

**PRIME IMAGE SMARTR COMPANY, LLC**

**SmartrVideo Pipeline & Commerce Platform**

*Powered by Prime Image*

**August 2020**

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## SmartrVideo Product Description

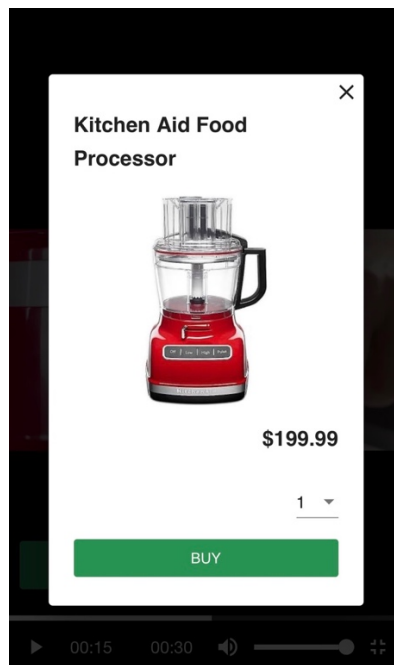
The **SmartrVideo Commerce Platform** was built to enable simple to use e-commerce transactions inside of any video. SmartrVideo improves virtual shopping experiences with a white label service that generates revenue in the form of commissions from e-commerce transactions.

Current Capabilities	Future Capabilities
<ul style="list-style-type: none"> <li>• Personalized viewer experience; customized calls to action</li> <li>• Manage checkout to reduce friction</li> <li>• Integrated product management with 3rd party stores and fulfillment providers (Shopify, Amazon)</li> <li>• Customizable product placement</li> <li>• Publish SmartrVideo links as website embeds, app embeds, and via social media</li> </ul>	<ul style="list-style-type: none"> <li>• Integration of native AI services and 3<sup>rd</sup> party content analysis tools to automate product identification</li> <li>• Fulfillment integration and setup automation via API</li> <li>• Shoppable live video streaming</li> </ul>

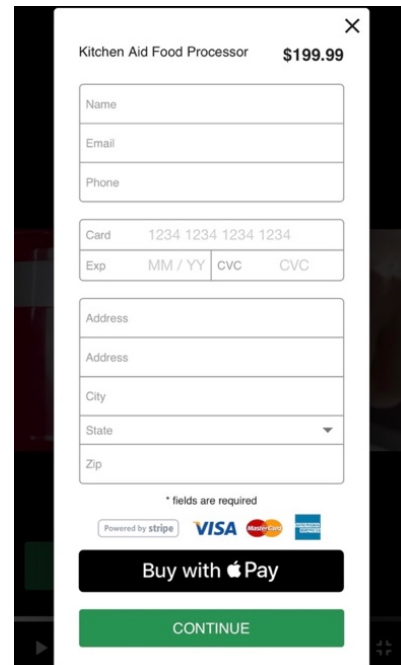
### Watch Video



### Click “Buy”



### “Purchase”



## Technology Overview

Prime Image developed its Automated Content Intelligence Pipeline (the “AI Pipeline”), a proprietary media asset pipeline leveraging patented Intellectual Property (IP) around media asset clock management. The AI Pipeline is fully extensible using a proprietary automation framework built on both Linux Ubuntu and Windows Server 2016. The web container is Glassfish and the framework fully utilizes related tools and rest standards to support and manage all API transactions. The AI Pipeline includes a software transcoder that supports bi-directional asset transcoding, decoding and encoding of standard broadcast and OTT formats. Decoding of the media stream happens in memory to reduce processing latency, specifically for those jobs that don’t require new video outputs. The automation framework works in both frames and time code (TC), which enables customers to build Edit Decision Lists (EDLs) or equivalent job descriptors into segments, chapters or total frame counts.

The AI Pipeline’s core model is centered around the OpenCV library. This tool provides the construct for frame inspection down to polygons or blocks of pixels, coupled with our proprietary algorithms to measure motion, object vectors and pixel similarity. The core model also includes an audio processor that analyzes every audio sample in 512 blocks and runs a proprietary waveform algorithm to identify matches, followed by splicing to remove samples and re-blends the audio stream. This process is not detectable during playback and does not require pitch correction.

