A.I. to the Rescue
How artificial intelligence is making media twice as entertaining (with less than half the work)

INTRODUCTION

“This article was written by a bot.”

OK, this particular article wasn’t, but disclaimers like this one are starting to pop up around the internet, and it’s just the beginning. Bits written by bots are just one example of how Artificial Intelligence (AI) is making basic tasks in media much more efficient and less expensive to execute.

Media & Entertainment has been identified as one of the industries that will realize the benefits of AI right away. So as the technology accelerates, Ooyala’s Strategic Media Consulting team (SMC) thought it would be helpful to review a number of exciting ways AI will impact our industry: from the optimization of metadata to advancements in content production, publishing, monetization and data.

WHAT IS ARTIFICIAL INTELLIGENCE?

If you’ve heard about AI but aren’t exactly sure what it is, you’re not alone. According to recent Rocket Fuel and Qualtrics survey published by eMarketer, about 90% of internet users are in the range from “not an expert” at artificial intelligence to “don’t know what it is.”

So before we get started, here are some definitions and examples that might help...

Artificial Intelligence (AI)
A branch of computer science dealing with the simulation of intelligent human behavior in computers. Basic examples include voice-powered assistants, automated customer support, fraud protection, suggestive searching and personalized entertainment.

Machine Learning
An application of AI that provides systems with the ability to learn automatically by using data to improve from experience without being explicitly programmed. Examples include self-driving cars, speech recognition and advanced genome study.

Deep Learning
A subset of machine learning, deep learning uses networks capable of learning from data that is unstructured or unlabeled. An example would be a program that uses a neural network to caption an image automatically (“brown dog sitting”) by having analyzed many images prior.

Neural Network
A computer system, modeled on the human brain and nervous system, that contains a number of connected processing units that analyze information and pass weighted results to lead to a final output. Pattern recognition is a good example: a program can determine the artist of a particular painting by running it through a neural network of indicators. Each “neuron” evaluates the image using its uniquely programmed “knowledge” and provides information that leads to a final output.

Super Intelligence
A hypothetical intellectual agent evolved from general artificial intelligence that is much smarter than the best human brain in practically every field, including scientific creativity, general wisdom and social skills. In popular culture, Skynet from the film The Terminator is a particularly crude (but scary) example.
BACKGROUND

Many believe that AI is a new technology, but it’s actually been around for decades. AI is considered to have been “born” at the Dartmouth Conference in 1956, where it was given its name and formal designation as a topic of study by the scientific community.

Over the years, AI has evolved to become widely adopted throughout the technology industry. This has mostly happened behind the scenes, where deep learning and neural networking have had a big hand in processing big data and automating many useful programs. These days however, AI is really starting to take off as its capabilities are being applied to many of our everyday activities.

From personal assistants like Amazon’s Alexa, to the personalization of media and entertainment, AI has the very real and exciting potential to impact our daily lives. A leading indicator of this adoption is the amount of spending being funnelled into AI. Forecasted by International Data Corporation (IDC) to be approximately $13 billion this year, AI spending will grow by more than 3x to a projected $46 billion in 2020.

AI IN MEDIA & ENTERTAINMENT

Let’s talk about how AI is changing the media and entertainment industry. AI relies on data to be effective. And considering the very large amounts of data surrounding our very human need to consume media, AI is poised to make a big impact in this field.

The Foundation: Metadata

AI is powered by data. That often means Big Data, but when it comes to optimizing media and entertainment workflows, more precise data about specific assets, aka Metadata, tends to be the hero. Metadata can include any bit of information about a particular asset. For example, metadata for a video might contain:

- Cast and Crew
- Shoot Locations
- Description
- Series/Episode Info
- Format
- Licensing Terms
- Scene Timecodes
- Event Info

Any piece of information that can be generated about a particular asset can be stored as metadata. And the more metadata you have, the more AI can do to optimize the asset and maximize its ROI.

Automating the way metadata is captured

Imagine scores of spec sheets being consolidated for manual data entry or armies of interns transcribing videos. Capturing and entering metadata has traditionally relied on this kind of cumbersome human input. One producer told us that for every hour of content, it takes four hours of manual labor to capture and enter metadata for that asset. This is changing.

Platforms like Microsoft Azure Cognitive Services are pioneering breakthroughs in advanced transcriptions and face, object and text recognition to capture key metadata automatically. Certainly, this technology will be used to ingest VOD content and store its surrounding metadata, but a more exciting real-time example occurs during live events, where an AI program can immediately identify a key datapoint and act on it in very short order. For example, if a movie star is shown in the crowd at a baseball game, AI can pull up that star’s most popular movie clip, check it for licensing and prep it for air... all within minutes, if not seconds.
Managing metadata and making the most of it

Setting up the foundation for properly storing and managing data is critical. This starts with an effective data-capturing engine like Microsoft Video Indexer and continues with a powerful media logistics platform like Ooyala Flex.

