

IONA

MEMORANDUM

0002 - FUTURE PREDICTION

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As described in MEMO 0001, an educational curriculum cannot be meaningfully proposed without first studying the probable future of labor. Here we examine some ongoing trends, then we use those trends to draw some concrete predictions for the year 2060, then with a picture of that future, we identify some “priority career paths”. Our identified career paths are ones which seem likely to see strong growth over the coming decades.

Trends

Before we can make predictions, we need to start with trends that are already here and have already stood the test of time so we may know they are not temporary fads. Only once we can identify stable trends, we can then extrapolate those trends into a future prediction.

Software eating the world

This phrase, first popularized in a 2011 [essay by Marc Andreessen](#), and later explored in [Breaking Smart](#) by Venkatesh Rao, illustrates a 35 year long trend of software formalizing the world around us as code and data, then making it massively copyable and manipulable. The recent growth in AI has a lot of people wondering whether it is the future or a fad, but if we

recognize it in the broader context of the rise of software, we don't necessarily need to decide. Software is something which can be considered an evolution of written language and formalized thought, and it leads us toward an endgame in which all physical objects and processes are represented and manipulated as code and data.

This means we should expect future careers to create digital work-product that can service everyone on earth. We should expect to see hyper-specialization, because in a global marketplace, anything that's not *the best* is not worth adopting, but everyone can be the best at something - as long as it's sufficiently specialized. One example of a business area that is growing in this regime is B2B SaaS services which are targeted to a specific customer niche such as (for example) restaurant automation. Another example is indy game or video creators who have the whole world as their market, and can therefore drill down on a very specific niche and be the best in that domain.

Rise of prediction markets

Platforms for explicitly betting on world events are a relatively new phenomenon, but financial markets have been evolving in the direction of event prediction for decades if not the entire 20th century. Buying an asset just before an event occurs which will increase demand for that asset is far more profitable than investing in reliable companies. When other people begin to realize the event is beginning to unfold, they too will pile in, making short term profit almost certain.

Prediction markets have a powerful impact on world events because - for example - signs that an organization's management has grown incompetent will cause short-sellers to begin dumping the stock whilst amplifying the message of doom and gloom so that others may join in. This can become a self-fulfilling prophecy as the company becomes less able to raise capital and their top talent hears the message and begins searching for another job.

Beyond corporations, prediction markets have even begun to impact world politics. When governments are seen as unstable, traders will begin to short their currency and their credit default swap, causing currency instability and interest on their sovereign debt to go up.

As information flows more freely, and global markets become more integrated, we can only expect this trend to continue. Every major decision will be the subject of brutal analysis, with billions of dollars of value moving around as a result. These capital flows will then be measured and analyzed, with praise or blame being assigned to the relevant decision makers. As organizations preview the power of prediction markets, they will become more and more fearful of making a wrong decision, and we see more decisions being reversed soon after they are made.

We can expect democracy to experience a decline over the 21st century. Politicians will find that whatever they may promise to their constituents, there is very little that they can change without disrupting the markets. Constituents will become disenchanted with politicians who seem

allergic to keeping campaign promises. Businesses and citizens will find that corporate style autocracies do all of the same things but with more stability and less corruption.

End of privacy

Privacy is steadily declining, and personal reputation is becoming increasingly visible and consequential. Reputation is emerging as a form of social capital, shaping trust and opportunities. In the future we can expect high-profile people to face ever-increasing public scrutiny, and reputation-washing through performative philanthropy will be less and less effective. Insurance and credit ratings will most likely be replaced by decentralized markets, meaning more people will have access to financial products than before. Historically liquid markets such as corporate and government debt can be expected to thin out as capital is able to find better opportunities.

The biggest winners are those with strong and well developed ethical frameworks. They will rise in positions of leadership, displacing those with weak morals and those who, even with the desire to be good, lack the discernment to make the right decisions when faced with moral dilemmas.

Decentralization of narrative power

Control over public narratives is becoming increasingly distributed. Traditional gatekeepers—mainstream media, political elites, and institutions—are losing influence, as alternative voices proliferate. Ideological pluralism is growing, and consensus is less imposed from the top; instead, it emerges dynamically through social networks, memes, and digital communities. It has been suggested that this trend will prove the undoing of the American empire, and that no other empire will be able to emerge in the foreseeable future. We can at least expect that this trend will result in the eventual disruption of all types of centralized institutions, including academia, research and education, medicine, finance, law, and government.

This is an important trend because it means that a lot of careers traditionally considered “safe” will be at risk in the future because of their dependence on institutional protection.

