IPA Excellence Diploma – Final Dissertation
Candidate number 4002 - 4994 words

Unleashing Cyborg Creativity

Abstract:
Creativity grows brands.
It's the core competency and
competitive advantage of agencies,
but it is being eroded by the pressures of digital
to create more with less. This leads to a creativity
deficit, harming brands, agencies and consumers.

AI has the potential to transform our ability to create. Using it to deliver craft at scale, fuel it with new depth of insight and unlock a new higher order creativity.

We must unleash cyborg creativity, leveraging AI, machine learning and automation, to transform the creative process and meet the challenges of tomorrow.

Introduction – creative agencies under threat

In James Cameron's Terminator II, we see a dystopian future, where humanity is enslaved and dominated by robots. The crushing, implacable nature of machines makes them all but unstoppable.

However, their salvation lies in a machine as well: The Terminator. But only through working with the machine, can humanity be saved. And only through working with humans does the machine realise the importance of humanity.

The creative industry faces a similar dilemma. Creativity is one of the most powerful forces available to brands. It is also one of the most unique and important things that agencies have historically been able to provide. But this is under threat from the machines.

The demands of the ever-growing digital ecosystem place agencies under increasing pressure. This insatiable need to create more, combined with the creative industry's inability to adapt, has led to a creativity deficit.

The system demands more creativity than agencies can provide. Creativity is inadvertently being squeezed out of advertising, and we all end up poorer for it. It is bad for brands, for agencies, and for consumers.

AI, machine learning, and automation provide the tools to radically re-engineer agencies so they can fill the creativity gap. It can help us provide brands with the creativity they need, at a pace, scale, and quality that the modern marketing ecosystem demands.

To escape this vicious cycle, we need a new, optimistic hegemonic ideal to aim towards. One where it isn't humans vs. the machine, but humans and the machine. Where a new kind of cyborg creativity liberates human creativity, helping us to reach a new, higher order creativity.

This essay will outline the need for cyborg creativity, what this might look like and how we achieve it.

It has far reaching, disruptive and potentially painful implications for the advertising industry as a whole, throwing up questions around remuneration, talent, structure, and process.

This is covered in four sections:

1. The Creativity Deficit
2. Cyborg Creativity
3. Reimagining the Creative Process
4. The New Cyborg Agency

1: The Creativity Deficit – why agencies are failing to deliver the creativity brands need

Creativity is one of the trickiest resources in the world to work with. It's hard to find, harvest, value and use. Misapplied or mismanaged, it disappears. A strange phenomenon, it has fascinated humanity. Artists, composers, writers, and film-makers over the centuries have struggled to define its ineffable nature. You can't force it, intensively rear it or drill it out of the ground. You can't see it, smell it or taste it. For many, it is a passion, a higher purpose, a calling. For others, it is a confusing, frustrating and elusive concept.

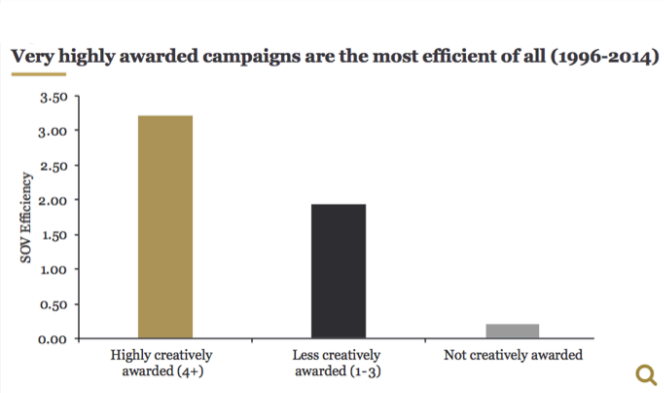
We still pursue it because it is also hugely valuable. With the global art market worth $56.6b (2016),[1] the global home entertainment market over $50b (2017)[2] and the worldwide video games market at $91b (2016)[3], creativity is clearly highly valued by the economy and society.

Applied to a brand, creativity contributes significantly to the intangible assets that make up the business. Over half of all listed business value exists in intangibles assets, accounting for $31 trillion globally.[4] The proportion that is created or supported by creativity varies by category and by individual, but a sizable component of this can be attributed to creativity.

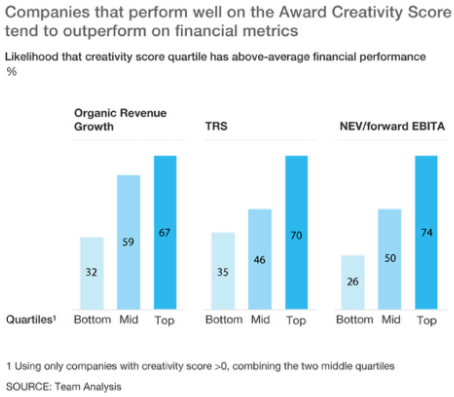
Study after study confirms the link between creativity, and business success. *Selling Creativity Short* links IPA and Gunn Report data to show the connection between creativity and effectiveness over a twenty-year period. Highly creative campaigns drive share growth 16 times more per point of ESOV. The conclusion is clear: *"marketers in pursuit of maximum effectiveness cannot have too much creativity: the more creative, the more effective."*[5]

A recent McKinsey study further supports this, linking creativity and successful businesses;*"enterprises which flourish in the creative realm, […] witness impressive outcomes on fiscal metrics favored by the C-suite and Wall Street: Namely, organic revenue growth, total return to shareholders and net enterprise value. […] Firms receiving a high "Award Creativity Score" doubled the ratings posted by low-ranking competitors."*[6]

Fig 1. Creativity drives brand and business performance



Source: Selling Creativity Short 2016



Source: Creativity and the Bottom Line, McKinsey 2017

Applying creativity to a brand is a key part of successful business management. The IPA's Janet Hull states, *"Creativity is not just a rescue strategy for an underinvested brand. It is the cornerstone of sound business management."*[7]

Creativity represents agencies' competitive advantage

Agencies have built their business on cultivating creativity. Since the invention of advertising, brands with good advertising succeeded and grew, those without performed less well. Correspondingly, the demand for good agencies exploded, based on their ability to deliver valuable creativity for hire.

Creativity represents a competitive advantage, that agencies have been tailored to deliver. In the words of Bob Hoffman, *"[creativity] is the only thing of major value from agencies - everything else they can get from somewhere else."*[8]

This is no happy accident. Agencies have spent 50+ years learning how to cultivate creativity. Through trial and error, folk science, innovation and practice, agencies have created environments that produce creativity. Building teams, nurturing talent, fostering a creative environment, formalising the creative brief. All are agency inventions to cultivate creativity.

Ed Catmull of Pixar recognised the value of sustaining a creative culture: *"Figuring out how to build a sustainable creative culture […] wasn't a singular assignment. It was a day-in-day-out, full-time job."*[9].

This competitive advantage has proven remarkably hard to copy. Few clients have successfully taken the creative function in-house. Consultancies are acquiring creative businesses in attempts to capture this ineffable creativity. Crowd-sourcing was supposed to disrupt and decentralise creativity, cutting out the agency middle-man, but has largely failed. Cultivating and capturing creativity is no sideshow to what we do. It is the main event.

The demands of the digital ecosystem

The explosion of digital has disrupted marketing, and now creative agencies are groaning under an impossible brief. Programmatic, personalisation, content, social media, and response-led digital have led to an exponential growth in demand for collateral. The IPA Future of Agencies report notes: *"automated media buying, self-service ad platforms, marketing technology platforms and commoditised production services are all serving to catalyse the trend of an accelerating downwards pressure on agency margins"*. [10]

Agencies need to produce more content, in more places, faster than ever before, for less. This hurts agencies and the creativity they produce. To keep up, agencies are working harder, becoming less creative in the process; struggling to keep heads above water, creativity is increasingly cast aside.

Agency leaders recognise the threat: *"Do nothing and ten years later you don't have a business… you end up asking more and more of people until it's more than is humanly possible"*[11].

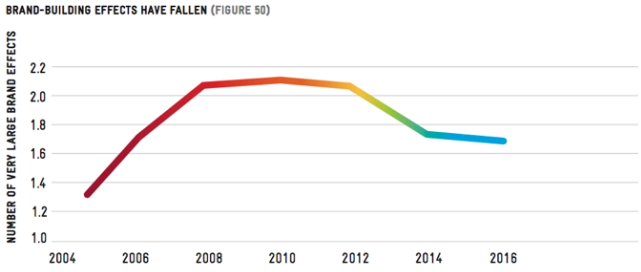
And the impact on creativity: *"The drive to do more for less is omnipresent. This has the potential to stifle […] creative excellence."*[12]

Tony Cullingham, of Watford Advertising College, opens his 2016 speech to graduating students with: "*Advertising is rubbish. It's broken. Busted. Kaput."*[13] This warning to young talent is a worrying sign for the industry.