The key here is automation. Once you have the data, Ooyala Flex can help any organization construct advanced data modeling frameworks to set up the relationships and workflow rules that allow a complex decision-making process become simple and effective. Once-complicated tasks can be streamlined and decisions made much more effectively, often even automatically. It’s truly amazing how much better things run with data flowing to the right places in the right way.

To this end, Ooyala is working directly with Microsoft Azure Cognitive Services to capture key metadata like audio transcripts, face, object and text recognition data. This data is captured by Microsoft Video Indexer technology and passed to Ooyala Flex for storage and management.

Once in Ooyala Flex, these key data points can be used to move an asset along the production and distribution life cycle as efficiently as possible. Tasks are performed faster, business questions answered more efficiently and costs minimized. This is the future of media logistics.

Case in Point

Ooyala has developed a proof of concept where video files go through an automated workflow from import through to distribution, including advert insertion and recommendations. Harnessing Video Indexer, a part of Microsoft Cognitive Services, Ooyala Flex triggers Video Indexer to process the video and audio for face recognition, sentiment, speech-to-text transcription and translation. All this information is then automatically logged as timecode-based metadata as part of the asset within Ooyala Flex.

When content is published to a VOD portal, specific metadata fields, such as celebrity names and sentiments, are also published with the video.

Subtitles are automatically generated from the transcript (which, again, have been automatically captured via Video Indexer). The added monetization value in this automated chain is the tailored automatic insertion of pre-roll ads based on who appears in the video. So for example, when an interview with singer Idina Menzel is chosen, this is automatically prefaced by a quick advertisement featuring Menzel.

A recommendations engine can also automatically suggest similar content based on the user’s viewing choices.
When it comes to actually creating content, AI can not only be quite efficient, but even creative!

**Deciding on Creative**

Need to figure out what content to produce next? Some publishers now use neural network intelligence to determine which type of content to spend valuable production dollars on, based on a multitude of complicated factors. For example, perhaps you’ve identified that your drama videos are getting the most views. Normally you might be inclined to produce more drama content. However when you factor in additional considerations (e.g. production costs, talent costs, rights and clearances, audience engagement, social virality, syndication opportunities, etc.), you might actually learn that your comedies tend to have a larger ROI. AI is the engine that powers these in-depth calculations.

**Automating Content Generation**

*The Associated Press* (AP) is leading the way in automating how stories are produced. When a print story is written, the writer has to create a number of versions to facilitate the full spectrum of AP distribution. This includes summaries of the main stories, alternate versions based on geography and language, broadcast versions and so on. According to the AP, their journalists spend a total of about **800 hours a week** making these alterations. They’re now looking at a new workflow framework that would rely on AI to manage the majority of this extraneous work, which would allow their writers to focus more on… you got it, writing! Hollywood is also starting to use AI to streamline the way trailers are produced by identifying key plot points within a movie and generating condensed trailer versions based on what it already knows about trailers and how audiences are impacted by them.

**Editing**

Imagine putting together a documentary based on hours of raw footage. Sorting through and capturing information about this footage manually would take weeks. Not to mention the time it would take to aggregate the relevant clips in preparation for editing. AI can eliminate much of this time in two ways: (1) by automating the capture of a wide range of metadata through face, object and text recognition; and (2) by optimizing search to find key elements within the large pool of content. This way, when an editor needs just the right shot, he can ask AI to find it much faster than he ever could.

**Archiving**

You’ve spent a lot of money on content, and you want to get the most out of it. AI can help. By indexing your existing content with powerful metadata capture techniques, you’ll find that archived content can be much easier to repurpose for future use. For example, locating relevant footage for an on-the-fly highlight package to supplement a live event can be done within minutes instead of hours. This is another key area where the Ooyala Flex is working closely with Microsoft Video Indexer to help publishers overcome a traditionally cumbersome pain point.

**Publishing**

When it comes to engaging your audience, the more intelligence the better!

**Localization/Translation**

Speech recognition and translation is a major aspect of AI today. There a lot of nuances to language, so progress is fairly nascent, but with most major AI tech investors from Microsoft to Google and Facebook working on it, expect major developments to happen fast. Pretty soon, you’ll be able to create a piece of content in its original language and have it converted to every major language almost immediately. Boom, your audience just went global!

