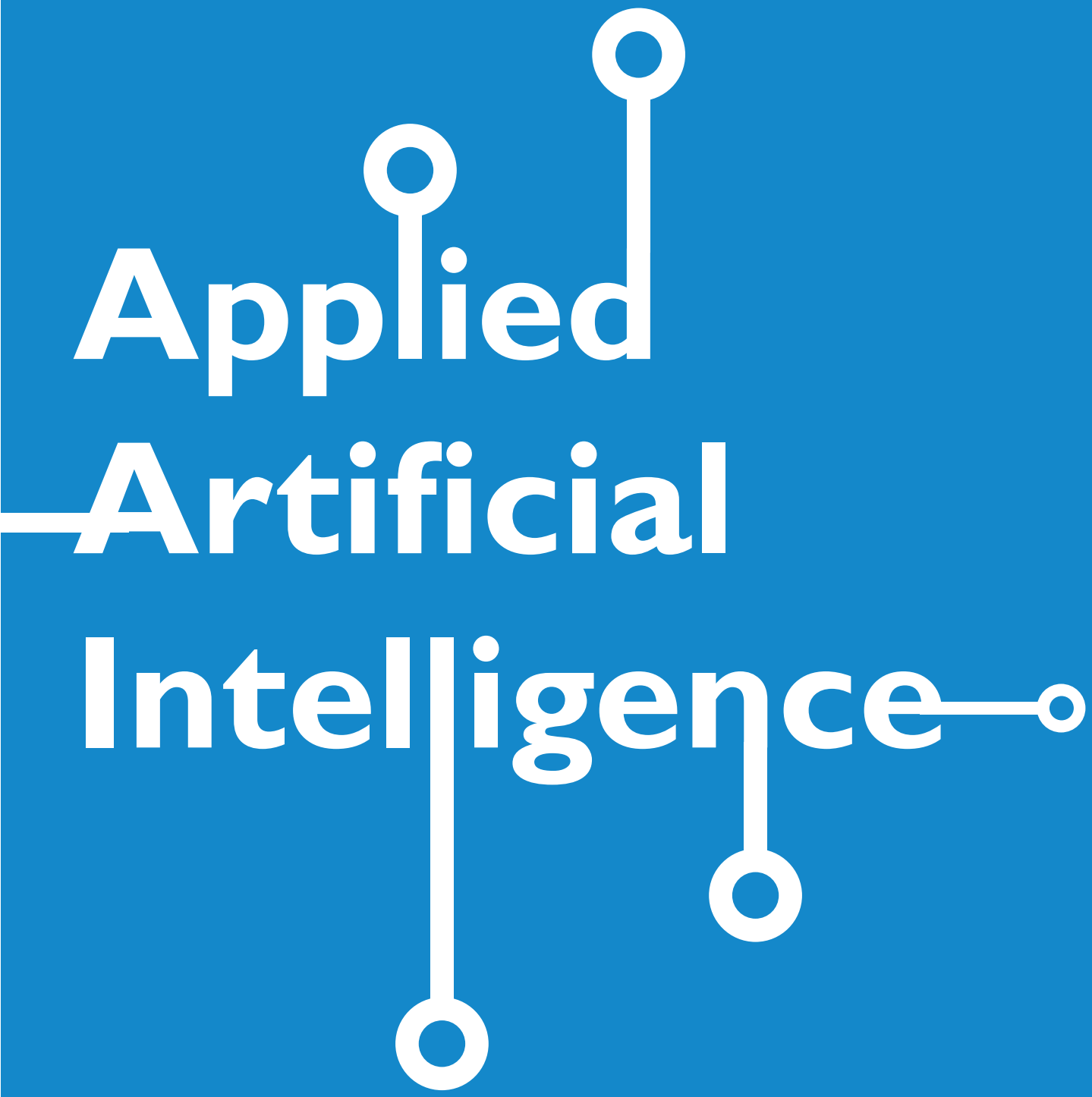
Applied Artificial Intelligence



In the Media and Content Distribution Industry

Introduction
Overview

This report will discuss the potential applications of Artificial Intelligence within the Media and Content Distribution industry and how it is set to disrupt this market in the coming years. The deployment of AI presents many business and monetization opportunities if used correctly. However missing these opportunities, or not producing effective counter proposals could result in increasing loss of market shares to better-positioned, specialized, digital competitors.

Report Focus

Are there any common trends among these innovation efforts?

What AI applications are in use now in the entertainment & media industry? How has the market responded?

How can organisations work smarter using applied AI?

AI Growth

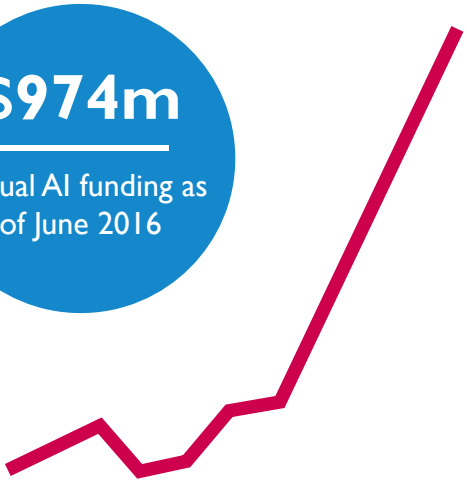
The coming years are going to be a time of great technological shift as many disruptive technologies are maturing into the market.

Gartner has predicted that IT spending will hit $3.8 trillion in 2018, a 4.5% increase from the previous year, with key growth areas being AI, IOT and Blockchain.

The Mckinsey Global Institute estimated tech giants spent between $20-30 billion on AI during 2016.

$974m

annual AI funding as of June 2016



Summary

If a company is not investing significantly in exploring AI already, then they need to start now, they cannot delay advancing their digital journeys. AI is poised to unleash the next wave of digital disruption, across entire market horizontals and industry verticals in the next 3-5 years.