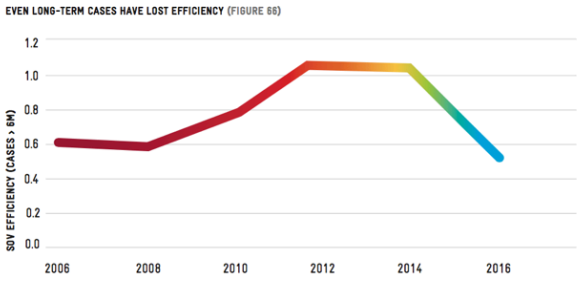
The result? Agencies are trapped in a vicious cycle. Facing burnout, margins eroded; talent drops out, and creativity ebbs away.

2017's *Media In Focus*[14], sees evidence of this in declining brand-building effects measured and a rise in short-termism. Effectiveness even declines in long-term campaigns as well, a potential symptom of a decline in creativity.

Fig 2a. Declining brand building effects and long-term campaign efficiency



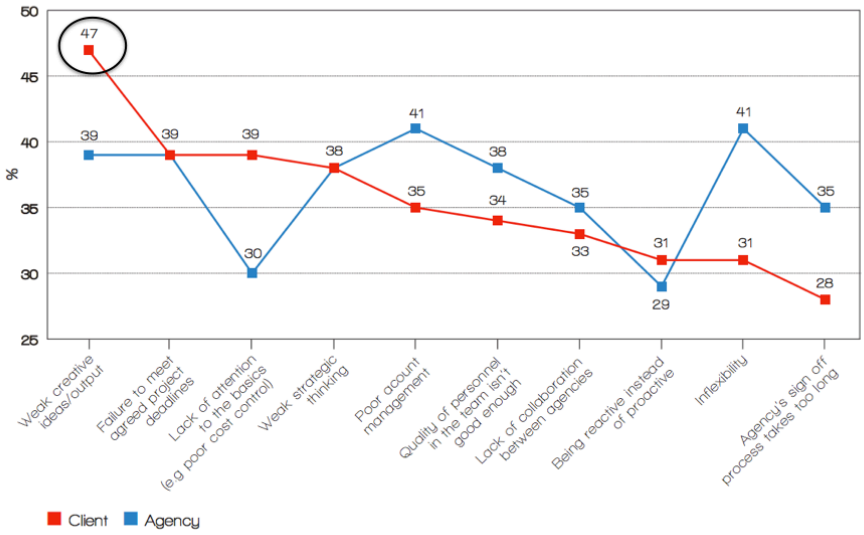
Source: Media In Focus, IPA, Les Binet and Peter Fields, 2017



Source: Media In Focus, IPA, Les Binet and Peter Fields, 2017

Similarly, the AAR shows clients rating "weak ideas and creative output" as their leading frustration.[15]

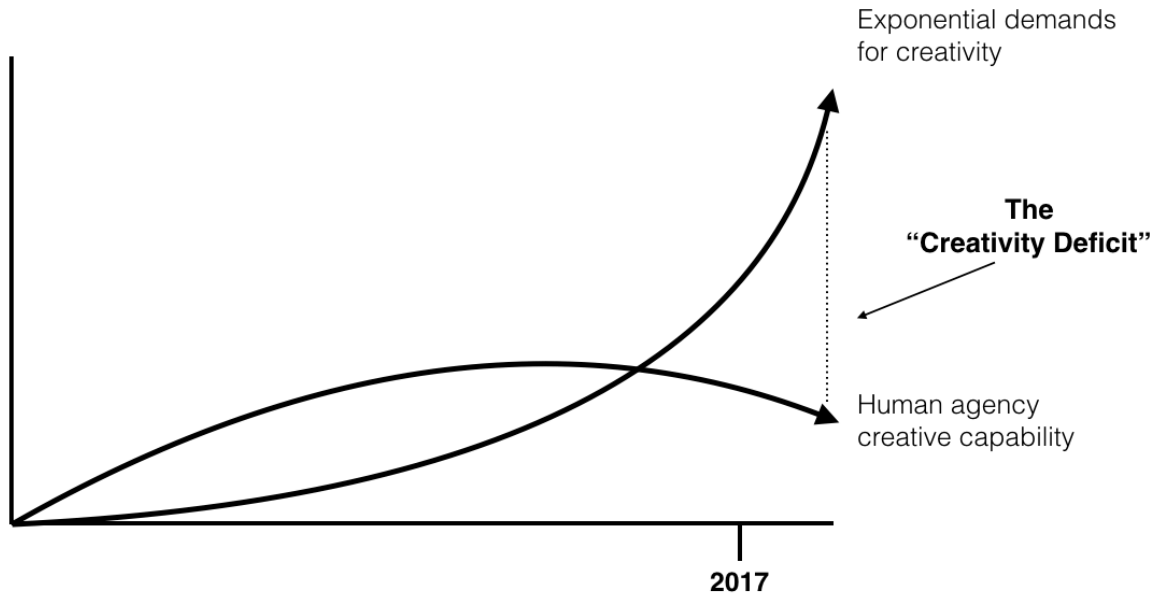
Fig 2b. AAR Client Relationship Problems



The creativity deficit

This has led to a creativity deficit in marketing. The exponential demands of digital clash against the very human limitations on creativity. This looks set to continue, as we try to catch up with a rapidly increasing capabilities gap. Agencies of today are unable to meet the needs of marketing, and this is set to get worse

Fig 3. The growing "Creativity Deficit"



The impact of this "creativity deficit" is threefold. It's bad for consumers, as advertising gets worse. Ad-blocking and banner blindness are both symptoms of this. It's bad for creative agencies, as their competitive advantage gets ground down by this vicious cycle. And it's bad for brands, as their marketing becomes less creative, less effective and more short-term.

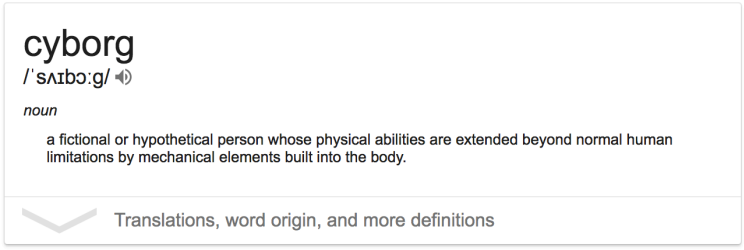
The insatiable demands of the digital ecosystem has led to substituting creativity for collateral, something referred to in *Culture vs. Collateral*, where agencies risk relegation to *"making marketing collateral, directed by media agencies. It's not there to get noticed, to be brand-building or defining, but to quietly nudge an audience member along a customer journey."*[16]

To escape, we cannot just retreat to the past, we need an optimistic vision and a roadmap towards a new, more creative future. One enabled by technology, not suppressed by it, revitalising the creative process and closing the creativity deficit.

2. Cyborg Creativity – our chance to close the creativity deficit

Our salvation lies in working with the machine, reinventing creative practices to achieve a new, sustainable, scalable creativity.

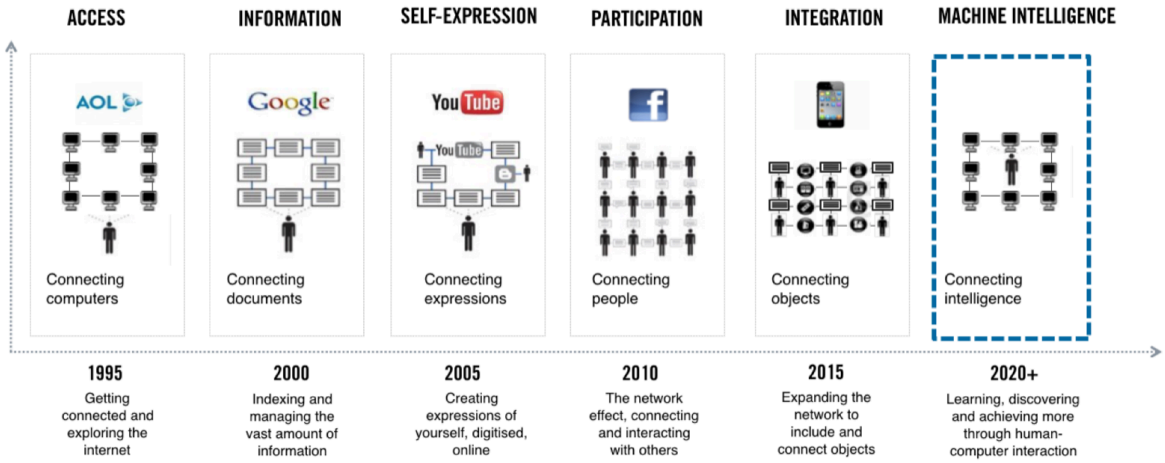
Cyborg creativity: using tools availed to us by AI, machine learning and automation to augment our creative ability and become creative cyborgs.



