How 3D Commerce Offers the Building Blocks of a Virtual Inventory

By Shrenik Sadalgi

Retail sales have grown by almost four percent annually since 2010. During that time, e-commerce penetration has increased more than sixfold, as more and more platforms have built exceptional shopping experiences online. Today, an online presence with a user-friendly storefront and beautiful, detailed product imagery is table stakes for any retailer, regardless of size. Independent retailers and big brands alike need to be able to provide first-class online shopping experiences. Retailers are exploring emerging technologies to refine and reimagine what shopping for their category looks like online. One of the most powerful e-commerce tools to gain traction in the past decade is interactive 3D modeling of virtual goods: Think 3D sneakers that can be viewed from multiple angles and in different colorways, or furniture consumers can "view in room" through an augmented reality (AR) app. This space holds so much potential that some of the biggest names in e-commerce, such as Wayfair and Shopify, have come together with companies across the technology spectrum to form a coalition. More than 80 companies are working together to enable the seamless design, manufacture, and presentation of 3D products, so that retailers of all sizes can better use this technology to deliver online 3D commerce experiences.

3D virtual products may one day accompany every product listing, together with the traditional 2D images. These digital assets can be enormously effective sales drivers. For example, Shopify began allowing merchants to upload 3D assets and associate them with products in 2018. Now, this feature is available to over 1.7 million Shopify merchants. "We've seen products with 3D/AR content convert at a 94 percent higher rate than those with just images," says Jon Wade, Sr. product manager for Shopify. "3D Models will be just as important as photography and videos in the coming years."

Jatinder Kukreja, founder and CEO of SuperDNA, reinforces this view: "Around 30 percent of browsers will make an impulsive buying decision if they interface with true-to-life product

visuals on an online store. 3D and AR/VR solutions can fulfill the appetite for cutting-edge, high-end visual content."

"The industry has seen solid proof for the benefits with respect to key success metrics such as conversion rate and number of returns," adds Max Limper, CTO, DGG (makers of RapidCompact). "The way we shop online is going to be enriched with 3D content more and more every day."

3D models of e-commerce goods offer retailers operational benefits as well. Retailers don't have to restage photoshoots of digital assets if a new colorway or material is released; the asset itself can be updated. These assets can also replace or supplement in-store displays, reducing shipping and inventory costs. "Advances in the modern retail experience benefit customers and retailers alike," says Brent Scannell, product owner at Autodesk. "Customers receive added convenience, a more engaging retail experience, and the ability to make a more informed purchasing decision, while retailers reap the benefits of cost savings, reduced inventory and showroom displays, and greater incentive driving potential customers to make purchases."

As early movers like Wayfair and Ikea experimented with ways to deploy 3D technology, the appetite for 3D content creation and platforms on which users could experience those models continued to grow. With retail, software, and hardware all sprinting to develop this technology, it became difficult to ensure cooperation across the design, manufacture, and presentation of products across multiple platforms at an increasingly enormous scale.

Then, in 2019, a group of retail companies came together and approached the Khronos Group to form a 3D Commerce Working Group focused on easing the friction in the 3D content development pipeline. The Khronos Group is a non-profit consortium, creating open, royalty-free interoperability standards for 3D graphics, virtual and augmented reality, and parallel computation. It was the natural home for this work, because it was already responsible for the creation of the glTF file format. glTF is the 'JPEG of 3D': a compact, easy-to-process format that can run on a wide variety of platforms including web browsers,

mobile devices, PC desktops, and the cloud. This format is flexible; it can describe any 3D model from single objects to full scenes with animation; and it's a pure asset format, which means it can be used by any type of software that uses 3D — including on the Web and in social applications.

The 3D Commerce Working Group brought together Khronos's 3D engineering expertise with the new participants' retail insights to optimize the process of deploying glTF for e-commerce. The group has made advancements to help retailers, artists, and 3D tool vendors. Khronos' work directly benefits retailers through advancements like new extensions that enable more realistic glTF models, or programs that help ensure a more consistent display of glTF assets across different platforms. As retailers add 3D content to their storefronts, building new interactive experiences and engaging with or hiring artists to develop assets, they should develop familiarity with a few tools and concepts relating to the Khronos Group's work.

