

# We Can Predict the Future Only by Learning to Map the Present |

Tim O'Reilly

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"I didn't predict the future. I drew a map of the present that identified the forces shaping the technology and business landscape." – Tim O'Reilly

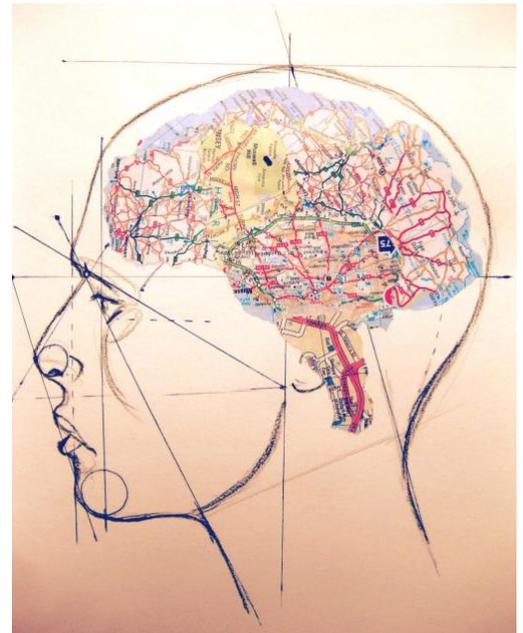
## INTRODUCTION

**What's up everybody?** Welcome to this week's episode of Hidden Forces, with me, Demetri Kofinas. My guest for this episode is Tim O'Reilly. Tim is the founder of O'Reilly Media, and a pioneer of the early Internet, having popularized the terms Open Source and Web 2.0. He is the author of numerous books including: WTF? What's the Future and Why It's Up to Us.

"The map is not the territory."  
— Alfred Korzybski

## THE MAP

1. Mapmaker – You have called yourself a "mapmaker" and that your "book is a map." What kinds of maps/models are most people are working off of today? How much does your map differ from those of others? Why might this be? How does the speed of change affect the quality of our maps, the need for updating them sooner, and how does it challenge our expectations about the immutability of some singular, human experience?
2. Updating Our Maps – Do you think we spend more time in our heads today than in the past? (open email threads, text messages, running social media posts, etc.) Does this make us more vulnerable to "mistaking the map for the territory?" Borthwick says he makes a point to "stay close" to the technology around which he is investing (building, using, etc.) – is this another way of protecting ourselves from getting lost in our maps, so that we can update them accordingly?
3. Building Accurate Maps – How do we train ourselves to look deeper, beyond the noise and beneath the simulation? How do we shake ourselves out of thinking in old paradigms? How do we get better at seeing and understanding the source of what is driving our perception and not mistaking the map for the territory?
4. Working Off Good Maps – You have asked: "Where is technology taking us? Is it going to fill us with astonishment or dismay? And most important, what is our role in deciding that future? How do we make choices today that will result in a world we want to live in?" You have also said: "We must keep asking: What will new technology let us do that was previously impossible? Will it help us build the kind of society we want to live in?" If history is any guide, learning how to think differently – building a new map that incorporates the tools of today and those that are soon to come – takes time, energy, and talented minds able to spread the gospel of the future. How do we facilitate a faster, better, and deeper adoption of new maps that show us more of what is possible and less of what is impossible? How do we use those maps to guide us as we engineer the future?

