Moonshot Mega Outline

1. **Introduction**
    - Story opener
        - First-person from “The War Room” with Uber’s CEO and executive team in 2015, underscoring the importance of network strategy
            - Overview of every network within the company - city by city
            - “Our network is collapsing! We need to stop the bleeding now”
            - NACS and Black Gold
        - Uber is a network of networks
            - Flags hanging from ceilings
            - Teams in hundreds of markets
            - Why is it so important to Uber?
            - How is it important to everyone else? (Quickly name drop a bunch of other tech companies)
    - The Most Powerful Force in the Tech Industry
        - (The engine that powers modern consumer tech companies is network effects, but we don’t really understand them. This book is explain how it all happens)
        - Most consumer tech companies have network effects at their core
            - People have been talking about network effects since the dot com boom (provide a toy definition to kick things off)
            - So what are network effects? (Define here)
            - Software is eating the world
            - The biggest winners started out as startups at one point
            - The big get bigger - that’s why FAANG is so big and are in winner-take-all markets
                - That’s why FAANG is so dominant - underutilization of time is much less now. Used to compete with waiting in line. Now you have to compete with hyper competitive addictive products
            - In my job in venture capital, we get to see a lot of these guys when they are small
            - One of the core reasons why these companies work is that they have virtuous cycles in the middle
            - Often these are called network effects
        - Increasingly, it’s the only option since competition can build easily
            - The zero sum era of mobile apps. Mass proliferation of products mean getting/maintaining the attention of customers is much harder
                - Noisy customer acquisition channels, plus lack of new platforms, but WOM always works
                - Law of shitty clickthroughs

        - Red Queen effect with consumers - have to run just to stay up to date
        - The zero-sum era of mobile apps. In the initial era of mobile, apps just competed with waiting in line and bathroom time - now they have to compete with many other choices. It's zero-sum
    - The zero defense era of competition
        - Consumer products are low defensibility, low technical risk
        - In a world where tech is easy to build, there's low defensibility. Network effects are one of the only levers that work
        - in the original dot come bubble, everything was hard
        - Now we have open source, cloud computing, remote teams, more funding, more users
            - Https://andrewchen.co/startups-are-cheaper-to-build-more-expensive-to-grow/
        - Low defensibility, low technical risk. Big guys can usually copy you, but they can't copy your network. Andy Rachleff quote. https://techcrunch.com/2012/09/30/why-angel-investors-dont-make-money-and-advice-for-people-who-are-going-to-become-angels-anyway/
        - Network products can grow organically, the big guys can't copy your network
        - FAANG is ridiculously dominant. They can copy, chase companies down, etc.
    - As a result, the best products will look like network products - they've been successful in the past, and will in the future
    - No wonder the best network products have been huge
    - Network effects aren't new - they've been around for a long time and are a powerful, classic strategy. Stretching back hundreds of years. But they are particularly important in tech because creating and joining a network is cheaper than ever
- Network effects are newly important in the tech sector
    - they've been around for a long time (radio, television, etc.)
    - however, a couple things have changed.
    - first, ubiquity of the internet, mobile, and digital platforms makes the size of the networks ridiculously big and quick to grow - as opposed to needing to build up infrastructure
    - new digital networks are interactive. More buyers can become sellers, etc
    - Transformation of the economy: Computers tell you what to do, or you tell computers what to do
    - software sits in the middle
- This is a foundational topic in tech
    - because of the upside, and because of the defensibility, network effects are key
    - The most powerful force in the most powerful new industry
    - this is why companies are getting bigger and bigger
        - Sachin: FAANG's depth of understanding of network effects is what has enabled them to avoid the classic innovator's dilemma. And make them stronger than incumbents in previous history and other industries. And the only way to fight back is to equally understand it.

        - However, there's a rift between the Practitioner and the Public
            - Practitioner: People at most network companies know how to improve their network - but are very deep in their domain
            - Public: For the public, they aren't able to connect the dots between companies
            - Someone has to generalize between the two groups, and abstract the ideas so that everyone can apply them
            - Here are questions we want to ask. But we don't know the answers (Pose the core questions the book answers)
                - What are network effects? We know they're important, but what kinds of products have them?
                - How do they start? How do you scale?
                - What markets have stronger network effects and are winner-take all, vs. which businesses will have weaker network effects / split markets (like rideshare)? And how does that translate into valuation for the company?
                - Why did Facebook win, versus dozens of other competitors, when they started as one of the smaller networks?
            - the right answer is to create a systematic framework
                - here are people we talked to, to kick things off
                - here are the concepts that we tried to generalize
                - the result is this book, which lays out a systematic framework with examples and playbooks
- Network Effects are Hard to Understand
    - (The surprising reasons why we don't understand network effects, including why previous frameworks like the oft-cited "Metcalfe's Law" are wrong)
    - Networks are tricky. Much of what we know about creating, launching, and scaling is wrong
        - Metcalfe's law is wrong
            - It says a network is valuable right away - when we know that a sub-scale network collapses
            - It says a network gets more valuable forever - but it's not because of crowding
            - It says that every node is homogeneous, and contributes the same amount of value. In reality, not every user in the network is equivalent, some are more valuable than others
            - It also implies that two separate networks should always merge, because then they can be worth, collectively, 4x as much
            - It focuses on the value of the network, when what we really care about is shifting individual user perception towards your product
            - The right answer looks like a S-curve with a droop. (But more on that later!)
                - Curves: https://a16z.com/2018/12/13/network-effects-dynamics-in-practice/
        - People say companies "have" or don't have network effects - It's not binary
        - If you think you have network effects, your competitors probably do too
            - Network effects are an attribute to product categories - not individual products
            - For example, all messaging apps have network effects
            - The question is who is futher along on the S-curve

