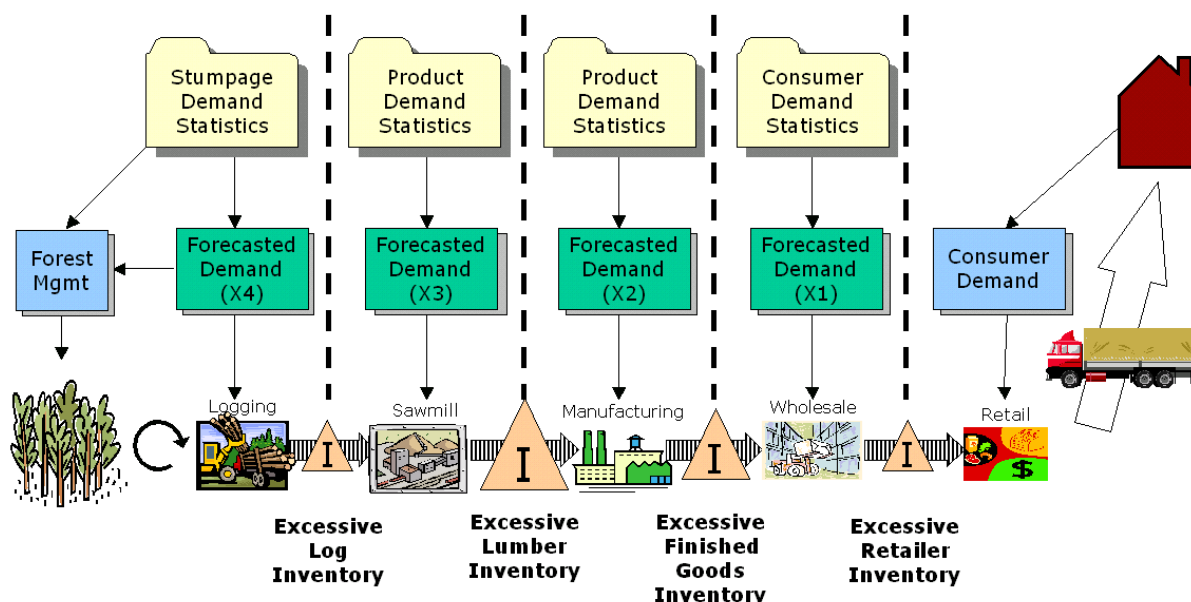


Figure 1 Top consumer products derived from forest resources in the USA (Source: Survey of Manufacturers 2005).

Since mass production replaced custom woodworking in the early 1900s, the forest products industry has evolved into a highly fragmented supply chain with many interrelated but uniquely distinct industry segments: landowners, harvesting operations, sawmilling, secondary manufacturing, distributors, wholesalers, retailers, etc. (see Figure 2). Currently, each step/company along the supply chain takes current demand information (folders) and generates some forecasting numbers (boxes) with some safety factor applied to address the variability of demand. It is this safety factor and inadequate information amongst the segments that lead to overproduction and translates to excessive inventories at each stage in the supply chain. As the forecasting error (higher safety factor) increases, there is a need for larger inventories (shown as triangles). Thus, higher inventories will occur upstream due to cumulative errors in forecasting or anticipating market demands. This is called demand amplification or more commonly referred in supply chain dynamics as the “bullwhip effect” (Forrester, 1958). Adding forest resource uncertainties along with demand amplification can lead to artificial supply and demand imbalances in the supply chain.

In the fragmented supply chain shown in Figure 2, a lack of interaction (represented by dashed walls placed between each industry segment) is the result of many years of standardized or “commodity” products that can be graded and priced to certain standards and then separated to service a number of markets. In spite of the creation of standard products, research has identified that companies desire greater access to information about their customers, vendors, and consumer market trends to help them customize or distinguish their products and services (Bumgardner, et al., 2004; Vlosky and Smith 2003). However, under the current system of trade where the major information emphasis between industry segments is treated as proprietary and mainly driven by the lowest price of standard product grades, it is difficult to collect and transmit information about true customer needs and to translate this information effectively into customized products and services.

