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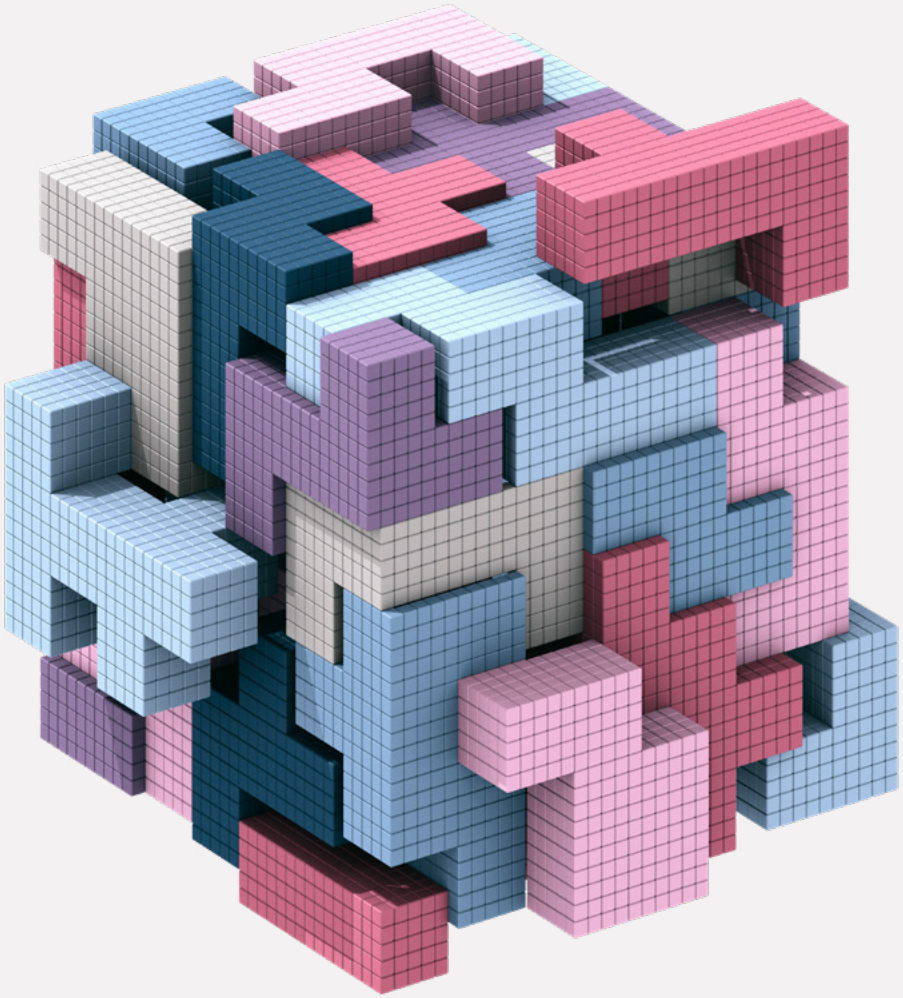
MAY 2022

