



Web-Enabled Configurators Simplify the Selection of Complex Products

*A Winning Solution for Manufacturers
and Their Customers*



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Introduction

This white paper describes the use of Internet enabled product configurators in manufacturing industries. In addition to describing the characteristics of configurators, the benefits that can be realized by suppliers and customers that utilize configurators are addressed. Finally, important criteria for selecting and implementing an effective product configurator solution for your business are outlined.

Background

The rapid explosion of the Internet and e-commerce has provided businesses with a virtually unlimited number of opportunities to grow sales and profits by accessing new customers and markets, offering new products and services, expanding sales channels, and implementing new, non-traditional business models.

E-commerce sales in 2007 (the latest comprehensive statistics from the U.S. Census Bureau including B2C and B2B e-commerce sales) were approximately \$3.33 trillion, a 12% increase over 2006. E-commerce shipments are projected to grow to approximately \$1.3 trillion in 2004, based on the annual increases of approximately 6% since 1999. These new opportunities have fueled businesses' enthusiasm to participate in this new economy and capture their share of it.

Media focus on e-commerce has been on business-to-consumer (B2C) sales, but business-to-business (B2B) e-commerce sales actually account for over 93% of all e-commerce shipments. More specifically, e-commerce shipments are led by manufacturers of durable goods. In 2007, e-commerce shipments by businesses in manufacturing industry segments were \$1,856 billion. Six industry groups with the highest shares of e-shipsments accounted for 70% of all manufacturing e-shipsments in 2007. Industry groups with the greatest e-commerce shipments include: Transportation Equipment, Chemical Products, Food Products, Petroleum and Coal Products, Computer and Electronic Products, and Machinery Products. ,

While e-commerce shipments are growing rapidly, in many industries, they are still a relatively small portion of total shipments. For manufacturing industry segments, e-commerce shipments on average are approximately 20% of total shipments.

Many businesses have encountered obstacles in achieving rapid e-commerce sales growth. Realizing e-commerce sales isn't as simple as replicating a traditional business model and putting a static catalog on-line. To ensure

success, businesses must simplify customers' buying experiences, provide increased value add with new products and services, effectively utilize multiple sales channels, and in some cases implement new business systems and or business models. Product configurators and a standard platform for implementation (the Internet) can minimize the impact and in many cases eliminate the obstacles that are encountered by suppliers as a result of product and customer needs becoming more complex and the increasing speed of doing business.

Industry Challenges

A number of obstacles must be overcome to achieve consistent e-commerce sales success and capture a share of the growth in e-commerce.

Increasing Product Complexity and Longer Sales Cycles

A variety of products are inherently complex, not only to install and use, but also to specify and purchase. Customers must evaluate and choose from a broad range of base models, options, and accessories to identify the best solutions to meet their needs. The constant introduction of new technologies, products, and features only makes the sales process more difficult. Constant change has resulted in longer and highly challenging sales cycles.

Customers often require more time to research, learn about, and evaluate their options before the purchase decision is made. Along with this, sales representatives must make special efforts to understand a customer's needs - often times consulting with headquarters marketing and engineering experts - prior to identifying and recommending the best solution. Even then, the recommended solution may not exactly satisfy the customer's unique requirements. In addition, the overwhelming complexity of many products is driving sales costs higher.

Multiple Sales Channels

In the past, manufacturers typically selected one channel over another on the basis of cost or convenience. Successful selling strategies today generally require the use of multiple channels to reach different customers and offer different products and services. Some customers may prefer to buy from a direct sales force, while others would rather purchase from a channel partner (ex. wholesaler), and others may want to purchase on-line over the Internet. As a result, many manufacturers are aggressively expanding their channel mix - broadening and strengthening existing channels and developing new channels such as the world wide web.

What Is a Configurator?

A configurator is a rule and constraint based software application designed to assist a user specify and select a product by describing general needs and requirements. The configurator “guides” the user through the process. The user can specify requirements and make selections in any order. Based on the step-by-step selections, the configurator applies the rules and constraints in real time to ensure that at the end of the session, only a valid product is defined. At the conclusion of the selection process the item can be placed in a shopping cart. The configurator generates all pertinent product information including: specifications, prices, and fulfillment lead times. Depending on the complexity of the product and customer needs, configurators (at the wish of the supplier) might also generate installation/assembly instructions, user manuals, and literature.

Configurators are ideal for complex products and services that include many options and accessories that are often times mutually exclusive.

Not only do configurators generate product information (ex. part number and specifications), but they may also generate specific market, contract, discount, and “special offer” pricing in multiple currencies.