A successful AI program requires firms to address the entire digital and analytics transformation: identify the business cases, set up the right data ecosystem, build/buy the appropriate AI tools, and adapt workflow processes, capabilities and culture. AI deployment is accelerating the digital frontier, expanding the gap between adopters and laggerards across companies, industries and geographic regions. Collaboration and experimentation with digital first start-ups is essential, in order to be exposed to new thinking.

Current Media Space
Overview

Traditional Market Declines

Digital based companies such as Facebook, Netflix and Alphabet are increasingly dominating media consumption, whether it is news, videos or opinion pieces.

A YouGov online survey conducted with 70,000 people in 36 countries found that 54% of respondents used social media as a source of news. Traditional outlets still hold a competitive edge, being viewed as more trustworthy sources. However with the development of ever improving AI and the rise of consuming news media through messaging apps like Whatsapp, this is susceptible to change.

Increasing AI Adoption

The use and awareness of AI is accelerating within the media industry. According to IABM End-User survey the percentage of media technology suppliers saying that they are unlikely to adopt AI dropped from 57% to 36% between April and September 2017.

Firms need to identify their most valuable AI use cases, and build out the supporting digital assets, capabilities and data ecosystem while reskilling the workforce. This requires an understanding of AI'S capabilities, limitations, and how it differs from conventional methods.

Tech giants and digital natives are investing in and deploying the technology at scale, but widespread adoption among less digitally mature sectors (travel, construction) companies is lagging. However, if current trends hold, variation of adoption within industries will be even larger than between industries.

New Market Trends

The media landscape is changing, you cannot guarantee what device users will view your content on, from where, and through which platforms, as videos are likely to be shared across multiple sites including social media.

Social media has accelerated media content creation cycles, meaning to stay relevant a company needs to produce media at a faster pace, and deliver it through multiple platforms and create personalized user experiences across a variety of formats.

"Consumers demand services with highly personalised and flexible viewing experience. It is impossible to have humans manage these complexities without the help of AI-powered, cognitive support systems and tools."

Why Now?
Overview

After decades of false starts, artificial intelligence is on the verge of a breakthrough, with the latest progress propelled by machine learning, significant improvements in computer hardware and the enormous amounts of readily available real-world data.

Digitally native companies have already invested billions in artificial intelligence research and constructing data and machine learning infrastructures, so that now we can enter a period of applied artificial intelligence. AI is increasingly being seen as an enabler improving the efficiency, accuracy and quality of current industry services.

Compound Gains on AI Investment

Future gains from an AI ecosystem are not limited to todays; computational power continues to grow significantly, algorithms are improving in accuracy/speed and the world continues to generate vast quantities of data, 2.2 billion gigabytes a day. Models can easily be retrained and redeployed into these established architectures, improving their complexity, accuracy and applications.

Numerous Avenues of Interest

Applied AI can improve the efficiency of processes via automation across a plethora of market horizontals and provide many monetisation opportunities. Machines powered by AI can process information from the external world (computer vision, natural language processing), learn from information (machine learning, predictions) and act on information (robotics, autonomous vehicles).

New Technological Capabilities

New technological capabiltiies mean that AI is no longer confined to research labs, and applied AI can be utilised by industry. These include the availability of large and diverse data sets to train models, improved algorithms, increased R&D financing, and powerful graphics processing units (GPUs).

The coming wave of fifth-generation wireless systems and cloud 3.0 will play a key role in facilitating the implementation of new AI driven media production tools and delivery systems. Intel's Comp stated, "With 5G you'll have up to 10 times less latency and you can support up to 100 times more users."

New AI Infrastructures

Google, Amazon and Microsoft have created extensive AI Cloud Computing infrastructure lowering the cost of entry into the AI space. While beneficial to larger companies as well, it has its most significant impact on start-ups who can innovate and deploy AI rapidly without significant initial capital, making industries more susceptible to AI-based disruption. The rate of development of new AI applications is only set to increase, from 2013-2016 external investment in AI had a compound annual growth rate of almost 40%.

AI is open to everyone, and could change entire business models creating winner-takes-all dynamics, firms should not wait for the metaphorical AI dust to settle before they make their first move.

Successful Company Properties
AI Adoption

Whole Data Ecosystems

Early AI adopters are largely from sectors that have already undergone successful digital transformations with the use of cloud services and big data. This is important as when it comes to digitization, each new generation of tech builds on the previous. **Companies must invest in developing a whole data ecosystem,** it is insufficient to develop small-scale AI applications in pockets of business. This means they can leverage their technical skills, digital expertise and data resources to smoothly integrate each new AI solution.