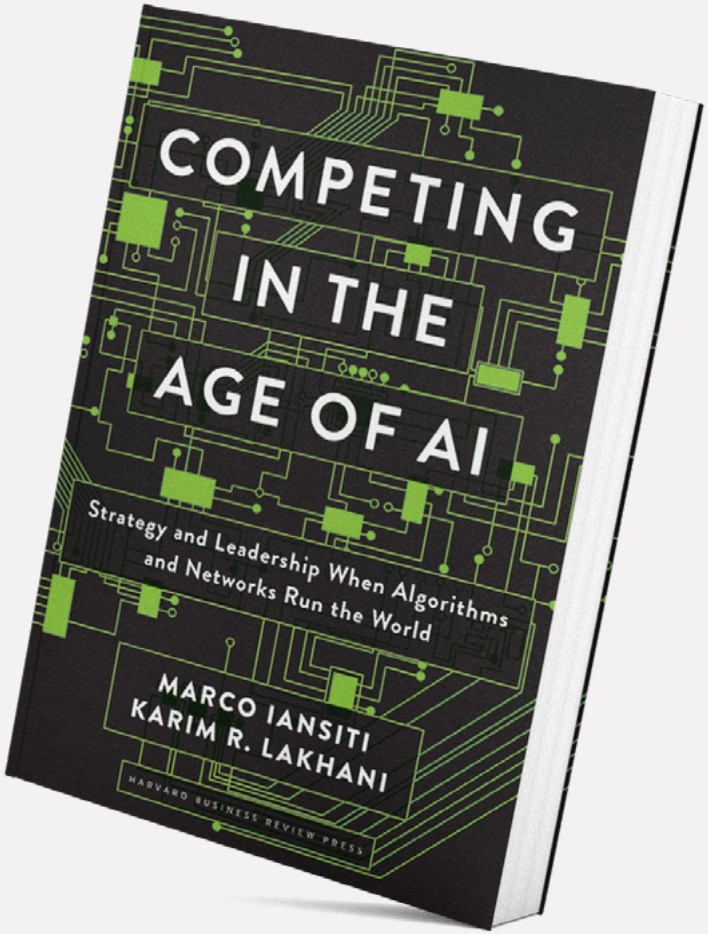
LISH
Laboratory for Innovation Science at Harvard



Business of AI

Technology disrupts but it's people who develop strategy and lead. Our Short Intensive Program is giving leaders new ways to learn.

Digital transformation: it's about leadership as well as technology



AI-first firms grow faster. They can scale and learn in ways that traditional organizations can't. Using algorithms, and with access to networks generating billions of data points, AI-centric companies have advantages that analog-born companies struggle to compete with. Think of the disruption caused to retail by Amazon. The more merchants operating on Amazon, the broader the range of products and the more customers arriving, and the more customers the greater the appeal to merchants and the wider the range of products in demand. So the network effect takes hold.

Despite an abundance of data, analytics, AI, and machine learning, there exists a shortage of managerial wisdom. How do we manage these exponential enterprises? That's one of the problems that LISH professors Karim Lakhani and Marco Iansiti set out to address in 'Competing in the Age of AI' (Harvard Business Press, 2020).

The book takes a broad view of digital transformation and its implications for business and society. Packed full of examples, anecdotes, and occasional humor, it considers what it takes to be an AI-first company. The authors identify how to build networks and the architecture that removes restraints on scope and scale.

The book's concluding chapter picks up the question of leadership and the lack of managerial wisdom. 'Engineering is not enough…[ ]. We must find better ways to manage the new assets and capabilities that are being created and deployed, every day, across every organization.' That's the challenge at the heart of our new hybrid, four-day 'Business of AI course' launched in February 2022.

Kicking off the course, Lakhani was joined by Vladimir Jacimovic, CEO of Continuum Capital Partners LLC, Executive Fellow at HBS, and HBS alumni. They discussed the book and its significance as the foundation for the four day course.

Founders and funders bring panels to life

Panel discussions were a central feature of the course and participants were treated to the views and insight of a stellar line-up of executives, entrepreneurs, explorers, and investors.

Day 1 The panel featured three co-founders and an investor in the healthcare sector.

Owen McCarthy, President & Co-Founder of **MedRythms**, a pioneer of digital therapeutics, was joined by Vinay Seth Mohta, CEO & Co-Founder of **Manifold.ai**, an AI company building scientific infrastructure for the modern era and Mahsa Rostami, CEO & Co-Founder of **Revero** which seeks to reverse the effects of autoimmune diseases via a virtual-first clinic. Representing the private equity community was Richard Zhang, a seed investor, Chief of Staff & Director of **Accelerator, Pear VC**. Richard has previously worked on using ML to optimize hospital operations.