AI: the next wave of disruption

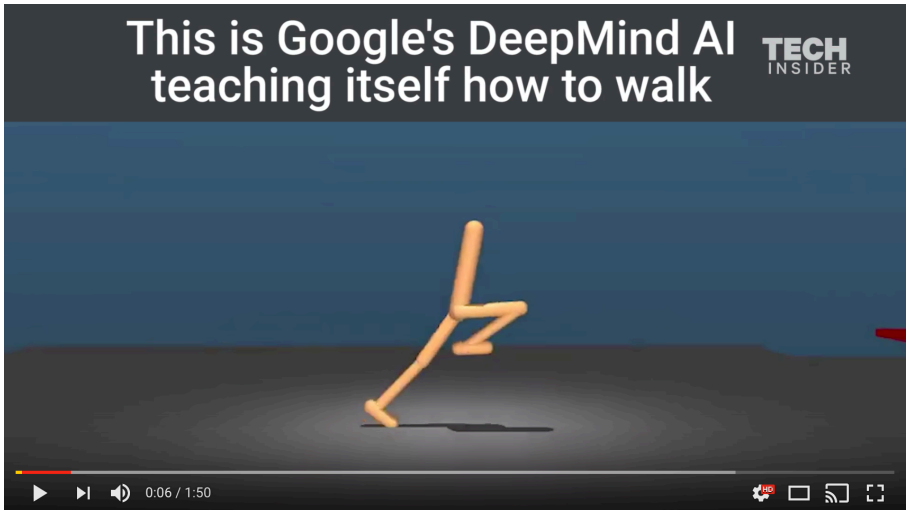
Still reeling from the last wave of digital disruption, a bigger one is on the horizon – AI. Google CEO Sundar Pichai claims *"we are now witnessing a new shift in computing: the move from a mobile-first to an AI-first world."*[17] The next generation will be defined by AI and machine intelligence.

Fig 4. Era's of digital evolution



AI covers a range of phenomena including deep learning, machine intelligence and automation. Leading to emergent intelligence, based on learning from data. For example, Google's DeepMind division has just taught an AI how to walk. It may look goofy, but it was simply given an objective to get from A to B, and through repeated trial and error, over

multiple simulations, it has learned to walk with no programmed understanding of physics, biomechanics or gravity.[18]



Machine learning makes sense of vast data sets and learns from them. Rather than programming every step in an unpredictable process, a computer learns and adapts, allowing artificially intelligent machines to do many tasks previously impossible for computers: driving, understanding speech, diagnosing disease, designing mechanical parts from scratch.[19]

The impact of this will be far reaching. Joseph Sirosh of Microsoft states that *"Everything at scale in this world is going to be managed by algorithms and data"*[20]. Any business that doesn't figure out how AI will play a role in its transformation will become a cottage industry.

Applying AI to creativity

AI can augment creative capabilities to transform our industry. Like the impact of industrialisation on mass production, AI brings the tools for mass creation.

Creativity represents something of a holy grail for AI development. Attempts so far have had mixed but surprisingly competent results. AI has created intelligible song lyrics, stories and short films. Sony used AI to create a sinister but otherwise convincing song, "Daddy's Car"[21], while 20th Century Fox partnered with IBM's Watson to edit the trailer for their horror film Morgan.[22] Watson accelerated a 10-30 day process into 24 hours. The final trailer needed editing by human, showing human and AI cyborg creativity in action.

Daddy's Car, a Sony AI music project

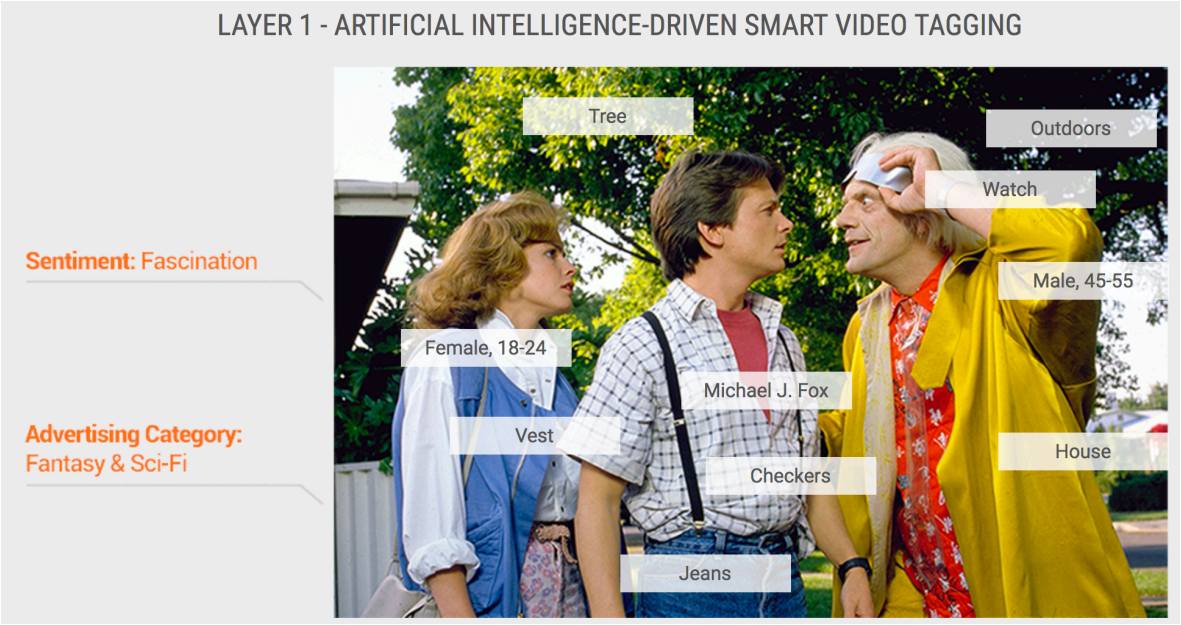
Source: https://soundcloud.com/user-547260463

Data fuels cyborg creativity

Machine learning is fueled by data, as The Economist outlines "*Artificial-intelligence (AI) techniques such as machine learning extract more value from data.".*[23] This is why Tesla, selling 25,000 cars a quarter, is valued more highly than GM, selling 2.3m[24]. They represent a huge bet on the value of the data to fuel machine learning.

This is also true of machine learning applied to creativity. But the data can be harder to come by. Currently, the valuable data about the creative process is wasted. Every tweak made by a designer, every concept approved or rejected by a creative director, every scamp and every word represents a data point from which the machine needs to learn.

To build AI capable of cyborg creativity, we need to start digitising our creative process and applying machine learning to it. Tools such as Anyclip can ingest and tag creative output, taking 2 minutes to tag an hour of content.[25] It can identify mood, lighting, products and people featured and in each scenario.



This data should be a foundational layer to cyborg creativity, giving phenomenal insight on our creative process and output.

On top of this, we need a feedback loop with the machine. Like traditional creative direction, machine learning utilises unsupervised, supervised and partially supervised learning. Unsupervised, AI are given data and left to spot patterns within it. Supervised is where it is told what it is looking at and working towards. A partially supervised approach is often the best approach.

This strikes me as similar to a creative director guiding a creative team. The team may not understand the director's intuition or decisions, but it helps them develop, learn and hone creativity. Similarly, as an AI carries out a creative task, the creative direction provides critical learning data for the machine.

Working with the machine

AI is exciting when applied to creativity because, by its very nature, it thinks differently. However, this will also lead to some incredibly unpredictable and frustrating experiences.