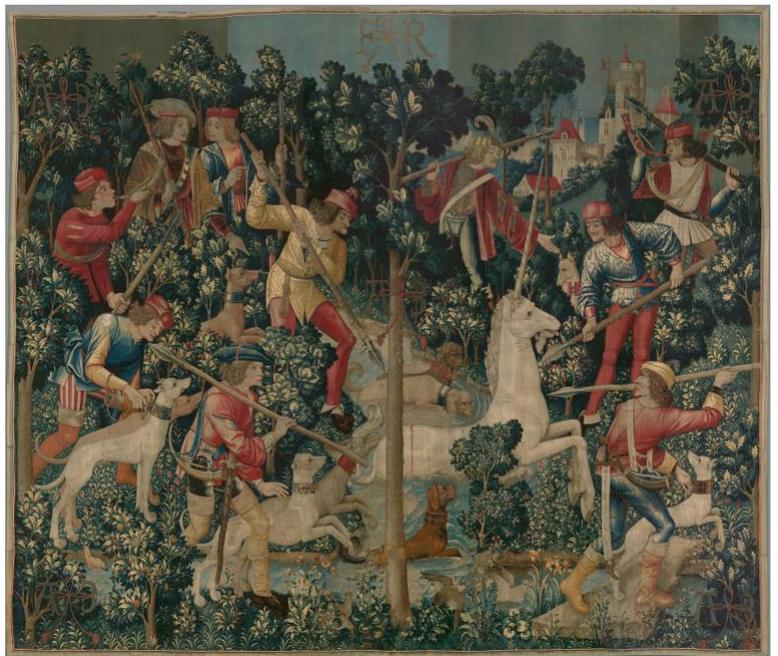


5. Predicting the Future – You have developed techniques, maps, and mental models to help you predict and to help you form a framework for thinking about how technology is changing the nature of our world (business, government, education, etc.). **Can you walk us through how you do this? How do you see the future?**

## SEEING UNICORNS

6. Learning How To 'Think Different' – You have said that “understanding the future requires discarding the way you think about the present.” Easier said than done! **Can this be taught? What does it *feel like* to do this in practice?**
7. Seeing Unicorns – You have this great quote by Tom Stoppard about how the vision of a world that would normally seem impossible (magic) spreads from the mind of a single person, to become a collective reality. You wrote in your book: **“Treat curiosity and wonder as a guide to the future. That sense of wonder may just mean that those crazy enthusiasts are seeing something that you don't . . . yet.”** **What does this allegory mean to you?** For me, it is a description of how one person's vision of the future becomes lived reality, and it speaks to what common reality is – it is the common experience. **What unicorns do you see?**
8. You wrote: **“This is a key lesson in how to see the future: bring people together who are already living in it.”** This is something that we strive to do with this show. You are part of that process, and so are all those listening. There's something REALLY POWERFUL in this statement. **Do you believe that, on some level, anything is possible? That there is no problem we cannot solve? That we can build a beautiful future together if we just find a way to spread the vision of that utopia?**
9. Unicorn Tapestries – I'm reminded of the Unicorn Tapestries. Are you familiar with them? (The Hunt of the Unicorn & The Unicorn in Captivity). This may stray from the classic interpretations, but I have always seen the hunt and the captivity as a commentary on the dark side of humanity, and how we deal with or react to things that seem too beautiful for this earth. Another way to think of it is that they are beyond the framework that we have for understanding the world. The visionaries who bring us the future are often ridiculed or fought against by the established paradigm. Worse, they can be hunted down and persecuted. There is also a dark side to seeing a unicorn. At the same time, the unicorn could represent the beautiful aspects of humanity that we are readily destroying in order to make way for the machines we are creating. **How concerned are you that we are discarding the old so quickly that we haven't had the time to take proper account of what we had to begin with? Do we need a strict definition of what constitutes a human being?**

A man breaking his journey between one place and another at a third place of no name, character, population or significance, sees a unicorn cross his path and disappear...“My God,” says a second man, “I must be dreaming, I thought I saw a unicorn.” At which point, a dimension is added that makes the experience as alarming as it will ever be. A third witness, you understand, adds no further dimension but only spreads it thinner, and a fourth thinner still, and **the more witnesses there are the thinner it gets and the more reasonable it becomes until it is as thin as reality, the name we give to the common experience.** - Tom Stoppard, British playwright and screenwriter



## THE FUTURE

10. The Vanguard Of Disruption – What areas/sectors of the economy are most likely to be disrupted first? (based on market forces) How will they be disrupted? Are there areas that *need* to be disrupted first? (government incentive). Healthcare seems like an obvious contender, as does education. How does the “on-demand” economy fit into this?
11. Distributed Consensus – How would a solution to distributed consensus change your calculus and force you to alter your map? Would this be a revolution akin to the Internet? Would it be the biggest revolution since the Internet?
12. A New Dark Age – You are a classicist by training. How does that training inform your thinking? Do you see similarities between the world today and societies past? Do you ever worry that we will fall into a new dark age? What would cause such a thing? Do you worry about a rebellion of sorts among the luddites?