Current State: A Fragmented Supply Chain



Production and Inventory Levels are a result of Artificial Supply/Demand Responses

Figure 2 Current state of the extended “forest to consumer” value stream.

Advanced web-based computing and computer visualization tools such as Geographic Information Systems (GIS), Global Data Synchronization (GDS), databases, and inventory tracking and control systems have been emerging and some are being adapted for forest industry applications. The capabilities and increasingly easy to use interfaces could potentially address the information needs of the forest industries and potentially lead to innovations that can bridge the information gaps between the various industry segments from the forest to the final consumer.

The objective of this paper was to evaluate online information systems currently available on the Internet for players in the forest products supply chain. This evaluation classifies and discusses the types of information systems available and for which industry segments, the data formats used, and future needs to bring the individual segments of the supply chain closer together to help promote more sustainable business practices to better compete in today’s global marketplace.

2. Classification of Information analyzed on the Internet

Three classification groupings were established in an effort to present websites and their data by like characteristics. The following groupings best represent the data that were analyzed:

1. Resource Sites- State and natural resource agencies have mapping tools and informational pages available to the general public at no cost. These systems are made available through local state

departments or federal agencies. Many of these sites pertain directly to on the ground resources such as timber, water, roads, and infrastructure.

2. Market Sites- These sites are devoted to relaying accurate information on current market supply and demand based on data that has been collected and analyzed. These systems provide some information free of charge but may have a fee in order to gain access to all values of the services provided by these companies.
3. E-Commerce Sites- These websites provide services that make trading platforms for timber, lumber and a variety of other forest products available for all forest businesses. These sites facilitate the buying, selling, and trading of wood products around the world. Many e-commerce related sites require membership to enjoy most of the benefits and services offered by these companies

The above classifications broadly define the types of information easily available via internet from a forest industry stakeholder perspective. This information has a variety of uses outside of the forestry and wood products industry but for the purpose of this paper we will analyze this data with the aforementioned industries in mind. Information of all types is needed by members of the forestry community. Information allows the constituents of any industry to make essential contacts, business transactions, and basic daily business operations successfully (Kuglin 1998). Table 1 lists informational needs categorized by members of the forest and wood products industry.

Table 1 Informational gaps defined by forest industry stakeholder

<i>User Groups</i>	<i>Informational Wants or Needs</i>
Landowners	Professional advice, Stumpage prices, availability of loggers
Consultants	Landowners in need of advice, Stumpage Prices, Loggers
Wood Dealer	Stumpage Prices, Bare Land Values, available inventory, wood demand
Loggers	Mill prices, product specifications, stumpage prices, timber type, fuel prices, ground condition, weather information, available inventory, delivery time/cost, timber availability
Mills	Fashion trends, demand for various products, current stumpage prices, current/future supply, delivery time/cost
Manufacturers	Market trends, future expectations, raw material cost, wood inventory available, delivery time/cost, logistics information in coordinating all suppliers
Wholesalers and Retailers	Customer preferences, material cost, delivery lead time, product and service options, future trends and economies

The business information needs in Table 1 have conventionally been met through traditional business practices of contact networks and business partners. This way of doing business is costly and does not generally act in the most efficient means for maximizing company profit or supply chain responsiveness. Furthermore, when the industry is fragmented as shown in Figure 2, information can be delayed or simply

be wrong due to artificial supply and demand variations caused in an extended supply chain. The internet is allowing new networking opportunities to be developed through easily accessible information. This information drives the business of forest industry and constitutes the buying and selling of wood products around the world. Today web capabilities have the potential to link members of the supply chain to establish efficient wood supply chain networks. With the help of readily-available updated information on the internet, a more informed, well-educated supply chain network is developing that is operating more efficiently and effectively. Figure 3 shows the forest industry supply chain and the relative players that make up the forest to consumer chain. This depiction portrays forest industry players and the respective information that those individuals need to have (boxes), provide to the system (arrows), and the respective websites that offer assistance in obtaining the right information for the players in question (blue ovals).