AI doesn't have common sense or judgement; it justs keep working on the problem, task or question it's set. Tom Chatfield notes, *"Even the smartest AI will relentlessly follow its code once set in motion"*[26]. It's concerned only with the output, not the process that gets there. This allows it to find solutions we don't entirely understand. *"The AI is a black box, immune to reverse-engineering—neither you nor anybody else can tell exactly how it comes up with the wonderful propositions it produces."*[27] It can be gloriously right or terrifyingly wrong, without understanding why.

In a world with creative AI, our role shifts from doing to guiding. *"Your job in a world of intelligent machines is to keep making sure they do what you want, both at the input (setting the goals) and at the output (checking that you got what you asked for)."*[28]

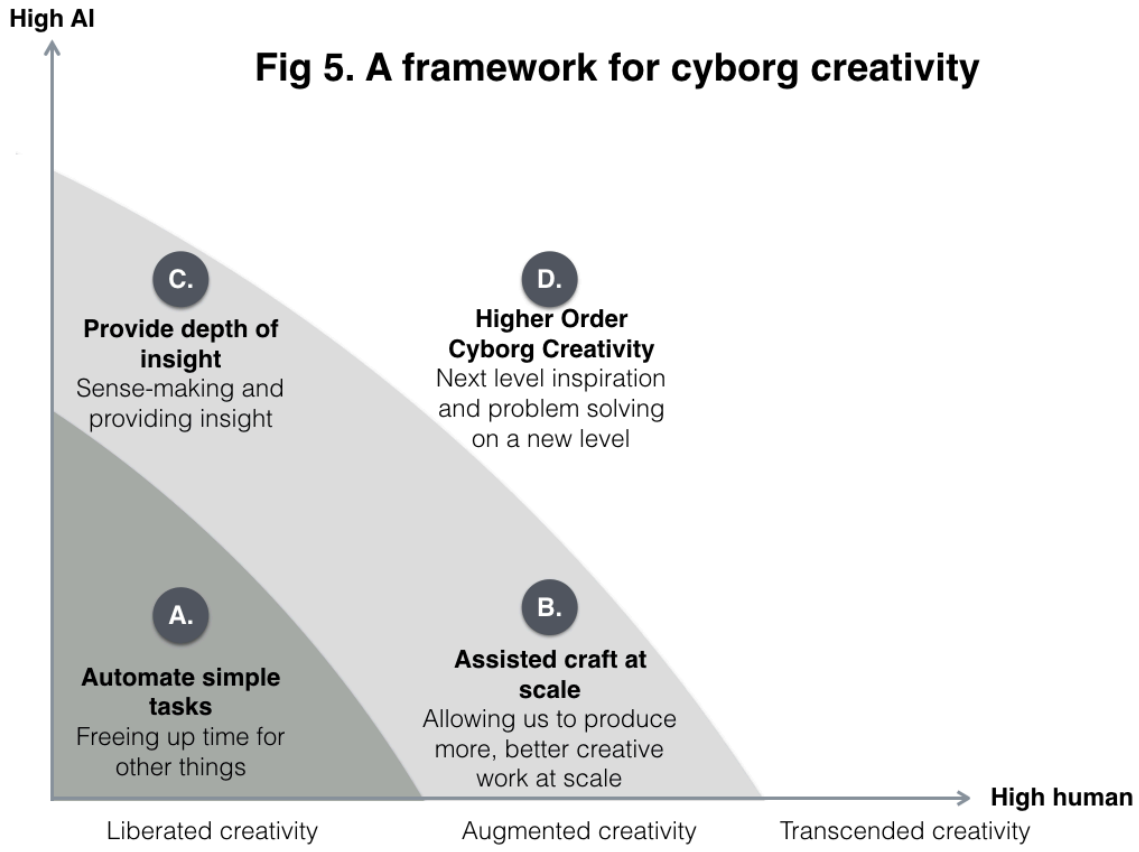
Much discussion of AI and automation has been on jobs lost along the way.
However, a report from McKinsey suggests that while 40% of current work can be automated, less than 10% of jobs can be 90% automated. Eric Schmidt agrees:*""It will be you with a computer, not a computer instead of you."*[29] AI will automate tasks, not jobs. [30]

Pedro Domingos claims that *"armed with machine learning, a manager becomes a supermanager, a scientist a superscientist, an engineer a superengineer. The future belongs to those who understand […] how to combine their unique expertise with what algorithms do best."*[31] Armed with AI, creatives agencies must become supercreative.

3. Reimagining the Creative Process – exploring AI assisted creativity

The focus is often on the narrower opportunity – how we can use AI to automate existing tasks. While this is certainly part of the solution, it cannot be the full extent of it.

Beyond automating simple tasks, AI allows us to deliver craft at scale, fuel it with a depth of insight and unlock a higher order creativity than is possible with humans alone.

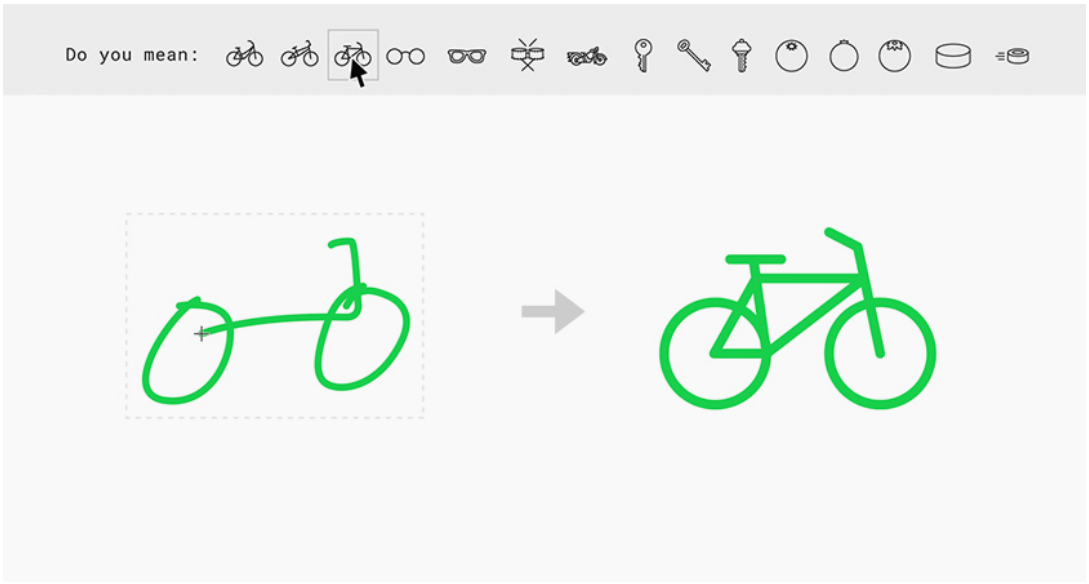


A. Automate Simple Tasks

Non-creative work wastes a lot of time. Time spent on frustrating processes, scamping up ideas, time and diary management, etc. could be better spent on other creative tasks. AI can help automate a wide range of tasks. Even if the AI is not directly involved in creativity itself, it can free up time for the organisation to focus on the end creative product.

AI is already being developed to answer problems at this level. x.ai is a tool for diary and meeting management, HaikuDeck offers automated presentation writing services, Respondable is an AI that helps you craft better emails while Grammarly uses machine learning to improve to spelling, grammar and proof-reading.

Beyond this, we need bespoke tools for the creative process. Google's AI Lab created AutoDraw, a simple tool that turns doodles to create an AI generated drawing.[32]



An AI Scamp-Bot for creative agencies would help capture and develop primordial ideas, speeding up the creative process. More than a glorified drawing tool, it could start to learn the creative process and help bring ideas to life. Like a sophisticated creative shorthand, it can help us early in the process of articulating, sharing and developing ideas.

This holistic suite of automation tools could free up the most precious creative resource; time.