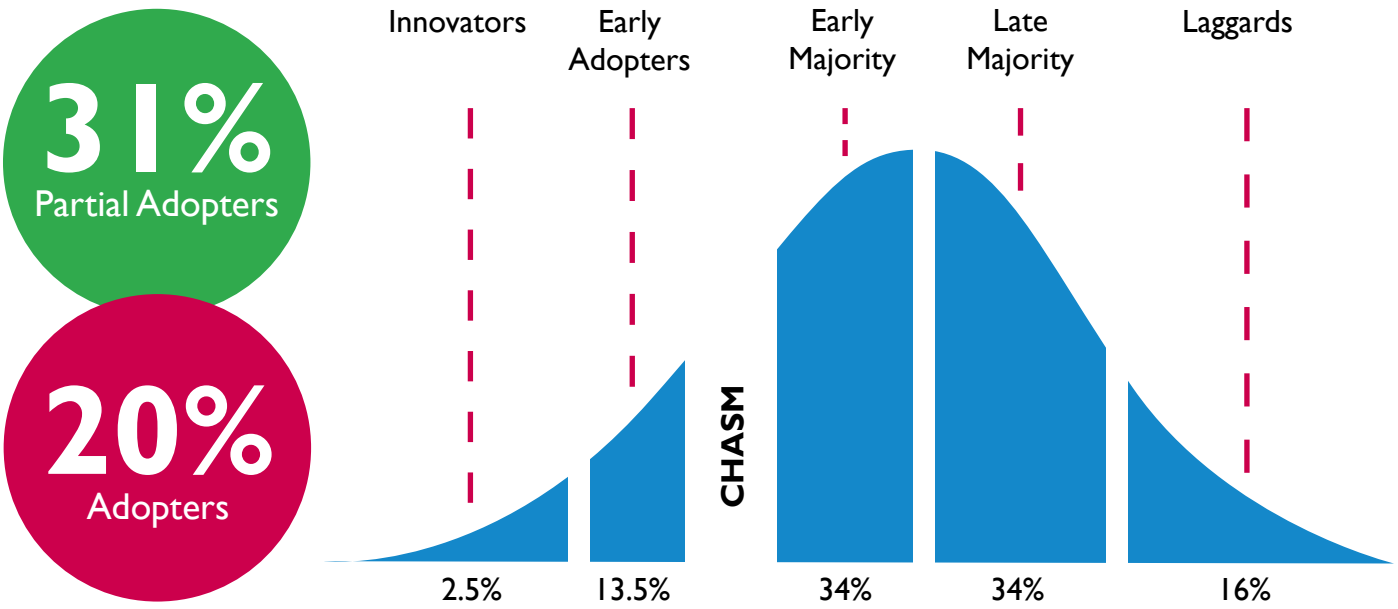
Company Size

Large companies have advantages in that they tend to have access to more and better-structured data, and are more likely to have employees with the technical skills necessary to understand the business case for AI investment. Additionally large companies have a better fixed-cost investment as AI generates higher returns when applied to a bigger base of costs and revenue.

Adopt at Scale

Firms that adopt at scale are motivated as much by upgrowth potential of AI as they are by cutting costs. They adopt AI affecting the part of their value chain closest to the core, and adopt multiple AI tools to address a number of different use cases. So as companies become more familiar with AI, the more potential for growth they see in it. This is essential, as successful AI adoption requires a proactive, wide strategy to generate the momentum to overcome organisational inertia.

AI Adoption is "crossing the chasm" to the early majority



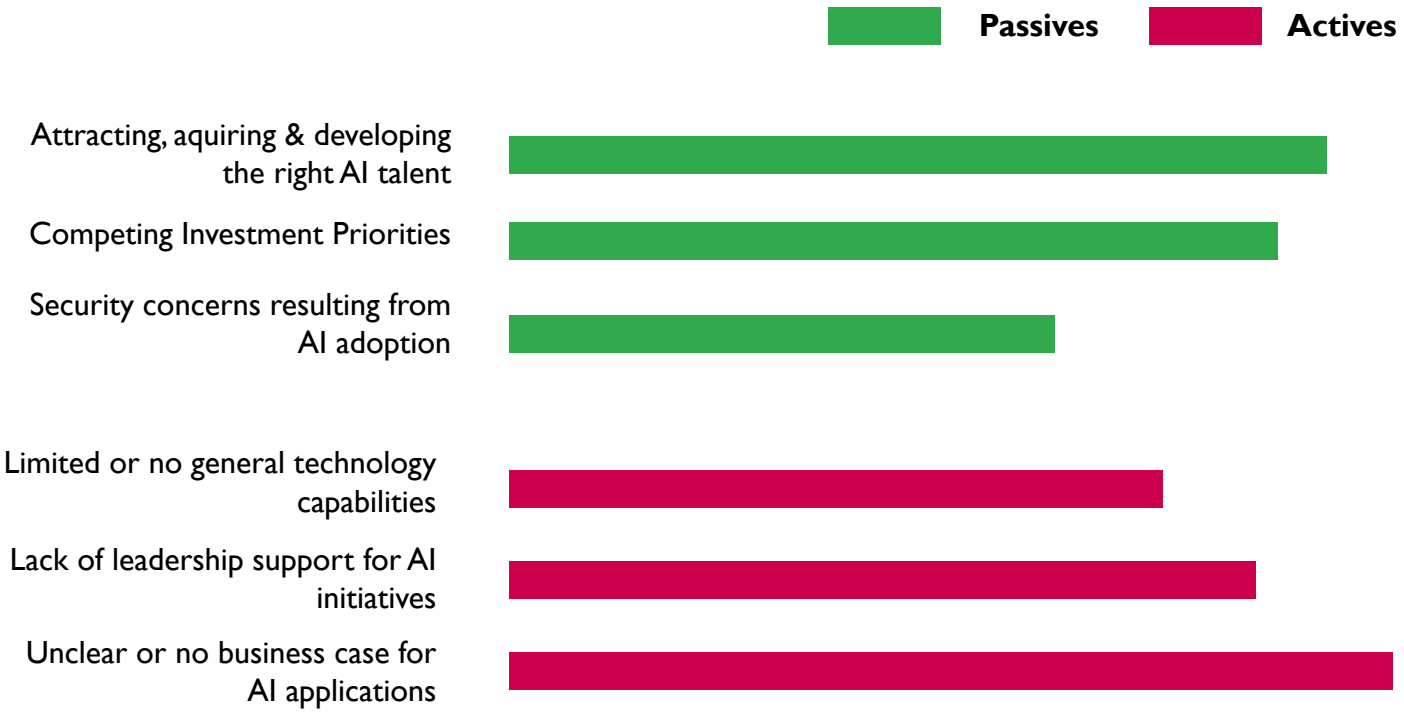
Obstacles
AI Adoption

A number of obstacles can stand in the way of a companys increased AI adoption. These can vary depending on whether the organisation understand and have already adopted AI ("Leaders") or if they haven't adopted AI yet ("Passives").

