



The Crucial Role of Rendering in Web-to-Print

Introduction

Let's set the scene. A first-time B2B customer orders a large run of printed marketing materials—business cards, flyers, and pens meant to serve as a first point of contact with potential leads for their business.

They use your printing company's web-to-print personalization portal to customize their products, and they immediately experience a frustrating hiccup: their order is delayed due to a file incompatibility issue with your equipment, requiring manual intervention in what should be an automated process. They decide to stick with you despite the holdup, but then the worst happens. You run the order, and the design on the finished products comes back pixelated with much darker colors than what the client saw in the online preview.

It's the last time you ever hear from them.

Well, after the massive chewing out and requests for a refund, anyway. And of course, when asked by other businesses in their industry if they know a good printer, your company's name does not come up. If it does, it comes packaged with a warning to stay away. How did it go so wrong?

The major point of failure was your rendering engine.

A robust rendering engine is the linchpin that holds your web-to-print workflow together. Without it, a nightmare scenario like the above can become a stark reality. On the other hand, the right one can set your printing business, marketing firm, or online e-commerce shop up for long-term success with many happy repeat customers for years to come.

The significance of the rendering engine in your workflow

Like any good story, the web-to-print process has a beginning, middle, and end. A client starts it off with **online personalization**, the rendering engine **generates a compatible file**, and your equipment uses that file to **fulfill the order**. To ensure a “happily ever after,” the file the rendering engine generates must be accurate and print-ready upon order submission.

Printers and other businesses that rely on a web-to-print solution encounter many challenges when the middle—the rendering engine—fails to reliably connect the beginning with the end. File compatibility errors, poor color management, and delays related to the engine can draw out the process, require manual intervention, and ultimately lead to a poor customer experience.

The Customer's Canvas rendering engine

This white paper aims to inform businesses about Aurigma's Customer's Canvas powerful web-to-print rendering engine, built on a foundation of decades of real-world image processing development experience in the printing industry. We designed Customer's Canvas to meet the challenges of your unique requirements—no matter your niche or size—and excel at a rendering engine's critical tasks:

- Render pixel-perfect designs that match what the user created.
- Allow flexibility for configuring print files and applying finishing options.
- Scale as your business grows to deliver high volume without compromising on speed and accuracy.

When your business adds a rendering engine that can deliver on these tasks to its workflow, operational efficiency grows. Higher design accuracy, better file compatibility, and increased speed for higher volume all contribute to an overall greater level of customer satisfaction and open up exciting new opportunities down the road.

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Aurigma's Legacy: A Strong Foundation in Image Processing

Founded in 2002, Aurigma has accumulated decades of imaging experience through development of its flagship image processing software development kits (SDKs). Over the years of working with businesses of all sizes in the printing industry, our seasoned team gained a clear-headed understanding of the biggest obstacles companies faced when developing web-to-print solutions.

We recognized that businesses were struggling along with out-of-the-box web-to-print solutions that could do some things they needed but fell significantly short of meeting the technical requirements for their unique niche. Many printers and marketers heavily specialize in one area or another, and one-size-fits-all solutions put a cap on the level of efficiency they could achieve.

At the time, the alternative for these businesses was to devote a huge amount of development resources to build their own solutions. This approach is time-consuming, expensive, and distracts away from the primary operations of a printing service provider. Of course, not every company has these in-house resources and would have to outsource a custom solution.