            - “10 friends in 7 days” is wrong - Everything is a curve
                - 12 friends in 5 days would work too
                - There isn’t a single, discrete tipping point - there’s an S curve with a bend
        - The framework we need to understand network effects has a couple ingredients
            - common vocabulary
            - common framework - the guideposts along your way to success
        - Many product categories have network effects - and they share attributes
            - These all have network effects: Marketplaces, Social Platforms, Ad networks, App stores, Operating Systems, Cloud Storage, Dating apps
            - Network effects directly impact the business, by making products more viral. Engagement goes up over time. An ecosystem develops. (More on that later!)
            - Not every product has network effects, you can’t force it
            - It’s possible to add network effects to some product categories that don’t currently have it
                - Dropbox is a good example, for storage/sync. Airbnb for hotel services
                - This is a nice move to evolve the product category
        - How do I know if my product has network effects? (Here’s 5 questions to ask yourself)
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        - (Tell them again) We need common vocabulary and a framework to tackle all of this
            - Introduce the “Moonshot” framework, which is a step-by-step guide for how to define, launch, and scale networked products.
            - They present guideposts along your way to success
            - Anecdotes and case studies from successful companies and founders
    - How this book is organized
        - The moonshot framework
            - Short summaries for each section: The Cold Start, The Liftoff, Escape Velocity, The Space Race, The Slingshot, The Future
            - Need a visual - each section underneath an S-curve?
        - Not a lot has been documented - everything’s been passed verbally
            - The “cold start” problem - but harder, because networks don’t exist in a vacuum
            - how to get there?
            - what does it feel like to hit escape velocity?
            - what happens when two networks compete?
            - how to measure?
        - Understanding the case studies - the great companies
            - Uber, airbnb, etc (marketplaces)
            - Twitch, Instagram, Facebook/MySpace (social + content networks)

            - Dropbox, Slack (workplace collaboration)
            - Ycombinator
            - Bitcoin
            - … but also the cases where the companies didn't make it. Learn from the contrast!
        - This is how the book is organized

2. Cold Start

- Story opener
    - Atomic network of Twitch breaking off from Justin.tv
    - Or, Tinder starting from USC parties
- You need a plan to keep your network from naturally self-destructing
    - Core dilemma: Initially, there are negative network effects
        - it's the vicious cycle not the virtuous cycle.
        - Most networks fail because they tend towards self-destruction.
        - You need a plan to get break through and get to escape velocity
    - It's when the network effects start to help you rather than hurt you
    - Products are already hard to launch - networks are even harder
        - Not just the features, you need the right people too
    - Beating the cold start problem is counterintuitive
        - Initially bootstrapping the network requires some kind of "hack" - often this is clever and counter intuitive
            - Started with an outsider's mindset - sit outside the industry. They don't have knowledge of them
            - "This is too small"
            - "This won't scale"
            - "This has regulatory issues"
            - "You don't know what you're doing"
            - "You should start stealth and iterate"
            - Things that go against the grain of common startup wisdom
        - List a bunch of hacks as examples: Not iterative, analytical, large, direct path, scalable, profitable, real, etc
        - However, after you use the initial hack, you often have to get rid of it. Move on
        - It's easy to forget to discard, and keep optimizing the initial hack
- Define the Atomic Network
    - The atomic network is the smallest instantiation of your network such that people will stick around
        - It's hard to get a bunch of people to do the same thing at the same time. Same as a party
            - Has to be a really cool activity
            - People/well-liked people are going

        - Split off a group of people who are already at a party
        - Create tools, make it incredibly easy to share
        - Ask a smaller number of people to go
        - D'arcy: I think there is a point you're missing here on network structure. Centrality of nodes, closeness/farness, betweenness, flow of info and blockers, etc. dont think you need to get into the technical measurements, but do think laying out how different networks look and function differently is important is understanding why nfx seems so tricky.
    - Smaller is better
        - Important to get them there all at the same time - that's why smaller is better
        - Whatever you are thinking, try to think even smaller
        - Product/market fit with the smallest group possible
        - When it works, cohort curves will work, organic traction will start, etc
    - Examples of atomic networks
        - Start with the smallest atomic unit of a network ("frat" "neighborhood" "party")
        - Slack channel - the couple coworkers on your team that are working on a project together
        - "soho strategy" (via Chan) to get all the cars/people in the same place at the same time. Same with Uber China, which tried to concentrate in an expat neighborhood
        - Tinder/dating starts with party at USC - this is an offline atomic network into the LA community
    - Once you figure out a atomic network, you can slingshot to the next, and the next. Proof by induction
- Some networks have multiple sides - you have to focus on the most constrained side
    - There's a "network topology" to keep in mind
    - Two sided, three sided, multi-sided
    - Geo versus product SKU versus whatever
    - Frequency of use (more is better)
    - The minimum network will need to incorporate enough active entities to keep the whole thing going
    - Look at it from each constituent's POV. How to acquire, activate, engage, retain? Will need a strategy for each
    - Unlock new forms of supply to satisfy the demand
        - re: innovator's dilemma, the key is to target the underserved part of the market
        - There's often parts of the market that seem unattractive - fragmented, low margin, too small
            - For consumer products - teens
            - For marketplaces - underutilized assets
            - For enterprise - SMBs and prosumers
        - If you can use technology to unify this side, make it easier, then that's a great starting point
        - This is especially on the supply side
        - But often the most critical node of the network is the "supply"