Leaders vs Passives

Organizations that understand and have already adopted AI ("Leaders") cited a talent gap, competing investment priorities, and concerns about security as their main barriers.

Meanwhile, companies that haven't yet adopted AI ("Passives") cited the need to identify business use cases, lack of management support, and limited technology capabilities as their main challenges.



Source: MIT Sloan Management Review

Overcoming Obstacles

Leadership conflicts where multiple functional areas invest in technology outside the sphere of the CIO can stifle a company's ability to make investments in emerging technologies. Organisations with multiple data and analytics teams need to combine their AI expertise. Departments need to sync their AI adoption to think through data access and management, cybersecurity, regulation compliance and other issues.

Companies starting to work with AI will be faced with dozens of potential AI prototypes and experiments. However by working on small projects on the edge of the core business workers fail to get the senior leaders attention. AI should not be introduced on a per-request basis or based on what data/algorithms the analysts are familiar with but on business priorities. Where do a high percentage of errors originate? What parts of the business generate a lot of revenue but have lower than desired profit margin?

In PwC's 2017 Digital IQ survey, only 20% of executives said their organizations had the skills necessary to succeed with AI and only about 43% of companies had a dedicated team for digital innovation. Teams vary greatly in size, capability and skill level, and companies struggle to recruit new AI talent due to its scarcity and high level of demand.

Next Steps
AI Adoption

Timeline

Big tech and academia are pushing the boundaries of the underlying technology, but companies need to focus on a broad number of engineering solutions for their high importance use cases.

Good early, applied AI focuses on proven & scalable use cases, e.g. robot automation.

Further out use cases with emerging technology can be identified and developed to scale.

Long-term unproven technologies can be selected that have high impact potential. By partnering with third parties to innovate, companies can create first-mover advantage.

AI Ready Culture

Companies need to build an AI-ready culture and, depending on their use cases, internal AI capabilities. Upskilling workers capabilities and awareness of AI, especially mid-level managers, builds a culture of AI and empowers workers to trust and make decisions based off AI-driven insights.

There still remains significant gaps between AI technicians and business use caes, either AI developers need to be familiarized with potential customer value chains and data systems or translators need to be hired to bridge the gap between the real world problems of management and the AI techniques available.

Next Steps

If one thing is taken away from this report, it's that a company cannot afford to stall in its AI development or even to simply wait for AI companies to emerge that will provide the desired end-to-end solutions. They need to start building connections with the broader networks of learning and innovation by collaborating with or acquiring AI start-ups/ leading AI firms.

Companies should recruit, train up or collaborate with a small group of data scientists educated in the current state of tools and technologies in the AI space. They need to work with business managers to idenify solvable, scalable business use cases for applied AI and potentially start a series of small pilot projects.

The emphasis of applied AI needs to be on demonstrating AI technologies applications and the benefits they bring to scale, identifying business use cases, as well as addressing potential market discomfort with human-machine interactions.

Overview
Applied AI Use Cases

Applied AI can create value in a variety of areas, most obviously cutting costs by automising production processes. Machine learning allows companies to forecast the future, and make smarter business decisions. Companies can create rich, personalised user experiences at scale, and couple this with targeted advertising: the right message, to the right customers at the right price, building brand loyalty and optimising monetisation schemes.

Section Breakdown

The rest of this report serves to explore the applications of AI in the Media and Content Distribution industries. These are likely to evolve exponentially over the coming years, and projects that may seem in their infancy now, will become scalable products disrupting industries in the near future.

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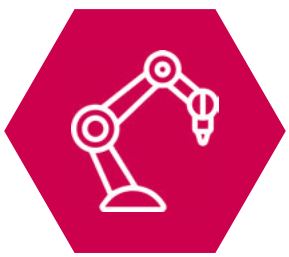

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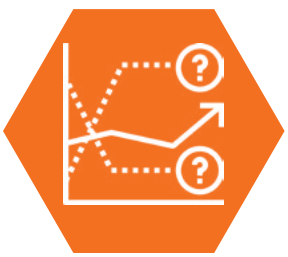

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Marketing Applied AI Use Cases

Researchers and engineers today face difficult challenges from sharp growth in demand from emerging countries to customisation driven market fragmentation. Applying AI to marketing can help companies track the public perception of their products and efficiently create more effective marketing content.

Applications

Applied AI can allow researchers to quickly assess whether a product would likely succeed or fail in the market and why. AI powered sentiment analysis through social media platforms can enable a company to track the real-time perception of their product and brand easily.

AI is already being utilized in Conversational User Interfaces, this provides additional, more natural ways to engage with users and experiment with marketing. Conversational User Interfaces can provide real time feedback on a large scale, utilising this form of feedback can save a company countless hours when used instead of in person surveys.

Marketing materials such as trailers and highlight reels involve the processing of huge quantities of stock footage; AI can substantially automate this process.

Case Studies

Film Trailers and Highlight Reels

For the Morgan film trailer, IBM Watson analysed the visual scenes, music and charcters tone of voice to determine the movies current emotions. This information was used to condense the 90-minute movie into 6 minutes of desirable footage over 24 hours, compared to the usual weeks long production time.

Similarly IBM Watson has been used to generate live sports highlight reels by analysing video footage, audio cues and fan reactions in real time from multiple angles, for instance at The Masters. Company Veo provides sports organizations with the ability to record matches and training sessions without needing camera operators and editors. A single camera shoots a 180-degree panoramic video, which their AI crops afterwards to highlight the action being played – with deep learning and computer vision tracking the ball and the various players.