Rise of geographically dispersed groups

We already see the emergence of remote companies and remote affinity groups. We can expect this to continue, with the role of the city becoming less central to knowledge-based enterprise. This will have a major impact on the future of the housing market and tax policies, as people begin taking advantage of their new-found ability to live and work from any place around the world. This will pose major challenges to tax collectors, as business and wealth will cross borders to find locations where it is not subject to significant taxation. Likewise, housing markets will be significantly disrupted as city living becomes optional for many professions. Increasingly mobile populations will “vote with their feet”, moving to places that better meet their lifestyle

expectations. Those who do not move to rural and suburban locations will gravitate toward more vibrant cities, creating death-spirals in cities which are unable to stop the exodus.

We should expect careers related to transportation, home-building, landscaping, and other services related to rural living to experience moderate growth, even as they go through technological disruptions. Urban centric careers will be lackluster, as the officework economy struggles to remain relevant and related careers will be risky as competition heats up for the remaining office roles.

Predictions for the year 2060

With these trends in mind, we can begin to make some predictions for the future. We aim for the year 2060 because students who begin school in 2030 will be about 40 in 2060, and their careers at that point will be well established and relatively safe from disruption.

Robotics as an app store for skilled labor

Estimated probability: 95%

When robots become mainstream, the most realistic model for AI + robotics is the “app store for skilled labor”. Great carpenters and great welders will not stop building houses and welding joints, they will just do it from a chair using a mouse or joystick. AI will augment their abilities - doing the easiest parts of the work. Smart artisans will insist on retaining intellectual property rights to the AI which is trained on their work, so they will make higher income than their predecessors ever did. As AI is able to do more and more of the work autonomously, the cost for a customer will steadily decrease.

Winning career paths: Specialized artisans, robotics hardware makers, applied AI engineers.

Disrupted career paths: Handyman, unskilled or low-skilled laborer.

Programming languages that compile to DNA

Estimated probability: 80%

We will have programming languages which can meaningfully represent biological constructs, and we'll have compilers that can convert these languages down to DNA and decompile DNA back into code. All of the known beings on the planet have been sequenced and decompiled to some extent, though certain constructs will probably still be difficult to gracefully represent. Biological or hybrid bio-silicon computers will be fairly commonplace, and DNA based nano-assembly will be an active field of research.

Winning career paths: DNA programmers, DNA (de)compiler development, Bio-computer development, biologically grown nano-material engineering.

Disrupted career paths: Classical medical scientists and professionals.

Reputation as de-facto social credit

Estimated probability: 85%

The end of privacy and the rise of prediction markets leads to the rise of a de-facto “Decentralized Credit Rating” based on a person’s predicted trustworthiness. Decentralized prediction markets will obviously not respect regulations on how risk is calculated, so limitations on things like racial profiling will not hold. Because they are unencumbered by regulation, decentralized prediction markets will be able to offer more accurate risk predictions than traditional insurance and credit, so they will tend to edge out the traditional industries. Small businesses will thrive because it will be easier for customers to discover and trust them.

Winning career paths: Ethics consultant, micro-lender / private equity financier, small business operator.

Disrupted career paths: Insurance and loan officer, compliance officer.

Most litigation settled using AI and prediction markets

Estimated probability: 75%

Like many institutions, courts are coming under strain from decentralized narrative power and prediction markets. A judge who faithfully interprets the law by the established jurisprudence isn’t going to come to any conclusions that can’t be predicted beforehand. More embarrassingly, a judge who stretches or reinterprets the law to the benefit of their friends or to fit with their political ideology, can likewise be modeled and predicted.

In order to save themselves from the brewing crisis of legitimacy, courts will be forced to embrace the same prediction and modelling technology so as to ensure that their rulings cannot be attacked as corrupt or partisan. This of course will make the predictions even more accurate.

A plausible future scenario is that when a dispute emerges, and rather than going before a judge, the plaintiff publishes their complaint - allowing actors to bet on the outcome of the case. In most cases, the predictions will be lopsided enough that the parties will be strongly incentivised to settle rather than face the additional cost of litigation.

Winning career paths: Dispute modelling technologist

Disrupted career paths: Lawyer, judge

Majority energy production is nuclear and geothermal

Estimated probability: 60%

If the current trends continue, datacenters will become the majority electricity consumer by 2040. This consumer is highly sophisticated and price sensitive, therefore willing to invest in modernizing power generation technology to save cost. Marginal cost of nuclear and geothermal generation is lower than that of petroleum and coal, because mining, refining and transport are negligible fractions of the total cost. In this environment, electric vehicles become more economically competitive and internal combustion becomes increasingly a hobbyist niche. Likewise, electricity edges out other energy sources for home heating and domestic purposes. Environmentalism and regulatory pressure do not have any meaningful impact on this transition, it is made entirely for economic reasons. Renewable energy (solar, wind) proves manifestly uncompetitive in this new environment and becomes mostly a historical amusement.

