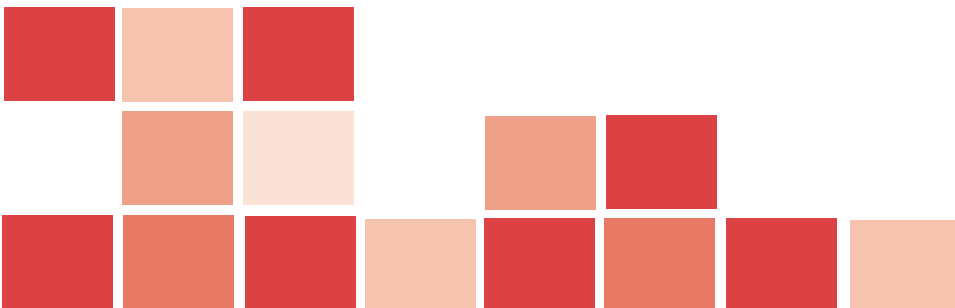




WHITE PAPER

bizLinx eCatalog



The bizLinx e-catalog is a means for a distributor, or group of distributors, to offer their product information, pricing, and availability on a world wide web store front. Searching for product information with a browser-based system has traditionally been done by using a wild card or keyword search, or by entering the very specific information. This means the end users need to be somewhat informed about the products they are trying to locate. They must know in advance which products or product lines might be carried by a distributor so they can understand which keywords will work to search for available products.

In a traditional paper-based catalog, users have the benefit of using a catalog index, or an appendix, to help them find their product. In addition, some products may offer technical information along with the product reference information, such as specifications and images, which are merely printed in the paper catalog along side the reference information.

How, then, can the bizLinx e-catalog offer solutions to improve these proven traditional paper catalogs?

The bizLinx e-catalog addresses these primary requirements by providing:

- an **attribute-based system** for searching for products. This system allows for assignment of a series of attributes to each product record, which could then be used in the search process. By providing lists of valid attributes for the users to choose from, this attribute system goes beyond the normal free-form search mechanisms.
- **additional fields** of information for searching. This could include brand names, long descriptions, size, color, etc.
- **unlimited links** from the catalog records to images, specification documents, web page references, etc.
- **authorized to buy** capabilities, where a table of valid products and customers can be validated to limit access of certain products to selected customers.
- **outing rules**, based on the user or the product selected, to send that user information to a specific distributor.

Catalog Attribute Structure

The catalog system is designed to allow the user to search for a product based on its attributes. The system is capable of prompting the user to select from a list of attributes, based on the previously selected attribute. This is a structured search, similar in style to the MS-Windows Explorer directory tree structure. The number of attributes a user can enter is dynamically based on the number of attributes assigned to each product. The system is designed to have a sub-second response time, when parsing through 500,000 or more records, to return a list of products that meet all attribute values selected for display.

Attributes

<i>Table</i>	<i>Description</i>
<i>Groups</i>	Sets of attributes are associated with a group or catalog record. Groups are generally determined by the types of products handled by the distributor or manufacturer, as well as the commonality of those attributes for a given grouping of products.
<i>Attributes</i>	The sets of attributes associated with a group or catalog. Think of attributes as the questions, not the answers. For example, power type is the question and AC or DC is the answer to the question. A typical catalog might have just four or five questions, even if there are hundreds of answers to those questions. There is one record per question or attribute.
<i>Values</i>	Valid values are the answers to the attribute questions. AC or DC will each be a record for the Power type attribute.
<i>Rules</i>	Rules for value applications. Rules get into the hierarchical example addressed below. Basically, rules establish a chain of valid answers when trying to identify a set of products. There is a record for each valid parent/child relationship in the example.

The attribute table below is keyed using numbers. When combined, the numbers represent a unique set of attributes that can be connected to a product in the SX.enterprise catalog table, producing a set of identifying attributes associated with that specific product.

Storage Mechanism

Using the key structures below, it is possible to define all of the attributes for any product, through a series of small strings designed to represent the group and attribute values. This string is only 12 characters and has the following format: G999A99V999 (Group999 Attribute99 Value999). Using this information with a simple search algorithm, we can quickly find any item by the group it belongs to combined with the attribute values associated with that product record.

Values are assigned to a field for each product in the catalog and stored in a string in that field for each catalog product record. Once that string is defined, a keyword index is created using the standard Progress® key-index methods. This means that any word in that index can be searched from left to right very quickly, and all matching records can be found, regardless of any other values in the field. In fact, any attribute value, or combination of attribute values, can search a product record very efficiently. It is simply a matter of matching user-selected attribute values with the stored strings that represent those values for each product record.