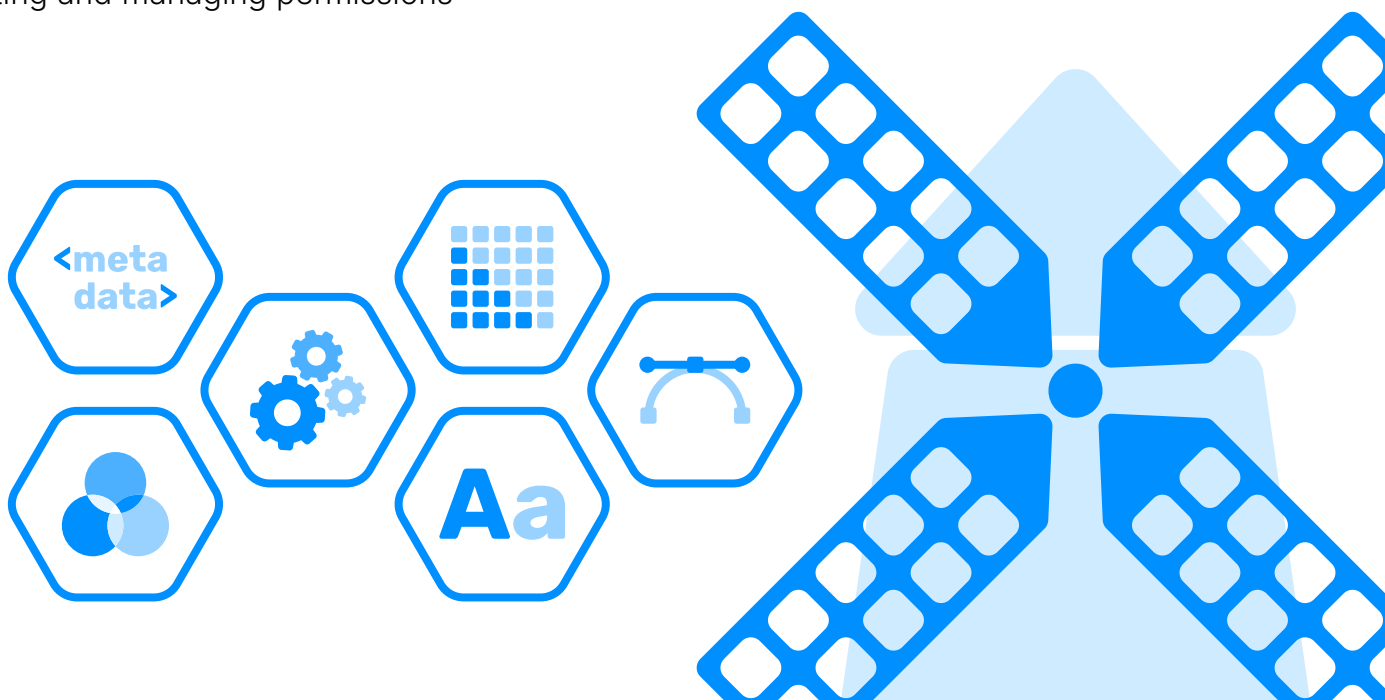
Enter Customer's Canvas

Through building [Graphics Mill](#), a powerful imaging toolset that brings raster and vector image processing to .NET apps with ease, we gained a holistic understanding of what functionality printers, marketers, and e-commerce businesses were lacking in their web-to-print software. We set out to fill the gap for a uniquely flexible and customizable web-to-print solution that could fulfill almost any use case and leveraged our years of experience and skilled team of .NET and C++ engineers to develop Customer's Canvas.

Our previous image processing work led us to parse and interpret Adobe's barely documented file formats, and we developed our own marker-based system for InDesign and Photoshop files for editing and managing permissions

within the Customer's Canvas Design Editor. Together with the option to also design from scratch, the Design Editor unlocked nearly limitless online personalization scenarios for printers and their customers.

The Customer's Canvas rendering engine brings the same unrivaled level of flexibility to the production phase for businesses of any size and in any niche, reducing headaches in-house and delivering reliable quality to the customer.



Built for Precision: Delivering High-Quality Output Files

When a B2B client orders business cards or a B2C customer purchases a customized T-shirt from an e-commerce platform like Shopify, they probably don't exactly know how a product goes from its digital form they see on the screen to the printed form they can hold in their hand. Generally, they expect what arrives in the mail to look exactly like what they saw in the online preview.

It falls on the printer to meet those expectations as best as possible. The challenges in front of that goal are accurately matching the colors, reproducing complicated designs without sacrificing quality, and supporting various industry-standard file formats compatible with the printing equipment.