            - The important aspect of the niche is underutilization of supply (empowering would-be suppliers, e.g. Twitch, IG content creators), which is easier to pick off market can can be its own network. Under-utilized inventory, asset, labor. Under-utilized content, time, etc. But needs to be its own standalone network that can be split off.
            - Marketplace launch pads start with remnant inventory, a underutilized asset, etc. Service marketplaces start with some kind of fragmented labor supply. Licensing constricts supply
            - Social/commas/etc starts with content supply that doesn't have an audience or isn't being captured. On the demand-side, underutilized time/engagement
        - The best networks tend to be supply-constrained over time
            - Supply side acquisition is often high-friction: Licensed labor, content creation, event organizer, fragmented or concentrated
            - One way is to provide tooling: Content creation tools / hosting, Supply side on marketplaces (More on that later)
- Atomic networks are grown one node at a time - or with a jump start, if you want to do an initial split
    - The atomic network starts with a leading node that's near the center
        - Either the node has to bring other neighbors, meaning, natural virality
            - Pick a center node that can spread quickly
            - Seller that promotes their store, to bring buyers in
            - Friends who invite each other to use a new communications app
            - IRL - like scooters
        - Easiest to atomic into another network
            - Split a new network off of an existing one
            - Airbnb and Craigslist - and generally, the unbundling craigslist strategy
            - Twitch from Justin TV
        - Identify the minimum sized group needed?
- The product matters - you need product/market fit on every side of the network
    - Tap into pre-existing demand and human motivations
        - Motivations that have already existed for a long time
        - People want to talk to their friends - that's the motivation. Phones, email, SMS, and Snap all satisfy
        - If it works, there will be so much demand that supply won't be able to keep up
        - People are always looking for new ways to satisfy their motivations. E.g. for shopping: bartering -> markets -> retail stores -> department stores -> e-commerce -> social commerce
    - Walk through the value prop from every side - it has to work on every side
        - You may intuitively think like the rider, or as a guy in a dating app, but you can't optimize for veryone
        - Market balance becomes a key concept

- The product experience is key. And every side of the network matters
    - Have to think about the value prop of each side of the network
    - How to acquire? What's the value prop? Why do they stick?
    - The product experience matters - it's not just the network
    - Social/content
        - For creators
            - Social feedback loop
            - Monetization
        - Viewer
            - Interesting content

- Figure out your growth hack to create density
    - New tech + human motivations + growth hack
    - Specifics
        - Addressbook importing for social networks
        - Video embeds for YouTube
        - New mobile platforms for messaging apps
        - GPS + mapping to unlock rideshare
    - Need to find a way to grow quickly, but open disposable
    - it's not enough to have a lot of users - you need a lot of density
        - density is what causes stickiness
        - You also need density in the right places
            - Viral growth
            - Some way to bring in a niche quickly
            - Might need to flip at various times: Tap into existing demand. Create new supply, then flip to growing demand… will have to flip back to supply in the long term
    - Start with a portfolio of different tactics, but ultimately only a few will scale
    - More sides of the platform will emerge over time - you'll have to master those too
        - (Worth touching on but probably not a deep discussion until a later section)
        - Influencers: For example, one-sided network effects (like Instagram) that grow into 2-sided platforms with more and more distinction between creators (suppliers) and demand (audience)
        - Advertisers/brands
        - Developer platforms
    - This is why networked products often start with a closed system niche in a market, establish liquidity, and go from there
        - Create one atomic network, then scale up, then build another and another

            - B2B: individual, then teams, department, then company
            - Geo: Yelp, Facebook, eBay, Airbnb, etc
            - Category: Twitch as part of YouTube
            - Others: International messaging versus global messaging. High-end videos versus horizontal.
    - Examples:
        -
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3. **Failure to Launch**
    - Opener
        - Potential case study/anchor story here is Uber's new market entry strategy
        - Tinder's strategy of throwing parties, expanding college-to-college
    - Central dilemma: Most networks fail to launch
        - Getting to a stable atomic network is easier said than done
        - Why is this?
        - When networks fail, they usually fail at the beginning! (Add drama)
            - Example of a network that failed?
                - How about any of the FB products they tried to spin up to copy other networks, like Poke, Paper, Bonfire?
            - Example of a network that worked
    - How to know when you're failing
        - Gravitational pull from cyclical churn. Churn that causes other users to churn
        - Normal techniques don't work
            - Launching doesn't guarantee the "right" people on the network
            - Can't just buy ads - you get randoms or it goes in an unintended direction
            - Users are bad at self-reporting
            - Product Death Cycle
            - Network Death Cycle
        - However, you can apply growth accounting to really understand how
            - net MAU = new + reactivated - churned
            - people need the "aha" moment to create word of mouth
            - churn will suck at the beginning - high bounce rates
            - reactivation won't matter since new products don't have many users to reactivate
        - Business metrics and KPIs
            - demand-side "zeroes" for Uber
            - supply side KPIs