Let's conduct an attributed search string, using the attribute example tables below. We will search for all cordless power saws:

- First, look at the **Group Table** below. We can see that Group **007 / Power Tools** is a group offered in our catalog.
- Next, review the **Attribute Table**, where you will see four (4) attribute values (for 007 Power Tools): **01 Tool/Accessory, 02 Type, 03 Power Type, and 04 Brand**.
- Finally, in the attribute **Value Table**, we are interested only in the **six (6) type** values for power tool and the **seven (7) power type** values available within the 007 Power Tool Group product records.

Since we specified above that we want to search for only *cordless power saws* (or the 02 Type attribute and 03 Power Type attribute), our search string values would look like this:

G007A02V003 G007A03V004

The **A02** attribute specifies what **Type** power tool, where the **V003** attribute narrows the selection further to the Saws.

The **A03** attribute is additionally looking for a **Power Type** attribute, and the V004 attribute again narrows the selection possibilities to **Cordless**.

Based on the above selection, we searched the catalog file for products where the *key-index* contains "G007A02V003, G007A03V004." It should be noted that the space in the search represents an "and", and does not necessarily represent the physical structure of the stored information. Note that attributes do not have to be in any particular order.

Group Table

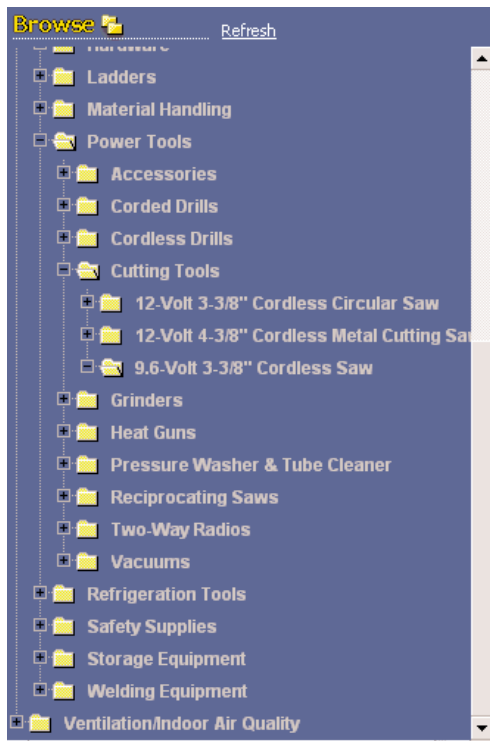
GroupNo	Group Descriptions
006	Electrical
007	Powers Tools and Accessories
008	Construction Equipment

Attribute Table

GroupNo	AttributeNo	Attribute Descriptions
006 - Electrical	01	Type
006	02	SubType
006	03	Voltage
007-Power Tools	01	Tool/Accessory
007	02	Type
007	03	Power Type
007	04	Brand

Value Table

GroupNo	AttributeNo	ValueNo	Value Descriptions
007-Power Tools	01-Tool/Acc	001	Tools
007	01	002	Accessories
007	02-Type	001	Drills
007	02	002	Hammer Drills
007	02	003	Saws
007	02	004	Drivers
007	02	005	Cutters
007	02	006	Sanders & Polishers
007	02	007	Grinders
007	03-Power Type	001	120V
007	03	002	220V
007	03	003	Rechargeable
007	03	004	Cordless
007	03	005	Air
007	03	006	Accessory
007	04-Brand	001	DeWalt
007	04	002	Makita
007	04	003	Pferd
007	04	004	Milwaukee
007	04	005	American Saw



Attribute Rules

The attribute rule table below could be used to further define hierarchical relationships between values at one attribute level and valid values at the next hierarchical level (upon user selection). The following table illustrates what rules might have been presented to the user for the tools we selected in our example above.

Follow the colors in the parent/child attribute table below and work down through the flow for each level of the hierarchy to select a product from the catalog. The 02 Type / 003 Saws are selected. The system then offers 03-Power Source choices. Once 003 Cordless saw is selected, the next rule in the hierarchy asks us about Brands (001 Dewalt, 002 Mikita). We choose Mikita and make the sale for this distributor.