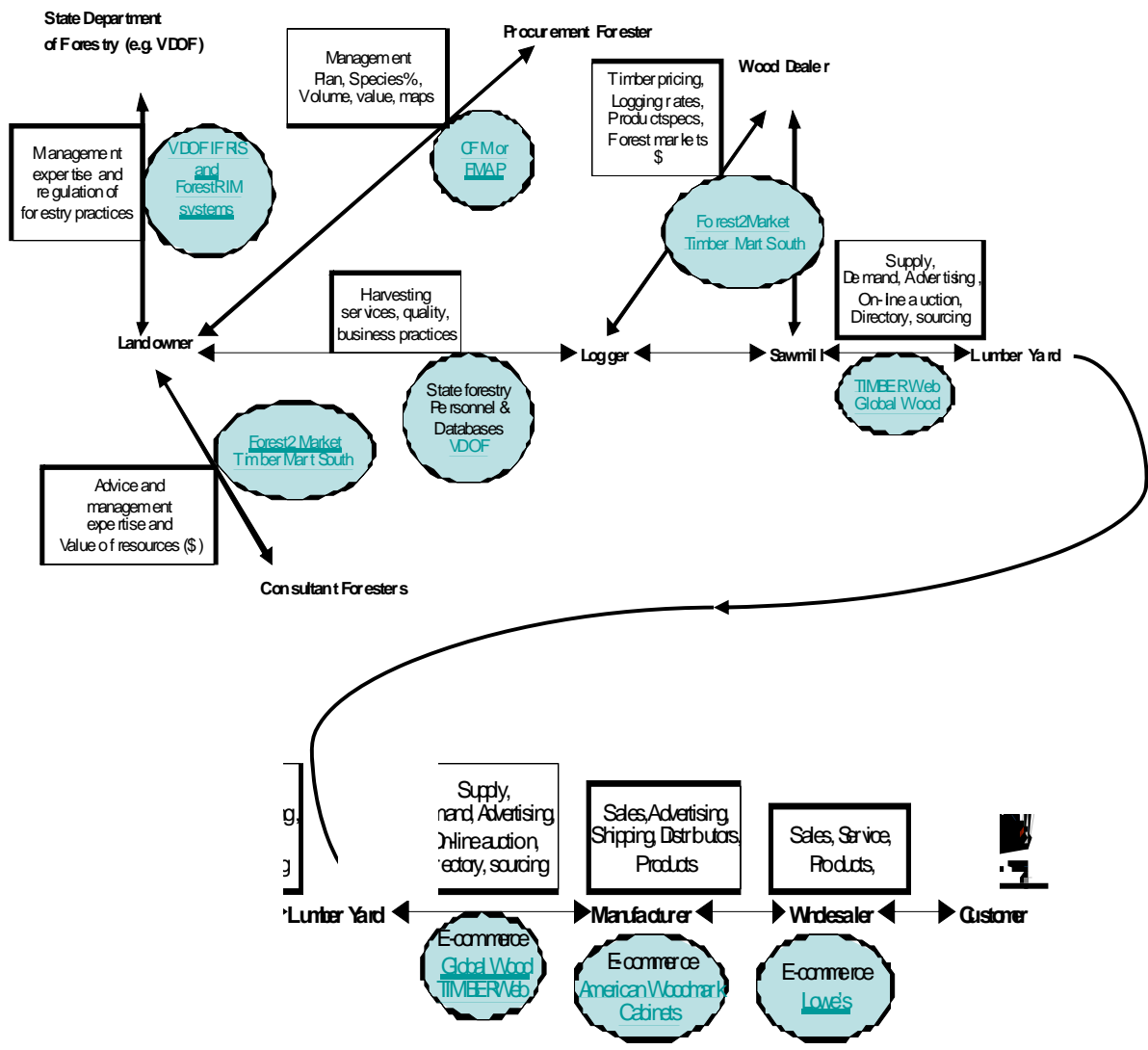


Figure 3 Forest to consumer supply chain network with respective information by industry stakeholder.