        - How do you measure liquidity? “Getting liquidity?”
            - Match rate, Offer depth, Search to fill, Time to fill
- We need a better understanding of network effect curves to understand why they fail
    - Let’s step back
        - We know the cold start problem exists, and there’s a critical threshold
        - Can we create a better model for network effects that looks like a curve?
    - What goldfish can teach us about network effects
        - As mentioned, Metcalfe’s Law is wrong - but what’s the right way to think of things?
        - Surprisingly, fish ecology is more accurate about networks than metcalfe’s law
            - Small populations die off - not at a critical mass
            - Big populations can create overcrowding
            - These are complex adaptive systems. Hard to model
            - Terms
                - Allee effect (strong and weak)
                - Allee threshold
                - carrying capacity
                - population density
                - logistic curve
                - https://en.wikipedia.org/wiki/Allee_effect
    - The right way to think of this is that it’s an S-curve - it’s the “network effect curve”
        - The tipping point doesn’t exist - it’s a curve
    - Network effect curves are different, depending on the product
        - Each product has its own unique curve
            - Some have stronger network effects than others, different thresholds, different asymptotes, etc.
            - Gravitational pull on each side of the network
                - under escape velocity on one side
                - saturation/overcrowding on the other side
        - Failure modes
            - Know where you are on the curve
            - You can also have negative network effects, not positive
                - All your energy should be to break through to escape velocity
                - Doesn’t matter if it scales, or is profitable, etc.
            - How to make the atomic network as minimal as possible?
                - Make it useful with just 1 person, or small groups

        - Seed with bots, employees, etc to fake the network early on
        - Burn $
    - Focus on growth not getting the UX perfect
    - S curve rewards density rather than breadth of networks
        - This is why big company cross-sell launches don't work. This is why G+ doesn't work
    - You can overlay the S-curve on top of the various stages of the Moonshot framework
    - Understand network topology: Local vs global network effects
        - Local nfx products have a curve for each geography/market. Global can bridge curves between geos
        - Within enterprises, there are team-level and company-level network effects. Dropbox, Slack, etc. When "land and expand" happens virally within a business, that's an example of utilizing the network for GTM
            - It would be interesting to explore work networks in this context. It feels like work network products have "hyperlocal" (company-level) network effects -- they're valuable insofar as other people in the same team or organization are using it, but other companies using the product doesn't make it more valuable for a user at another company. There's a few exceptions to this, e.g. Affinity trying to create like a global CRM, and Dropbox which has cross-company collaboration (but even then, the network effects exist on the collaboration team level). Is this possibly why enterprise is more fragmented, and exits are usually smaller than consumer--because there's not global network effects at the same scale?
            - And decisions about enterprise products are often made in a top-down manner e.g. by IT, so maybe that shores up the intra-company network effects even more (OR makes them more fragile if the product that gets adopted by employees isn't sanctioned by the company)
- Formalizing the Network Effects Curve
    - Also, what's the right Y-axis? I argue, centered around the user's POV
        - The moat is a perception from a user, not just network value (unlike Metcalfe's)
        - Y-axis could be oriented on acquisition
            - % who activate and take their first trip (for ride share)
            - % who get to X friends in Y days
            - This is an S curve!
        - Y-axis could be oriented on engagement/utility
            - % who convert from a session to a trip request
            - % who are active on any given day
            - This is also an S curve!
        - There are a number of ways networks directly impact business metrics - big topic for later
    - you can grow the X-axis and Y-axis
        - some minimum networks are actually quite large. It's flat for a long time on the S-curve

        - some S-curves take forever to inflect
        - some S curves plateau early - if it's a small market
        - the point which the curve inflects is important. That's the escape velocity!
- Let's look at the launch playbook to see how others have solved
    - The playbook is built on the intersection of human motivations, tech breakthroughs, growth hacks
    - Successful liftoffs result from an intersection of pre-existing human motivations, new technology breakthroughs, and clever insights on growth
        - Could build off of: https://andrewchen.co/consumer-startups-at-a16z/
    - New tech emerging all the time - and faster too
        - Telephone versus mobile phone
        - Motivations were there, but had to teach people how to talk
        - Recent new technologies have been growing even faster
        - D'arcy: "FWIW I think there is something about the networks that lift-off that capture the zeitgeist of the era. Like the AirBnB / uber era was this time where everyone believed SV and an app could solve any problem, so we had a natural inclination to try (and trust) those products. Now I think we're in a time were there is less trust in institutions so crypto is capturing the mindshare. ultimately a successful product appeals to a core human motivations, but when we think about what people are willing to try and where we can get liftoff, i think it's worth acknowledging that some products find product-zeitgeist fit."
    - We're the same humans that have been around forever
        - We love scooters, take selfies, make art, etc
    - Spotting a "Growth Hack" to kick everything off
        - Build on pre-existing behavior that's already existed
        - Michelin guide? (Not sure this is relevant)
        - When these hacks are pointed at a network, then magic happens
        - Historical examples - coupons and grocery store
- Strategies and Tactics
    - Aggregate and create discovery of existing supply
        - Uber - going to black car companies and blocking out hours
    - Be the principal and produce the supply yourself
        - Beepi - bootstrapped the managed marketplace for used cars by actually going out and buying cars: "The hack that we did - bought 50-70 cars that we launched. After 4-5 months, moved to marketplace model."
        - Yik Yak - seeding interesting posts as content in the apps, upvoting and downvoting content (social)
    - Subsidize the market to capture proprietary supply
        - Uber - hourly guarantees
    - Flip the sell