On-line configurators are an intuitive interface for customers and sales channel participants, but many configurators can also generate bills of materials and associated documentation (ex. work orders) that can be integrated with other business systems including Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and Sales Force Automation (SFA). Configurators have been available for “internal use” in companies by highly trained personnel for years – the newest configurators being implemented on-line are “customer focused” and developed first and foremost to meet the needs of customers when purchasing products.

Configurators can be utilized to define both products and services. Since manufacturing is the focus of this white paper, characteristics and features of product configurators will be emphasized.

Configurator Benefits

On-line configurators provide benefits to both suppliers and their customers.

Primary customer benefits include:

- No need to be an expert on the supplier's products
- Instant information
- Easy order placement
- Convenience

Following are overviews of the customer benefits as well as related issues associated with realizing those benefits.

No need to be an expert on the supplier's products

Customers' expertise and core competencies are on their own products and the applications of those products, not the supplier's products. Tools that simplify the customers' selection of complex components that are part of their product, or used with their product increase their productivity and enable them to devote more time to ensuring the growth and success of the business for which they are directly responsible. There is no need to worry if a valid product is being selected - the configurator ensures it.

Instant information

The fast pace of today's economy requires that businesses be capable of responding almost instantly to customer requirements and new opportunities. Determining valid products, available accessories, product specifications, price, and availability with on-line configurators eliminates the necessity of waiting for a salesperson or factory representative to provide assistance in specifying and selecting complex products. The frustration of missed phone calls, lost faxes, and scheduling conflicts can be avoided.

Additionally, on-line configurators allow a wide variety of different products to be easily compared (attributes, price, availability) to determine the best product to satisfy the application requirements. Products with different features from the same product line or products from different product lines can be compared.

Easy order placement

A shopping cart is integrated with most on-line configurators. Once the product selection process is completed, the item can be easily added to the shopping cart for purchase and checkout.

There is no need for the customer to prepare extra paperwork. Depending on supplier policies and sales channels, ordering documentation can be

generated and forwarded electronically directly to the factory, distribution center, or any other channel intermediary such as a wholesale distributor.

Convenience

The Internet age has made it possible to conduct business 24 hours a day, 7 days a week. On-line configuration, and e-commerce in general facilitate conducting business at anytime and anywhere based on individual circumstances. The constraints of “normal business hours” and the availability of service personnel during that time no longer apply. This convenience is particularly helpful when conducting business on a global basis across multiple time zones.

Primary supplier benefits include:

- Increased customer satisfaction and loyalty
- Shorter sales cycle
- Increased sales
- Reduced costs
- Improved time to market

Following are overviews of the supplier benefits as well as related issues associated with realizing those benefits.

Increased customer satisfaction and loyalty

The cost of obtaining new customers is significantly greater than the cost of retaining existing customers, so customer satisfaction and loyalty is key to ensuring long-term success. Product configurators contribute to increased customer satisfaction and loyalty as a result of the following:

- Guided selling process
- Simplifying complex products
- Real time updates

Guided selling process

Configurators provide a guided selling process enabling customers to define product and application requirements by description. Customers work at their own pace and make selections in any order; the configurator doesn't require defined starting and endpoints. If a mistake is made during the selection process, it can be corrected at anytime. Similarly, if additional options or accessories are required, they can be added at anytime.

Throughout the process, as product requirements are specified, configurator constraints and rules ensure only valid products that can be assembled and delivered can be specified and selected by the customer. Additionally, “help” bullets and suggestions are provided to assist the customer in making appropriate selections to satisfy their requirements.

The on-line configurator interface and specification process is intuitive and logical, providing customers with confidence and a comfortable experience. This level of comfort encourages customers to continue through the process to completion and order entry. A downfall of more elementary, less customer friendly systems (for example on-line “static” catalogs that are not configurator based) is that the order process is abandoned as much as 75% of the time before an order is actually placed.

Simplifying complex products

Customers are experts in their own products, not the supplier’s products. Configurators enable customers with limited knowledge of a supplier’s products to successfully specify and select only valid products – even when there are hundreds or even thousands of possible product variations. Only compatible accessories and options are presented to the customer by the configurator, based on the selections that the customer has already made. Product configurators incorporate the “skills and best practices” of the most successful salespeople to ensure the customer specifies and selects the product best suited to satisfy the application requirements.

Real time updates

With every click of the mouse, product description, price, part number, specifications, product availability, and other information are updated and displayed to reflect the selections made. Real time updates enable customers to compare the value and functionality of products, price additions of individual features, and the effect that any individual selection has on product availability.