3. Analysis of Websites

The following websites were chosen based on the types of information that they delivered when compared to the broad analytical groupings that were assigned. Vast numbers of websites deliver comparable information but only two sites from each category are described to give readers a feel for the types of information that are available on the web pertaining to the forest industry.

Resource Sites Analyzed:

- Virginia Department of Forestry: (www.dof.virginia.gov)
- United States Forest Service: (www.fs.fed.us)

Market Sites Analyzed:

- Timber Mart-South: (www.tmart-south.com)
- Forest2Market: (www.forest2market.com)

E-Commerce Sites Analyzed:

- Global Wood: (www.globalwood.org)
- TIMBERWeb: (www.timberweb.com)

The *Virginia Department of Forestry* (VDOP) makes available a wealth of information through their departmental websites. The department is responsible for the protection and management of some 15.8 million acres of forestland in the state of Virginia and assists with some 300,000 non-industrial private forest landowners that control 77 percent of the states land. VDOP's website (www.dof.virginia.gov) allows users to access valuable information about forestry in Virginia as well as all other state departmental websites for the entire United States. In addition links are available to access both federal and state partner agencies of the VDOP such as the Natural Resource Conservation Service (NRCS) and the Virginia Department of Environmental Quality (VDEQ). The department provides public access to an online mapping interface called Forest Resource Information Mapper (ForestRIM) [www.forestrim.org]. This program allows users the ability to view digital online map layers for Virginia and also construct simple maps with polygons and map features. Data layers within ForestRIM include: aerial photography, infrastructure, hydrology, topographic maps, digital elevation models as well as many more land and resource based layers. This information allows non-industrial private forest landowners as well as small consulting and logging firms the ability to use mapping technologies to plan management applications.

A wealth of literature pertaining to forest management is readily available for landowners who are interested in learning more about management options for their landholdings. Information on financial assistance and incentive programs is available for landowners to view and online applications are available for direct application of some programs. Business and bid information is posted as it is received by VDOP on both private and public timber sales. Timberland tax information as well as links to help landowners with tax planning and filing are also readily accessible. Contact information for professional private consulting foresters is by and large available as well as the contact information for local county foresters. State departmental websites are a good place to look first for contact information and basic forestry information for a given area. They generally provide enough information on the resource end to answer any questions that landowners or other resource managers may have with natural resources.

The *United States Forest Service* (www.fs.fed.us) is a federal agency housed in the United States Department of Agriculture. The mission of the Forest Service is to "sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations". The U.S. Forest Service maintains a diverse website that allows the many different users of national forests and grasslands the ability to obtain relevant information on federal lands. The some 193 million acres that make up the National Forest and Grassland landbase are managed for recreation, wildlife, water

quality, grazing, minerals, and timber resources. The agency manages all of its resources in a multiple use-sustained yield philosophy. Volumes of research documents are available to answer almost any forestry or natural resource issue and financial and technical assistance is granted to state and private forestry agencies. The website also offers up to date information on current forestry issues such as disease or insect outbreaks as well as current economic conditions within the forest industry.

Timber Mart-South, produced by the Center of Forest Business, Daniel B. Warnell School of Forestry and Natural Resources, University of Georgia, Athens is a quarterly market price survey and report of the major timber products in 11 Southern States. Timber Mart-South's website (www.tmart-south.com) allows viewers to see quarterly Southeastern average stumpage prices in \$/ton. The site also allows viewers to see past quarterly market reports from Timber Mart-South's quarterly market archive. The Timber Mart-South quarterly report (must be purchased through Timber Mart-South) gives a detailed look into current market conditions. The complete report includes logging and load rates, hardwood and softwood stumpage prices, whole tree and fuelwood prices and pine straw prices and markets.