Customer's Canvas excels at generating hi-res print-ready files

With the Customer's Canvas rendering engine on your side, you have nothing to worry about when it comes to meeting customer expectations. Whether you need to render color-accurate PDF files for your specialized printing equipment or generate raster image formats to publish on your social media accounts, the rendering engine can do it all with reliable quality and speed every time.

Color management that guarantees accuracy

A drastic discrepancy in color between the preview on the screen and the final product is one of the first things print buyers will notice. The Customer's Canvas rendering engine supports advanced color management, spot colors, and configurable DPI to ensure no such discrepancy occurs. You can define a color space (CMYK, RGB, grayscale) and a color profile (e.g., SWOP (Coated) 20% or Adobe RGB (1998)) to suit your specific use case.

The rendering engine also supports industry-standard ICC color profiles, for example, you can configure a US Web Coated (SWOP) profile. Regardless of how you're printing, whether it's inkjet, direct-to-garment, screen printing, and more, you can rest easy knowing that your customers can see an accurate representation of their products on the screen.

Use Case: Custom color profiles save the day

A printer was struggling to automatically reproduce colors, spending unnecessary time and resources to manually adjust each PDF file he received from customers to print accurate colors. This strategy is obviously not very sustainable for long-term growth, and also leaves a lot of room for human error with each job. Once he switched to Customer's Canvas, he was able to upload custom color profiles to guarantee accurate printing. Going forward, all files received from his storefront were rendered already compatible with his equipment.

Easy rendering for complex designs

When a client submits an order with an intricate illustration or a typographic-heavy design, a blurry or pixelated final result can lead to disappointment. The Customer's Canvas rendering engine provides printers with a vast array of configurable parameters for both proof images and print files that allow them to deliver pixel-perfect quality with every order.

Configurable DPI accurately reproduces the level of detail a customer sees on their screen. To avoid font compatibility issues and render products as close as possible to the designs, text is saved to PDF high-resolution outputs as vector paths, maintaining a crisp appearance, and saving you the trouble of tracking down a specific font.

Use Case: Complex typographic designs made easy

A company offering designs with custom fonts approached us with an obstacle that was bleeding time from every job they received. While the custom fonts provided a unique offering for their clients, they had several pain points with enabling online customization to their website due to typographic compatibility issues. After implementing Customer's Canvas, its rendering capabilities helped them avoid the time-consuming manual design process. Receiving print-ready files directly from the website saved time and resources they could devote elsewhere, and they were able to increase the speed and volume of jobs they could take on.

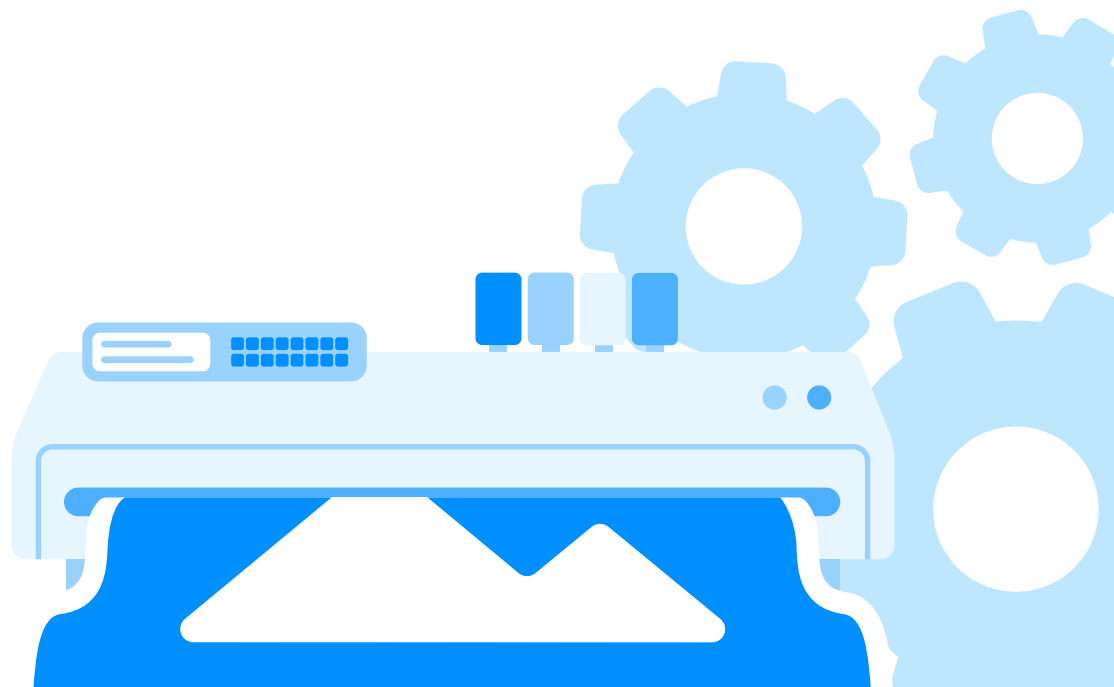
File compatibility with printing equipment