Utilizing the pipeline and native AI functionality, Prime Image is addressing the obvious need to disintermediate the highly disparate AI media service industry through a single input/output interface and pre-classifying job type to optimize AI results. Prime Image’s patented vertical cut (VC) detector is a key differentiator in the AI processing sequence. The pipeline auto-runs the VC detector on all media assets, this metadata provides frame sequences by camera and is used to capture specific frames within the sequences to be passed to AI services. This reduces the number of frames and processing time by media asset. This function is a cornerstone to all AI model processing.

## AI Pipeline Service Description

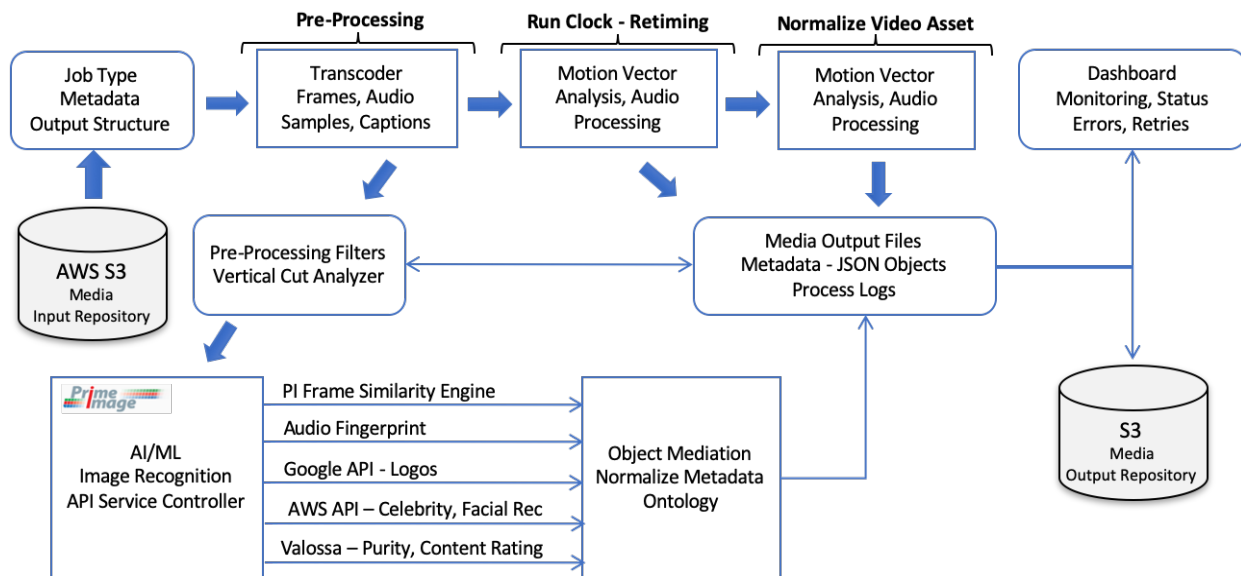
The AI Pipeline consists of a standalone pipeline and service controller to support native AI model processing and to further mediate input compliance to third-party AI model partners. This service interface leverages the media asset management pipeline and inherent filters and analyzers to improve and optimize AI processing intelligence resulting in fewer false positives and reduced processing costs by job request. The AI Pipeline contains Prime Image models, along with partner models from Google Image Recognition Service, Amazon AI Services and Valossa. Any number of partner models could be added to this extensible framework, including Microsoft Cognitive Services or other AI model requests from customers and partners.

Prime Image’s frame similarity work process provides a unique capability to quickly create actionable hotspots in media assets, thereby avoiding the more traditional model-based training approach. The technology enables content creators to develop an immersive user experience by targeting interactive hot spots or deleting undesirable content from the media asset. The process targets the frames or images a user cares most about within the media asset, from product

placement to content moderation, pattern recognition and product merchandizing. This advanced method of frame and image matching is used as a pre-filter to target and isolate frames within the frame similarity process. The frame similarity detector uses a multi-step iterative detection process to narrow down scenes, frames or TC that contain target images or frame content.