**Monitoring**

Live events can be stressful! There are a lot of moving pieces and if one thing goes wrong, it can shut down the entire event. Traditionally, the task of monitoring a live event and troubleshooting issues has been fragmented across each section of the event chain, making it difficult to pinpoint and solve issues quickly. By deploying an intelligent program to watch over and troubleshoot every aspect of your live event, problems can be identified more efficiently (sometimes even before they happen) and resolved faster. For example, an AI program can be instructed to watch out for any unexpected spike in users during your event. As it notices a spike occur it can immediately update your CDN server configuration to add the capacity needed to keep your event from crashing.

**Syndication**

These days, it’s not enough to just offer content on your site alone. You need to syndicate everywhere it makes sense. Syndication can be complex, however. You often have to wrestle with intricacies like partner specifications, rights and clearance terms, and metadata standardization across platforms. This is where a great media logistics platform like Ooyala Flex can be critical. By giving you the tools to create the framework for your syndication partnerships and leveraging AI to automate the heavy lifting based on your specs, much of this traditionally complex process can be made very simple.
Social

No social platform is the same, so your social strategies shouldn’t be, either. This is the trap many publishers fall into today and it’s vital to solve. Let’s say you create an amazing video you want to share with the world. Do you simply push the same cut of that video to YouTube, Facebook and Twitter and hope for the best? You can, but you shouldn’t, because each social platform serves its own purpose. Instead, you might want to drive traffic back to your site by posting the bloopers to Facebook, the trailer to YouTube and a key clip to Twitter. Now, that might sound time-consuming, and that’s because it is! But with a good media logistics platform and some basic AI, much of it can be simplified and automated. Imagine now with that same amazing video clip, you check a few boxes, enter a few timecodes and voilà: the video is cut up to optimize for your social strategy and automatically published to each social platform. Now that’s progress!

Personalization/Recommendations

OK, this is where it gets exciting! For the consumer, because AI will make it easier for them to find the content they like, and for the publisher, because it will increase audience engagements with their content. Thanks, AI!

For these reasons, personalization is one of the top benefits of AI: to understand you and your specific preferences.

Ooyala is doing this today with its video recommendation engine, Ooyala Discovery. By leveraging machine learning to understand both user behavior and content trends, Ooyala uses patented AI programs like “Collaborative Filtering” to make sure users are consistently being served content that they are most likely interested in watching.

This works by analyzing the behavior of a large group of users with respect to how they engage with a certain content library to identify and act on trends. For example, if User X watches Video A then clicks to watch Video B, then there’s a good chance that if User Y watches Video A, they’ll want to watch Video B as well. These patterns allow Ooyala to build a powerful neural network of decision-making that leads to higher viewership and engagement.

Case in Point

ZoneTV is utilizing media logistics tools from Ooyala plus Video Indexer, part of Microsoft Cognitive Services, to automate the curation of content of a first-of-its-kind, customizable suite of linear TV channels, which launches this fall.

ZoneTV has licensed digital-first content which it will curate into specialized channels delivered to pay-TV subscribers. For consumers, these channels will initially appear like any traditional linear channel. ZoneTV’s unique service allows consumers to do more, combining linear, on-demand and customized choices into a new offering called ZoneTV Dynamic Channels. The company’s ability to curate 6,000 hours of videos on the fly in these channels creates a unique and personalized experience for the consumer.

The content in the specialized channels will be presented in a consumer-friendly, easily discoverable way to viewers. ZoneTV will achieve this using the ZoneTV Programming Studio, which is integrated with Ooyala Flex and with Video Indexer to curate fine-tuned specialized channels.

The combination of these tools features advanced algorithms that characterize content; the platform automatically extracts and analyzes metadata to identify video genre and content sentiment, pulls topics from speech and text, translates captions into multiple languages and integrates subscriber analytics. This provides quick scalability for ZoneTV as it adds additional content, and reduces manual processes that can slow content curation and introduce errors in metadata translation and application.
Monetization
We’ve seen how AI can streamline processes to save costs. Now let’s talk about how it’s actually helping to make money!

Personalized Ad Experiences
Advertisers know a lot about us. Which isn’t necessarily a bad thing, because it means we see ads that are relevant to our preferences. If you’re a car fanatic you’d probably rather see an ad about the new Audi than an ad for life insurance. But how does AI play a role in ad personalization? Well, it all comes down to data, in order for advertisers to know what we like, they need to collect a massive amount of data across a growing number of platforms. And the only way to make sense of these mountainous heaps of data is to unleash AI to make the real-time, complex decisions only a computer program can handle.

Programmatic Ad Serving
More and more ads are being served in real-time based on a number of factors. Beyond just who you are and your known preferences, you might see a different ad based on your current platform and device you’re using, the time of day, and so on. All these factors must be considered in real time to intelligently select the right version of an ad that’s best for you at that specific moment. A lot of information must be processed extremely quickly which AI can help facilitate in a number of ways. For example, if Target has data that you live near one of its stores, it will likely bid higher in real-time to serve you an ad — whereas if you don’t live near a store they may not bid for your impression at all.