B. Assisted Craft at Scale

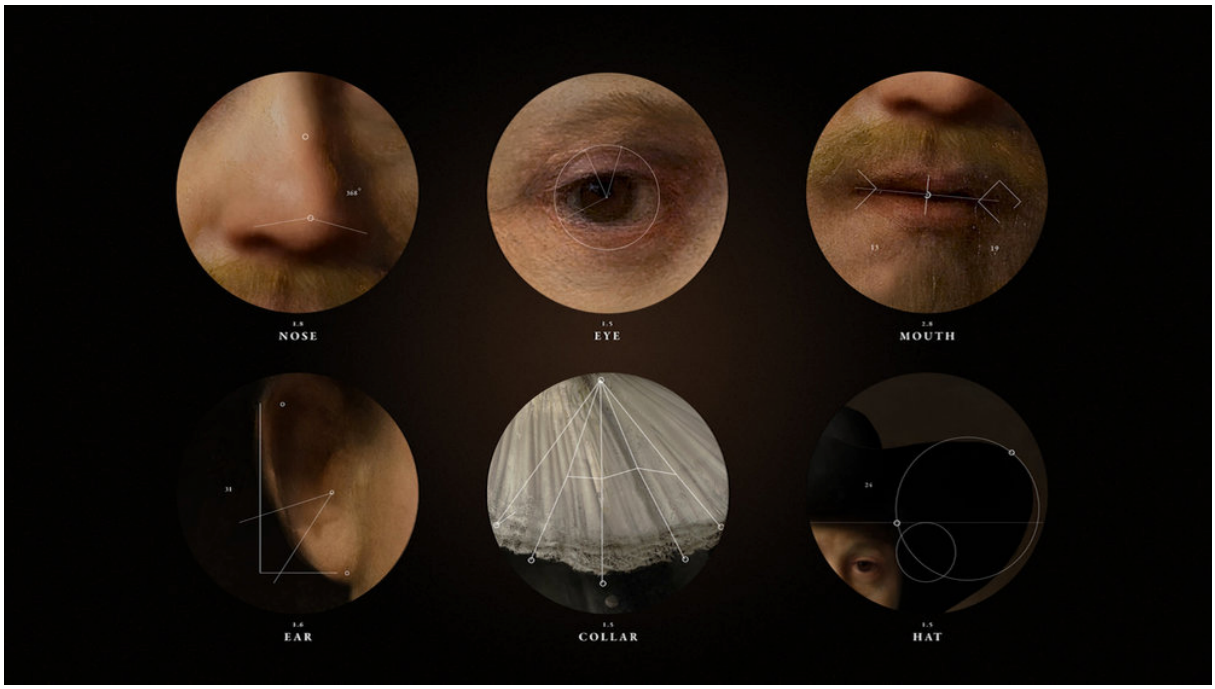
Beyond this, we need radical solutions for delivering crafted, creative output at scale. Well written copy, art direction, editing, sound production and animation are all core craft skills that we need to transform with AI.

This is already being developed. Adobe Sensei learns from all the documents, photographs, images and clicks on their platform, to create predictive layouts, automated retouching, cropping and editing features.[33] The Washington Post created Heliograf, a bot that writes journalist copy, to help cover real-time events like elections, sports or finance.[34] These aren't just innovations to become more efficient, churning out collateral, they are critical tools to allow modern newsrooms, studios or editing suites to succeed.

It's easy to see how agencies could apply this, with copy and design bots creating increasing amounts of content. Initially focusing on relatively simple tasks, they could expand to underpin an exponential growth in creative output.

Creative application of tools opens up new approaches, such as Nutella's playful algorithmic packaging campaign[35], that would have been hideously laborious done manually.

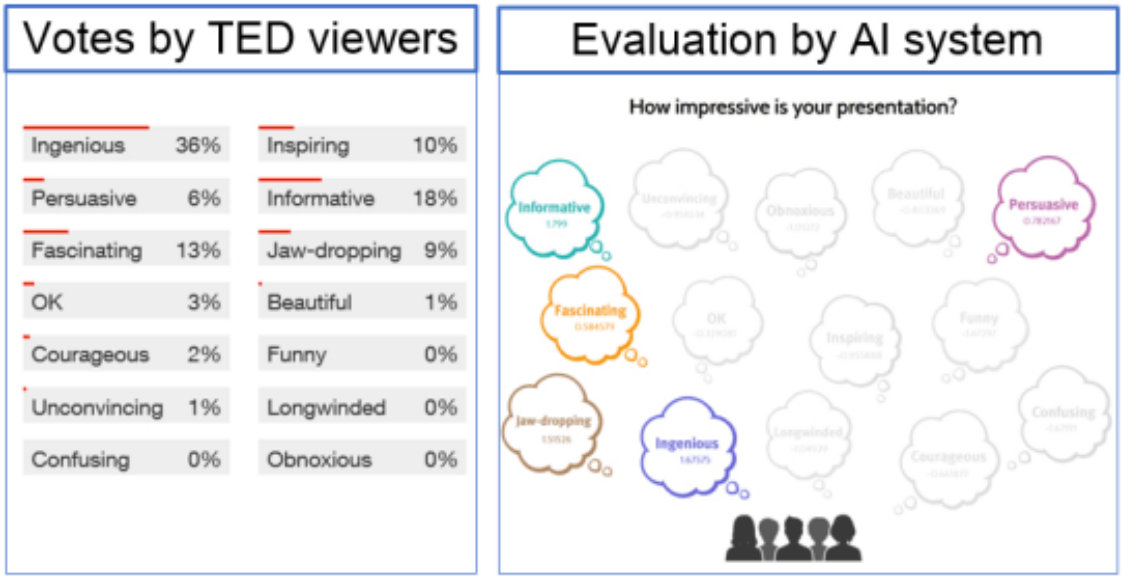
A critical aspect is how AI tools learn from the process and people they work with. As the AI learns through doing, it will become better, faster and stronger. The more it writes copy for a specific brand, the more it learns the brand tone-of-voice. The more it works with a certain creative, the more it learns their creative flair. We see this in action with The Next Rembrandt, where an AI learned to paint in the style of Rembrandt.



C. Provide New Depth of Insight

Creativity must be fuelled by powerful insights on consumers, culture, business and the world. AI can deliver deeper insights to help; sifting data, spotting patterns and making inferences that humans cannot.

Toshihiko Yamasaki, of Tokyo University, used machine learning to analyse TED talks, assessing performances in realtime based on previous data.[36]



This process of tagging and analysing video output could be a way to learn more precisely how our advertising works, analysing a performance, structure, or a holistic campaign, tracking it for consistency, moods, tones, colours and emotions.

Linking this data to effectiveness or creativity databases like the IPA and Gunn Report could provide real-time creativity and effectiveness feedback on our work. Deep learning could better demonstrate the link between creativity and effectiveness, applying learnings to individual campaigns and defending the value of creativity in brand building.

A partnership between IBM's Watson and The Weather Channel applies predictive insights from weather data to many business applications.[37] Similar partnerships could feed a breadth of insights into the creative process.

Insight bots could trawl the internet and social media, looking for insights for whatever brief is at hand. The user could rate the usefulness of what it found, helping optimise the selection criteria further. Combining Spotify Discover Weekly and Newsfeed curation algorithms, it could become an enterprise level creative insight and inspiration platform for each client, account and brief.

Chatbots also offer an interesting application for consumer research. Partnering with qualitative and quantitative research agencies, one could construct a range of audience or brand specific consumer chatbots. After ingesting all available data about their audience and chatting directly with them, natural language processing could allow anyone in a creative agency use our virtual consumer as a sounding board for ideas, helping put consumers back into the process in a fundamental way.

Using speech synthesis tools, we could liberate it from a chatbox window, by giving it a voice. As a potentially dystopian side-thought, one could even imagine moderating groups of AI QualiBots, helping test ideas quickly and cost effectively.

These Insight Bot tools, can put the consumer, evaluation and inspiration back into the creative process at a new scale, leading to more insightful, creative and effective work.

D. Higher Order Cyborg Creativity

All of these applications are just a warm-up for the main potential of cyborg creativity. Thus far, we've just looked at how AI can augment our existing creative process. The biggest potential is its ability to move it to a higher level.

In 2016, Go Grandmaster Lee Sedol had already lost two games in a 'best-of-five' against Deepminds AlphaGo deep-learning AI. This third game was the decider. At the 37th move, AlphaGo made a move that confused everyone. Lee's jaw drops and he walks away from the table.

