ROADMAP ON AI TECHNOLOGIES & APPLICATIONS FOR THE MEDIA INDUSTRY

SECTION: "INTRODUCTION"

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Introduction

The world is changing. Following a series of breakthroughs in the field of *Artificial Intelligence (AI)*, new technologies are emerging which are ushering a wave of revolutionary innovations in nearly all aspects of business and society; from transportation[1] to finance[2], the fight against climate change[3], the media industry[4], journalism[5], and politics[6].
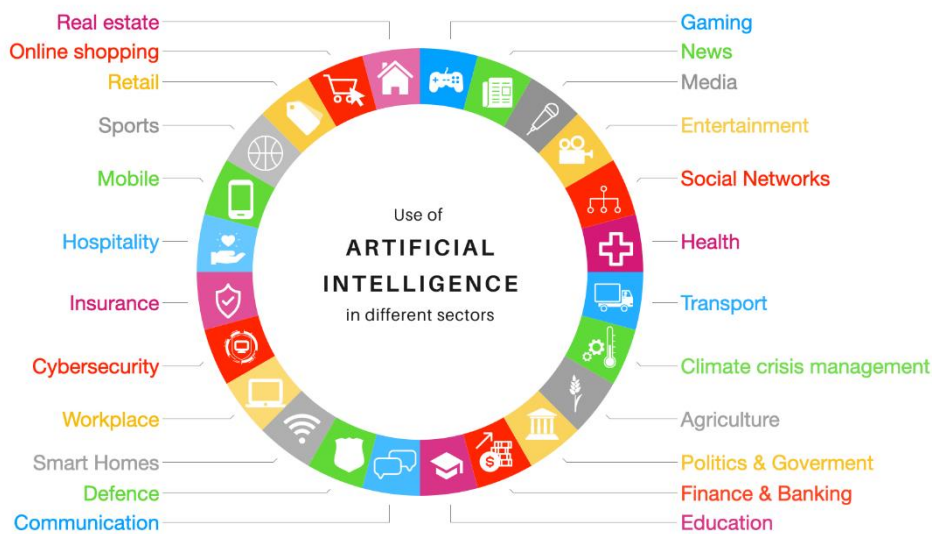
Figure 1: Industries and areas of life to be disrupted by Artificial Intelligence[7].

In all facets of economic and social life, AI is disrupting existing practices and creates opportunities for accelerated technological progress and global economic growth and development, promising to make our professional and personal lives easier through increased automation[8], to provide solutions for and achieve breakthroughs in major world problems like

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[1] European Parliamentary Research Service, Artificial intelligence in transport - Current and future developments, opportunities and challenges (2019): https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/635609/EPRS_BRI(2019)635609_EN.pdf

[2] OECD Business and Finance Outlook 2021 - AI in Business and Finance (2021): https://www.oecd-ilibrary.org/sites/39b6299a-en/index.html?itemId=/content/component/39b6299a-en#:~:text=Artificial%20intelligence%20(AI)%20is%20increasingly,and%20enhance%20the%20product%20offerings.

[3] K. Hao, MIT Technology Review (2019): Here are 10 ways AI could help fight climate change: https://www.technologyreview.com/2019/06/20/134864/ai-climate-change-machine-learning/

[4] C. Dilmegani, Top 17 AI Trends/Applications in Media & Entertainment 2022 (2022): https://research.aimultiple.com/ai-media/

[5] C. Underwood, Automated Journalism – AI Applications at New York Times, Reuters, and Other Media Giants (2019): https://emerj.com/ai-sector-overviews/automated-journalism-applications/

[6] M. Rissehttps, Artificial Intelligence and the Past, Present, and Future of Democracy (2021): https://carrcenter.hks.harvard.edu/files/cchr/files/ai-and-democracy

[7] Figure inspiration from https://www.oneragtime.com/24-industries-disrupted-by-ai-infographic/

[8] J. Marsh, The Intelligence Revolution: 4 ways that AI makes life easier (2021): https://datafloq.com/read/10-ways-automation-makes-life-easier-everyone/

poverty[9], climate crisis or cancer[10], to ensure equitable access for all[11], to increase productivity, innovation and creativity[12], to empower communities and strengthen democracy[13], and to create a safer and better world for all.

Although the potential of AI seems unlimited, it also comes with a considerable amount of ethical challenges and risks. While it can generate value for business and prosperity for society, it also gives rise to a host of serious consequences, some of them visible (e.g. violation of personal privacy by unauthorised user profiling, discrimination against underrepresented groups of citizens, accidents caused by autonomous AI systems, manipulation of public opinion through disinformation, violation of fundamental rights like the freedom of expression through questionable moderation choices, just to name of few) but also many other that we do not fully grasp yet[14]. In order to safely and responsibly enjoy the benefits of AI, we should at the same time be ready to mitigate its various risks. This necessitates a greater focus on issues of trust, ethics and accountability, besides the pursuit of technological progress and economic growth.