Winning career paths: Nuclear and battery storage engineering, electric generator / motor design

Disrupted career paths: Petroleum mining, transport and refining, and renewable energy technology

Multi-polar global financial system

Estimated probability: 55%

US government borrowing (printing) has already entered a parabolic phase which cannot continue for even a decade, let alone 2. However, there is still a massive amount of institutional momentum around the dollar system so its eventual fade from prominence will not be quick or linear in nature. We should expect a patchwork of different solutions to emerge across the global financial system. Major currencies such as the US dollar will almost certainly continue to exist in some form, but what will significantly change will be the ability of governments to borrow money by printing it. Pressure from prediction markets and geographically dispersed groups will frustrate both borrowing and classical tax collection, leaving governments with no alternative but to cut spending and try to attract productive residents with libertarian pro-business policies.

We should expect some countries to embrace hard money such as Bitcoin or metal-backed currencies while other countries will continue to use debt based money. We should expect a long but relatively gentle devaluation of major currencies like the USD, with numerous currency crises happening in emerging markets.

Winning career paths: Financial / commodities trader, arbitrage trader.

Disrupted career paths: Classical banking, careers dependent on government spending

End of copyright and patent based business models

Estimated probability: 60%

Initially conceived as a protection for inventors against unscrupulous factories, patents have evolved into a mechanism that largely protects established industry players against disruptive

startups. The problem with patents is that the incentive for those writing them is to be as broad as possible without getting rejected. If they're too broad, then they risk rejection for patenting something deemed to exist already. So the way to avoid rejection is to write in a form of doublespeak which seems narrow and specific to the patent examiner, but also allows lawyers to argue that just about anything is infringement. This form of malicious vagueness is called [Motte and Bailey Doctrine](#), and it has become the standard way in which patents are written.

But patents are not even ideal for established industry players. Industry players often engage in Patent Pools and Covenants Not To Sue, tacitly admitting that they all do things which are potentially covered by each other's patents, and that litigation would be mutually assured destruction. However, there is another type of entity which is dangerous to even established industry players, and this is the Patent Troll. So-called patent trolls are small organizations which do nothing at all except write patents and sue. They do not make anything so they are insulated from any patent infringement suits of their own, and therefore they are able to attack with impunity.

AI has proven unparalleled in its capacity to generate paperwork, and we can expect that it will exacerbate this trend, leading potentially to thousands or even hundreds of thousands of one-man, work-from-home patent trolling operations. People and businesses who create things will inevitably find themselves moving to locations where they are insulated from patent litigation. This will create pressure on governments to liberalize their patent legislation in order to attract business.

On the copyright side, things are not much better. AI companies insist that training AI on a work does not constitute copying, and as AI is currently thought to be critical to next-generation military/economic supremacy, governments have been receptive to this argument. However, users of AI are able to "launder" concepts and themes out of copyrighted work at a scale never seen before. But AI is only the most recent blow to copyright based business models. Music and film has already been suffering a steady decline, as the ever-broadening array of media options creates a fickle and apathetic audience who wants to be entertained as cheaply as possible. Streaming services have become the new media gatekeepers, negotiating ever decreasing royalties under the implicit threat of irrelevance.

New media creators such as Youtubers often fuse marketing with content, effectively side-stepping the need for copyright monetization. Likewise, Software as a Service (SaaS) side-steps the need for copyright protection of the code, as the code is kept secret on company servers.

By 2060, we should expect that patents will be generally considered an unenforceable relic, and their usage will be mostly a formality. Likewise, copyright will be used primarily between contracting businesses and their employees to formalize digital asset ownership. Business models which depend on sharing copyrighted material with the general public will be considered an unfruitful endeavor as AI is able to create "remixes" that are not provably copies. Trade

secrets (e.g. SaaS) and Trademark protection will continue to thrive as reputation becomes an increasingly important asset.

Winning career paths: New media creators, startup founders

Disrupted career paths: Corporate roles dependent on protection from startups.

Non-predictions

There are some popular future predictions which we are not standing by, and here we will discuss briefly why.

AI mass unemployment

This is a popular narrative that AI will soon become so powerful that it will be able to do all jobs currently done by humans, leaving practically everyone unemployed. This narrative dates back to the early 20th century when the same thing was believed of mechanization. Over the 20th century, mechanization and mass production *did* disrupt almost all pre-20th century jobs, but there was no real impact on overall employment (at least until the post-1971 malaise era). Old beliefs have a tendency to be recycled and carried forth, something we see in Nostradamus / apocalypse predictions which never seem to leave the public consciousness, no matter how many times they are disproven. We also must consider the impact of AI companies and their investors on steering the public discourse about the future of their technology. For all of these reasons, we consider that the prospect of AI based mass-unemployment is significantly over-blown and that in reality, it does not have a high enough likelihood to be worth putting on the list.