When a web-to-print solution can't reliably render the right files for specific equipment, expensive and time-consuming production bottlenecks that require manual intervention can occur. The downtime delays printing jobs, which negatively impacts customer satisfaction. Automatically generating compatible files improves overall efficiency, and cost/time savings that printers can pass on to their customers.

The Customer's Canvas rendering engine generates industry-standard PDF/X-4 print-ready files. The configuration options (expanded on further below) suit nearly any use case at any size

and comply with almost any printing equipment. You can leave the hours spent on manual adjustments in the past and start automating your outputs exactly how your workflow requires.

With the prevalence of social media today, any successful marketing campaign requires a mixed approach that leverages both print and the web. For marketers who want to publish online, the rendering engine generates raster image formats such as JPG, PNG, or GIF images.



Tailored to Your Needs: Unmatched Flexibility and Customization

Among print service providers, marketing agencies, and e-commerce businesses that rely on web-to-print, there is such a broad range of different niches, target customers, and business models that almost no two situations are the same. No typical boxed solution is really capable of covering all the bases. Many businesses end up with a solution that has some of the functionality they need, but not all.

Settling in this way generally means there will still be some extra work where the software falls short of automating. Perhaps the personalization works fine, but the configuration of output files requires manual attention, or there is no option to apply finishing options like embossing and foiling.

The adaptability of Customer's Canvas bridges the gap

One of the greatest strengths of the Customer's Canvas rendering engine is its flexibility and customizability. It bridges the gap where many other web-to-print solutions fall short, freeing up businesses to spend their time elsewhere rather than tinkering with certain pain points in the workflow. The spread of configuration options and post-press finishing options available streamlines production for your current catalogue and opens up new possibilities for the future offerings that would be unachievable with a more rigid solution.

Configure files to meet your unique requirements

Many businesses have a broad product offering, with each category requiring different configuration settings. For example, perhaps one product requires a specific color profile, and another product with a different production process requires another. If you produce multipage products, you might wish to generate a single hi-res file containing all the pages or separate each page into its own file. Runs that require imposition have their own challenges—it's a costly mistake if done incorrectly.