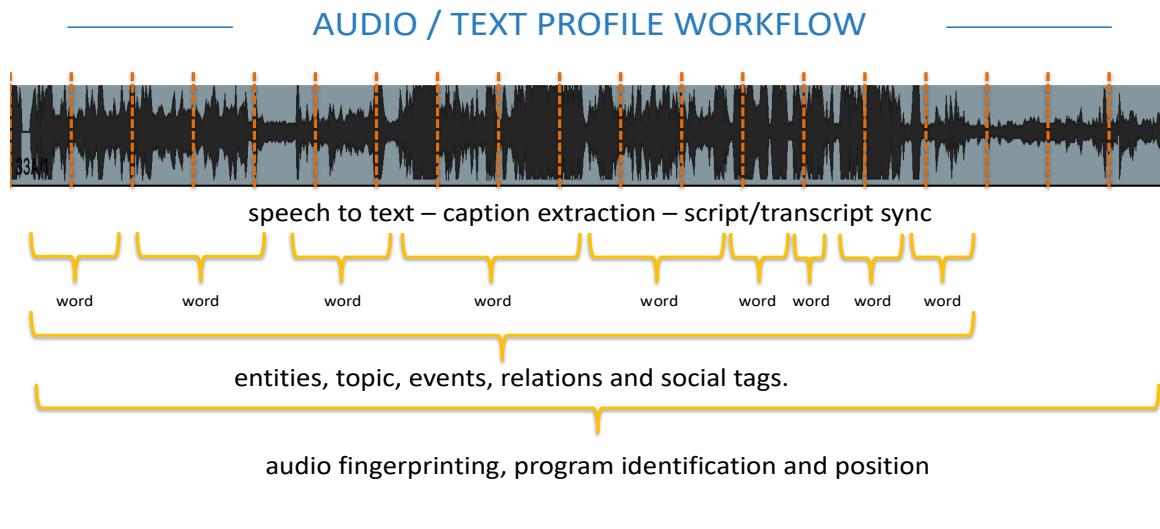
1. Step 1 uses a similarity score on every frame in the media asset. This score is done by processing blocks of the image for similarities rather than the image as a whole. This filters out the most likely frames and derivative confidence score.
2. Step 2 uses the same frame differencing algorithms from our frame drop technology. This further narrows down the set of frames to only the scenes that match the source image.
3. Step 3 in the detection process identifies the source frame sequence by adding the vertical cut detector, with the output metadata including both the frame counts and TC for viewer engagement.

The image below provides an overview of the pipeline data services:



Prime Image’s audio fingerprinting service operates by extending a virtual access layer of time-aligned metadata and assets staged for engagement to any application or device. The automated character recognition (ACR) and API engagement stack exposes any curated event at accuracy thresholds up to a sample rate level. This service is often used to enhance contextual metadata from the audio stream and serve as a surrogate to further triangulate image recognition accuracies. Third-party speech recognition, speech-to-text and ACR services can be seamlessly integrated into the existing pipeline work process.

The image below provides a high-level overview of the audio fingerprinting service:



## AI Pipeline Scalability

The AI Pipeline processes today operate within the CPU and utilize cores and processor clock speeds to drive throughput. To improve native performance and throughput, much of the processing is managed in memory using a complex buffering architecture. This approach eliminates disk I/O latency and generates quicker transcode times to and from the analysis engine. Throughput can vary by 50% depending on the type of job (detection vs. alteration). Standard AI operations using the video frame or audio sample analysis engine can take less than .5 of real-time of the processed asset. Other alteration or content moderation jobs where the process generates a new output file can take up to 1.1x of real-time of the processed asset. This process generates encoded mxf, mov and mp4 container files at the customers desired bit rate.

Prime Image’s AI Pipeline application runs in a standard Docker container. The container can run on any host (node, VM) or cluster using native cloud architectures and elastic services, e.g., Flexible App Engine, AWS EC2 Container Service (ECS). This service with an Elastic Load Balancer (ELB) enables the pipeline to elastically shape capacity with demand, while maintaining 100% utilization and price-performance from the job queue manager. Scale is a function of load as the pipeline is a serial process. Improvements could come from parallelization of audio and video splices (blocks of frames, audio samples) through a GPU process using the embedded EDL framework to concatenate altered parts of the video and audio back into a sequential video asset. These improvements are part of the Prime Image roadmap and will further enhance scalability across millions to 100s of million assets/day.