Asset Creation Guidelines:

Many experienced 3D content developers aren't familiar with the specific requirements of e-commerce. The 3D Commerce Working Group created a set of real-time asset creation guidelines that provide best practices for creating 3D models for cross-platform delivery. Using these guidelines, artists can produce assets that work equally well in a digital storefront, a native app, and a social media ad. The guidelines are free and tool-agnostic.

Material Variant Support:

Many products come in a variety of materials and colors. Material variant support makes it possible to combine these different options in a single glTF asset. 3D files are not small. Having to download multiple versions of the same asset to view different style options can lead to increased memory usage and slower interactivity. Packaging variants in a single asset using material variant support results in a better consumer experience.

Physically Based Rendering (PBR):

PBR is an approach to 3D rendering that creates realistic results by modeling the physical properties of real-world objects: how soft, shiny, reflective, translucent, etc., the material is in real life. Without PBR, 3D models can look sterile and uncanny. With PBR, 3D objects come to life, looking more appealing to consumers and giving them more accurate information about the potential purchase. The Khronos Group's 3D Formats Working group has been cooperating with the 3D Commerce Working Group to develop the PBR extensions most urgently needed by the e-commerce community. This work enables the creation of photorealistic assets that can be displayed in any context, including virtual product photoshoots.

KTX 2.0:

To provide the best consumer experience, retailers must balance image quality against file size and memory requirements. KTX 2.0 is a texture container format that helps thread that needle by offering compression that works universally across platforms. KTX 2.0 offers both high-fidelity and high-efficiency compression options. Retailers can work with content creators to select the right parameters for a beautiful 3D asset in a smoothly functioning experience.

Viewer Certification:

A glTF asset is created independently from the 3D viewer used to build a consumer experience. The viewer itself can have a major impact on what the consumer sees: the same asset might look very different in a digital storefront versus a mobile ad. The 3D Commerce Working Group recently launched a Viewer Certification Program to address this problem. The group is currently assessing a wide variety of popular viewers using a test pack of images, ensuring they render the test images the same way the baseline glTF Sample Viewer does. Certified viewers will be listed in a public certification registry. When building a digital storefront, selecting a certified viewer will help ensure the consistency of the experience.

Retailers can leverage these tools and resources to work closely with artists and content developers to build their digital inventory and online consumer experiences. The Khronos Group's advancements mean more bang for the buck on each 3D asset. The Realtime Asset Creation Guidelines and material variant support extension mean that one glTF asset can do the work of many across platforms and applications. The universal glTF file format, made more photorealistic by PBR extensions and more compact by KTX 2.0, means retailers can commission great-looking assets that won't bog down their digital storefront's performance. The Viewer Certification program gives retailers confidence that the digital inventory they've invested in building will perform as expected in any context.

Most importantly, all of these guidelines are freely available, and these standards are open and royalty-free. The glTF file format is supported by just about every major 3D asset creation tool and display engine in the e-commerce space. This ubiquity means a truly level playing field. Independent retailers should stake their claim to this space now; opportunities are poised to grow. What today is a tool to drive sales and maximize efficiency may soon be crucial to maintaining customer relationships in an increasingly online retail landscape.

"The industry is in pursuit of innovative and interactive retail experiences that captivate and entertain consumers while shopping — and even after a purchase transaction is complete." says Scannell. "While the challenges of today are about delivering a compelling and convincing representation of the product, the challenges of tomorrow will focus on differentiation through memorable marketing and retail experiences."

SUMMARY:

- **3D models of retail goods are one of the most powerful e-commerce tools to emerge in the past decade, boosting sales, decreasing returns, and reducing inventory requirements.**
- **The glTF file format, known as the 'JPEG of 3D,' has become the center of standards development activity to make the 3D commerce asset development process more streamlined.**

- **The Khronos Group's 3D Formats and 3D Commerce Working Groups have developed tools, programs, and file format extensions that retailers and their partners can leverage to create cross-platform ass**

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