Marketing Creative Direction

Through data mining, AI can help creators to target themes and specific content that are most valuable to its consumers or that would suit a particular client's ad campaign. Human creativity is still needed to produce well-crafted, coherent and engaging personalized content. However AI will augment the design process, helping content marketers make more effective informed content.

As such content marketers will need to become more skilled in data and communications; this will require AI training that may cost advertising agents employee time in the short run. The use of AI in marketing while still in its infancy, is already being experimented with by MaCann Erickson Japan and Wavelength Analytics.

Content Generation
Applied AI
Use Cases

In todays fragmented, high paced market, content generation struggles both with volume and differentation. The use of AI can help solve this by automating parts of the creative process to free up time for creatives to work towards higher-level goals.

Applications

The future of entertainment could not only be ubiquitous but unique. While repetitive tasks can be more effectively handled solely by AI, for creativity human and computer collaboration is most effective as AI is inherently limited in its ability to generate cohesive, original ideas without human assistance. Creative projects often require substantial human oversight and input, so the future of generative media could be in enabling users to create and enjoy their own interactive narratives.

Case Studies

StoryTelling

Calm partnered with company Botnik to write a new Grimm style fairytale using AI, where the brothers grimm series was used to train a predictive text algorithm that suggested Grimm-style sentence continuations. A collaboration of writers, artists and programmers took these suggestions, and assembled them into the rough shape of a story, filling in the gaps.

AI procedurally generated podcasts have been experimented with, as the first step towards computers capable of generating fictional worlds, where a stories progression depends on the created characters personalities, that can be set by the user. AI is capable of generating these stories over a long timespan; as such only the most interesting plots can be selected.

Deep learning AI is still not good at generating coherent text, so by using older procedural techniques programmers can have more control over the output. MIT media lab, created an AI author to generate horror story tweets, it was trained on a collection of scary stories and it could come up with its own ideas or be provided with inspiration.

Generating Images

Generative adversial networks (GANs) are a tool in machine learning to generate convincing media, comprised of two networks: one that produces media and a the second that determines whether this piece of media is real/fake. They can be trained to enhance and automatically produce fake audio, video, and images, across any topic: celebrity faces, clothing, chairs… anything, as long as you have example data to train it on.

While most image solutions are low resolution, they can still prove useful in the inspiration pipeline, used to mass-produce images on any topic instantly so that teams can make better decisions and higher value assets from the beginning. Nvidia recently revealed AI capable of producing photograph-quality images of people who don't exist.

Content Generation
Applied AI
Use Cases

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Case Studies

Generating Music, Video

Music is another medium that can be AI generated; Abbey Road Red, a start-up incubator has been set up by studios to forge links between new tech companies and the music industry.

Allen Institute for AI, developed AI that could generate Flintstone videos from a given text description. It was trained on a database of 25,000 painstakingly annotated videos, and could generate scenes on novel input. While the output was low resolution and performed only well on very simple sentences, it does point towards a future where animation can be generated automatically.

University of Washington have developed a method to take an audio clip, and create a lip synched video to it. This has practical applications in improving video conferencing, virtual reality interactive experiences and character animation but could alse be misused to create clips with false information imitating celebrities, and fake evidence in criminal investigations.

Machine learning can also augment content; an artists work can be analysed to derive style and then overlaid onto other media. This allows for fast customisation and personalisation of content.

Template Engines

There are many industries where data is well structured, such as sports and financial data. A human can design a template, that AIs can fill with the relevant information, e.g. videos..

The film industry desires tools that reduce production time, costs and improves their ability to target audience niches, and to optimise the creative process. Most applied applications are in their infancy, so feedback can be expected in the coming years over which of these avenues of interest proves to be the most effective.

Guide Creative Direction

AIs can help recommend avenues of interest to the creative team that shows the most promise, this is most useful in high stake R&D processes. Motivo for example, an AI startup, helps compress design processes from a year to one month.

Accessibility

ML can be used to generate additional content/meta data from source content depending on a users needs, this can be used to improve accessibility, by for example auto-tagging images.

Content Generation
Applied AI
Use Cases

In todays fragmented, high paced market, content generation struggles both with volume and differentation. The use of AI can help solve this by automating parts of the creative process to free up time for creatives to work towards higher-level goals.

Case Studies

Generating Copy/Websites

AI has proved very useful to automatically produce objective, detailed reports and summaries which involve crunching massive amounts of data into logical text. This reduces the time copywriters must spend manually collecting, cleaning and summarizing big data. Gartner predicts that 20% of 2018's total business content will be machine generated.

However for marketing materials, AI generated content still performs poorly on engagement metrics, failing to write fresh, compelling stories. Similarly an AI powered design company Grid.io created a bot that could automatically produce personalised high quality websites. Yet again, feedback showed the service was limited, and that it would serve better as a more generic portfolio website generator.

AI is making great strides in supporting designers; Adobe Sensei debuted AI powered design capabilities at Adobe Summit 2017. It provided automated photo cropping, and element and design recommendations. AI can also support content personalisation to determine which photos/copy might appeal to a small user segment and swap them out. So while AI can't yet create user-experience designs from scratch, content marketers can still lean on AI to augment their own strengths.

Concerns

The use of GANs presents several concerns in fake media; a network trained to fool another network is likely to fool any algorithm a platform uses. Past fake media techniques used altered images found on the internet so could be detected, but GANs use generated images. Unfortunately while GANs are still inferior to humans at deducing what is fake, as they don't have real context/experience of the physical world, platforms often require automated real-time filtering. New companies such as Adverif.ai use ML to identify fake content, with some success analysing fake news and images.

64% of US adults say fake news has created a great deal of confusion about the basic facts of current events.