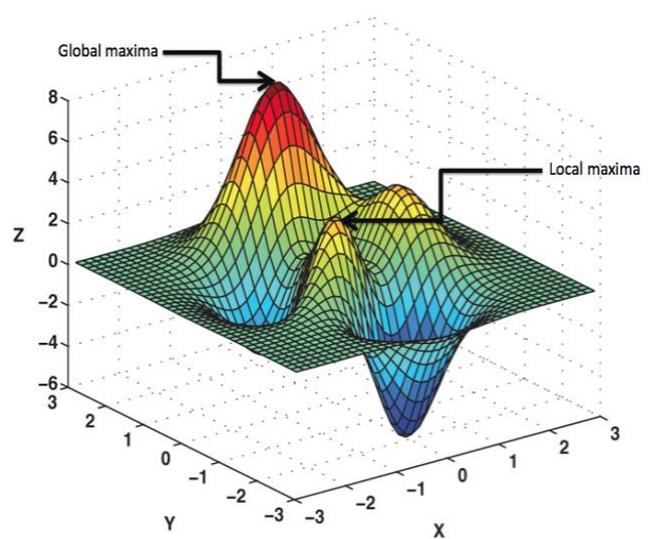
## RETHINKING GOVERNANCE AND THE MARKET ECONOMY

13. Technology Is a Tool – Technology is just a tool. What we choose to do with the tools of technology is up to us. The way a society is organized – the governing framework that compels and incentivizes through laws and regulations – determines our use of new technologies and informs how we integrate them into our lives. Our modern systems of social organization (liberal democracies) and wealth creation (capital markets) were created over the course of hundreds of years of cultural evolution. Are these systems ill-adapted for the tools we have/are creating?
14. Wicked Problems – How have different societies/polities (US, China, North Korea, etc.) used technology? How, *exactly*, do you feel that our technologies have interacted with our market economy to produce vast discrepancies in income and wealth? What role do financial markets play and is there a need for us to re-think how we regulate them? If we were building an economy from scratch – taking into account our best map – how would we build it?
15. Financial System – What is the objective function of financial markets? “The social responsibility of business is to increase profits.” – Milton Friedman. I like this idea that “we need to redesign the world in order to make the dreams of the technology possible.” This isn’t a matter of designing our tech right. It’s a matter of designing our social, political, and economic systems in order to take advantage of the tools that are now and will be at our disposal.
16. Taxes, Regulations, & Wars - You’ve said that “we made the wrong choice forty years ago,” when referring to, I assume, the deregulation and tax policy of the Regan administration. I’ve spend some time in my career studying this period, and I agree that much was done then that has created the problems of today, but how do we address the fact that many small businesses are over-regulated and that many people are over-taxed? What about the way that we globalized in the 90s? What about the wars of the 2000s? It’s not clear to me which “period” is most significant, other than to say that the burdens and benefits of empire have taken their toll. How important is tax policy in redistribution (transfer payments), or is that old hat? Can we find a better way to do this?
17. Rewarding The Builders – Entrepreneurs drive innovation, and the experience of succeeding in the face of tremendous odds and after taking on huge risks creates a communal sense that we deserve a bigger

A **wicked problem** is a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. Another definition is "a problem whose social complexity means that it has no determinable stopping point". Moreover, because of complex interdependencies, the effort to solve one aspect of a wicked problem may reveal or create other problems.

piece of the pie. It seems unfair that anyone should expect us to sacrifice so much without being properly rewarded. How do we not just incentivize, but proportionally reward (morally speaking) the winners, without wrecking the system? What is fair in the 21<sup>st</sup> Century?

18. Optimization vs. Resilience - You mention the concept of a "fitness landscape" in your book. Do you think that we are no longer genetically adapted for the environment that we are creating? Are we running state-of-the-art software on legacy hardware? Is there a limit to how human beings can organize? Is the momentum pushing us towards re-engineering the human animal? We are, after all, just apes with calculators.



