



WHAT CAN ARTIFICIAL INTELLIGENCE (REALLY) DO FOR YOUR VIDEO BUSINESS

INTRODUCTION

PwC anticipates that artificial intelligence will contribute \$15.7 trillion to the world economy by 2030.

There is no question that artificial intelligence (AI) currently plays an important role in all aspects of our society; moreover, experts like Andrew Ng, former Chief Scientist at Baidu, a giant Asian web services company and pioneer at putting artificial intelligence to work across its organization, claims that AI will have the same impact on the world as electricity had a hundred years ago.

In this respect, the entertainment industry is no exception; it is expected that AI will have a profound and far-reaching impact in the coming years, and there will be no going back.

Today's entertainment industry technology vendors are reeling off jargon like "AI", "machine learning", and "deep learning", touting the benefits these technologies promise. It can be difficult for video server provider decision makers to discern between the future promise of AI and what is truly feasible and effective today: how can deploying AI in your organization now improve customer acquisition, engagement, and retention and by extension, prove its ROI.

This White Paper describes the challenges faced by the entertainment industry – more specifically, the video industry –that can be effectively addressed by state-of-the-art AI today.

You should approach implementing AI in your organization like a journey where each step represents progress with real business benefits. Each step, having delivered satisfaction with incremental positive impacts paves the way for continued progress. Progress, that is demonstrable to senior management and represents a positive ROI for the business.

FIRST, WHAT IS ARTIFICIAL INTELLIGENCE?

In its simplest terms, the science of AI studies how to make machines or computational programs intelligent. It has four main objectives:

1. To automate manual production processes: automated intelligence.
2. To assist with making human-performed work fast and more efficient: assisted intelligence.
3. To help in decision-making: augmented intelligence.
4. To automate the decision-making without human intervention: autonomous intelligence.

HOW WILL THE ENTERTAINMENT INDUSTRY BE AFFECTED BY AI?



First of all, it is important to understand the current context of the industry: entertainment video consumption over the Internet is in full disruptive-swing with significant anticipated growth in the next few years. As of Spring 2018, it has captured more than 50% of all video consumption to the detriment of network TV which is astounding!

The numbers speak for themselves:

- The average viewer at home or on mobile watches 7 hours of video per day (a decades old maxim among consumer electronics manufacturers, particularly TV OEMs).
- The average streamer at home or mobile watches 3.75 hours of streaming video per day.
- The average viewer at home watches 3.25 hours of Network TV.

A perfect storm of innovation, global infrastructure, and device proliferation has created the opportunity and has disrupted the global video and entertainment market.

In an ecosystem experiencing disruption and growth, such as described above, traditional approaches to managing a video business no longer work. Speed, the ability to make fast decisions with overwhelming volumes of data never before seen – volumes that are still growing – has become a MUST. This is the video industry's point of no return and where AI can have a positive impact.

According to PriceWaterhouse Cooper's report "Sizing the prize. What is the real value of AI for your business and how can you capitalize?" there are three areas of high potential for AI in the entertainment industry:

1. Content search and recommendation.
2. Personalized content creation.
3. Personalized marketing and hyper-segmented advertising.

WHAT CAN I EXPECT FROM AI BY USING IT IN MY VIDEO SERVICE TODAY?

Like many other industries, the end goal of

AI-powered video businesses is to automate business decisions to deliver superior products and enrich the customer experience.

However, such an ambitious goal frequently falls by the wayside if it is not properly understood. From the very start, the AI-powered activities that are deployed must have a real, positive, and measurable impact for your business.

Before outlining the AI initiatives that can be successfully delivered to video services today, let's take a moment to look back to understand where the video industry has come from, thus better understanding the momentum that is currently driving it.



Since approximately 2010, the traditional players in the video and TV industry (TV broadcasters, networks, and media companies) have responded to the threats presented by the market newcomers (Netflix, Amazon, Hulu, etc. but not Google, Facebook, or Twitter who are in need of adult supervision) by investing time and money rolling- out “over-the-top” (OTT) strategies to bypass the industry’s long-established content distribution structure.

In today’s industry, those traditional players that are still relevant have deployed and actively market, with varying degrees of success, video distribution platforms and content catalogues (either licensed products or developed in-house) along with different business models (subscription, pay-as-you-go, advertising-based, bundled with pay-TV packages, etc.).

These players all face the same goal: to capture, retain, and engage their audience. Ultimately, they compete, not only with direct rivals from other video services, but also with the overwhelming choice offered to consumers by the Internet, all vying for the limited time of their users.

In this new, fast-changing landscape, consumers who are more and more indiscriminate and capricious will abandon your service if it does not wholly satisfy them. In this context, AI becomes an extremely helpful element for a video business.

Netflix, a company that needs no introduction, has understood this from the start. Consequently, it is extremely pragmatic about the ways it applies artificial intelligence across various areas of its business, ways that could undoubtedly be of potential use to other video services, adapted to their business goals.

Some of the real and proven AI-powered techniques that are potentially available to all video services are:

One of Netflix’s most valued assets is its recommendation engine. Recently, Netflix has been developing its own AI algorithms for content and user experience personalization.

As a result, service recommendation, in one form or another, is accredited with driving 75% of the content consumed by Netflix’s users.

Until recently, the integration of a content recommendation engine represented a monumental project with an equally large investment, that would have only been within the reach of the major players like Netflix and Amazon.

In recent years, however, advances in big data and data science have democratized these techniques, making them available to the rest of the industry so that today the market benefits from solutions like Deep Recommender, which enables cost-effective and agile implementations of highly precise personalization and content recommendation solutions, like never before. Arumai Technologies, Inc, has a recommendation engine powered by AI in its Multiscreen OTT Video



Platform for OEMs and for purposes of this White Paper is a proprietary and confidential trade secret as Arumai no longer makes use of patent prosecution – there is no need¹.