-PEW Research Center, Dec 2016

Advertising & User Data
Applied AI
Use Cases

We are currently in the information age, companies are receiving increasing quantities of data from sensors, machinery, social networks and face challenges in how to most effectively handle these massive streams of information.

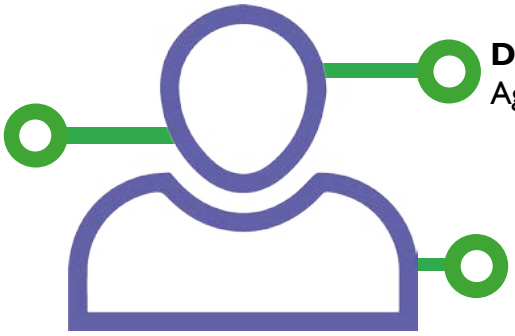
Applications

Big data is at the heart of the disruptions occurring across economies and is recognized as an increasingly critical corporate asset. While this space is due to undergo significant change, with the introduction of new data rights regulations such as GDPR, there are still lots of opportunities to capitalise on user data with the correct privacy policies in place.

Big audience data can be transformed into effective customer retention campaigns, leveraged to predict user behaviour, showing them targeted advertisements they're more likely to click on. AI can also determine the optimal placement of adverts, software Pippa enables podcasters/live broadcasters to insert ads into their offerings for optimal deployment.

AI creates value through personalisation, making market offerings at the right price, with the right message, to the right target; increasing customer satisfaction, leading to more sales and higher profit. AI allows sellers to extend dynamic pricing to the rest of the marketplace. Hyperconnected consumers continuously redefine value by comparing prices online, so the challenge is to set the optimal price in relation to time. Insights based selling including personalized promotions and tailored display can increase sales by 1-5%.

Companies want to reduce customer churn but also want to determine who the most profitable customers are. They can target these customers, offering discount codes, with the AI determining the merchandise on offer and the size of the discount based on the shoppers previous purchases, age, home address and browsing habits. An online focus on the most valuable customers, combined with dynamic pricing can lead to a 30% increase in sales.



Contextual Targeting
Contents of current page

Demographic Targeting
Age, Gender

Behavioural Targeting
Users likes, interests, interactions, purchase history.

What Data?

A company's data is a marketable and sellable asset, as more powerful analytics require substantial quantities of data.

"Data is the new oil, on which the world will run."

Leveraging a companies data is essential, but requires the development of a centralised data ecosystem. This is challenging in of itself, the Guardian took about a year to put all their data sets into one. Much of the data produced in industry is flat with no relational structure and heterogeneous. Companies will need to decide which data to store in its original form, what is useful, and what can be aggregated/ pre-analysed.

User Experience Personalisation
Applied AI
Use Cases

Applications

Personalising customer experiences holds much promise for AI applications, to reduce customer churn, overcome the paradox of choice, build brand loyalty and just overall improve the end user experience. To compete in the oversaturated digital space, user experience must take priority, having shifted from a luxury to an expectation. AI allows companies to understand their audiences demands, filtering content shown and help determine the original content produced. Audience data can be transformed into effective customer retention campaigns or can be fed to personalisation algorithms to establish more personal relationships with viewers, which is key in a direct-to-consumer model. Making your best customers feel special and welcome is one way to foster loyalty and increase revenue, AI can offer scaled down version of this for every customer.

Paradox of Choice

The theory states that there is a tipping point for choice; a point at which choice ceases to provide an advantage and instead becomes a hindrance.

By tailoring the content the user is shown according to their preferences, it reduces the content users have to sift through improving user engagement. Customers tend to give up if it takes them >90s to find a piece of content. Content recommendations are learnt over time, and build brand loyalty through sunk cost. Why would someone switch from Netflix to Amazon Prime, if Netflix already knows what shows they like?

Recommendation Systems

Recommendation systems allow companies to maximise their return on investment based on the user interactions with the site. This could be product preferences, their demographics, their purchase history and /or their spending allowances. By choosing tone, message and the product shown according to the users data, companies can accurately target micro-markets and greatly improve their engagement.

For companies like Netflix the ability to recommend relevant content to a user is a key part of its fixed-rate recurring billing business model, to avoid customer churn. Netflix estimates it saves $1billion in revenue annually by avoiding cancelled subscriptions. Similarly Spotify takes users through taste onboarding to identify their tastes, compiling playlists based on the data received. Recommendation systems can also improve cart value, if Amazon doesn't have to pay much more for shipping to send you 2-3X as many products, its razor thin profit margins improve. Many companies simply aim to improve long-term engagement and activity on their platform, this is usually companies such as Youtube where their biggest ROI is advertisement views.

Recommendation systems can collect information about abandoned shopping carts, recommend further products at checkout, and trigger actions based on a users interactions. For instance a reverse trigger would be sending users an email about products they haven't viewed yet.

User Experience Personalisation
Applied AI
Use Cases

Future of Recommendation Systems

Recommendation systems are borderline inevitable in the digital media and e-commerce spaces, but they will be increasingly seen across industry horizontals. They offer a wide variety of advantages from improving user engagement and profit margins to reducing customer churn and losses. To inform these systems an increasing amount of information will be systematically stored within the user profile. These systems will become more sophisticated and far reaching, incorporating item profitability into recommendation calculations as well as reaching customers with relevant promotions on multiple channels: email, text, social media. With this being said this space will be susceptible to new data regulations, and will need to ensure that consumer trust is not compromised.

