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# **think3's Product Configurator Powers Mass Customization**

**(Executive Summary)**

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# think3's Product Configurator Powers Mass Customization

**Allows development of the customization process without programming**

## Introduction

Last month we had the opportunity to meet with think3 executives and technical representatives to develop an understanding of think3's exciting thinkteam Product Configurator. This paper presents our findings.

Product Configurator, built on top of thinkteam, think3's product data management (PDM) offering, and also integrated with thinkdesign, think3's design authoring CAD system, provides a solution to companies that offer customized products in either a configure-to-order (CTO) or an engineer-to-order (ETO) model.

The business processes for delivering CTO or ETO products involves a combination of front office and back office processes. The front office sales processes capture the requirements of customers, followed by the generation of a custom proposal or quote. If the custom product configuration is accepted, back office processes can be initiated to produce engineering designs of the products to the specific customer requirements.

Companies offering such customized products frequently need heavy involvement of design engineering resources to produce proposals for the front office sales processes as well as new designs and information for engineering and manufacturing processes. This is necessary because such an order often calls for front end engineering analysis to select needed parts from families of similar parts in addition to designing new parts, all while understanding and melding these choices into the overall product engineering. For instance, emergency vehicles are usually custom ordered to the specific needs of the department. They might have requirements for size, capacity, sirens, and storage facilities for emergency equipment. In a large majority of cases most of these parts have already been designed and now need to be selected for this specific order. The engineering process determines which parts and assemblies are needed and whether any special designs need to be custom engineered. Often there are many shared parts and processes.

Without an automated product configuration capa-

bility, companies face challenges in their ability to generate accurate proposals and quotes rapidly, validate customer requirements, reduce cycle times for engineering and manufacturing, and be responsive to customer needs and schedules while controlling costs and quality. *In our estimation, the think3 Product Configurator meets this need.*

## think3's Product Line

The think3 products relevant to this paper include thinkdesign, an advanced 3D modeling system; thinkteam, a product data management system; Product Configurator Manager, and Product Configurator Browser. The latter two will be explained in this paper.

## Overview

Essentially, Product Configurator allows developing a catalog of product configuration models using

Product Configurator automates the processes for the engineering and manufacturing of customized and configurable products and components. The goal -- to provide the ability for enterprises to offer their customized products in a Configure-to-Order (CTO) manufacturing model or an Engineer-to-Order (ETO) design-to-manufacturing model. Since each customer can configure products to match their individual needs, this is called mass customization. Other terms are often used for CTO, such as Assemble-to-Order or Build-to-Order. ETO is also often called design-to-order.

configuration rules, constraints, and data parameters that allow input data, after being entered, to produce a custom finished product. It can not only select alternative configuration options, but can also design new parts if one does not already exist that meets the desired criteria. *The beauty*

*of think3's implementation is that no programming is needed to accomplish this.* Authors use the Product Configurator Manager for developing product configuration master models, based on a virtual bill of materials, parameters and constraints or rules. End user clients use the Product Configurator Browser application to select input parameters, verify valid configurations, and to generate the configured product.

## Customer benefits

Some examples of think3 customers using the Product Configurator in an engineer-to-order mode are manufacturers of elevators, hydraulic components, architectural and industrial panels, and industrial machinery. Their product portfolios involve a high degree of custom designs based on customer requirements, and thus lend themselves to achieving significant benefits from automating the product development process.

## think3 Product Configurator - Executive Summary

Achievable benefits have included: a 90% reduction in cycle time for creation of new configurations per product family, a 75% reduction in resources to manage new part numbers and BOMs, the elimination of errors and costs due to invalid configurations, a 60% time reduction in generating sales proposals, as well as saving engineering time by automatic generation of models, drawings, and BOMs. The end results are faster cycle times, increased quality, reduced product development costs, and improved product documentation.

In one case, a think3 customer in Italy producing custom built elevators achieved dramatic results. Before using the think3 Product Configurator, this customer designed each of their systems using traditional CAD methodology. By using the think3 Product Configurator, they reduced their average custom engineering time from 6 hours to 0.5 hours (90%), reduced their BOM management time from 2 hours to 0.5 hours (75%), and reduced their product development cycle time from 2 months to 1 month (50%). For an output of 500 designs per year, this has resulted in significant cost savings with faster time-to-market, improved quality and increased customer satisfaction. Excellent payback!

## Conclusions

We were very impressed with the capability of think3's Product Configurator. think3's mission is to provide integrated solutions to revolutionize the product development processes of mid-sized manufacturers; for this application they have really delivered. Not only is the application low cost, but also is the only product configuration application that delivers the results without programming.

Few competitors can offer such an easy to implement product configuration solution; none can match the low cost and flexibility that think3 offers. A possible alternative would be to use a KBE (knowledge based engineering) language, but this would be a difficult alternative requiring deep programming skills. Systems that use family tables would be another alternative, but with much more limited capabilities.

Companies developing or bidding on customized products based on variations of a basic design can benefit enormously from this type application and free up valuable engineering time for more innovative pursuits. In addition, they should be able to significantly reduce their turn around time since

these design variations can be produced virtually automatically once the design parameters are entered.

Once the user learns how to navigate think3's user interface, entry of the required rules and other data to perform complex custom configuration generation is straightforward. think3 expects to simplify the menu structure, which should be greatly improved for the next release. Some customers have implemented a step-by-step wizard for the client configuration process.

This application should prove useful not only to think3 customers, but to potential prospects as well. Getting started, even by users with competitive CAD systems, does not necessarily require a massive conversion. Instead, simply import the data related to the specific product to be engineered/configured to order. For instance, the virtual BOM capability makes it possible to import 2D AutoCAD drawings into thinkteam, which can then be managed by the PDM system and associated with part numbers. These part numbers can be used in the Product Configurator to develop the configuration model in the BOM. In this scenario, as the input parameters are selected to generate a configuration, the system can output a valid BOM, which references existing legacy AutoCAD drawings in the PDM database. This flexibility allows companies to begin the process of migration of legacy data while immediately deploying a configure-to-order process. Any engineer-to-order changes in the configuration would require that the components be designed in thinkdesign. One way to do this would be to utilize thinkdesign's excellent ability to import various types of 3D and 2D data.

***In summary, we strongly recommend that users needing or considering configure-to-order or engineer-to-order solutions take a serious look at think3's offering. think3's Product Configurator is in a class by itself — offering powerful capabilities, easy deployment with little or no programming required, integration with other applications, support by a knowledgeable***

***professional services organization, and best of all — the price is right!*** US pricing for authoring software starts at an annual subscription of \$8,285 including one seat each of thinkdesign, thinkteam and Product Configurator Manager. User software starts at an annual subscription of \$2,490 for one seat each of thinkteam and the Product Configurator Browser.

<p style="text-align: center;"><b>Configure-to-Order</b></p> <p>The CTO approach allows customers to select from multiple product options, which then automatically generates a customized BOM for the manufacture of the custom configured product (for example – to order a laptop custom configuration).</p> <p style="text-align: center;"><b>Engineer-to-Order</b></p> <p>The ETO approach, different than the CTO model above, allows customers to select from a combination of multiple design engineering variables and product options, which, when completed, automatically generates a new engineering product assembly design and its customized bill-of-material (BOM) for the manufacture of the custom configured product (as in the hydraulic cylinder design discussed in this article). In the ETO model, existing components are reused where available; new components are automatically designed, resulting in the automatic generation of the 3D models, 2D drawings, and the BOM for manufacturing.</p>
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