19. Major Disruptive Forces Shaping the World:

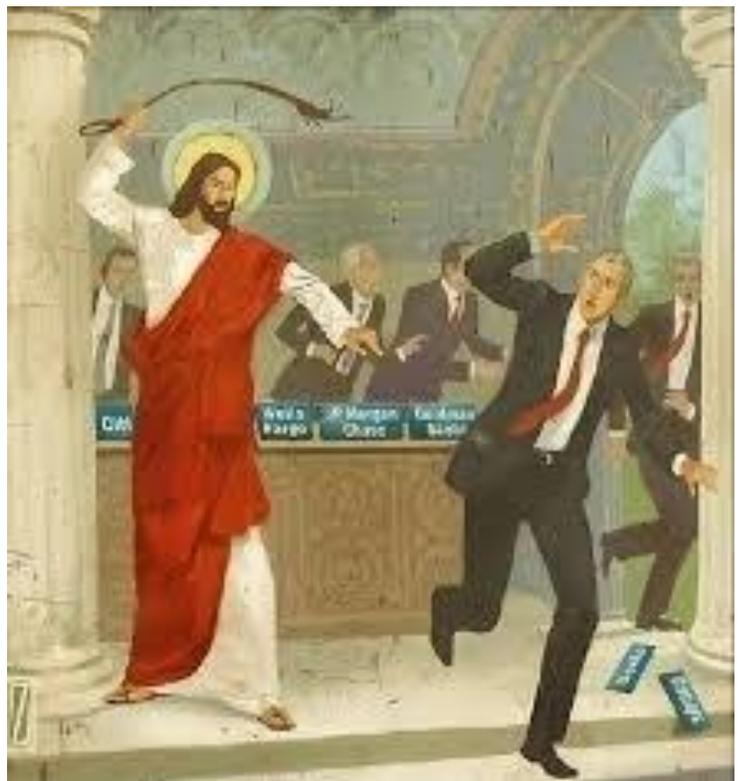
- Demographics (people are living longer, and fewer people are being born)
- Globalization
- Urbanization
- Technology

20. Open Source – Talk to me about the history of the Open Source movement (originally dubbed the “free software” movement by Richard Stallman). Is open source universally good? Apple is a great example of a company that exerted a tremendous amount of control and secrecy over their hardware/software, and yet, I would make the argument that we were better off for it. What are the pros/cons of the Apple Store model for software developers? How does this relate to innovations happening on the blockchain, and the challenges of governance?

21. Walking the Value Line – You ask: “How can a business create more value for society than it captures for itself?” This is a powerful question, because it speaks to the dilemma that has become more important today than in the past. Modern companies that are adept at using technology can create a lot of value for society, but they also need to capture some of that value for themselves in order to make their business viable. On one extreme, you have the free internet protocols or Wikipedia. On the other, you have the securitization market of the 2000s, where wealth was syphoned (hydroponics of growing mortgage market only to wreck it for the paltry gains – usury). How do you find that middle ground? Who is doing it right? Who is in a position to pass judgement?

22. Education – How important is education to you, and I don’t mean secondary or university education? I mean education in the purest, most abstract sense of that term: learning. How do we learn today? Considering the pace of change, is there a way for us to “learn how to learn” better?

23. The Early Internet – Let’s talk about the early days of the Internet. What did you learn? How did it feel to live in that period? Was it hard to escape the hype?



## CENTRALIZATION VS. DECENTRALIZATION

24. What are the advantages of decentralization? (finding ways to capture value without controlling the participants)
25. How do we rethink regulations in a decentralized world?
26. Do you believe that the current iterations of blockchain technology can fulfill the promise of distributed consensus for the data layer? Might there be an alternative protocol that will solve it? Does it already exist?

- HARNESSING COLLECTIVE INTELLIGENCE
- DATA AS THE NEXT INTEL INSIDE
- THE END OF THE SOFTWARE RELEASE CYCLE
- THINKING IN VECTORS