Shorter sales cycle

Virtually every phase of the sales cycle can be shortened as a result of product configurators powering on-line sales channels that can be accessed 24 hours a day, 7 days a week. Activity durations can be reduced during:

- Product specification and quoting
- Sales order processing
- Manufacturing

Product specification and quoting

Suppliers utilizing product configurators report decreasing product specification and quoting process times by as much as 80%, from weeks to days, days to hours, and hours to minutes depending on the product. A significant portion of the timesavings is the result of avoiding the delays between customers and supplier personnel associated with voice mail, email, and manual handling of documentation.

Sales order processing

On-line configurators also expedite the sales order processing phase. Orders are placed and routed electronically to the appropriate location. There is no

need for either the supplier or customer to generate extra paperwork (ex. purchase orders, invoices, and order acknowledgements) it can all be done electronically as the transaction is completed. Like the product specification and quoting phase, delays with handling paper are avoided. Reductions in order processing times from days to minutes are easily achieved.

Manufacturing lead time

Because only valid products can be ordered, more aggressive manufacturing lead times can be promised and achieved. Shorter lead times can be achieved because it is not necessary to plan and allow for time to resolve ordering errors. Additionally, manufacturing lead times can be reduced because systems can be structured to support “make to order” requirements instead of having to manufacture for stock, based “projected” orders. More effective use of work in process and manufacturing on-demand have resulted in as much as a 75% reduction in lead time by machine tool manufacturers.

Increased sales

In effect, the on-line product configurator is a virtual “expert sales consultant” assessing customer needs, providing help and suggestions, and pricing – just like your best salesperson. The guided selling process provides complete information for valid products during each step, giving the customer a degree of security and assurance to proceed with the order process through completion – closing more sales. Finally, accessing product information and ordering systems 24/7 makes it easier for the customer to do business with suppliers. Increased sales also result from:

- Cross selling and up selling
- Flexible and dynamic pricing
- Lower customer transaction costs

Cross selling and up selling

Product configurators are modeled to present multiple product variations, options, and accessories to customers based on the description of their requirements. As a result, configurator generated on-line average order sizes may be larger in comparison to traditional orders. On-line average order sizes are often times larger because customers that are not familiar with the supplier’s product offering purchase items that may have been “forgotten” or may purchase products that they were unaware of.

In addition to increased sales and order size, increased margins are also often realized through the sale of more complex, differentiated products.

Flexible and dynamic pricing

Like product attributes, pricing is updated click-by-click during the product selection process. Built-in pricing flexibility in product configurators enables suppliers to offer contract pricing, discounted pricing, and “special offer” pricing dynamically to provide incentives to customers to purchase specific

items or larger quantities. Pricing methods often provided include “cost plus” pricing and “base plus option” pricing.

Lower customer transaction costs

Customer transaction costs are reduced by the electronic exchange of orders, associated information (ex. address, contact name, etc.), payment (ex. with a credit card), and the elimination of traditional paperwork and its manual handling and processing.

Reduced costs

Cost reductions are used most frequently to justify investments in implementing product configurators and associated e-commerce systems and solutions. Cost reductions can be realized in almost every segment of the business:

- Cost of goods sold and administration
- Selling
- Engineering
- Information technology

Cost of goods sold and administration

Significant cost reductions can be realized by eliminating ordering errors. As many as 20% to 60% of first time orders include errors. Even after orders have been checked, up to 10% of the orders still include errors, which find their way into the manufacturing system. Large teams of people within organizations participate in checking orders, verifying product validity, processing rework, and processing returns when products are manufactured and shipped in error. By reducing the need to manually validate orders and process returns, realized savings in the cost of processing orders has been as much as 96% in one year, equal to 1% to 2% of total revenue in a single company where a product configurator had been implemented. Additionally, cost savings can be realized because there is less material scrap and rework.

Selling

On-line product configurators provide expert sales consulting to customers 24 hours, 7 days a week. Typical selling costs of 10 to 15% of revenue can be reduced through the efficiencies gained from on-line product configurators in developing product specifications, electronic order entry and every other phase of the sales cycle. Built-in expertise in the configurator system frees sales and marketing personnel to focus on more profitable activities such as relationship building, prospecting for new accounts, and executing promotional programs. Finally, sales training times can be dramatically reduced by as much as 90% due to the guided selling features of product configurators.

Engineering

Engineering costs can be reduced because some of the traditional engineering functions (ex. bill of material generation) can be performed within the product configurator application. Pre-engineering can be reduced, and the necessity of reviewing incorrectly specified or invalid products prior to manufacturing can be minimized. The potential savings is obvious when anywhere from 20% to 60% of orders include errors, and as many as 10% of orders that have been manually checked/validated still include errors. Additionally, the cost of product documentation, drawings, and routings (and their maintenance) can be reduced by up to 40% to 80%.