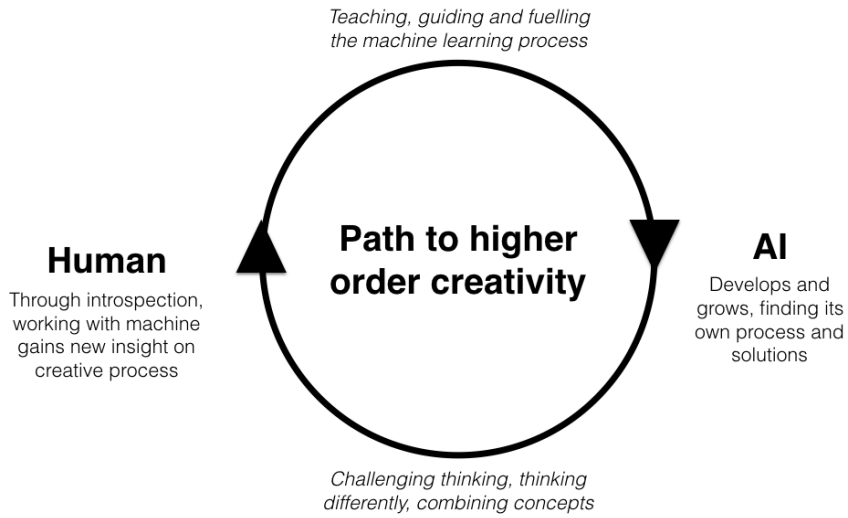
AlphaGo had been trained by Fan Hui, a European Go champion. Initially, he thought the move odd, but then saw its beauty. *"It's not a human move. I've never seen a human play this move,*" he says. *"So beautiful."*[38]

AlphaGo went on to win, achieving what experts had predicted would take decades, in just a couple of years. But this isn't just a case of computers beating humans. Fan Hui had spent five months training AlphaGo. But he wasn't just pouring his expertise into the machine; he was improving, along with AlphaGo. When he started, he was ranked 633rd globally, *"Now, he is up into the 300s. AlphaGo has taught him, a human, to be a better player."* [39]

Working with AI has the potential for us to gain profound insight into the creative process, elevating it to a higher level. Making us more creative, not just because we have liberated time, but because the AI teaches us to think differently. As we shape the machine, the machine shapes us, and cyborg creativity is formed. Unlocking higher-level creativity.

A Yale study showed even bad or unpredictable AI improved human decision making. Volunteers playing a problem-solving game performed better partnered with an unpredictable AI. "*Networks in which the bots randomised their decisions 10% of the time outperformed the all-human networks."*[40] An AI injecting different thinking helped the humans.

Fig 6. The Virtuous Cycle of Cyborg Creativity



It has opened up new thinking and approaches in architecture, design and art. It was used by Zaha Hadid to help create the Beijing Tower Project[41]. Generative Adversarial Networks* created images based on analysing 81,500 paintings. It learnt to recreate different schools of art, such as rococo or cubism but also come up with new styles. Humans often preferred the AI artwork due to its unexpected new styles and approaches.[42]

Cyborg Creativity In Action

Source: Zaha Hadid Beijing Tower Project

Source: Art and Artificial Intelligence Laboratory, Rutgers University

* Generative Adversarial Networks (GAN): Pitting two neural nets against each other to come up with the answers

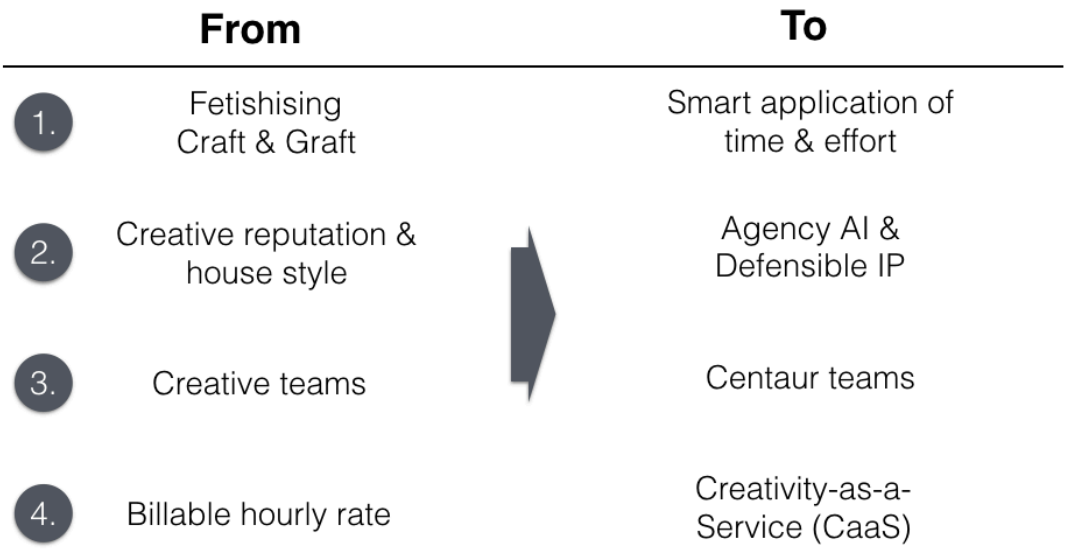
The most exciting potential of cyborg creativity is precisely this. They, by definition, think differently. But they will continually challenge us to think differently as well. Pushing us out of our comfort zone, refreshing our thinking, giving us new insight into the process.

4. Introducing The Cyborg Agency

What might this new agency look like? It would require some major shifts in mindset and operating model. As Tom Goodwin puts it, this must be more root canal than superficial polish: *"If AI doesn't lead to changes in company structure, […] then it's been done wrong. AI is more like root canal than a polish. It will be painful but what is needed. It's only a company rebuilt from scratch, […] with AI at the core that will unleash its full power."*[43]

A modern cyborg creative agency would have creative AI bots and platforms feeding into a creative process, to collectively and collaboratively orchestrate creativity on a vast scale. It is pivotal in filling the creativity deficit, and reinvigorating and refreshing creativity. A powerful partnership between humans and machines with an agency designed to support them.

Fig 7. The shifts required towards cyborg agencies



Escaping graft and craft

We overly fetishize the importance of traditional and old-school craft skills. Too much time is spent learning outdated techniques and processes. This comes from a culture of "earning your stripes" and presents a cultural and structural barrier to automation. We need to treat time as a precious, finite resource, not something we can throw at every little brief. If an automated process can do the job comparably well, faster and cheaper, that is a trade-off we need to start embracing.

From reputation to IP

We need to shift how we articulate our agency advantage. Successful agencies attract new business based on their reel and reputation. However, reputation is fleeting, and talent comes and goes, leaving agencies perpetually proving their worth.

Creative data and AI should become one of our most valuable assets. Tesla now has billions of miles of autonomous driving data under their belt. This represents a huge competitive advantage and is hugely defensible. We need to start doing the same with our creative learning and data. *"Vast pools of data can thus act as protective moats. Access to data protects companies from rivals."*[44]

The agency AI and the intellectual property attached to our creative output becomes our advantage. Allowing us to start pitching ourselves on the basis of repeatable success based on creative data. Future pitches could be automated and predictively managed based on the strength of an agency's AI to answer a brief. Agency style and philosophy should become hard-coded in our AI systems.

Centaur teams

Since computers beat humans at Chess, a new discipline has emerged, *Centaur Chess,* pitting teams consisting of a human and an AI working together.

We need a similar evolution of creative teams, towards centaur teams, made up of a human and their AI. Creatives could have multiple AIs, or they could license them out to new creatives. When someone retires, they could pass on their creative AI bot to a new up-and-coming creative.

Replika.ai is an AI chatbot designed to learn to know you and become your best friend. Users say it can be remarkably emotional and engaging. A simple tweak to the purpose of the bot could make an AI that learns to be a creative muse partnered with an individual.[45] Like any good creative partner, the more you work with it, the more you 'get' each other. Data and machine learning would supercharge this.

This powerful creative relationship built on data would empower creative individuals to defend their value. While the agency AI represents the agency body of work and learning, the creatives' AIs would reflect the sum of the learning from their career.

Escaping hours; selling services

This should change how we charge for creativity, and help defend agency margins. Experienced, talented bots would be in higher demand, and the process of switching agency would become more painful if the copybots needed to relearn the brand tone-of-voice. Popular or powerful creative teams and AI could charge a higher licensing cost.

Directors and production companies could start to capture their creative data and license it out. Can't afford to pay for the specific director himself? License their AI directing bot, and partner it with yours to recreate that style. Need a track that sounds like a certain artist? Rather than paying someone to replicate the style, license their data and run it through a music generating bot.