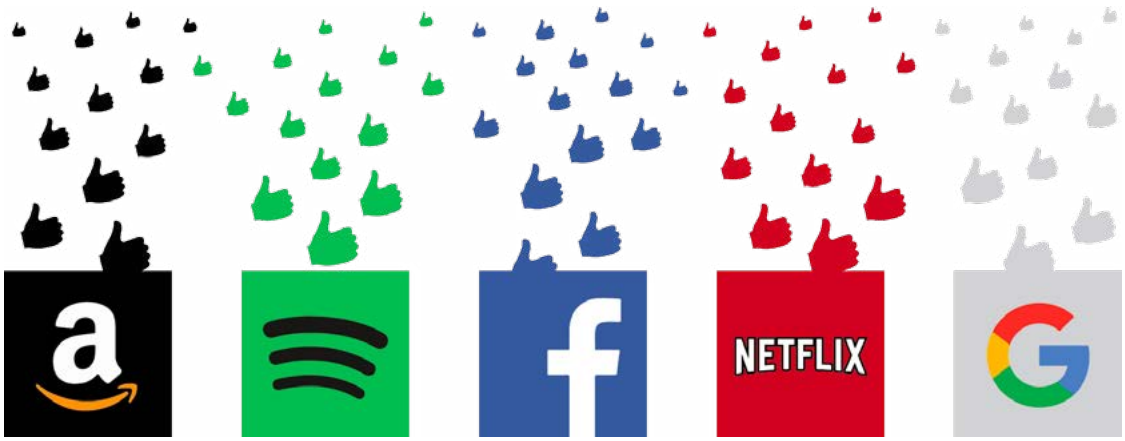
Modifying User Content

In the future AI could not only be able to extract action from raw metadata, but deduce semantic meaning: style and genre, as well. Optimising the product suggested is very beneficial, but being able to actively personalise the content in a way the user can appreciate is a very attractive prospect. Different versions of the same video could be shown based on the users data. These could alter in pacing, language annotation, as well as style. Will it possible in the future to develop a Stephen Spielberg model for filmmaking and apply it to any video?

End User Content Delivery

AI can be used to automate and optimize network efficiency managements when delivering digital content. This helps alleviate bandwidth issues when streaming and assists huge sites such as Netflix in video compression and delivery.

As physical companies seek to alleviate the last mile problem, the use of autonomous drones and vehicles will become more commonplace. Further breakthroughs in deep learning will help them categorize and handle anomalous situations such as when no one is home to accept a delivery.



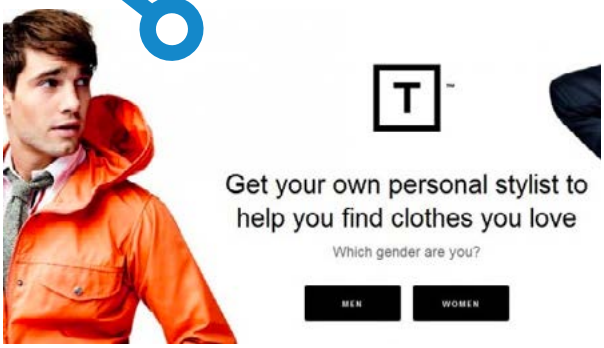
User Experience Personalisation
Applied AI
Use Cases

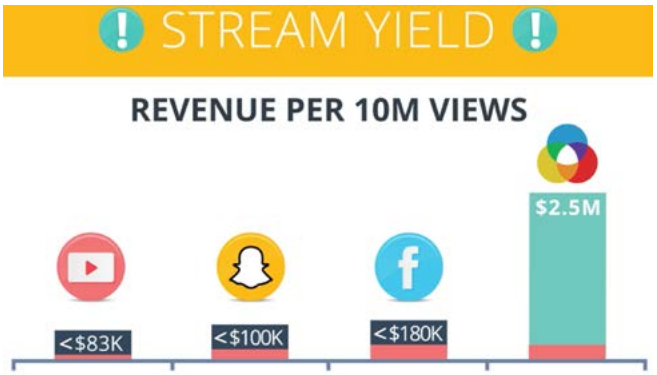
Case Studies

E-Commerce

Vue.ai, an online fashion start-up, sells a GANs based technology that allows a company to analyse a photo of a piece of clothing then auto-generate an image of it on a person of any size and shape. This greatly streamlines the process saving the company time and money on hiring photographers and models. Furthermore by tuning the neural networks it is possible to alter properties about the person shown. So it is possible in the future, online fashion retailers could change the models displayed based on the viewing users demographics.

Thread is a high-end, e-commerce mens clothing site, that uses AI to after a quick onboarding process accurately predict a mans style and recommend him relevant clothing combinations. This saves the customer time shopping and gives them the experience of a personal shopper who chooses them clothes according to their budget, size, style and a myriad of other preferences.





Personalised Video

Video is the fastest growing media, but distributed mostly through social media where a company loses control of its audience, and sees poor unit returns. Traditionally a single video playlist is shown to millions of users, but machine learning can help enrich video metadata, and create personalised viewing experiences. IRIS.TV is a B2B service that collaborates with IBM Watson to support companies in tracking and improving user interactions with their digital content. By embedding AI into a companys own video players, IRIS.TV can create dynamic personalised playlists, using archived video metadata and user data (videos clicked, demographics, device on, time of day, context). This helps companies achieve the reach and scale of social media on their own operated sites.

IRIS.TV targets the 20%, of viewers that stay for multiple videos, driving another 4-8 videos . One client, The Hollywood Reporter-Billboard Media Group, generated a 50% increase in viewer retention over 3 months. IRIS.TV also tracks an assets performance which along with their associated metadata helps inform content creation, distribution and monetisation.

Content Management & Search Optimisation
Applied AI
Use Cases

Applications

Content management is a natural area of application for AI technology. Most content retrieval services work by cross referencing the query with the metadata tags in the media archive. However traditional manual tagging is very time consuming and expensive, this has left much of a companys media "unsearchable". This is especially true for visual and audio media which due to their unstructured nature are much more difficult to classify. Nascar Productions for instance owns 500,000 hours of content and 3 million assets with only 9.5 million tags between them. This is problematic, as if you can't find anything, you can't sell it and you can't make money. Recent advances in AI techniques such as image, speech and emotion recognition, have enabled media technology companies to auto-tag their archives. This efficienctly increases the density of the metadata, so that more precise searches can be performed, thus boosting monetization opportunities.