## WHAT IS REAL?

27. The End of Innocence – Are we discovering that truth was never objective, or that most of what we believed as being “true” was just social convention? Are we also discovering that most of what we have considered “facts” are actually a reflection of our trust in authority?
28. Truth in the Age of Algorithms – Are you suggesting that maybe, the way to create truth determining algorithms is by rewarding articles that are the most sourced? Don't we run the risk here of diminishing the visibility of new truths (i.e. unicorns)? How do we prevent the fitness landscape from being dominated by one meme? This doesn't seem like a resilient marketplace. (Thoughts on recent changes proposed by Facebook to its newsfeed?)
29. Korzybski's Injunction – You mention a man named George Simon, who had an important role in shaping your intellectual life by introducing you to the work of Alfred Korzybski, and his book Science and Sanity, which dealt with the question of “what is knowable,” since everything we know is mediated by our senses (nervous system) and our brains, which operate using language. How important is language in structuring perception? Do you see a connection between Korzybski's insights and those of Immanuel Kant's philosophy of mathematics, that arithmetic and geometry is how we structure time and space?
30. Reflexivity – You cite George Soros in your book – specifically, his theory of reflexivity, built off of Karl Popper's ‘Oedipal effect,’ (the oracle played a most important role in the sequence of events which led to the fulfilment of its prophecy) – as you make a point about the communally formed nature of truth in most places where it matters (stock markets, history, politics, etc.). Let's discuss.

**Korzybski's Injunction** - humans are limited in what they know by (1) the structure of their nervous systems, and (2) the structure of their languages. Humans cannot experience the world directly, but only through their "abstractions" (nonverbal impressions or "gleanings" derived from the nervous system, and verbal indicators expressed and derived from language). These sometimes mislead us about what is the case. Our understanding sometimes lacks *similarity of structure* with what is actually happening.

## HUMANS IN AN AGE OF MACHINES

31. Symbiogenesis – You put forward this theory of Symbiogenesis, which was developed in biology to explain how eukaryotic cells evolved out of prokaryotic organisms, as a framework for thinking about our place in a world of machines. It's a very useful framework, and one that I've thought of myself in a different manner. First, can you explain this framework? Second, do you see a benefit in thinking about how we design our machines with ourselves as beneficent parasites? Gut bacteria? Is this an approach to solving the AI control problem, which refers to the challenge of building an AI that aids its creators without inadvertently harming us? You can't “debug” an AI. It's out of our hands at that point.

“Humans are living in the guts of an AI that is only now being born. Perhaps, like us, the global AI will not be an independent entity, but a symbiosis with the human consciousnesses living within it and alongside it.” – Tim O'Reilly

32. The Optimist's Message – Digitalization of everything will help us understand our world in ways we never could before and ‘debug it,’ in your estimation. What are some major problems that you think we could “debug?” You have talked about “augmenting people.” This is interesting.
33. Sigmoidal vs. Exponential – You make the point that the rate of growth we are experiencing is a sigmoidal function, not an exponential one. How does this put you at odds with futurists like Ray Kurzweil? If it's sigmoidal, how long before the curve begins to flatten out?
34. Finite Time Singularity – Geoffrey West writes about how our social systems demand exponential growth, while our physical environment features sublinear scaling. Technology bridges the divide at points that he calls “finite time singularities.” His function is one that could go from an exponential function to an inverse one (i.e. dark age). As a classist, how does this fit into your study of the fall of Rome?

## Can We Understand Evolution Without Symbiogenesis?

Francisco Carrapiço

*...symbiosis is more than a mere casual and isolated biological phenomenon: it is in reality the most fundamental and universal order or law of life.*

Hermann Reinheimer (1915)

**Abstract:** This work is a contribution to the literature and knowledge on evolution that takes into account the biological data obtained on symbiosis and symbiogenesis. Evolution is traditionally considered a gradual process essentially consisting of natural selection, conducted on minimal phenotypic variations that are the result of mutations and genetic recombinations to form new species. However, the biological world presents and involves symbiotic associations between different organisms to form consortia, a new structural life dimension and a symbiont-induced speciation. The acknowledgment of this reality implies a new understanding of the natural world in which symbiogenesis plays an important role as an evolutionary mechanism. Within this understanding, symbiosis is the key to the acquisition of new genes and new metabolic capacities driving living forms' evolution and the establishment of biodiversity and complexity on Earth. This chapter provides information on some of the key figures and their major works on symbiosis and symbiogenesis and reinforces the importance of these concepts in our understanding of the natural world and the role they play in the establishing of the evolutionary complexity of living systems. In this context, the concept of the symbiogenic superorganism is also discussed.