Separating capabilities from individual graft allows us to escape the billable hours model. Software-as-a-Service (Saas) has become a common way to pay for valuable services. We should make a similar shift, moving to Creativity-as-a-Service (Caas). Clients could license

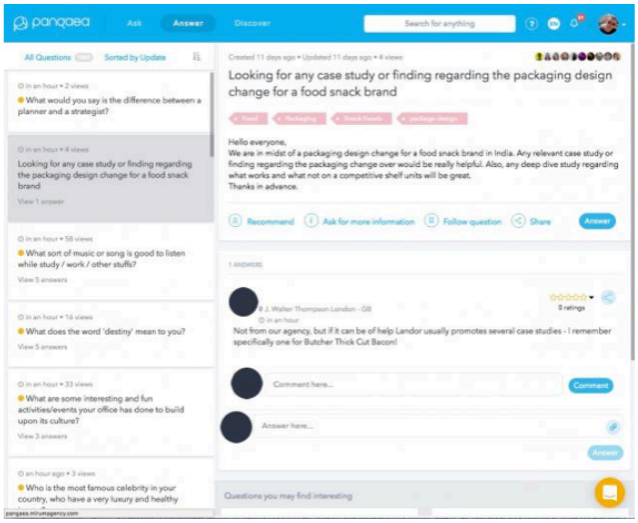
different service relationships; maybe they just want to license a packaging copywriting bot, with the right tone-of-voice, or they may choose to license a full-service creative package. Bespoke solutions could command a higher premium, but agencies could also deliver more value, freed up from the everyday grind.

Making this happen

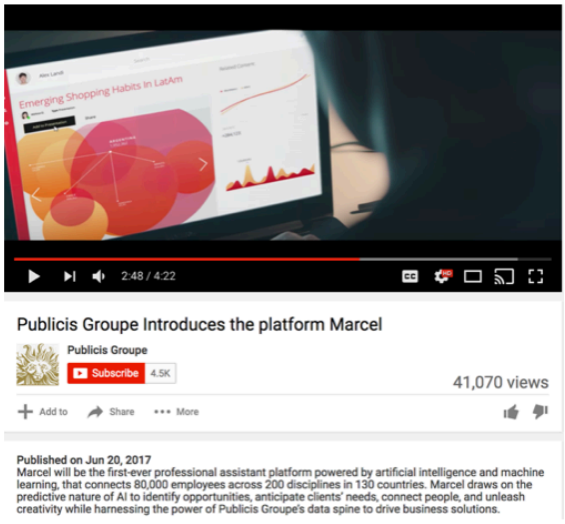
Data is the crucial fuel for machine learning, but currently, it's overlooked and wasted. We need to start capturing data throughout the creative process, digitising all work and decisions. An AI can tag all agency output, historical and current, to assist this process.

Agencies should experiment with both existing AI platforms and developing their own. This will require new talent and investment. Early attempts may have mixed results, but prove critical learning experiences to overcome cultural barriers to cyborg creativity.

Marcel from Publicis or JWT's Pangaea platforms are both good steps towards this.[46] But they will need continual investment and evolution. They should Focus should on empowering the creative process, rather than duplicating other enterprise AI platforms.



JWT's *Pangaea* AI Platform



Publicis *Marcel* AI Platform

Getting the narrative right will be key to unlocking investment. Booming interest in AI means there is plenty of potential capital. We must leverage our valuable creative data, the major card we hold in forming partnerships. Data can open doors, like Deepmind's partnership with the NHS in exchange for their data.[47] With Google, Amazon, IBM and Microsoft holding much of the expertise, partnerships will be critical.

Agency networks could invest in platforms centrally, leveraging scale to squeeze smaller rivals. AI "lock-in" means that as soon as an AI shows an advantage to one, everyone is forced to follow suit lest they fall behind. Otherwise, as with Google's algorithm, it leads to an unassailable advantage. [48]

Deriving value from data and AI should also support a shift in share price multiples. Publicis is trading at a 15x multiple, while Google and Facebook trade at multiples of 33x and 39x (as of June 24th). Embracing cyborg creativity could shift industry multiples, attracting investment based on our future creativity.

In conclusion:
Cyborg creativity represents an exciting and optimistic vision for a more creative future. We need to make it tangible, achievable and desirable to orient agencies towards it.

It is necessary because the present model is unsustainable. The digital ecosystem looks set to continue growing, and brands need for creativity seems as true as ever. Agency margins are the lowest they've been since 2003 and on a downward trend. ISBA figures show the lowest satisfaction with remuneration since 1997.[49]

But beyond this, there is a possible vision of a more creative future, one where human and machine working together can achieve a new, deeper, higher order creativity. Every wave of disruption brings new tools of creation. AI could be the most disruptive one yet.

A future where everyone is empowered to be more creative, operating at higher levels in partnership with AI, reaching heights never thought possible. In the words of the Terminator, "come with me if you want to live".[50]

Notes

[1] Reyburn, S. (2017, March 23). What's the Global Art Market Really Worth? Depends Who You Ask. From https://www.nytimes.com/2017/03/23/arts/global-art-market.html - UBS and Art Basel estimates
[2] Radcliffe, D. (2016, August 15). PwC's global media outlook 2016-2020: six key trends, from https://www.themediabriefing.com/article/pwc-s-global-media-outlook-2016-2020-six-key-trends - PwC estimates
[3] Worldwide game industry hits $91 billion in revenues in 2016, with mobile the clear leader. (2016, December 21). From https://venturebeat.com/2016/12/21/worldwide-game-industry-hits-91-billion-in-revenues-in-2016-with-mobile-the-clear-leader/
[4] Brand Finance (2016, May). GIFT: Global Intangible Brand Finance Tracker
[5] The IPA and Gunn Report (2016, June 23) Selling Creativity Short: Creativity and effectiveness under threat
[6] Brodherson, M., Heller J., Perrey, J., and Remley, D. (2017, June). Creativity's bottom line: How winning companies turn creativity into business value and growth. From http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/creativitys-bottom-line-how-winning-companies-turn-creativity-into-business-value-and-growth
[7] The IPA and Gunn Report (2016, June 23) Selling Creativity Short: Creativity and effectiveness under threat
[8] Hoffman, B, (2017, May) Take Fucking Risks with Bob Hoffman, https://vimeo.com/220801216
[9] Catmull, E. (2015). *Creativity, inc.*
[10] Perkins, N, IPA. (2017, May) IPA Future of Agencies: Systems and Empathy
[11] Perkins, N, IPA. (2017, May) IPA Future of Agencies: Systems and Empathy: Digital Agency CEO
[12] Kemp, N (2017, 9th March). Is it possible to work in advertising and still have a life?, from http://www.campaignlive.co.uk/article/possible-work-advertising-life/1426466
[13] Cullingham T. (2016, March). Advertising is on its knees. What an opportunity! from http://www.campaignlive.co.uk/article/advertising-its-knees-opportunity/1389326
[14] Binet, L. Fields, P, (2017), Media In Focus: Marketing Effectiveness in the Digital Era, IPA
[15] AAR Pulse Survey, (2016/17). http://aargroup.co.uk/wp-content/uploads/2017/01/AAR-Agency-Pulse-2017_collective_web.pdf
[16] Golding, D. (2017, February). The Big Adland Divide: Culture vs Collateral. From http://www.campaignlive.co.uk/article/big-adland-divide-culture-vs-collateral/1424173
[17] Pichai, S. (2017, May 17). Making AI work for everyone. Retrieved July 21, 2017, from https://www.blog.google/topics/machine-learning/making-ai-work-for-everyone/
[18] Google's DeepMind AI just taught itself to walk. (2017, July 12). From https://www.youtube.com/watch?v=gn4nRCC9TwQ
[19] Brynjolfsson, E, McAfee, A, (2017, June) Why "How many jobs will be killed by AI?" is the wrong question. From*https://www.linkedin.com/pulse/why-how-many-jobs-killed-ai-wrong-question-andrew-mcafee*
[20] Sirosh J, (2016, June) CVP of Data Group and Machine Learning at Microsoft, quoted in https://medium.com/emergent-future/machine-learning-trends-and-the-future-of-artificial-intelligence-2016-15c15cd6c129
[21] Vincent, J. (2016, September 26). This AI-written pop song is almost certainly a dire warning for humanity. From https://www.theverge.com/2016/9/26/13055938/ai-pop-song-daddys-car-sony
[22] Heathman, A. (2016, September 02). IBM Watson creates the first AI-made film trailer – and it's incredibly creepy. From http://www.wired.co.uk/article/ibm-watson-ai-film-trailer
[23] The Economist, (2017, May 06). The world's most valuable resource is no longer oil, but data. From https://www.economist.com/news/leaders/21721656-data-economy-demands-new-approach-antitrust-rules-worlds-most-valuable-resource
[24] The Economist, (2017, May 06). The world's most valuable resource is no longer oil, but data. From https://www.economist.com/news/leaders/21721656-data-economy-demands-new-approach-antitrust-rules-worlds-most-valuable-resource
[25] http://www.anyclip.com/technology/ , (2017)
[26] Chatfield, T. (2016 June), speaking at Google Firestarters 20: Artificial Intelligence (AI) or Intelligence Augmentation (IA)
[27] Chatfield, T. (2016 June), speaking at Google Firestarters 20: Artificial Intelligence (AI) or Intelligence Augmentation (IA)
[28] Domingos, P. (2015). The master algorithm: how the quest for the ultimate learning machine will remake our world
[29] Schmidt, E. (2017 June) speaking at Viva Technology Paris. From http://www.campaignlive.co.uk/article/eric-schmidts-vision-better-world/1436643#LjH2mHqKv82UJ297.99
[30] Bughin, J., Hazan, E. (2017 June) McKinsey, speaking at Viva Technology Paris. From http://www.campaignlive.co.uk/article/ai-dominates-first-day-viva-technology-paris-2017/1436649
[31] Domingos, P. (2015). The master algorithm: how the quest for the ultimate learning machine will remake our world
[32] 2016, https://aiexperiments.withgoogle.com/autodraw
[33] 2017, http://www.adobe.com/uk/sensei.html
[34] Keohane, J. (2017, June 3). A Robot May Have Written This Story. From https://www.wired.com/2017/02/robots-wrote-this-story/
[35] Carman, A. (2017, June 2). Nutella employed an algorithm to design its packaging. From https://www.theverge.com/2017/6/2/15731648/nutella-packaging-algorithm-software
[36] Bellis, R. (2016, October 28). Can These AI-Powered Tools Help You Perfect Your Next Presentation? From https://www.fastcompany.com/3064951/can-these-ai-powered-tools-help-you-perfect-your-next-presentation
[37] Fullerton, L. (2016 Dec) A cloud with a silver lining - IBM Watson and The Weather Company are both in the business of forecasting. From http://www.thedrum.com/news/2016/12/20/cloud-with-silver-lining-ibm-watson-and-the-weather-company-are-both-the-business
[38] Metz, C. (2016, March). In Two Moves, AlphaGo and Lee Sedol Redefined the Future. From https://www.wired.com/2016/03/two-moves-alphago-lee-sedol-redefined-future/
[39] Metz, C. (2016, March). The Sadness and Beauty of Watching Google's AI Play Go. From https://www.wired.com/2016/03/sadness-beauty-watching-googles-ai-play-go/
[40] Matthew, H. (2017, May). Bad bots do good: Random artificial intelligence helps people coordinate. From http://www.sciencemag.org/news/2017/05/bad-bots-do-good-random-artificial-intelligence-helps-people-coordinate
[41] Wood, H. (2017, March). The Architecture of Artificial Intelligence. From http://archinect.com/features/article/149995618/the-architecture-of-artificial-intelligence

