Digital Tails Group

Custom Software Development & Digital Transformation Solutions
Advanced Technology for Business Growth and Automation

CASE STUDY

téchne FURNITURE

How Téchne Transformed Custom Furniture Manufacturing into a Scalable Business with 3D and CPQ

2025

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Overcoming Production Bottlenecks and Complex Customization: How Téchne Automated Manufacturing, Pricing, and Ordering

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Introduction

Crafting excellence for over 30 years

Our client, Téchne is a family-owned furniture manufacturer in Romania that has specialized in high-end, custom furniture for over 30 years. In their region they are renowned for their quality designs that address the challenge of non-standard home dimensions that are common across Eastern Europe.

Breaking growth barriers

The Téchne team expressed their intent to expand into neighboring markets, and to be able to do that, they sought assistance in overcoming the limitations of their traditionally based, labor-intensive manufacturing process. Their vision is to launch a new product line offering simpler, more affordable furniture with the possibility of configuration and ordering online. For the company that would bring more efficiency in operations, reduced costs, and maximized capacity for their upgraded production facilities.

A vision for scalable customization

To achieve this, Téchne partnered with us to create a custom 3D configurator and a CPQ platform that automates configuration, pricing, and ordering. This solution is planned to serve in scaling the business efficiently while maintaining the hallmark customization and quality.

The solution: a custom CPQ platform

To address Téchne's goals, we developed a custom CPQ platform with the main objective to simplify and automate the entire manufacturing and sales process – from product configuration to pricing and order placement – while adhering to budget constraints.

Initial scope and adjustments

During the initial discussions, it became clear that Téchne required a solution capable of handling both the complexity of custom furniture production and the need for cost-effective scalability. After reviewing their requirements and goals, we jointly decided to develop a Minimum Viable Product (MVP) that concentrated on two core elements: an eCommerce platform integrated with a 3D configurator.

Why we suggested the Minimum Viable Product

The MVP allowed Téchne to start using the CPQ platform sooner, while leaving room for future enhancements and additional features later on. The project began with these foundational elements to address the most critical parts of the solution – product configuration, quoting, and online ordering. This approach also helped us to manage costs and development time, and align with Téchne's goal of launching their brand's product line on time.

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Objectives for the CPQ system

Streamlining
the entire production process, from design to pricing and order placement

Creating
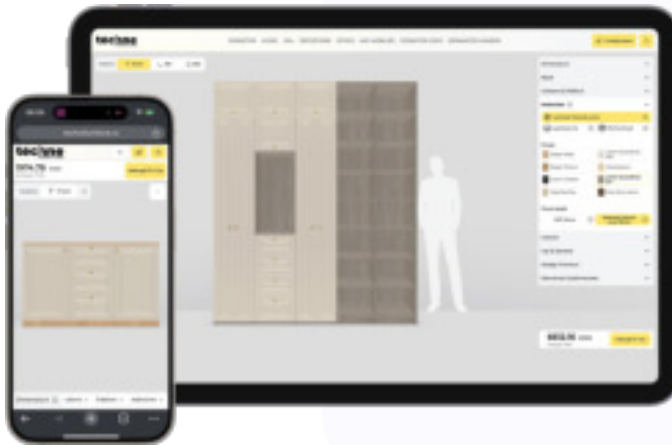a customer-friendly platform for users to easily configure and order custom furniture online

Scalability and flexibility
to accommodate future growth and additional product lines

Integration of the platform
with Techne's CRM to manage order management and production

Dynamic design made easy – configure and customize in real–time 3D

A key component of Téchne's CPQ platform is the 3D configurator for real–time customization of various product attributes. It gives their customers a fast, easy and interactive way to "design" their own furniture right on the platform. The configurator handles a range of parameters and practical constraints of furniture manufacturing.

Parameters managed by the configurator

Materials

wide range of materials for the furniture like different types of wood, laminates, and metals

Colors and finishes

various limited options related to the material selection

Dimensions

the exact dimensions for furniture items, such as cabinets, side tables, kitchen furniture, and models to fit non-standard room size

Accessories

extended furniture accessories such as handles, legs and clothing rails

Rules and constraints in configuration options

One of the most challenging aspects of the project was accommodating the complex configuration options that Téchne required. The configurator needs to dynamically adjust product dimensions, materials, and finishes, which required the implementation of specific rules and constraints, such as limiting placement for doors, handles and accessories or enforcing size restrictions based on production capabilities. The configurator accounts for these conditions automatically.