## Viewer Engagement – Shoppable Video

Prime Image developed a multi-dimensional video engagement prototype five years ago, as we saw the OTT video market transform viewer engagement and content monetization. The new interactive engagement experience would generate dynamic and immersive advertisements

surrounding the native video player (device agnostic). To further extend this model, Prime Image developed a fully integrated video commerce platform built on the AI Pipeline that enables and simplifies the connection between retailers and their target consumers through an immersive content monetization experience. The SmartrVideo platform runs on the Google Cloud, Flex App Engine framework to dynamically manage cloud service resources and end-user scalability.

The SmartrVideo Portal provides the core CMS and video management functions, connects and integrates third-party stores (Shopify, Amazon, custom, etc.), allows users to create their own products, manage fulfillment and place products and services into video content for checkout. The Portal encapsulates a “Provider” configuration utility that allows the tenant to create and manage provider settings, from Payment merchant, to Product Catalog, Shopping Cart, Order Management and Sales Tax provider. The two images below capture the method to synchronize a third-party store with the SmartrVideo portal and the optional Shopify checkout experience vs. the embedded SmartrVideo shopping cart.

**1. Existing Shopify Store**

**SmartrVideo One-Click to select Store Provider**

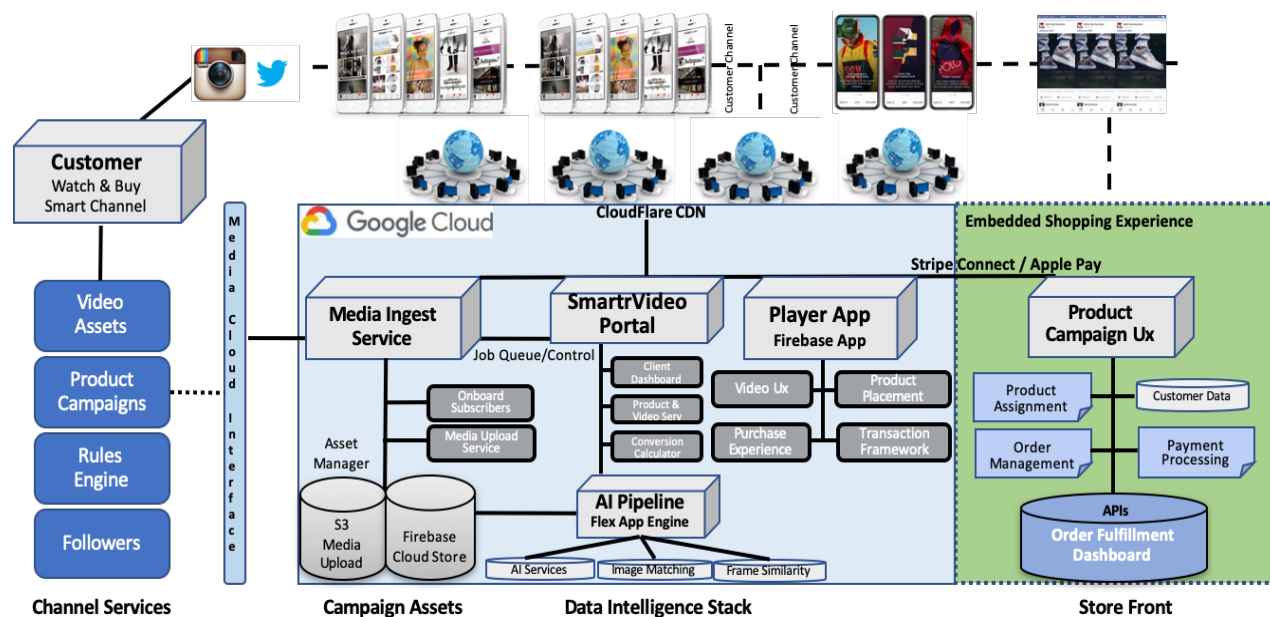
**2. Auto Sync Shopify Store Product to SmartrVideo**