> *"The key takeaway from this course is a lot of difficult problems in healthcare can be solved using AI.*
> - OWEN McCARTHY

Day 2 The panel discussion focused on the world of financial services, a sector that is rapidly applying new age digital technologies to transform customer experience.

The panel was made up of: Tess Michaels, CEO & Founder of **Stride Funding**, a Boston start-up providing flexible borrowing solutions as an alternative to traditional student loans; Javier Betancourt, Senior PM/PO of **nCino**, a cloud-based bank operating system 'built by bankers for bankers'; Kenneth Salas, COO of **Camino Financial** which is funding overlooked entrepreneurs through an AI-powered lending platform.

Day 3 The format changed, and the group heard from Bratin Saha, Vice President & General Manager of Machine Learning Services at **Amazon Web Services**.

> *"We're still in the early days of AI. It means a lot has to be done to integrate AI into every part of the business and get us into the age of industrialized AI.*
> - BRATIN SAHA

Day 4 Participants were treated to two panel discussions.

The first panel was not sector-specific but considered the perspective of both start-ups and incumbent organizations.

The participants were: Rob May, Venture Partner, at **PJC** and Co-Founder at **Dianthus**, an AI platform optimizing eCommerce; Vinciane Beauchene, Managing Director at **Boston Consulting Group** which specializes in agile at scale and digital transformation. She brought an international perspective joining from Paris, France; Rudina Seseri, Managing Director & Founder at **Glasswing Ventures**, a VC fund investing in early-stage AI and frontier technology start-ups.

Later in the day, the focus turned to career opportunities with a diverse panel representing views from Europe, Africa, and North America.

Dr. Rana el Kaliouby, Deputy CEO of **Smart Eye**, a Swedish-based eye-tracking outfit and Executive Fellow at HBS was joined by Bertrand Bodson, CEO of **Keywords Studios**, the international technical and creative services provider to the global video games industry.

Completing the line-up were Tuck Rickards, Managing Director of **Russell Reynolds Associates**, a consulting practice that helps enterprises find world-class leaders and Teresa Clarke, Chair of **Africa.com**, a women-led, modern digital media holding company with an extensive array of platforms that reach a global audience interested in African content and community.

It's not a marathon, it's a sprint.

> *"The results were unprecedented as the 250 participants identified more than 1,000 use cases in response to the call to invent the future of business with AI.*
>
> - VLADIMIR JACIMOVIC

Design sprints are a form of rapid prototyping. In its pure form, the design sprint is a five-day project in which a small group of up to nine contributors work together to deliver a tested solution to a stated problem. It is a way of validating an idea before major investments are made.

The process was conceived by a Google guy, Jake Knapp, who tested the process with more than 100 start-ups funded by Google Ventures (now GV). Knapp, with contributions from GV colleagues John Zeratsky, Braden Kowitz and others, authored a playbook called 'Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days' in 2016.

DAY 1 **Map** ▶ DAY 2 **Sketch** ▶ DAY 3 **Decide** ▶ DAY 4 **Prototype** ▶ DAY 5 **Test**

The archetypal design sprint process has the following phases: Participants in design sprints use online platforms such as Miro and Mural to record their work.

The sprint team is multi-disciplinary and includes a facilitator along with some combination of the following roles: designer, decision-maker such as the CEO or other executive sponsor, engineer, product developer, marketer.

Over time the process has been tailored for other scenarios.

Setting sights on future research subjects

The design sprint is one of the foundations of the SIP. It was modified from a five day exercise to a short 2-hour activity. In this instance, participants were presented with a number of questions (see below) to solve challenges across the three categories of healthcare, finance and technology. Their answers, captured on more than 200 Miro boards, have been used to identify new use cases.

Says Vladimir: "The design sprints were truly representative of how we are thinking about the future at HBS, bringing together current MBA students with HBS alumni to do something that has never been done before, solve problems in real time with a cross pollination of ideas and knowledge."

MIRO

The Business of AI course included three of these truncated design sprints.