Forest2Market is a company that prides itself on helping forest products companies and businesses meet their supply and demand of wood products more efficiently. At this time their website, (www.forest2market.com) is used primarily as a price reporting medium and portal where members of Forest2Market can access up-to-date timber prices. The site also provides links that correspond with local timber markets and current timber prices. One can also find registered forestry service providers by location and an average southwide timber index for pine pulpwood, pine chip-and-saw, pine sawtimber, hardwood pulpwood and hardwood sawtimber. Membership is segmented between landowners, small businesses, regional businesses, and south-wide businesses with different costs representative to the extent of price coverage.

Global Wood (www.globalwood.org) is a website devoted to serving the needs of the lumber and wood products industry. The website provides a variety of important information for the forest industry, such as up to date information on current events in the lumber and wood products markets. This site also provides U.S. and Canadian timber prices, international log and sawnwood prices, international plywood and veneer prices, and New Zealand pine log prices. An online timber inquiry service is available for anyone who has questions pertaining to the timber, furniture and wood products sectors. Global Wood also maintains an up to date trade center in which businesses can offer to buy or sell, post their contact information, and post an offer for a particular resource. This service enables buyers and sellers to benefit from efficient transaction capabilities, which results in lower material cost. A products page lists available manufactured and non-manufactured wood products and their representative companies. Global Wood also maintains a multitude of useful links on a variety of subjects within the forest and wood products fields to help better serve and educate businesses and individuals.

TimberWeb (www.timberweb.com) asserts that it is one of the leading global business-to-business (B2B) timber and lumber e-markets. This site provides a networking environment for buyers and sellers of timber and lumber. The website is segmented into three distinct sections including: e-trading centre, global timber directory, and an information centre. TimberWeb's e-trading centre is a unique trading platform that enables buyers and sellers to trade publicly as well as conclude deals privately. The global timber directory that TimberWeb maintains is comprised of over 90,000 businesses that advertise their products and services. Lastly the information centre portal keeps members up to date on current news, events, jobs, and other market information. Four types of membership are available for interested parties to access the benefits of the TimberWeb network. Trading membership is designed for members that are buyers or sellers of timber, lumber, roundwood, veneer, logs or other wood products. Logistics membership is specific to industries that are part of the shipping, transport, or movement of wood around the world. Services membership is designed for businesses that provide financial services, machinery, equipment, computer technology, etc to the forest industry. Lastly an associate membership is available for parties such as universities, associations, commerce departments, and other business or educational groups. Nearly all activities on TimberWeb are reserved for members. In order to become a member of

TimberWeb and enjoy the benefits offered by this website one must sign-up through TimberWeb's membership portal.

4. Conclusion

The internet enhances information sharing within the forest industry and is used in business applications on a daily basis. The broad outreach of the World Wide Web is allowing forestry consumers and producers the opportunity to "meet" on one global network. This increased information sharing can lead to more well informed consumers and producers that have increased marketing opportunities for their timber products. The speed and efficiency of internet communication and increased marketing potential; allows the forest industry to more closely operate at true supply/demand levels. Two hurdles of information flow on the internet is proprietary information, which is information that limits who can view or know about its contents and anti-trust regulation which aims to protect the economic ideal of consumer welfare by ensuring business must compete for its share of the market economy (BusinessDictionary.com 2007). Companies keep proprietary information if they feel that they can derive economic benefit from not having this information widely known to the general public (Libraries 2007). Current proprietary information would be convenient to have to make the best decisions possible in the forest industry. Anti-trust regulation is something that must be closely monitored to ensure that within a system of widely available information that market fixation is not allowed. Readily available information sources are critical components of efficient business operations and the future of business networks. The future of all successful businesses is likely to take the shape of a customer centered supply chain. "This new and innovative supply chain will incorporate the extended supply chain, working together to provide a common product and service to the marketplace that the customer desires and is willing to pay for. This multicompany group makes use of shared resources (people, processes, technology, and performance measurements) to achieve operating synergy" (Kuglin 1998). The Internet will continue to provide a way for business transactions to perpetuate efficient and timely use of our forest resources.

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