**Checkout Using ANY Store Provider (Shopify Example) OR**

**Automate Fulfillment through 3<sup>rd</sup> Party Provider or SmartrVideo**

**SmartrVideo Embedded Checkout**

SmartrVideo uses a HTML5 video player with a proprietary interactive commerce construct embedded into the player experience. The architecture shown below is similar to the influencer/entertainer engagement model where short, targeted video assets are used to engage and merchandise blocks of viewers. This expanded data flow model is an extension to the Prime Image SmartrVideo Pipeline offering and can quickly transform any video asset into a commerce transaction and cashflow to related parties. The image below captures the reference architecture:



## ACTIVE PATENTS

D&N Ref.	Title	No.	Date	No.	Date	Status
PII-2710	Embedded Ancillary Packet Data Processing System and Method with Real Time Program Duration Alteration	13/439,285	4-Apr-12	8,724,968	13-May-14	ISSUED. Expires 4/4/2032
PII-2911	Controlling Digital Audio/Video Segment Duration with Remapped Code	14/820,907	7-Aug-15			PENDING.
PII-3100	Method and System for Detecting a Vertical Cut in a Video Signal for the Purpose of Time Alteration	13/755,986	31-Jan-13	9,113,133	18-Aug-15	ISSUED. Expires 1/31/2033.
PII-3101	Detecting a Vertical Cut in a Video Signal	14/823,817	11-Aug-15	10,116,909	30-Oct-18	ISSUED. Expires 8/10/35. (Continuation of PII-3100)

## SmartrVideo E-commerce Market

Retail as we now know it is about to change even more in the coming months and years. The effects of COVID-19 on consumer behavior will be far reaching and require adjustments from retailers. The new normal will see less brick and mortar retailers and more virtual shopping by the consumer. Virtual shopping will require an expanded video experience with the ability to integrate commerce within that virtual video experience.

Prime Image developed SmartrVideo to help major retailers and other enterprises convert video engagement into an e-commerce transaction. By embedding transaction capabilities inside of video, we eliminate friction and enable retail where consumers are most engaged - in videos they consume. SmartrVideo converts any video on any platform into a personalized e-commerce enabled advertisement. Video message targeting can now be combined with product targeting.

## Why Current E-commerce Practices are Suboptimal

Improving e-commerce enhances the future viability and growth of retailers. Currently, online shopping underperforms for retailers due to too many clicks and a lack of contextual awareness. Statistics show that 80% of shoppers are now abandoning their shopping carts prior to making a purchase. That inefficiency can have a material impact on the retailer's revenue and bottom line performance. Reducing e-commerce friction and improved product personalization are the keys to increased sales conversions and increased ROI from digital marketing<sup>1</sup>.

Even before COVID-19, traditional retailers struggled to compete with more efficient e-commerce platforms<sup>2</sup>. Without the cost of managing physical stores, large platforms like Amazon offered both variety and attractive pricing for bargain hungry consumers. Even with these advantages, Amazon and other online first retailers are little more than online mail order catalogs with the ability to find products through keyword searches. The effects of COVID and the apparent change in consumer habits have put more pressure on retailers to provide an e-commerce shopping experience that captures the consumer and is far more efficient than the current experience.

Major retailers incorporated e-commerce capabilities in their websites but as online shopping grew as a share of total retail, the shopping experience itself was little more than a website full of product images and text heavy descriptions. Digital marketing tools like Facebook Ads and Google AdWords steer consumers to a retailer's website but the process is disjointed with customers having to excessively click through to find the products they want and retailers undergoing significant expense and effort that does not necessarily yield improved sales conversions. As digital ad budgets have grown dramatically, retailers have not seen the desired returns on investment. Even prior to COVID analysts warned of a retail apocalypse. If retail was struggling pre-pandemic, the economic effects experienced SO FAR since March 2020 are nothing short of catastrophic. In the landscape that will emerge during and after the pandemic, retail will be forced to evolve and reinvent itself.