World government

This has often been discussed as a dystopian future, and it appears to have been a goal in the past, but with the decentralization of narrative power and rise of prediction markets, this future begins to seem impossibly out of reach. Furthermore, the resurgence of nationalistic and multi-polar sentiments also serves as a nail in the coffin of global cooperation / empire.

End of globalization

While world government is unrealistic, an end to globalization is also considered unlikely. This is because global communication through the internet has already given rise to cross-border collaborations and geographically dispersed groups. Furthermore, high tech specialization and SaaS services which serve the whole world have been the norm for almost two decades, and it seems that this trend will only accelerate. While nationalistic sentiments are running high in this era, a post-globalization world would be more or less a post-internet world, and there is just no realistic basis for that in the currently identifiable trends.

Climate catastrophe

This is a controversial topic because a lot of people have strong opinions about it, but in our analysis, there is no scenario which is likely enough to warrant specific preparation. Firstly, the topic is suspect just on account of the fact that catastrophe predictions are very common throughout history, they have a strong cultural draw, and so far none of them have panned out. Furthermore, the stated likelihood and impact of popular climate predictions is such that we should expect to see significant predictive investments in classical financial markets. So far the scale of investments based on climate predictions seems to be fairly modest, so we can conclude that the people whose job is to predict the future, mostly don't expect anything to happen.

Priority career paths

Based on these identified trends and predictions, we identify 5 "priority career paths". These are career paths which are expected to be robust and have good growth potential, but which also seem to have good risk/reward properties. Roles such as DNA nano-assembly specialist were not considered because the technology is still so young that risk involved in entering that specialism is too high for the potential reward. A major theme is the creation of SaaS services which perform the actual customer-facing "work" using software, so that the same effort is re-usable for servicing everyone on earth.

This does not have all of the elements described in MEMO 0001, it is just a first attempt to ideate on some possible career paths. These will be further explored in later documents.

Process engineer

The role of a process engineer is to identify processes used in business, formalize them, and then design software to make those processes easier. They lead product management in SaaS companies and will likely become the new superstars, as programming is increasingly commoditized. An example of a process engineer's job would be to analyze the job of a plumber and design an app to help plumbers estimate jobs, plan parts orders, and invoice at the end. This app will use the best practices of great plumbers to propose job solutions (e.g. pipe layout designs) that meet the highest standards, thus amplifying the capabilities of even young and mediocre plumbers.

Robotics engineer

Robotics engineers will have a similar role to process engineers, and they will in many cases work together. Robotics engineers will be in charge of bridging the gap between the process, as defined by the process engineer, and the set of software, hardware, and AI models, which can reliably perform it. An example of a robotics engineer would be someone who works on the

robotic hardware and software to do comprehensive landscaping, including mowing, trimming, pruning, mulching, etc.

Ethics modeller

The role of an ethics modeller will be codifying legal, ethical, and moral concepts in order to create software / AI which is capable of predicting legal dispute outcomes, and identifying reputational issues which may arise from decisions. One product that ethics modellers will produce will be an AI legal and ethical advisor which businesses can use to avoid unexpected liability or reputational damage. Ethics modellers will also be involved in market-making of prediction markets relative to legal disputes.

Quantitative analyst and trend forecaster

Quantitative analysis and trend forecasting are already well established fields, but low-risk high return opportunities are limited in scale, so once enough investment money flows into them the market corrects and they go away. This means that as the prediction industry grows, the challenge becomes ever more difficult. Therefore more analysts and more advanced methods will be needed for investment firms to stay afloat. The scope of analysis will undoubtedly grow from markets, to also encompass corporations, societies and governments and this is an area which is almost certain to be perpetually hiring.

Content creator

The decline of copyright based business models and the rise of reputation are converging to push sincere, authentic, quality indy creators into the limelight. In order to differentiate themselves in an environment saturated with low effort “slop”, creators will seek to continuously raise the quality and authenticity of their work. We should expect a huge diversity of niche creators making content related to their specific domain expertise. Product promotions will increasingly become seamlessly integrated into the content, such as cooking videos promoting the ingredients they are using.

Conclusion

In this document we have explored current trends, future predictions, non-predictions, and extrapolated from this, some potential priority career paths. The key deliverable of this document is the future predictions. These predicted scenarios are derived from verified existing trends, so the estimated probabilities are quite high. Some thought was informally paid to the risk/reward profile and synergies of the career paths (as described in MEMO 0001), but this has not been formally examined yet. In a follow-up document, we will explore the risk/reward and synergies as well as probability of success and potential value, as well as the skill tree that will be needed to reach these careers.