        - Hotel Tonight: Call them up and buy hotel inventory
        - Good Dog: We want to feature you on our site...
- Fake it until you make it
    - Fake reddit users
    - Yik Yak - seeded network w/ fake posts that were generic enough to apply to any campus
    -
- Create new supply via training, UX improvements, etc.
    - Sidecar and Uber X - using unlicensed supply
- Use automation/AI to create new supply
    -
- Circumvent licensing (for marketplaces)
    - UberX - unlicensed taxi medallions
    - Airbnb - unlicensed hotels
    - YouTube - pirated content, like Lazy Sunday, music videos
- <social> Seeding with small groups of friends/smaller networks for social (“atomic” network)
    - Quora - started with 300 people in Bay Area
    - Secret - started with own network in Bay Area
    - Orkut - started with Google employees, who then invited their networks
    - Yik Yak - started with frats and sororities on a school-by-school basis, expanding out geographically
    - Facebook obviously
- Come for the tool stay for the network
    - Instagram photo filters
    - Youtube video hosting
    - Github project hosting
    - Dropbox sync - but stay for shared folders, collab tools
- Reward / loyalty systems for the supply side
    - Quora points
    - Yelp Elite
    - Foursquare checkin badges
    - Uber driver badges and trip counts, etc
- Community management / Launch tactics
    - Yelp Launch Parties
    - Uber Kittens
    - Rider Zero for Uber

- Uber discussion
  - Organizational structure
    - Highly decentralized. GMs, RGMs, etc. Leaderboards
    - Programs and platforms
    - Uber 1.0 cultural values
    - Monitoring market by market
  - Processes
    - Weekly ops syncs
    - Rollout processes by cities. Product Ops, rolling out 1% in cities
    - Flags hung from different offices by city
  - Interactions with cities
    - TK white paper https://www.dropbox.com/s/eq0oers5m9qwb1m/uber-policy-whitepaper.pdf?dl=0

4. Escape Velocity

- Opener
  - XXX example where things aren't working and then BOOM it works?
    -
  - XXX alternatively, could be contrasting Uber vs Sidecar and what happens when one is at scale and the other one isn't?
- It's not a magic bullet (Central dilemma)
  - Network effects sneak up on you, and it's not a magic bullet. You still have to work hard
  - You get some benefits
    - more organic as a % of total
    - decreasing CAC
    - smile curves on old cohorts
    - increased activation rates
  - But there's still a lot of problems - all your efforts are amplified but still fighting gravity
    - Underlying CAC is increasing
    - Churn is still straight down
  - Often you need multiple network effects happening at the same time
    - You can have data network effects on top of 2-sided network effects
  - There are three things you want to double down on:
    - 1) Your exponential growth curve is actually a bunch of lines, stacked
    - 2) viral growth = increasing returns for acquisition
    - 3) network density
      - Anti pattern: Big company builds a lot of little networks w no density. Google+ and others

        - Another anti pattern: Dropbox and personal networks (for photo sharing). Small networks, low frequency per ChenLi
        - Land and expand as a term as part of building out a network effect
- How Network Effects Actually Impact Business Metrics
    - Growth Accounting (Net MAU = new + reactivation - churned)
    - Why network effects can be optimized by growth teams optimizing a growth model
        - Growth hacks versus growth models
    - Shared fiction (from the book “Sapiens”). People begin to “believe” the network
        - New people show up automatically
        - People come back because it’s the “best” product
        - Becomes a place for people to make money / earn their living
        - Capture the zeitgeist of the era
    - 16 metrics to measure network effects, divided into 5 main categories: acquisition, competitors, engagement, marketplace, and economics-related metrics. https://a16z.com/2018/12/13/16-metrics-network-effects/
- Three vectors: A “vector” that connects network effects to business metrics
    - Viral Loops = Vector for Customer Acquisition
        - Advantages of viral growth
            - More organic acquisition
            - Lower CAC - people come to you!
            - Organic/WOM is an uncapped acquisition channel
        - How it happens
            - Viral loops are built on top of pre-existing networks
                - Early social networks on email
                - YouTube initially on MySpace
                - Yelp/etc on Google SEO
            - Use “viral factor” to measure the efficiency of producing new users
                - Can discount paid acquisition
            - Cross-side referrals (from drivers to riders, and riders to drivers)
            - Your network "surrounds" unconverted nodes, increasing their chances. The bigger your network, the more surrounded nodes get (Dark nodes via Chamath)
            - Esports produces video, people seeing each other use scooters, social networks built on email, rideshare built on IRL
        - How to make it better
            - Viral growth is a science, not just cool marketing stunts
            - Loops generate many casual users, which you convert to engaged users. Have to get them to climb a ladder of engagement