Such a human-centric, trustworthy and ethical brand of AI is particularly relevant to the media sector. Digital media permeates most aspects of human and social activity and is intertwined with information exchange and knowledge transfer. Machine vision and visual content understanding were some of the first fields to exhibit significant breakthroughs in the evolution of AI, including advances in audio/music analysis and generation, text and language analysis, and modelling of social trends. The media market is already benefiting from AI-based support across the value chain: for media newsgathering, production, distribution, and delivery as well as audience analysis. This includes a range of tools and services for processes such as information analysis, content creation, media editing, content optimisation, audience preference analysis, and recommender systems[15].

AI technologies are expected to disrupt the media and entertainment industry through advances in content synthesis, analysis, and distribution, but also by offering new deeper in-sights into the complex and rapidly evolving social processes that unfold online and offline by sensing citizen activities, interests and opinions. AI technology could help shape the media experience for users by enabling new ways of being informed, being entertained, being creative, interacting with content, communicating with other people all over the world, etc.

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[9] J. Bennington-Castro, AI Is a Game-Changer in the Fight Against Hunger and Poverty. Here's Why (2019): https://www.nbcnews.com/mach/tech/ai-game-changer-fight-against-hunger-poverty-here-s-why-ncna774696

[10] C. Luchini, A. Pea, and A. Scarpa. Artificial intelligence in oncology: current applications and future perspectives. Br J Cancer 126, 4–9 (2022): https://doi.org/10.1038/s41416-021-01633-1

[11] C. Martinez, Artificial Intelligence and Accessibility: Examples of a Technology that Serves People with Disabilities (2021): https://www.inclusivecitymaker.com/artificial-intelligence-accessibility-examples-technology-serves-people-disabilities/

[12] B. Dickson, The Artist in the Machine: The bigger picture of AI and creativity (2020): https://bdtechtalks.com/2020/04/22/artist-in-the-machine-ai-creativity/

[13] K. Johnson, How AI can empower communities and strengthen democracy (2020): https://venturebeat.com/2020/07/04/how-ai-can-empower-communities-and-strengthen-democracy/

[14] B. Cheatham, K. Javanmardian, and H. Samandari, Confronting the risks of artificial intelligence (2019): https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/confronting-the-risks-of-artificial-intelligence

[15] F. Tsalakanidou et al, "The AI4Media project: Use of Next-generation Artificial Intelligence Technologies for Media Sector Applications", Proc. AAAI 2021: https://doi.org/10.1007/978-3-030-79150-6_7

It will also transform the existing workflows of the media industry[16]:

- by automating routine or tedious processes (from content creation and content search to automatic analysis of legal documents to ensure compliance with copyright standards);
- by developing AI assistants that can support media professionals in their daily tasks (e.g. when writing an article or creating visual assets for a new game);
- by improving audience analysis and user profiling to offer better content and services to users;
- by offering advanced forecasting capabilities and other decision support tools that will facilitate better short-term and long-term business decisions by management and staff.

AI technologies can support the relationship between media providers and their audiences, helping to align with the needs of media users and citizens. The use of AI can also cut down operating costs and ultimately free up resources that can be directed to support work of better quality and increased creativity. Moreover, AI can create opportunities for the better realisation of public values, such as media diversity, freedom of expression, and inclusiveness. Finally, AI can help legacy media to be more competitive in a digital marketplace that is currently dominated by large platforms.

This report aims to provide an accurate overview of the current landscape with regard to the use of AI on the media sector. Our aim is to:

- **collect the opinions** of members of the AI research community and the media industry, with regard to the most important AI trends, benefits, risks, and challenges for the use of AI in the media sector, also collecting their insights on handling AI ethics;
- shed light on **AI research and technology trends**, exploring the potential of emerging technologies for the media industry;
- explore techniques for **trustworthy media AI**, focusing on issues of robustness, fairness, explainability and privacy;
- look into issues of **data collection and algorithm benchmarking** for media-related tasks, also examining relevant legal aspects;
- investigate how **open AI repositories and integrated intelligence** can accelerate AI development, facilitate adoption by the media industry, and ensure democratised access to AI offerings by small and large organisations and individuals;
- explore the wide range of **AI-enabled applications for the media industry**;
- predict how AI can **transform the different sectors of the media industry**, presenting informative scenarios of possible use and analysing opportunities and challenges;
- examine **ethical, societal, economic, environmental, etc. concerns & risks** for the use of AI in the media sector, and also presenting possible mitigation measures;
- summarise relevant **EU policy initiatives and proposed regulations** and discuss their impact on future AI research for the media industry; and

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[16] Dataiku, Ink., The AI Disruption in Media & Entertainment (2020): https://content.dataiku.com/ai-media-entertainment/ai-media-entertainment

- explore the *impact of* external forces like *legislation initiatives, the pandemic, and the climate crisis* on the development & deployment of AI in the media sector.

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