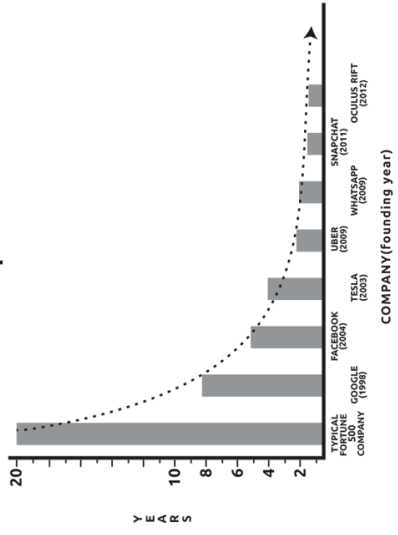
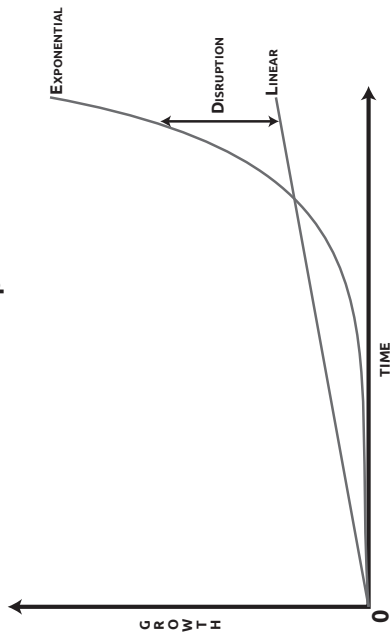


# Market Cap to a Billion



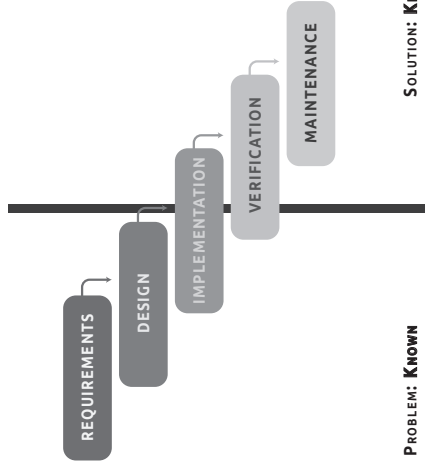
# Linear vs. Exponential



	<b>Cost (averages) for equivalent functionality</b>	<b>Scale</b>
<b>3D printing</b>	\$40,000 (2007) to \$100 (2014)	400x in 7 years
<b>Industrial robots</b>	\$500,000 (2008) to \$22,000 (2013)	23x in 5 years
<b>Drones</b>	\$100,000 (2007) to \$700 (2013)	142x in 6 years
<b>Solar</b>	\$30 per kWh (1984) to \$0.16 per kWh (2014)	200x in 20 years
<b>Sensors (3D LIDAR sensor)</b>	\$20,000 (2009) to \$79 (2014)	250x in 5 years
<b>Biotech (DNA sequencing of one whole human DNA profile)</b>	\$10 million (2007) to \$1,000 (2014)	10,000x in 7 years
<b>Neurotech (BCI devices)</b>	\$4,000 (2006) to \$90 (2011)	44x in 5 years
<b>Medicine (full body scan)</b>	\$10,000 (2000) to \$500 (2014)	20x in 14 years