It is actually possible to make tailor-made recommendations for each video service customer by using high tech techniques like content image recognition or natural language processing, based on audience behavioral factors. Recommendations can finally be made to each individual customer based on the day of the week, time of day, or the device type that is being used when the recommendation is made.

Increasing SVOD competition and slowing OTT market growth is making customer acquisition a more challenging and expensive proposition for OTT services. As it becomes harder to win new customers, it becomes increasingly important to retain those customers who are already on your service.

For some OTT services churn is over 50%, which means it is a considerable impediment to growth and has a significant impact on OTT business profitability².

Obviously, sometimes users have to or want to leave the video service, but it is important to understand when this happens and if there is a trend. More importantly, it predicts at-risk users in advance, so retention campaigns can be launched.

Today there are proven consolidated techniques to make churn management a mandatory activity, especially for video services based on a subscription business model.

A need market is solutions which are capable of tracking the distribution of users according to their likelihood of leaving the service in the coming months. The main variables that influence near-future churn probability for each user are also provided.

In this area, the applications vary, depending on the video service provider's business model.

For those video service providers that traditionally license content from the major Hollywood studios, it is very important to forecast what type of content will be the most relevant for its customer base for one to two years ahead.

Should I invest more in licenses for series or movies, in action or comedy, etc.

On the other hand, those service providers who produce their own content have to have an even longer forecast window. We all remember Netflix's success with its first in-house production (House of Cards), which was the result of using consumption forecasting techniques.

For those operators who license sports rights (TV operators, for example) being able to predict the fair value of media rights for a certain entertainment or sports property, for a given period and in

¹ Arumai is also the design of a Cloud-Based Transcoding and Streaming System for Media Companies that may double as middleware for set top boxes, in general and Comcast's X1 TV Box.

² Arumai has an additional trade secret, a System and Method for Buffering Minimization, the inner workings of which is a proprietary and confidential trade secret – minimizing buffering minimizes churn.



a given geographic territory, is critical for the rights negotiation because traditionally these represent a massive investment.

By learning customer preferences and determining trends, automated learning solutions exist today that are able to propose a content mix that will maximize the ROI of the content investment. For example, JUMP Prediction today is already building predictive content consumption models that help with these decisions.

AI applied to product development. Product development based on empirical experimentation:

- using A/B testing algorithms, different product alternatives can be evaluated prior to launch allowing the product with the greatest positive impact on business objectives to be the one eventually rolled-out.
- Every detail, down to the creative work that accompanies each piece of content, is tested with different alternatives, resulting in an uptake increase of up to 20%.

With voice commands in the video-on-demand service, viewers can now launch and control their viewing experience giving voice commands to devices that support technologies like Alexa, Google Assistant (notwithstanding Google's propensity to challenge regulators from China to Washington, D.C.), or Siri.

As an example, Accedo and Channel 4 have been working together to allow all Channel 4 viewers in the UK to start viewing content from All 4 simply by saying, "OK Google, play Gogglebox". Once the content is playing, they can then control the viewing experience by simply asking Google to pause, seek, stop, play the next episode, and so on.

AUDIENCE CLUSTERING

Understanding user behavior relationships related to engagement levels across the user base and clustering them for segmentation purposes is key to effectively reach your audience with the right message, at the right time, across the right channel

Identifying relevant user engagement clusters (loyal users, sleeping users, frozen users, inactive users) and targeting marketing activities for each of them can have a significant impact on business outcomes for video services.

Additionally, to understand user behavior relationships related to the content type watched across the user base and clustering them for segmentation purposes is a key element for your content personalization. In this sense also identifying relevant genre consumption clusters and using different targeted marketing activities and service personalization can have a significant impact on video services' business outcomes.

MARKETING CAMPAIGNS

In this domain, there is infinite potential to use AI based on automatic-learning to automatically launch campaigns personalized to each user.



Currently, it's possible to launch automatic, personalized campaigns that optimize impact depending on the audience type (specific clusters of users, with a particular churn risk, etc.), the time of day, the campaign type (engagement, retention, recapture, etc.), channel (email, push notification, social media, etc.). We can put machines to work, as they learn about the effectiveness of previous campaigns.

ACQUISITION

New user acquisition has slowed by X% in the last week.

ENGAGEMENT

Last week, user activity decreased by X%.

Yesterday sleeping users increased by X%.

RETENTION

There are Y # users that are about to leave your service for the following main reasons. Act or lose them!

FINAL CONCLUSIONS

In short, AI is not an option; it's a must. To successfully compete in an ever-increasing competitive market, the only options are when and how much to invest in AI. The sooner you start down the path, the sooner you will be able to identify which areas of your business are the ripest for an investment in AI-powered processes. You will then start to see the positive impact on your business.

Artificial intelligence permeates almost every aspect of our lives; it certainly affects the way we enjoy entertainment.

ARUMAI TECHNOLOGIES, INC.

Arumai is the only leading, independent, pure play OTT products and solutions company in the industry today. Arumai's groundbreaking OTT Video Suite of products and video frame manipulation techniques, proprietary streaming systems and methods make any video content universally enjoyable in high quality on any screen, by any viewer, across any network, at any time enabling a pure play OTT products and solutions company. Arumai TranStream™ is designed to deliver millions of content streams to mobile phones/handhelds, tablets/laptops/PCs, Blu-ray Players, Game Consoles, and Smart TVs, and in every market in the world on behalf of content owners, mobile service providers, cable companies, satellite companies, telecom operators, streaming video providers. At Arumai, it is not all about money, products, or trade secrets. It is about values! We value originality and innovation and pour our lives into making the best products on Earth to the delight of our customers. In the end result, values will win, and we hope the whole world listens.

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