186

PEOPLE PARTICIPATED ON DAY 1 IN THE HEALTHCARE SPRINT

213

PEOPLE CONTRIBUTED TO DAY 2'S FINANCE SPRINT

244

TOOK PART IN DAY 4'S TECHNOLOGY SPRINT

Carefully selected cases were a key component to the SIP. These focus discussion and help participants explore concepts around the adoption of AI such as value creation and data strategy.

VideaHealth:
Building the AI Factory

Florian Hillen, a serial MedTech entrepreneur, founded **VideaHealth** to improve the diagnostic accuracy of dental x-rays using AI. His team of dentistry veterans, software engineers, and machine learning experts, spent the initial years working on an AI factory. An organizational framework rather than a physical factory, it consisted of four stages: data pipeline, labeling operations, software infrastructure, and machine learning programs. The AI factory let Hillen experiment with new products faster than his competitors.

The hard work done in the formative years proved fruitful. Videa's AI products have surpassed human performance and can detect 25% more diseases than regular dental products. The products were successfully piloted in both the dental and insurance markets.

The case unpacks the various stages of the AI factory and its data flows. It also looks at the response from both sides of the market payors (insurers) and providers (dentists).

> *"AI and data analytics will improve the care of every dental patient in the not-too-distant future. But the transformation ahead involves many players, and we have to chart the right path to drive the change carefully.*
> - FLORIAN HILLEN

Commonwealth Bank:
Customer-Centric Design with AI

Sydney-based **Commonwealth Bank** (CommBank) is Australia's largest retail bank with more than 11 million customers. In 2015, it was part of the industry drive to standardize data and apply AI to attract and retain customers. To match the expectations of the fast-changing financial world and to introduce an interactive banking experience for customers, CommBank appointed Andrew McMullan as Chief Data and Analytics Officer. In the next three years McMullan and CEO Matt Comyn built an AI-enabled Customer Engagement Engine (CEE) that drew on 450 machine learning models and learned from 157 billion data points.

The HBS case compares the pre- and post-CEE landscapes and considers how Comyn and McMullan overcame internal resistance, data sharing barriers and requirements for technical capabilities that were unavailable within Australia.

The CEE has transformed CommBank operations and uncovered possibilities that weren't initially anticipated. Chief Decision Scientist, Dan Jermyn, joined the SIP from Sydney to provide his perspective on CommBank's CEE journey.

> *"We only really saw a fraction of the full potential of where we could take it. While the scope and impact we've had together has been way beyond what we imagined at the outset, we feel we're just getting started to connect the dots on some really big, important, and powerful things.* - MATT COMYN

SmartOne:
Building an AI Data Business

Habib and Shahysta Hassim, husband and wife co-founders, grew **SmartOne** from a call center to a successful data labeling firm. The desire to become a leading data processor using cutting-edge AI has translated into immense growth. Between 2016 and 2021, SmartOne doubled its bench strength every two years and now employs more than 1,000 data specialists, providing data annotation for global Fortune 500 companies and startups.

The HBS case, brings SmartOne's incredible journey to life. It explores SmartOne's business model, explaining the processes such as recruiting, training, resource and project management, and quality control. It also explores the concepts of data labeling, data pipeline, and the AI factory.

In 2021, when the case was published, Habib and Shahysta Hassim were considering options for future growth. They joined us from Madagascar to offer their unique perspective and answer questions from participants.

> *"Where in the AI factory could SmartOne position itself to remain relevant and take a piece of the evolving pie? Should the company grow upstream and become a full data pipeline provider? Or go downstream into developing algorithms?*
> - HABIB AND SHAHYSTA HASSIM

Over the four days authors joined the group and shared extracts and insights from their books on digital transformation.

'Networked products, on the other hand, have the unique capability to reactivate these users by enlisting active users to bring them back.'

Day 2's guest speaker was Andrew Chen author of 'The Cold Start Problem: How to start and scale network effects', (Harper Business 2021).