[42]Baraniuk, C. (2017, July) Artificially intelligent painters invent new styles of art. From https://www.newscientist.com/article/mg23531333-300-artificially-intelligent-painters-invent-new-styles-of-art/
[43] Goodwin, T. (2017, July) How To Use Artificial Intelligence In Business. From https://www.linkedin.com/pulse/how-use-artificial-intelligence-business-tom-goodwin
[44] The Economist, (2017, May 06). The world's most valuable resource is no longer oil, but data. From https://www.economist.com/news/leaders/21721656-data-economy-demands-new-approach-antitrust-rules-worlds-most-valuable-resource
[45]2017, https://replika.ai/
[46] Diaz, A. (2017, July). Marcel Is Just a Baby Compared to JWT's Pangaea http://adage.com/article/agency-news/meet-pangaea-jwt-ai-a-year-head-start-marcel/309821/
[47] McGoogan, C (2017, July). NHS illegally handed Google firm 1.6m patient records, UK data watchdog finds http://www.telegraph.co.uk/technology/2017/07/03/googles-deepmind-nhs-misused-patient-data-trial-watchdog-says/
[48] Azhar, A. (2015, June), The Six Accelerants of the AI Boom. From https://medium.com/the-exponential-digest/the-six-accelerants-of-the-ai-boom-903e5b5a0719
[49] Singh, S. (2016, Aug). The cost of advertising: ISBA/Arc study reveals adland's commercial trends. From http://www.campaignlive.co.uk/article/cost-advertising-isba-arc-study-reveals-adlands-commercial-trends/1406152
[50] Cameron, J. (1984), The Terminator

Bibliography:

AAR Pulse Survey, (2016/17)
Accenture Technology Vision, (2017)
Azhar, A. (2015). *The Six Accelerants of the AI Boom*, Medium
Baraniuk, C. (2017). *Artificially intelligent painters invent new styles of art*, New Scientist
Bellis, R. (2016). *Can These AI-Powered Tools Help You Perfect Your Next Presentation*?, Fast Company
Binet, L., Fields, P., (2016) *Selling Creativity Short: Creativity and effectiveness under threat,* The IPA and Gunn Report
Binet, L. Fields, P., (2017) *Media In Focus: Marketing Effectiveness in the Digital Era*, IPA
Bostrom, N. (2016). *Superintelligence: paths, dangers, strategies*. Oxford: Oxford University Press
Brand Finance (2016, May). *GIFT: Global Intangible Brand Finance Tracker*
Brodherson, M., Heller J., Perrey, J., and Remley, D. (2017). *Creativity's bottom line: How winning companies turn creativity into business value and growth*
Brynjolfsson, E, McAfee, A, (2017) *Why "How many jobs will be killed by AI?" is the wrong question*
Bughin, J., Hazan, E. (2017) McKinsey, speaking at *Viva Technology Paris*
Carman, A. (2017). *Nutella employed an algorithm to design its packaging*, The Verge
Catmull, E. (2014). *Creativity, Inc.: Overcoming the Unseen Forces That Stand in the Way of True Inspiration*
Cullingham T. (2016). *Advertising is on its knees. What an opportunity!,* Campaign
Chatfield, T. (2016), speaking at Google Firestarters 20: Artificial Intelligence (AI) or Intelligence Augmentation (IA)
Christian, B. (2017). *Algorithms to live by.* William Collins
Contagious (2016). *Machine Learning Trend I/O*
Diaz, A. (2017). *Marcel Is Just a Baby Compared to JWT's Pangaea*, Campaign
Domingos, P. (2015). *The master algorithm: how the quest for the ultimate learning machine will remake our world*
The Economist, (2017). *The world's most valuable resource is no longer oil, but data*
Fullerton, L*. (2016) A cloud with a silver lining - IBM Watson and The Weather Company are both in the business of forecasting,* The Drum
Golding, D. (2017). *The Big Adland Divide: Culture vs Collateral,* Campaign
Goodwin, T. (2017). *How To Use Artificial Intelligence In Business*, LinkedIn
Heathman, A. (2016). *IBM Watson creates the first AI-made film trailer – and it's incredibly creepy,* Wired
Hoffman, B, (2017) *Take Fucking Risks with Bob Hoffman*
Huntingdon, R. (2015) *The State of Digital Advertising Right Now*
Kemp, N (2017). *Is it possible to work in advertising and still have a life?,* Campaign
Keohane, J. (2017). *A Robot May Have Written This Story*, Wired
Matthew, H. (2017). *Bad bots do good: Random artificial intelligence helps people coordinate*, Science Mag

McGoogan, C (2017). *NHS illegally handed Google firm 1.6m patient records, UK data watchdog finds,* The Telegraph
Metz, C. (2016). *The Sadness and Beauty of Watching Google's AI Play Go*, Wired
Metz, C. (2016,). *In Two Moves, AlphaGo and Lee Sedol Redefined the Future*, Wired
Perkins, N, IPA. (2017) *IPA Future of Agencies: Systems and Empathy,* IPA
Pichai, S. (2017, May 17). *Making AI work for everyone*, Google
Radcliffe, D. (2016). *PwC's global media outlook 2016-2020: six key trends*, PwC
Schmidt, E. (2017 June) speaking at *Viva Technology Paris*
Singh, S. (2016). *The cost of advertising: ISBA/Arc study reveals adland's commercial trends,* Campaign
Sirosh J, (2016) *CVP of Data Group and Machine Learning at Microsoft,* Medium
Snow, C.P. (1959) *The Two Cultures*, Rede Lecture
Srnicek, N. (2016). *Inventing the future: postcapitalism and a world without work*. Verso
Vincent, J. (2016). *This AI-written pop song is almost certainly a dire warning for humanity*, The Verge
Wood, H. (2017). *The Architecture of Artificial Intelligence*, Archinect