        - Virality is driven by engagement: Network effect = more density = more engagement = more virality
        - Viral growth is often intrinsic to the product category
            - Sharing, collaboration, communication, etc.
            - Some categories, like high-intent/low-frequency like real estate, or personal health/etc are hard to make viral
            - Mirror copy- inviter and invitee. Sharer and someone who's shared to
    - (Not every product with virality has network effects - a movie that everyone's talking about has virality, but not network effects)
- Smile curves = Vector for Engagement
    - More density over time increases engagement and frequency
        - more nodes in a communication network means more people to talk to (and who will talk to you)
        - more nodes in a marketplace means there's more listings, and higher transaction %
        - Fewer "zeroes" (empty profiles, searches, bookings, etc.)
    - Look at "ROI" from the standpoint of supply and demand
        - For supply, it's high ROI if a user can upload content and get a lot of social feedback
        - For demand, it's high ROI if a user can check a single place and see a lot of their friends
        - Algorithmic changes can help scale the smile curve
    - You can win "First look" versus competitors
    - Reactivation of individual users who come back because their friends are there
    - More frequency means higher monetization
- Emergence = Vector for Ecosystem
    - Supply is king. ("Why uber for X failed")
    - People learn to trust and count on the service
        - Professionalization of supply
        - Training
        - Ecosystem
        - Developer ecosystem
    - Higher utilization: asset, service, or something else
    - More liquidity - inventory turnover
    - Better unit economics
        - Transfer costly / risky development to partners
        - Do first couple app integrations on a SaaS platform, let others do the rest
    - Much of Uber's efforts have always been about the quest for supply
        - Supply growth as the tip of the tip of the spear. The most important team
        - XChange Leasing: 300 cars in Iraq, Somalia, Afghanistan
        - Lion City Rentals. ⅓ of new imports coming into Singapore

        - Licensed > unlicensed > shared > incentives battle > autonomous
- Network effects in conjunction with scale effects
    - Network effects can be combined with scale effects and traditional GTM strategies to accelerate
    - Scale effects - cost advantages, bigger advertising budgets, etc.
    - Use of B2B channels / marketing / sales to go “wall to wall”
    - FIXME: probably more to add here
- Understanding the math is great, but also getting exponential growth is hard work!
    - Your hockey stick isn't actually an exponential growth curve. It's a bunch of linear curves added together
        - Increasing geography
        - Increasing product lines (and revenue!)
        - Increasing automation
        - Increasing conversion
        - Increasing frequency and engagement (via new use cases?)
        - Increasing channels
            - Including sales - land and expand
    - What drives the “Land grab”
        - Competitive moats or lack thereof
        - Investor dollars piling into “winner-take-all” models
        - Consolidation of networks can be powerful - M&A
        - Once the moat is too deep for a new startup or a big company to try to buy into the market, then the land grab ends
        - When does a land grab make sense and when does it not?
            - Sachin: Might be interesting to have a discussion around when the "land grab" makes sense and what specific dynamics should be there for you to make that play. So thinking about this from the offensive as opposed to just the defensive that it's going to happen to you.
    - Global versus national versus local versus hyper local effects
        - Can leverage sometimes to expand egos
        - When you can show networks accelerating, that’s good!
            - Compare activity in city 1, versus 2, versus 3
        - Subnetwork acceleration (cities on top of each other)
        - The best network topology for geo-based networks: Global > Local > Hyperlocal

5. Space Race

- Opener
    - Uber China versus Didi (Mostly Ben Chiang’s interview)
        - Didi started with taxi hailing (tapping into existing supply)

        - Uber China was the smaller network, but figured out P2P
    - Social Network Wars
        - Andrew bets Arjun Banker on Facebook versus MySpace. Arjun wins!
            - https://andrewchen.co/why-i-doubted-facebook-could-build-a-billion-dollar-business-and-what-i-learned-from-being-horribly-wrong/
            - https://andrewchen.co/wanna-bet-in-1-year-will-facebook-be-bigger-or-will-myspace/
        - Facebook buys Octazen
        - Facebook buys Onavo
        - The successful players ended up being different enough versus Facebook to succeed
            - Reddit
            - Twitter - first to mobile, celebs/etc, interests
            - YouTube
- The network death spiral
    - (central dilemma) The downside can be catastrophic
        - The S-curve in reverse means networks can lose value exponentially
        - If you have network effects, your competitors often do as well. They often exist for the entire product category - when they win, and you lose, then the comparative difference is non-linear
        - If you get pushed out of orbit, then you can crash
        - The “Network Death Spiral”
        - Some network markets are winner-take-all, some are not
            - Managed versus unmanaged marketplaces (per Gurley point)
            - Hyperlocal versus global marketplaces (rideshare versus Airbnb)
- At scale, you’ll experience gravitational pull
    - Natural laws of gravity
        - Diminishing returns to scale - more notes matter less
        - Customer churn
        - Acquisition costs trend up over time
        - Examples of cities: https://www.quora.com/What-are-the-different-ways-in-which-network-effects-break-down
    - Misaligned incentives
        - Supply crisis - professionalization. Why supply tends to concentrate
        - Disintermediation
        - For social networks- spam, bots, etc
    - Crowding / scale effects
        - Run out of new goes, new product lines, etc.