With dozens of similar tech products launched every day, it is tough for startups to stand out and compete. In The Cold Start Problem, Andrew Chen shows how entrepreneurs use network effects to capture market share. Using case studies, and drawing on his own experience as an early stage investor at Andreessen Horowitz and former Head of Rider Growth at Uber, Chen explains why the network effect has become the Holy Grail of growth for tech entrepreneurs and investors.

The book is divided into two parts. In the first, Chen talks about the framework and principles of network effects. In the second, he offers a practical approach for business executives building a network product. Readers learn how to attract initial users for a new product and scale existing products. He cites a ton of real-life examples from companies such as Bank of America (introducer of the credit card in the 1950s) to modern day network giants Apple, Google, LinkedIn, Tinder, and Airbnb.

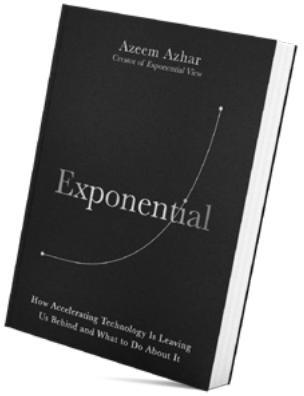
'You can either surrender the future to revolutionary challenges or revolutionize the way your company creates strategy.'

On day 3, technology day, co-authors Julia Hautz and Kurt Matzaler talked about their book 'Open Strategy: Mastering Disruption from Outside the C-Suite', Christian Stadler, Julia Hautz, Kurt Matzler, Stephan Friedrich von den Eichen, (MIT Press).

The digital revolution is making organizations step back and rethink their approaches to strategic planning and decision-making. Feudal, top-down thinking is being replaced by more democratic models better suited to a dynamic business environment. In this book, four renowned professors cite examples such as NATO, Nokia, NASA, Barclays, Adidas, and the US Navy and their experiments with 'Open Strategy'. Without boring readers with academic theory, the book takes an interactive approach. The methods, processes, and tools needed to 'open up' strategic initiatives are explained using case studies. Readers learn how to bring stakeholders including customers and front-line staff into the decision-making process.

The authors share tips to avoid the pitfalls that make open strategy implementation messy. Applying the principles in this book will help organizations build and sustain a responsive open strategy so that they reach their objectives faster and at lower costs.

'Those who are well-educated and lucky can thrive. Those who aren't might find themselves trapped in an unprecedentedly punitive workplace.'

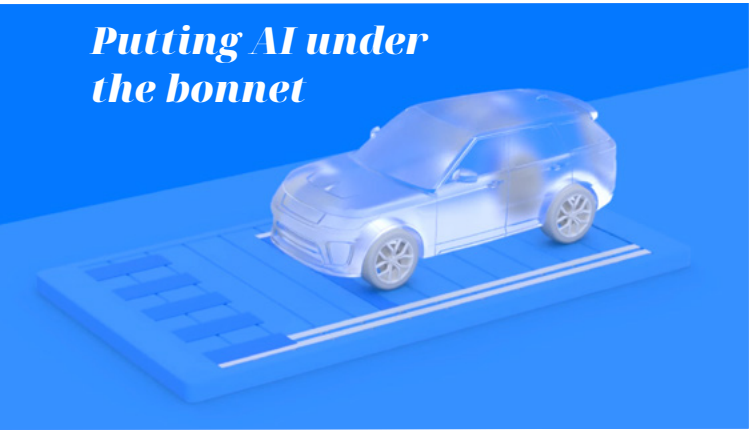


Day 4 kicked off with a talk by Azeem Azhar author of the 'The Exponential Age', (Diversion Books).

The Exponential Age raises the alarm on society's struggle to handle rapid technological innovations. Azeem Azhar describes the pain of individuals, businesses, and governments and their struggles to deal with the developments happening every day in the field of AI, computing, biology, and renewable energy. Society can only adapt incrementally while technology is evolving exponentially. This he calls the 'exponential gap'.