Information technology

Information technology costs can be reduced by implementation of highly functional off-the-shelf product configurators. Administrative interfaces of many configurators enable product managers (non-programmers) to develop models and introduce new products, options, and pricing. Highly skilled and specialized IT computer programmers are not required to maintain and grow the functionality and usefulness of product configurators. IT personnel roles and responsibilities can be limited to the initial installation of the configurator application and integrating the application with other business system applications such as financial, distribution and inventory, ERP, CRM, and SFA.

The use of off-the-shelf configurator packages also reduces IT costs by benefiting from new technologies and capabilities developed by application vendors, leveraging the expertise and experience of application vendors in similar industries, and avoiding the distractions and interruptions of peripheral activities that may not be directly linked to the IT organization's core competencies and expertise. All of these combine to provide a lower total cost of ownership and a shorter time to market.

Improved time to market

Fierce competition and a rapidly changing environment demand improvements in time to market for new products and services. Product configurators facilitate time to market improvements through:

- Easy on-line administration
- Consistent and simultaneous product information
- Reduced pre-engineering requirements
- Interface with other business systems

Easy on-line administration

Configurator applications include administration tools to enable suppliers to easily model products, define validation rules and constraints, and implement pricing policies.

Administrative tools are available in various forms including: graphical "drag and drop", simple spreadsheet or database data entry, and definition wizards.

Many of the tools have been developed to enable non-computer programmers to perform administrative functions. The intuitive and simple functions of the administration tools require limited or even no involvement by IT personnel. There is no need to write code to develop the product models and constraints.

Tools generally provide off-line and on-line administration capabilities enabling suppliers to introduce new products, information, and pricing strategies almost instantly.

Consistent and simultaneous product information

A critical element to the success of new products and the ongoing sales growth of products is ensuring the same product information is presented consistently and simultaneously to customers. This enables suppliers to get a fast start and competitive advantage when introducing new products, pricing, or options. With the increased use of multiple sales channels – especially indirect channel partners, this is becoming increasingly more difficult. Product configurators present information in a structured format based on the model developed for each product – every customer and all sales personnel see the same information while specifying products, regardless of the order or process that the specification is being completed.

Reduced pre-engineering requirements

Due to the automated operation of the product configurator (based on validation rules and constraints), pre-engineering of each and every possible product can be minimized. This is particularly significant as the majority of most suppliers' sales come from a relatively small number of items from all of the possible items that are offered. Machinery manufacturers have reduced engineering and assembly documentation by as much as 80%. This enables complete product families to be introduced, as opposed to introducing one product at a time as engineering is completed. The ability to reduce pre-engineering is dependent on the configurator's functionality – for example the ability for the configurator to generate bills of materials and interface with other business systems (ex. ERP).

Interface with other business systems

The complexity of business today requires the integration of business system applications – including product configurators. The open architecture design (ex. XML) of many product configurators facilitates the sharing of information between applications. When information cannot be shared directly between applications, simple interfaces can be developed to enable the seamless operation of “separate” applications. Product configurators are often times integrated with financial, distribution and inventory, SFA, CRM, and ERP applications.

Utilizing Multiple Sales Channels

On-line configurators have been developed to work efficiently and effectively in multiple channels from direct sales over the Internet to internal use by sales personnel and channel partners such as distributors. Products and best sales practices can be modeled once, and deployed across all sales channels. This ensures that customers access product and service information consistently and in the exact same way, no matter who or what their preferred channel is.

Because customers interact with suppliers through more and more touch points, ensuring that the answers are always consistent regardless of where the interface occurs, is critically important. On-line configurators are a single source of valuable information, information that can be retrieved in the same way by customers or channel partners.

On-line product configurators make existing channel participants more effective, and are not generally intended to replace them. Good existing customer relationships are developed over time and are extremely valuable, every effort must be made to maintain and grow these relationships.

By providing information about products and ordering capability on-line, sales personnel can minimize the time they spend on administrative tasks such as performing research in product catalogs, price books and spread sheets, and manually processing quotes, orders, and product returns. By eliminating or minimizing these tasks, sales personnel can devote more time to value-added activities such as growing their relationships with existing customers and establishing relationship with new prospects.