Rule Table (Note - Group no.007 is assumed for all of the following attribute value examples)

ParentAttrNo	ParentValueNo	ChildAttrNo	ChildValueNo
01-Tool/Acc	001-Tools	02-Type	001-Drills
01	001	02	002-Hammer Drills
01	001	02	003-Saws
01	001	02	004-Drivers
01	001	02	005-Cutters
01	001	02	006-Sanders
01	001	02	007-Grinders
01	002-Accessories	02	001-Drills
01	002	02	003-Saws
01	002	02	004-Drivers
02-Type	001-Drills	03-Power Source	001-120V
02	001	03	003-Recharge
02	002-Hammer Drills	03	001-120V
02	002	03	002-240V
02	003-Saws	03	001-120V
02	003	03	002-240V
02	003	03	003-Cordless
02	004-Drivers	03	001-120V
02	004	03	003-Cordless
02	004	03	004-Battery
02	004	03	005-Air
02	005-Cutters	03	005-Air
02	006-Sanders & Polishers	03	001-120V
02	006	03	002-240V
02	006	03	005-Air
02	007-Grinders	03	002-240V
02	007	03	005-Air
03-Power Source	001-120V	04-Brand	001-Dewalt
03	001	04	002-Makita
03	001	04	003-Milwaukee
03	002-240V	04	001-Milwaukee
03	002	04	002-Am. Saw
03	003-Cordless	04	001-Dewalt
03	003	04	002-Makita
03	004-Battery	04	002-Makita
03	005-Air	04	003-Pferd

Additional Search Methods

The above search method uses different attributes to narrow the product list. The bizLinx e-catalog product lookups also allow a user to search for a product by using keywords of description in addition to, or instead of, the hierarchical attribute search. The keyword search can be unstructured user free forms or structured, where the user is prompted for certain fields from the product record.

If, in the above example, the user was looking only for a cordless saw, they could have entered "cordless" in a keyword field to limit the search to products with the above attributes and the word cordless in its description. This is an example of an unstructured keyword search. The same method can also be used for certain values associated with key fields in a record. Instead of searching the whole description to search for the words,

we use a method of storing the values in a keyword indexed field with prefixes that denote their usage.

For example:

Catalog Number	SXCat
Prod Category	SXPCAT
Model Number	SXModel
Vendor	SXVendno
TradeName	SXTrade

In the search engine, the user can be prompted to enter a specific value (free form or table driven) in any of the above product attributes. The result will only contain products that have the value in the corresponding field. Different users have the tendency to spell words differently. In a free-form search engine, the spelling of the word could limit the search and frustrate a user. To overcome this, the bizLinx e-catalog supports abbreviations and synonyms. This is accomplished by using a simple table of word pairs (or abbreviation pairs) which represent the same logical values. Then, during the construction of the search string, each free-form word entered is compared to the entries in the table. If matching entries are found, the corresponding synonym is added to the search clause using an "or" clause. In our above example, we have the word "circular." So if the synonym table had the following entries:

Curcular	Circular
circular	Circular
circle	Circular
rotary	Circular

Now if someone entered any of the words on the left, our search string would still include "circular." For example, the entry "rotary" entered in the keyword will search through the description for rotary or circular.

Additional Product Information: In the bizLinx e-catalog links to additional product information like JPEG files, Adobe acrobat files containing MSDS or product specification information, graphic images or URL information to the manufacturers web site can be stored. Also substitute product information can be stored. All of these information or links to the information are displayed with the product information.

Additional Processing Information: Business logic can be setup in the bizLinx Catalog that will control the information that is displayed based on the profile of the user that is searching for information. Software like Broadvision or Websphere can be used in conjunction with bizLinx Catalog to personalize the presentation based on the user profile. If the bizLinx Catalog is used as single e-commerce initiative for more than one business entity, then the business logic can be setup to control the routing of information to each of the business entity based on the user profile or product category or a combination of both.

Minimum configurations and network requirements

- NT Server running Windows NT
 - * Server version 4.0 with service Pack 4 recommended.
 - * NT server needs:
 - Microsoft IIS (Internet Information Server) v.3.0 or 4.0.
 - Progress 9.0 with Webspeed 3.0. pcAnywhere.
 - * NT version 8.x is required for support capabilities.

Server must be:

- at least 400MHz
- with 128 MB RAM
- CD-ROM
- 2 GB Hard Drive
- LAN Card and Internet Connection
- Speed of connection determined by the amount of expected use

Host system must:

- be on Trend 8.0.003 / SX.enterprise 1.2 or higher
- run Progress 8.
- Access to bizLinx Catalog requires an Internet browser. Microsoft Internet Explorer 4 or higher, or Netscape 4.5 or higher are currently the only supported browsers.