        - Saturation effects on demand and supply
    - The most important gravitational pull, however, is competition
- How competitive pressure impacts business metrics
    - “Winner take all” is easy to say, but how does it actually manifest itself?
        - If your industry’s S curve doesn’t plateau early, then there is always an advantage to being ahead of another
        - Alternatively, just different networks entirely (Local network versus global network)
        - Contrast that with “Land war in Asia” if both networks are flat at the end (when both rideshare networks can deliver <5min ETAs)
    - Revisit the Growth Accounting framework. new + reactivated + engaged - churned
        - New user acquisition go down over time, especially organic. CAC goes up
        - Reactivation doesn’t happen because people are happy with the competitive product
        - Engagement is split - there’s only finite time in the day, # of times you’re waiting in line, etc.
        - Cohorts start getting worse - churn increases
    - Often the most common defense is to spend $ to support, which increases burn rate - leading to premature company death
- People talk about moats. You can quantify it
    - The moat is the “energy” needed to get to escape velocity - where this energy is measured in dollars, time, or equivalent
        - Might be a $ amount, if you need to acquire+subsidize the supply+demand side
        - Might be a minimum feature set needed before the product is attractive enough
        - Might be a combo: $ needed and content needed to bootstrap a content network
        - In social, the network density you need before users find the product useful/valuable
    - “Efficiency over subsidy” Uber story
        - For example, in rideshare, competitors have to subsidize each trip until they get high utilization of drivers’ time - as the market matures, the moat deepens and the $ goes up since everyone’s getting more efficient
        - Sachin: “This is a really important story. I might make sure to address this in detail. For example, when the utilization is low, why wouldn't you just keep the price of the service high so you aren't losing money as opposed to running the service at a loss? And what implications does that have on network effects?”
- “Network Defensibility” is built on the following characteristics: Value Proposition, Density, Frequency, Topology, Asymmetry
    - Value Proposition
        - Core utility and value of the product
        - Creates foundational baselines for Growth Accounting metrics
    - Frequency
        - High frequency networks win
        - Product categories have a natural cadence- you can optimize though there are limits
        - marketplaces: Frequency of transaction, cheaper, etc

        - social networks: More like communication
        - Frequency aids downstream bundling, etc
- Density
    - Highly dense networks means that there's strong ROI on both sides
    - Networks can help you re-engage users (reactivation) and acquisition (surrounding "dark" nodes)
    - How "clustered" are the networks? e.g. Snapchat is designed to be used with 10-15 closest friends, LinkedIn with 1000s of connections. (Trying to capture the fact that there's a certain optimal level that the network effects exist at)
- Topology
    - Global > local > hyperlocal
        - In SaaS, intracompany vs. intercompany?
    - AT&T's "long-lines"
    - Airbnb's global network versus Uber's local ones
    - Makes it harder to create "atomic networks"
    - Bidirectional or one-directional follow/friending? Influencers or people you know? How does this impact the strength of a network?
        - Examples:
            - Bi-directional connections are stronger. Brian Kim also talked about this in the context of following influencers vs. bi-directional friends
            - Vine: small group of creators who got the most views, then large audience who rarely created/didn't get much love on the platform
    - Heterogeneity vs. homogeneity of nodes. All else equal, heterogeneity makes for a stronger network (at least in marketplaces. Not sure if this translates to other types of network effects?? Phone networks have homogeneous nodes)
- Asymmetry
    - Asymmetric advantages versus rival networks
    - David Strategy - when you're the little guy
        - When you're David, you have to do it different
        - Density and frequency trump anything else
            - Big guy is horizontal, small guy can cherry pick (use case, segment, route)
            - You're rewarded for density, but you don't want to lose any markets either
        - Big guy educates, small guy gets you to multi-tenant
            - For supply
                - Just share/publish/list in both places!
                - Upload video on YouTube, Facebook, Twitter, etc. - to get social feedback
                - Uber/Lyft driver dual-apping to increase productivity

                - Can “feature” a smaller set of supply more prominently, which is an asymmetric advantage
                - Example: Bebo just copying Facebook platform, and making it easy for developers to also publish to Bebo’s platform without much effort (Darius Contractor).
            - For demand
                - Uber/Lyft rider dual-apping to check prices on both
                - Limited by apps on the home screen
        - Competitive wins are better than creating new market
        - Small guy subsidies cost less - asymmetric advantage
        - Unbundling the horizontal. Craigslist vs Airbnb
- Goliath Strategy - when you’re big guy
    - What to do when you’re the big guy
    - Competition in network effects tends to favor the big guy!
    - M&A - consolidating the market
    - Use scale effects, brand, PR, other efforts to amplify network effects
        - D’arcy: “- Open question that i think is worth addressing is where scale and nfx intersect, especially as you get farther along the moonshot spectrum. For example, FB can invest a ton in the newsfeed algorithm to make it better which makes the network work better, but it's really a scale effect since the cost of better algos is spread across lots of users. Or how the scooter companies have network effects and scale effects. or how brand can impact perception of the network more than the network itself. For example lyft launched in toronto last year and there are other local rideshare options there besides uber that are bigger, but perception is that lyft is bigger cause it's the bigger brand”
        - D’arcy: “- There is another interesting idea that might be worth addressin which is combo linear + nfx business. Might just overcomplicate it but i think they're are fascinating since they have defensibility of scale and nfx. I think of both amazon and apple as these combo linear/nfx businesses. apple has the phone business (linear) attached to app store (nfx). amazon has a logistics company (linear) and a marketplace (nfx). maybe that slides in where you talk about faang or why nfx are tricky to understand”
    - Fast-follow on features
        - Instagram stories versus Snap stories - showing most of their users the mechanic for the first time. Differentiation not as needed
    - Box out new markets by growing fast
        - Instagram launching early on Android, going into developing markets before Snap
    - Build algorithmic feeds to scale the S-curve - draw on a larger set of listings
        - Utilize massive data that exists for a later stage company