Specifying and Selecting a Configurator for Your Business

When specifying and selecting a product configurator for your business, the following characteristics should be evaluated:

- Administration tools – the administrative interface should be intuitive and easy-to-use. It should be possible to perform administrative activities both on-line and off-line.
- Open architecture – XML input and output and compatibility with common hardware and software platforms to simplify the implementation and integration of the product configurator with your existing applications.
- Thin-client application to minimize the required resources of the user.
- Scalable – the product configurator should be scalable and able to accommodate the addition of new products and options that may be introduced as your business grows.
- Application flexibility – the application must be flexible so that it can be adapted to have a common look-and-feel and be compatible with your other business applications.
- Security – administrative tools and customer access should be capable of being password protected and secure if required.
- Definition wizards and re-usable models – to help simplify the definition of rules and constraints for similar products.
- Reporting and documentation – the product configurator should be capable of generating purchase order documentation and associated reports (ex. complete description of the products selected).
- E-business enabled for operating over the Internet
- Bill of material generation – the product configurator should have the capability to generate a bill of material that can be easily passed to the manufacturing system.
- Pricing flexibility – to accommodate multiple currencies as well as contract, discount, and “special offer” pricing options. Pricing methods supported should include “cost plus” pricing and “base plus option” pricing.
- A modular software suite with optional modules that can be added to the system as e-business success grows.

Conclusion

The rapid explosion of the Internet and e-commerce has provided businesses with a virtually unlimited number of opportunities to grow sales and profits by accessing new customers and markets, offering new products and services, expanding sales channels, and implementing new, non-traditional business models. E-commerce sales is one of these opportunities.

E-commerce sales in 2007 were approximately \$3.33 trillion. Business-to-business (B2B) e-commerce shipments account for over 93% of all e-commerce shipments. E-commerce shipments by manufacturing industry segments were \$1,856 billion.

Many businesses have encountered obstacles in achieving rapid e-commerce sales growth. The primary challenges faced by industry include: increasing product complexity, longer sales cycles, and the use of multiple sales channels. Product configurators and a standard platform for implementation (the Internet) can minimize the impact and in many cases eliminate these obstacles.

A product configurator is a rule and constraint based software application designed to assist a user specify and select a product by describing general needs and requirements. The configurator “guides” the user through the process.

On-line configurators provide benefits to both suppliers and their customers.

Primary customer benefits include:

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Primary supplier benefits include:

- Increased customer satisfaction and loyalty
- Increased sales
- Improved time to market
- Shorter sales cycle
- Reduced costs

Manufacturers that utilize multiple sales channels and supply complex products with many options and accessories have adopted the use of configurators fastest. Recognizable companies that have implemented product configurators include: BMW, Ford, Iowa Mold Tooling, Gateway, Dell, Samsung, Cisco, Cabletron, Hewlett-Packard, 3Com, Rockwell Automation, ABB, Danfoss, General Electric, Grayhill, Magnetek, and Corning to name just a few.

Webcom's WebSource Configurator

WebSource Configurator is a thin-client web application available to any customer with a web browser. The configurator walks customers through the process of specifying a product or service by description. Based on a customer's selections, the WebSource Configurator engine spins out, in real time, all pertinent specifications, prices, and fulfillment lead times.

As a customer responds on-line to questions about a product or service, WebSource Configurator, much like a good sales consultant, is already adapting and preparing the next set of questions to qualify or constrain the product or service. At the end of the process, the product or service is placed in a shopping cart for easy purchase.

Following is a brief overview of key features of the WebSource Configurator application:

- Supports an unlimited number of products and configurations.
- Interactive guidance – “Help” bullets and suggestions.
- Click-by-click updates of product, price, and availability information.
- Dynamic pricing – contract, discount, and “special offer”. Supports “cost plus” pricing and “base plus option” pricing methods.
- Product definition wizards simplify and speed modeling, rule and constraint development.
- Supports multiple currencies and languages.
- Allows product comparisons.
- Generates quotes, proposals, and project charters.
- Generate bills of materials.
- Includes an on-line shopping cart with credit card ordering capability.
- Graphical, appealing user interface that can be easily customized.
- Training and ongoing support provided.
- The Webservice Configurator software suite includes optional modules that can be easily integrated into the system when additional functionality is required. Optional modules include: proposal and quotation, bill of material, on-line/off-line, reporting, on-line product catalog, and shopping cart.
- Open architecture – XML input and output for integration with other applications such as ERP, CRM, and SFA.
- Administration, maintenance/program interface: HTML and Java. Requires Java 2 compatible browser on client and JSP support on server.
- System requirements:
 - Browsers: Internet Explorer 5.X or higher, Netscape 4.7X or higher
 - Databases: Oracle 8 or higher, Microsoft SQL7/2000
 - Web servers: MS IIS
 - Other: MSDAC

Notes



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