Handling customization complexity

To manage the complexity of the customization options, we built a set of configuration rules directly into the CPQ platform to prevent incompatible configurations and guide customers toward viable options without manual intervention by Téchne's team.
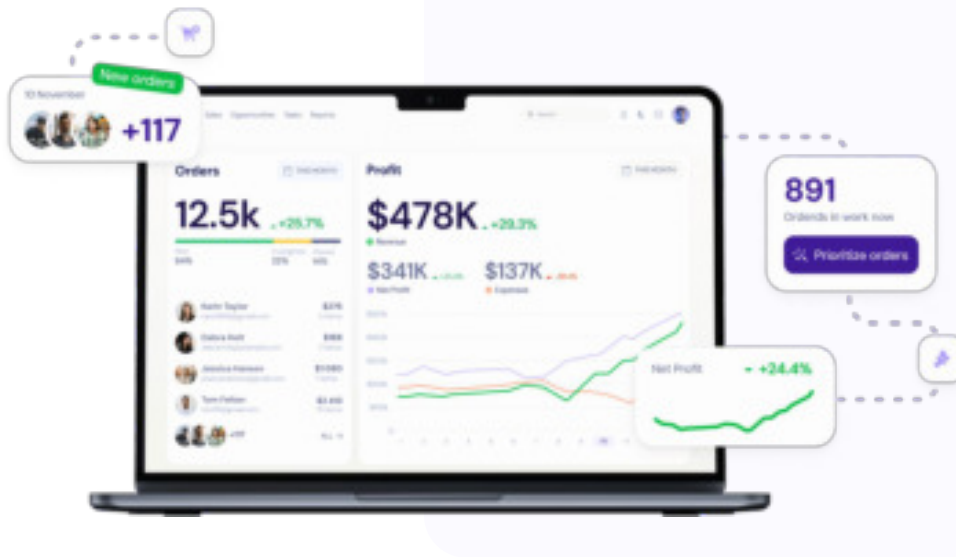
Optimizing sales and production with custom ecommerce tools

Our development approach prioritized creating an efficient eCommerce platform, supported by a robust backend infrastructure. The MVP centered around the 3D configurator as the frontend feature and an eCommerce platform with a minimal but functional implementation. Backend rules were developed to support the 3D configurator's functionality, including price calculation and integration with the admin panel.

System and platform integration

We customized an admin panel to make it compatible with the configurator, including tracking orders, managing configurations, and overseeing quotes. The platform was designed to allow future CRM integration if desired, but the admin panel serves as a centralized system for Téchne to efficiently handle customer data and sales operations.

Unlike more complex CPQ setups requiring ERP and inventory management systems, Téchne's requirements focused on a straightforward, direct link between the 3D configurator and the production process which are facilitated by the admin panel and the backend system.

Customer-focused experience

The CPQ platform was built to deliver an intuitive and user-friendly experience for easy navigation and customized selections with minimal support. The UX/UI design, including the 3D configurator interface, was custom-designed by our team.

The 3D configurator provides accurate, real-time previews of customized furniture but also incorporates tailored product rules and constraints seamlessly in the backend. This approach empowers customers, even those without technical expertise, to confidently customize a product they desire.

Building the 3D configurator

The 3D configurator was the centerpiece of Téchne's CPQ platform. We developed the configurator using **Three.js**, a widely used framework for 3D visualization, which allows for highly detailed and responsive rendering of models.

The development process

The development of the 3D configurator required close collaboration between us and Téchne, particularly in handling the detailed CAD models provided by them. The models included designs for furniture components such as handles, legs, and other accessories, all of which needed to be accurately rendered in the configurator. Our team focused on optimizing these models for web use, making sure that they were detailed enough to meet Techne's visual standards without compromising load times or performance.

We faced several challenges during development, including the need to accommodate Téchne's complex product structures while maintaining user-friendliness. For example, certain furniture designs required dynamic adjustments in size and material, which had to be reflected in real-time within the configurator. Ensuring that the rendering of these adjustments runs smoothly, particularly when dealing with multiple customizable components, required optimization of both the models and the underlying software.The configurator offers several real-time customization options (dimensions, materials, door placement, accessories etc.), which have to be visually represented with high accuracy.

Tasks and solutions

One of the standout challenges in this project was achieving the construction flexibility required for the furniture configurator. The system was constructed manually through custom programming, which created extended adaptability in the design and customization process. Our task was to find a way to handle a wide variability of furniture designs, and at the same time ensure that every configuration could be accurately rendered and customized according to user preferences.