        - Facebook invented the newsfeeed - reducing pageviews but scaling engagement over time. Hi5 and Bebo also had newsfeed. But perhaps didn't invest as much in algorithms to surface the most relevant updates, so it didn't scale with the user base
    - Cross-selling from other products - leveraging existing networks
    - Partnering with other complimentary platforms
    - Efficiency over subsidy
- Case studies
    - NACS
        - competitive tracking: Slice email, Credit card analytics, etc.
        - Slog: https://www.theverge.com/2014/8/26/6067663/this-is-ubers-playbook-for-sabotaging-lyft
    - Efficiency over subsidy
    - Uber's soft underbelly
        - Why it's hard to stop the first 20% of competitive market penetration
        - The importance of capital as a form of competition
    - Social networking wars - Orkut, Bebo, Friendster, Hi5, Facebook
        - Importance of providing the best user experience, product, and concerted growth efforts
        - How a better product (more user value) can topple one that has a bigger network
    - Slack vs. Hipchat
    - Vine vs. IG, Snap (other video / content platforms)

6. Slingshot

- Opener
    - XXX best case would be something where there's saturation and then they unlock using a slingshot?
    - Facebook spinning out Messenger is probably the most interesting one and best executed
        - Can interview Jon Perlow, Peter Deng, Stan Chudnovsky
- When you hit saturation, what's next? (Core dilemma)
    - The growth vectors stop working
    - Acquisition starts to slow - there's very few new users left. The supernodes have been acquired
    - Engagement hits a max - it's hitting a natural cadence of usage
        - Nature versus Nurture
    - Ecosystem - partners/developers move onto other platforms
    - Need to grow the market through other means
    - After your initial "atomic network" - you need to slingshot into n+1, then n+2
        - This is a loop!
        - Have to figure out what dimension to launch into

- The best products become distribution platforms
  - In the rocket analogy, escape velocity is lower for objects already close to space
  - Network effects are a moat and also a growth vector for future products/segments/geos
  - However the transition from product->platform is very hard
    - timing is wrong, too soon
    - need to build things
    - need to build more sides of an ecosystem
  - But how to do it well?
- Different kinds of expansions
  - new product
  - new audience
  - new geos
  - often in combination
    - UberX is a new product for a new price point that expands the market
    - Uber Eats is a new product that serves the existing audience, but also adds suburbs
  - etc.
  - metrics
    - Multi city launch curves
    - Like Uber market curves - comparing each city. Ideally it gets faster and easier
      - http://static4.uk.businessinsider.com/image/557aa22782e985af0217d58b-1200-600/annotated%20uber%20graph.png
- How to take on an adjacent market
  - Always be the big guy
  - Use your momentum to hit adjacent markets
    - geo expansion
      - spin up a new region/language
    - product stacking
      - New product, same demand (EATS, pool, etc.)
      - same supply, new demand.
    - adjacent network. Old product, new market
    - hard to do new product, new network
  - One type is “product stacking”
    - Build the “killer app” then create the developer platform
    - New product to the same network
    - Uber P2P is one example - so is POOL - but it grows the market. Unlocks new user segments

        - Your network co-exists with a collection of adjacent S-curves, some are going better than others
            - Use one side to move onto another side. Sell more stuff to the demand side
            - Use high frequency to cross-sell lower frequency
        - Cannibalization
    - Geographic expansion
        - Product customizations
        - Partnerships
        - GM / RGM model
    - Case studies
        - Uber and Uber EATS
        - Facebook to Messenger
        - Facebook growing Instagram
        - Stitchfix Kids, Men's, Plus Size, Maternity (serving existing customers who are pregnant)
        - Dropbox Paper, Carousel

7. **Future**
    - Opener
        - ???
    - Crypto and the end of centralized network effects
        - Crypto: Come for the $, stay for the network
    - Why the $10T services economy will be the next major industry to be revolutionized by marketplaces
    - The future of existing large tech companies and why they tends towards natural monopolies
    - What opportunities might exist for startups in the future
    - Marketplaces + AI will evolve into the future of work, and you'll either tell computers what to do for a living or companies will tell you what to do
    - Closing
        - 1 year after. Monroe, SF. Nov 2018. Close with a post-Uber alumni story one year after the tumultuous year.