Visual mediums stand to gain the most, as by using image recognition, semantic meaning can be derived from the content that can then be tagged. Video especially, can be auto-segmented into different scenes making it easy for content distributors to license out individual clips within larger videos. This benefits not only the world of sports and entertainment but broadcasters and film producers who are drowning in a sea of content.

Case Studies

Video Tagging

Zorroa is a company that provides a platform to manage large scale visual asset databases, by auto-tagging the media uploaded using AI. Their algorithms can be trained to recognize specific components, such as faces with names if known. Sony Pictures Imageworks used Zorroa EVI to analyse and monitise its millions of visual assets, enabling them to quickly find specific footage. In one case a specific video search that would normally take 27 hours, was completed within 3 minutes using the EVI platform. Zorroa also reports it increases the discoverable visual assets from 10 to 90 percent.

C-SPAN recently uploaded over 200,000 hours of video using the AWS Recognition Cloud Visual Analysis service to create a searchable database.

These systems can be incredibly precise, IBM Watson was applied to TedTalks vast archive of recorded presentations, and by searching "happiness", it would return previously unsearchable videos tagged at the precise point the word was mentioned by the speaker.

Other Uses

On the user-facing end Shazam uses Machine Learning to identify songs by corresponding the features it hears to a compiled song characteristics database. Axle AI is also another media management company that employs AI capabilities to auto tag media, search transcripts and identify faces in a browser based interface.

Workflow Automation
Applied AI
Use Cases

The broadcast industry today faces accelerating content creation cycles, coupled with the need to deliver content across multiple platforms and create personalised user experiences for non-linear services. This require more efficient methods to produce and manage deliverables. The integration of AI into core processes to automate repetitive production steps is essential.

Applications

Workflow automation doesn't in general cause the displacement of workers, but allows them to prioritise more demanding projects and work towards higher level goals.

AI tools can assist with the assembling of teams, choosing the optimal collection of humans and robots that are best aligned with the tasks goals. The development of new algorithms and more powerful computers, means collaborative robots have sophisticated vision systems so are no longer limited to pre-defined movements. They are particularly relevant to non-fully automatable tasks, increasing productivity by up to 20%.

Not all AI innovations in this space target the use of labour, many target non-labour cost saving through the use of predictive maintenance or by improving the efficiency of services. Shifting from regular scheduled maintenance to responsive monitoring of a machines status helps improve a services quality and reliability, reducing downtime. AI techniques can also determine a products optimized operating conditions to significantly reduce defects in manufacturing.

Case Studies

Robot Automation

Rethink Robotics is a company designing collaborative robotics that allow for joint human-robot workspaces. Amazon recently acquired Kiva, a robotics company that automates picking and packing, for $775million to much benefit. Its original "click to ship" cycle time ranged from 60-75 minutes, and has been reduced to 15 minutes, its inventory capacity has been increased by 50% and its operating costs have fallen by 20%.

Software Automation

Collaboration.ai is a platform that assists teachers in forming optimized class groups with compatible skills and personalities. Project Jigsaw uses machine learning to protect freedom of speech online by isolating trolling on message boards and identifying online abuse.

Amagi Media Labs is one of many companies turning to ML to automate stages of content preparation, launching a ML powered suite called Tornado. It can determine ad breakpoints, perform color correction, noise reduction and insert credits automatically.

Business Decisions
Applied AI
Use Cases

Predictive machine learning uses both disparate, archived and novel data to discern trends. This allows companies to anticipate the future for competitive advantage and make more informed business decisions.

Scheduling

Based on a products qualities, and analysis of the past performance of similar products the optimal release date and quantities can be determined. By being able to better predict demand, companies can minimise waste, and by anticipating sales trends they can ensure the desired products are always in stock. There are a wide variety of factors that can impact the supply chain from production introductions, weather forecasts to changes in customer perception and media coverage. Traditional systems aren't taking advantage of the plethora of data offered by live IOT and social media systems as well as data archives to make accurate forecasts.

By analysing the markets appetite for different kinds of art and media, the potential of new products can be predicted. This helps production companies direct their funding towards the most promising avenues. It also allows companies to precisely target promotional materials and products to specific market demographics.

What is key in the advancement of using AI to inform business decisions is creating an AI forward facing company culture. Ensuring that employees feel empowered to make decisions based off the indications they receive from the AI systems.

Case Studies

Predicting Demand/Engagement

The German online retailer Otto uses an AI application that is 90 percent accurate in forecasting what the company will sell over the next 30 days. Otto is confident enough in the technology that they let it order 200,000 items a month from vendors with no human intervention.

Unbounce AI uses computer vision to outperform humans at predicting which landing page design will achieve an above average conversion rate. At the "Call To Action" Conference it had a 80% success rate compared to a 50% average by the 1300 attendees. Cortex AI algorithms can rate images and determine which images will generate greater engagement from a target audience. For example when a brand needed to attract tourists seeking ski experiences, the algorithm boosed conversion rates 23% by determining skiers prefer scenes of one person, clean trails, blue skies and pine trees.

Product Development

DataArt, a technology consultancy, show that producers and artists are increasingly using AI in the creative process to make more intelligent business decisions. Data can be used to drive collaborations, schedule concert dates, and change how the music industry relates to its fans, impacting merchandising and experiences. ScriptBook is a company that has developed an AI that can predict the commercial and critical success of a movie purely from the screenplay. It is likely that in the future all business decisions will need to be approved by AIs that can accurately assess risk.