Another task was managing CAD models. Models were essential for representing the furniture accurately, but their complexity made them unsuitable for web-based rendering. To address this, our team optimized the models by reducing polygon counts and simplifying textures. Finally, we programmatically implemented realistic lighting to create a visually appealing and consistent 3D environment.

Pricing and quoting automation

One of the most crucial aspects of the platform was the pricing and quoting functionality handling custom orders. Our system enables automatic price calculation based on a range of variables, and by automating this part of the workflow, the CPQ platform reduces the time and effort typically required for manual calculations and minimizes the need for extensive double-checking.

Pricing logic

The pricing system in the CPQ platform was built to handle multiple parameters:

1. Surface area and materials

— pricing for furniture is calculated based on the surface area of materials used, such as wood and laminates.

2. Accessories

— additional components like handles, legs, cabinet connectors, edges for materials and other were priced per item.

3. Dimensions

— custom dimensions for furniture items influenced material usage and production costs, with larger pieces incurring higher prices due to the increased material and labor requirements.

4. Delivery cost calculation

— it is incorporated into the quoting process based on weigh

Handling complex orders

Though Téchne's focus was primarily on highly customizable, one-off furniture pieces rather than bulk orders, the CPQ platform was designed to handle the complexity of such orders as well. Even when customers select multiple customization options, such as mixing materials or adjusting dimensions, the system can accurately calculate the final price without any manual intervention.

Future features

While the current implementation focused on handling individual orders, the system was built with flexibility in mind. For the future, Téchne' team expressed interest in adding features, such as:

Bulk discounts

to offer lower prices for larger quantities of similar furniture pieces, which could be implemented for future expansions into B2B sales or larger client orders

Discount features

for promotional pricing for specific items or configurations to be able to offer seasonal discounts or targeted pricing strategies

Augmented reality (AR) integration

for virtual previews of furniture in real-world environments

3D model downloads

to allow users to download 3D models of their customized designs

User cabinets

to enable users to manage their design configurations (potentially different levels of access for clients)

3D planner tool

for interactive 3D planning of layouts

Expanded customization features

to provide more personalization options

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Tech stack behind our CPQ solution

Our technical team selected the following tools and frameworks:

Vendure

For the eCommerce platform, we chose Vendure, an open-source headless eCommerce framework. Vendure was selected because it provided the flexibility that was needed to build the CPQ solution. Unlike off-the-shelf platforms like WooCommerce or Shopify, Vendure allowed us to adjust what was necessary to fit the requirements, including close integration with the 3D configurator. Vendure has a modular architecture, and uses Node.js and NestJS, which made it an ideal choice for building a scalable and future-proof platform.

Three.js

As our usual staple choice for the 3D visualization, Three.js is a robust JavaScript library for rendering 3D graphics in the browser. Given the complexity of Techne's designs, Three.js provided the necessary flexibility and performance. In more visually demanding cases, we often use Verge3D, but for this project, Three.js struck the right balance between flexibility and complexity.

JavaScript/TypeScript

The entire front-end of the configurator was developed using JavaScript and TypeScript for a robust and maintainable codebase. These technologies also made it easier to integrate with Techne's systems and allowed us to develop the dynamic and responsive features of the configurator.

Growing smarter: Techne's automated future

By automating key aspects of the configuration, pricing, and ordering processes, we hope to transform Téchne's production management and allow them to expand into new markets. The development of this platform followed a gradual iterative process that we refined along the way. The MVP approach allowed Téchne's team to start utilizing the core features right away, while additional features can be added in future phases as their needs evolve.

Expected results

With the CPQ platform, Téchne can now streamline their manufacturing processes and automate time-consuming manual tasks, such as configuration checks and price calculations. The solution has been particularly impactful for their unique furniture designs, which previously required extensive manual effort to manage. Our solution has significantly reduced the time spent on designing and configuring products, and allowed Téchne to focus on creativity and innovation rather than manual repetitive tasks.

For customers, the platform delivers an easy, user-friendly shopping experience that aligns with modern eCommerce expectations. They can effortlessly customize furniture and view accurate visual previews – proven to boost both purchase confidence and sales conversions.
The CPQ solution also supports Téchne's expansion plans by offering the scalability and flexibility needed to launch future product lines for a broader audience.

Let's discuss how we can help you with your projects

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