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<sup>1</sup> <https://youtu.be/vkSNW6CJN7Q>

<sup>2</sup> <https://www.nytimes.com/2019/11/25/business/macys-kohls-nordstrom-problems.html?smid=nytcore-ios-share>

## Pandemic Impact on Retail - Cash is King

In the current atmosphere, retailers are focused on preserving cash. Capital expenditures for existing brick and mortar stores are being placed on hold or eliminated altogether. Inventory levels are being carefully examined in anticipation of a post-pandemic world. Even after stay at home rules are relaxed, retailers can reasonably expect a resurgence of COVID-19 or perhaps new pandemics that could again disrupt their brick and mortar operations. Major retailers will need to expect growth in e-commerce to offset the drop-off in brick and mortar revenue and more importantly to stay in business. They will need to invest in their e-commerce experience to greatly improve the shopping experience and be able to compete with the likes of Amazon and other marketplace sites.

## Retailers Aren't Using Video for Sales Conversions

Retailers have long used video to promote their brands and their products. In social media (where the dominant digital ad tools proliferate), video is the most compelling form of engagement of any form of content - superior to text or images<sup>3</sup>. As retailers upgrade their strategies, introducing commerce inside of video should be at the top of their list. It will not be enough to replicate the in-store experience online with product images, descriptions, and a shopping cart. Engaging customers virtually with the right products at the right moment will become key to a successful e-commerce strategy. Retail is becoming more integrated and more available inside of social media and other apps where people consume video.

## Video E-commerce in China - Taobao

Utilizing video directly to create an immediate transaction is not new. China has become the largest e-commerce market in the world and applications such as Alibaba's Taobao have demonstrated that integrating commerce with video engagement drives retail revenue. Taobao has doubled each of the last three years and in 2019, Taobao had 400 million viewers and generated \$28 billion in revenue.

Taobao's experience illustrates an emerging trend to make retail more accessible and more available inside of video<sup>4</sup>. While Chinese e-commerce platforms like Taobao have been blacklisted in the US due to sale of counterfeit products, that has not stopped mainstream retailers such as Coach and influencers such as Kim Kardashian from using it to sell into the Asian market<sup>5</sup>.

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<sup>3</sup> <https://www.socialmediatoday.com/news/10-video-marketing-statistics-for-2019-infographic/550274/>

<sup>4</sup> <https://www.youtube.com/watch?v=nj2kcN7e6p0&feature=share>

<sup>5</sup> <https://www.marketplace.org/2020/04/06/chinas-brands-use-livestream-reach-consumers-during-covid19/>

## Conclusion

The future of retail will be defined by how the shopping experience can be made easier for the consumer. SmartrVideo will be an integral part of the survival of many retailers who will need to rely even more on the virtual marketplace to offset the losses realized from the normal brick and mortar outlets.

SmartrVideo is positioned now to help retailers evolve and improve their e-commerce strategies with technology that can be customized and controlled to meet every retailer's unique needs.

## Why SmartrVideo?

- Designed to drive sales by focusing on simplicity for the viewer and retailer.
- Underlying technology adds automation and scalability for large scale enterprises with extensive product catalogs.
- Simple, intuitive viewer interface accessible via browsers; no subscriptions, memberships, or proprietary access needed to consume content or execute transactions
- Integrate with existing e-commerce store and fulfillment providers or utilize SmartrVideo integrated checkout for impulse purchases
- Autosync product information from 3rd party stores
- Customize SmartrVideo to work on top of any 3rd party native video or OTT app - no walled gardens to lock you into any particular video platforms
- Configurable for retail or non-profit fundraising; customizable call to action button text
- Published video links can be embedded or shared via social media with all transactional capabilities intact
- Configurable payment options Apple Pay, Credit Card, Samsung Pay, Google Pay, PayPal
- Manage placements – products, contributions, embedded re-directs, polling (questions, answer text and survey results fed back to viewer as JSON file or CSV download)
- Multiple products per video using timecode
- Embedded Google Analytics – viewer metrics and transactional behaviors
- Manage user and group permissions

## About Prime Image Smartr Company, LLC

Prime Image Smartr Company, LLC is licensing Prime Image's Automated Content Intelligence Pipeline to apply the technology to the e-commerce market. Prime Image Smartr Company, LLC is a wholly owned subsidiary of Prime Image AI Corporation.