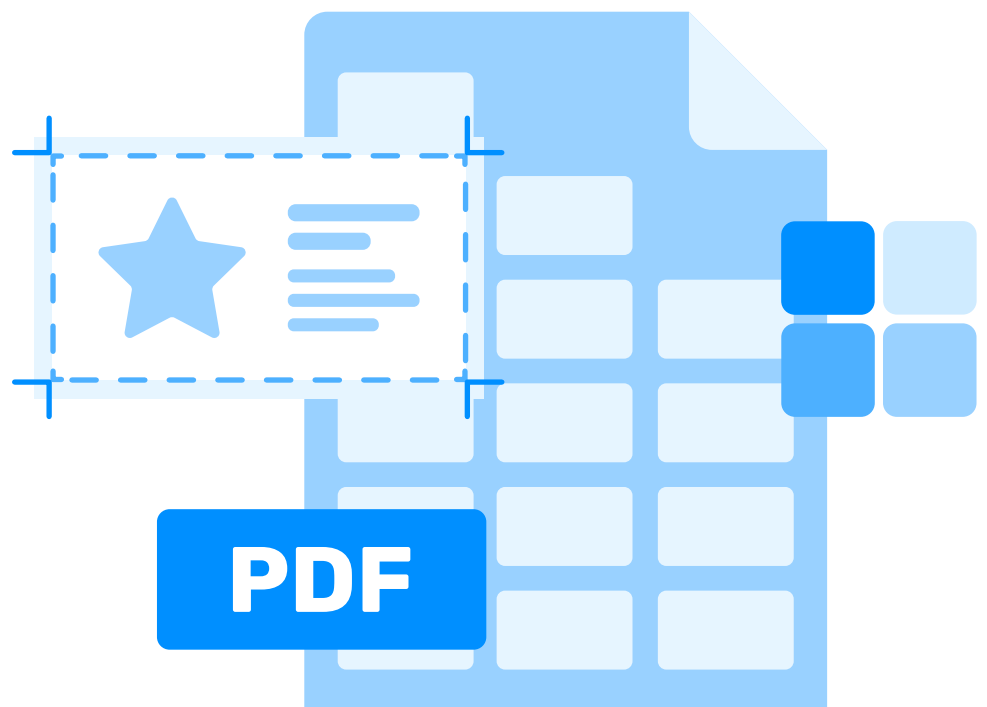
The Customer's Canvas rendering engine is packed with rendering options to adapt to your needs and meet all these situations. It doesn't matter if you're just starting out or planning the next steps to grow your business. You can optimize your existing workflow for all kinds of products with these options and more:

- Image resolution in dots per inch (DPI)
- Type of hi-res output (PDF, JPEG, PNG, TIFF)
- Color space (CMYK, RGB, grayscale)
- Color profiles (device-independent and device-dependent)
- Automatic and accurate imposition
- Separate each side of a multipage product into separate files
- Background color of a hi-res output
- Compression for hi-res outputs
- Display hints for unfilled in-string placeholders in hi-res outputs
- Specify PDF metadata

Use Case: Extensive configuration options streamline a broad product catalog

One of our clients had a broad range of product categories that each required different output file specifications. To further complicate matters, they had dozens of print partners, all with their unique requirements. Hundreds of products across several categories needed configuration for different resolutions, color profiles, naming, and more.

The ample configuration options of the rendering engine allowed us to prepare multiple setups and implement rules that determined what specification to use based on the partner. This project highlighted how no operation is too large, complicated, or varied to configure, and demonstrates how businesses can plan for future expansion without concerns over outgrowing the capabilities of the rendering engine.



Add an extra touch with finishing options

The Customer's Canvas rendering engine can help you expand your offerings with a suite of finishing options. Post-press techniques like embossing, foiling, and other embellishments are an extra touch that make products even more appealing to potential customers.

In the Customer's Canvas Design Editor, it's possible to enable channel containers in either Photoshop templates, InDesign templates, or product definitions to design print embellishments. The editor supports two types of these containers: spot colors and textures. The channel container type defines how a print embellishment appears on the canvas

and proof images. The spot color type applies a fill color to design elements while the texture type applies an image to design elements in the channel.

For example, you can create a postcard with two channel containers for print embellishments: one called Embossment for the texture and the other called PANTONE 185 C for the spot color. Upon rendering, you can choose whether channel containers will render in the same PDF output file as the basic design or in separate PDF files. Whatever existing workflow you have, it's a straightforward way to offer your customers a more premium feel to their products.

A flexible rendering engine unlocks new possibilities

A rigid rendering engine can lock your business into one niche and at one stage of growth. On the other hand, the flexibility that the Customer's Canvas engine provides through a substantial list of configuration options and post-press embellishments opens new doors. Adding a greater selection of products becomes more feasible. The range of additional customizations you can offer your customers increases. Ultimately, the additional flexibility increases your competitive advantage over time, and business opportunities like working with a vast network of print partners becomes a real possibility.