Dynamic Content Marketing
You’re watching your favorite TV show and the bus on the show has a Coca-Cola ad on it. Your friend watches the exact same scene but sees a FedEx ad instead. That’s AI in action. Technology is being developed that will identify various points within content that lend themselves to native advertising. Once in inventory, those ad points can be dynamically programmed to insert different ads based on audience and other contextual drivers. Apply this technology across all content and AI has opened up a massive new ad channel with powerful targeting applications.

Brand Safety
If you follow the advertising industry, you know brand safety is a very big deal these days. Advertisers simply don’t want to associate their coveted brand with content that isn’t up to par. Google has already taken measures by leveraging AI to ensure premium advertisers don’t find their ads in front of lackluster content, and it’s very likely that as the technology advances, the same type of intelligent evaluation and reporting will be leveraged by all publishers big and small.

Analytics and Reporting
Data powers AI, which is why AI should power your data.

Intelligent Reporting
Data is everything! You can’t have enough of it, but it’s also hard to manage. Data is also everywhere! It’s on 3rd-party platforms like Google Analytics and Facebook Insights, on in-house spreadsheets, DMPs and so on. With so much data across so many locations, it’s almost impossible to decipher sophisticated analytics without a little help. This is where AI is vital. Imagine connecting your 3rd-party data, in-house spreadsheets and any other data points you have into a program that intelligently processes it all and spits out a clear, easy-to-understand set of metrics that speak directly to your business objectives. Doesn’t that sound nice? Well, we’re not there yet, but stay tuned.

Applied Insights
If you’re making business decisions based on performance metrics and key data insights, then you’re on the right track. But what if you didn’t need to make those decisions? What if they were made for you? Imagine asking an AI program what type of content to produce next? Which syndication partners to expand on? Which platforms to focus on or which talent is providing the best ROI? What if you could ask a computer these questions and get the answers immediately and with a data-based explanation to back it up? To be clear, decisions like these will always require human participation, as there are nuances AI won’t always grasp. But AI this powerful will certainly make it much easier!

CONCLUSION
The benefits of artificial intelligence are exciting, to say the very least. The promise of increased efficiencies and streamlined workflows can sound like fantasy at times. Yet they’re quite real.

Certainly a shift to such a hugely impactful technology has its downsides as well. The increased infringement on our privacy, the complacency that can come with having a computer make many of our decisions for us, and just the general transfer of control to intelligent programs can be a little scary to consider (very scary depending on who you ask!).

But all that said, it’s pretty clear that AI will improve just about every single way we produce and consume media entertainment for decades to come. AI is still very much in its nascent stage but it’s picking up steam as the technologies and human resources that support it become more advanced each day.
So, if you're a publisher or broadcaster, what should you do about it? Well, two things:

1. Get your house in order when it comes to metadata, the foundation for effective AI. Take a good long look at how you're ingesting media assets today and how you're capturing the metadata that surrounds those assets. Consider leveraging existing AI services like Microsoft's Cognitive Services to optimize that process.

2. Make sure you have a powerful media logistics platform to store and manage all that crucial information. If you're still relying on an in-house infrastructure that was built years ago and is constantly being jerry-rigged to support new workflows, then you're not in good shape. You can either start thinking about optimizing these workflows today and be ready for the future, or wait until the last minute and hope you can restructure in time to not be left behind. Take a look at Ooyala Flex to get a better understanding of what's possible with the right media infrastructure and go from there.

In short, optimize your foundation and stay tuned to developments in AI that speak directly to your pain points. It's the smart thing to do as the massive wave of intelligence comes our way.

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**Ooyala Strategic Media Consulting**

**Engage the Experts**

Ooyala Strategic Media Consulting brings the experts to you. With wide-ranging experience across media and broadcast technologies, our consultants are uniquely positioned to help you derive maximum value from your content.

**Our Approach**

As an extension of your team, we consult objectively and collaboratively with your key executives. We look at your company's strategic goals and critical challenges, collect relevant internal and external information, and use a data-driven approach to make impactful recommendations that unlock value. Our recommendations help you stay ahead of fast-moving industry trends. Perhaps most importantly, we pride ourselves on transferring knowledge to your team with repeatable frameworks that let you make better and smarter data-driven decisions in the future.

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**We'd love your feedback!**

We hope you found this white paper valuable. Please take a moment to answer a brief five-question, multiple-choice survey to help inform our future content. As a thank you, we'll send you an exclusive guide from our Strategic Media Consulting team, "5 Tips for a Successful SVOD Strategy."

[Take the survey]