Azhar highlights how new technologies available at low cost are impacting economies, trade, civic institutions, and geopolitical alliances. Azhar backs all the arguments with facts and data, drawing on his own experience as a startup investor, technologist, and creator of the acclaimed 'Exponential View' newsletter.

Putting AI under the bonnet



Automotive engineer turned entrepreneur Qasar Younis is CEO & Founder of **Applied Intuition**, a company making software for the next generation of vehicles.

The five-year-old company has raised around $350million in funding. Operating from six offices around the world, it has more than 200 employees.

"We are essentially a tools company," Younis told our SIP audience. "But it is deep learning that enables the creation of autonomous vehicles" he said. The technology extracts human behavior to create models then those models are trained for simulation. "Without the advent of deep learning there would be no autonomy ecosystem."

He's bullish on the scope for autonomous vehicles but also realistic about the challenges: Talent is top of mind: "We are fighting for a limited amount of people in the industry". And it's a dynamic market: "Autonomy is changing constantly with new research and methodologies. Companies must keep up."

Q Tell us a bit about your journey and the choices you made.

A "When I was graduating, I didn't have any money and so I took a job for Eddie Lampert, a hedge fund manager who owned Sears Holdings. It was a brutal 2 years but I saved up about $30K- what would be needed for a year to go out to the Bay and I had 3 goals. They were to come up with an idea, find co-founders, and get funding. I had 12 months to do that. There's more seed money in the bay area. If you really are interested in software and start-ups Mountainview is the place and maybe Palo Alto and Sunnyvale. Figure out your industry and go there."

Q What of your education at HBS was useful, what are things you had to draw from, and what new things did you have to learn?

A "I believe the HBS brand is relevant in Silicon Valley – almost every venture fund has HBS MBAs even as partners. HBS folks tend to come with a level of polish and social acumen that I wouldn't say is prevalent. So, the raw education of what is a VC, how do you raise money, what is a term sheet all the way to the network and entrepreneurship at that time was super different."

Q Can you speak about finding a balance between having very good real-life data to improve your algorithm of driving cars and safety concerns.

A "You should be afraid when you get in a car. Humans are terrible drivers. The 'wavo' in the cruise vehicles are incredibly safe and have never had accidents where they are at fault. Any human driving for that many millions of miles would've gotten in many accidents. In terms of regulations, the Model-T hit mass production in 1906. The first stop sign in Detroit was in 1930. Regulatory environments tend not to lead, but to follow, and I think that will be true in autonomy."

> *"An AI business is still a business that faces challenges present in many technologies.*
> - QASAR YOUNIS

Drug discovery on speed dial

Mike Nally is the CEO of **Generate Biomedicines**, a company founded to generate breakthrough therapeutics by applying machine learning at scale.

SIP attendees heard Nally describe the usual course of drug discovery and how his business is reimagining that process. "It is an empirical process of trial and error that is random, takes months to years, focuses on individual modalities or diseases, and has high costs with low success. Generate Biomedicines creates a direct generation of potent, specific, and safe biomedicines that is precise and controlled, takes seconds to weeks, has multiple modalities and diseases, and is low cost with high success".

The company's vision is to leverage AI to instantly generate medicines that treat and cure humanity's most intractable diseases. They are doing this by turning the discovery process on its head. Nally said: "Drug discovery has long been centered around artisanal mastery over bespoke biology. That limits scale and potential adjacencies. Generate's platform is general across every protein modality and continues to learn with every protein we generate. That means that for the first time we're allowing network effects to take hold in biology. The rise of AI enabled discovery will rewrite the balance of power in the biomedicines industry."

It's an ambitious agenda and to achieve it Nally is set to grow his team from around 100 today to more than 450 by the end of 2023.

> *"The rise of AI enabled discovery will rewrite the balance of power in the biomedicines industry.*
> - MIKE NALLY

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Contact Us

150 Western Avenue | Suite 6.220 | Allston | MA 02134

lish@harvard.edu

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