Rendering at Scale: Powering High-Volume Production

A major pain point of rendering for many printers is variable performance during high-volume runs and the ability to smoothly scale up or down when required. Direct mail, mass personalization, and seasonal marketing campaigns require reliable efficiency to pull off. Some solutions may perform adequately for low to medium-volume production but compromise on quality or speed when a business needs to scale up for higher volumes. Especially during time-sensitive campaigns around different holidays, such a compromise can reduce the effectiveness of a campaign or even make it not worthwhile to attempt.

Lightning-fast and secure cloud rendering for any job

Customer's Canvas employs powerful cloud rendering to handle high-volume runs at impressive speeds. The rendering engine can produce up to **1 million print-ready files per hour**—perfect for mass personalization and large direct mail campaigns. Since rendering jobs automatically start executing upon creation, you don't need to sit around

waiting to run them yourself. You also have the option to stop, resume, and restart jobs from the beginning. Some businesses may be wary of cloud-based solutions and how secure their data is when using them. Data security is a major priority for us and we guarantee privacy while using our cloud rendering solutions.

Scalability for high-volume exactly when you need it

Regardless of your usual volume, Customer's Canvas readily integrates into any existing web-to-print workflow and scales as required. For example, if your business plans to launch a direct mail campaign with tens or even hundreds of thousands of personalized pieces, it's possible for the rendering engine to meet virtually any capacity. We can always set up additional server nodes depending on your needs.

If you decide to run a holiday-themed greeting card marketing campaign for your customers, you can easily scale up to meet the deadline and then scale

back down to normal operations when the campaign concludes. Of course, this scalability also works very well for businesses that may not run such a high-volume work currently, but hope to at some point in the future. You don't need to wait until you reach that point for the Customer's Canvas rendering engine to be the right solution for your needs at the present.

Use Case: Parallel rendering for direct mail at scale

Another client of ours specialized in direct mail and needed a powerful, scalable rendering solution to increase the efficiency and volume of their campaigns. We implemented a scalable solution where we automatically deployed additional server nodes whenever they started a new job. We also managed the scheduler automatically, allowing file rendering through multiple parallel processes. The increased automation and parallel approaches enabled them to speed up higher volume jobs to meet their targets with plenty of time to spare.

Empowering Printers with Unparalleled Rendering Capabilities

For success today and future growth tomorrow, increasing customer satisfaction is everything. To achieve it, printers must meet expectations quickly, accurately, and with a high level of quality. Flexibility for how you configure your files is key, and outputs must meet industry standards and be compatible with your equipment. Finally, the rendering solution should be able to scale for high-volume jobs and future growth.

The Customer's Canvas rendering engine is loaded with tools to ensure color accuracy and print quality. The extensive configurations eliminate any concerns about reliably producing outputs that meet industry standards and can be used by your equipment without extra manual steps. No matter how big or time-sensitive the project, it can scale as your

workflow requires. The synergistic blend of precision, flexibility, and scalability make it the ideal solution for printers of any size or focus.

Of course, no matter how powerful a particular solution is, decision makers in printing, marketing, and e-commerce firms will always wonder what happens if something goes wrong. The Customer's Canvas team is ready to assist at any stage in the process, from assessing your needs and implementation to any troubleshooting support down the road. We have an extensive archive of technical documentation for Customer's Canvas available on our website, and we are also ready to help with as much hands-on support as it takes to resolve your situation.

Unlock your next stage of growth with advanced rendering

Don't wait—every day you stick with an inefficient, inflexible rendering engine robs your printing, marketing, e-commerce business of a greater level of quality, flexibility, and scalability you could have with Customer's Canvas. Our team is ready to **set up a personalized demo** that will give you a clear understanding of how the rendering engine could function in your unique scenarios. We're also happy to provide a **free assessment** of your current rendering processes and outline how Customer's Canvas can address pain points. [Contact us today.](#)

Useful links

[Customer's Canvas Rendering Engine](#)

[Documentation — Color Management and Rendering Parameters](#)

[Documentation — Post-press Finishing Layers](#)

[Documentation — Rendering Pipeline](#)