# Traditional Product Development

WATERFALL



REQUIREMENTS

DESIGN

IMPLEMENTATION

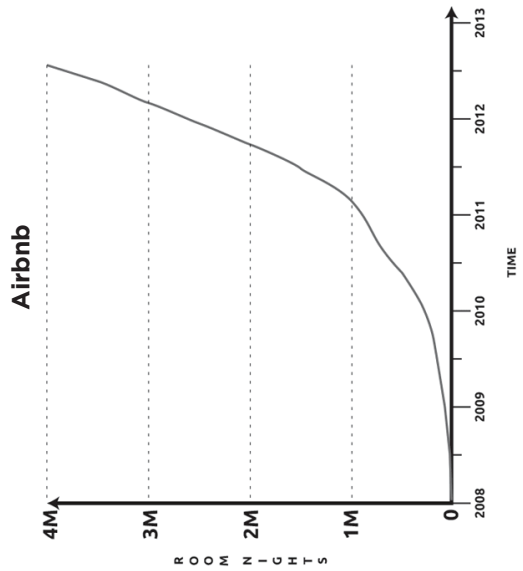
VERIFICATION

MAINTENANCE

PROBLEM: KNOWN

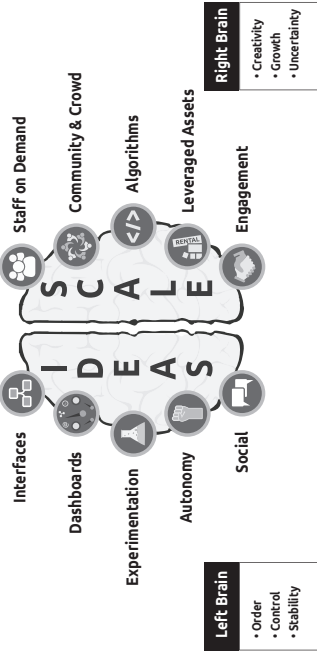
SOLUTION: KNOWN

<b>Airbnb</b> Hotels	90x more listings per employee
<b>GitHub</b> Software	109x more repositories per employee
<b>Local Motors</b> Automotive	1000x cheaper to produce new car model, 5-22x faster process for a car to produce (depending on vehicle)
<b>Quirky</b> Consumer Goods	10x faster product development (29 days vs 300 days)
<b>Google Ventures</b> Investments	2.5x more investments in early stage startups, 10x faster through design process
<b>Valve</b> Gaming	30x more market cap per employee
<b>Tesla</b> Automotive	30x more market cap per employee
<b>Tangerine (formerly ING Direct Canada)</b> Banking	7x more customers per employee, 4x more deposits per customer



# MTP

MASSIVE TRANSFORMATIVE PURPOSE



## Left Brain

- Order
- Control
- Stability

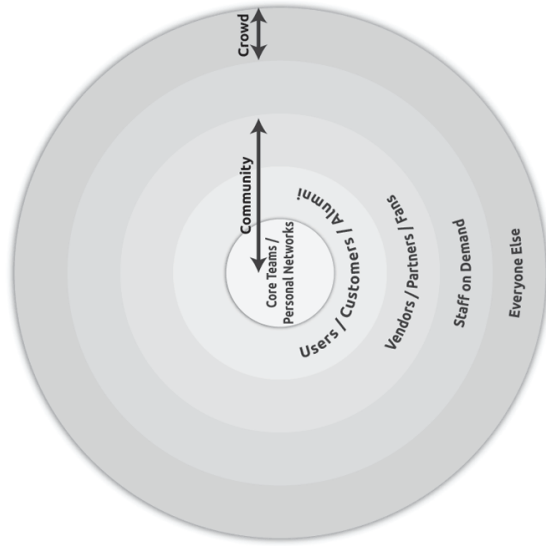
## Right Brain

- Creativity
- Growth
- Uncertainty

Why Important?	Dependencies or Prerequisites
<ul style="list-style-type: none"> <li>• Enables coherent exponential growth</li> <li>• Binds collective aspirations</li> <li>• Attracts top talent across the ecosystem</li> <li>• Supports a cooperative/non-political culture</li> <li>• Enables agility and learning</li> </ul>	<ul style="list-style-type: none"> <li>• Must be unique</li> <li>• Leaders must walk the walk</li> <li>• Must support all three letters in acronym</li> </ul>

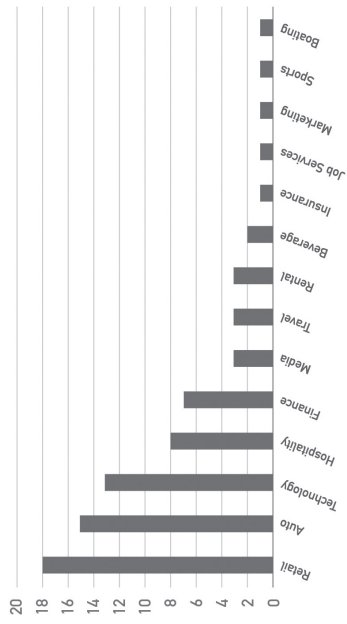


<b>Why Important?</b>	<b>Dependencies or Prerequisites</b>
<ul style="list-style-type: none"><li>• Enables learning (fresh perspectives)</li><li>• Allows agility</li><li>• Forms stronger bonds among core team</li></ul>	<ul style="list-style-type: none"><li>• Interfaces to manage SoD</li><li>• Clear task specifications</li></ul>



Why Important?	Dependencies or Prerequisites
<ul style="list-style-type: none"> <li>• Increase loyalty to ExO</li> <li>• Drives exponential growth</li> <li>• Validates new ideas, and learning</li> <li>• Allows agility and rapid implementation</li> <li>• Amplifies ideation</li> </ul>	<ul style="list-style-type: none"> <li>• MTP</li> <li>• Engagement</li> <li>• Authentic and transparent leadership</li> <li>• Low threshold to participate</li> <li>• P2P value creation</li> </ul>

Why Important?	Dependencies or Prerequisites
<ul style="list-style-type: none"><li>• Allows fully scalable products &amp; services</li><li>• Leverages connected devices and sensors</li><li>• Lower error rate stabilizes growth</li><li>• Easily updated</li></ul>	<ul style="list-style-type: none"><li>• Machine or Deep Learning techniques</li><li>• Cultural acceptance</li></ul>



Source: Crowd Companies April, 2014



<b>Why Important?</b>	<b>Dependencies or Prerequisites</b>
<ul style="list-style-type: none"><li>• Allows scalable products</li><li>• Lowers marginal cost of supply</li><li>• Removes having to manage assets</li><li>• Increases agility</li></ul>	<ul style="list-style-type: none"><li>• Abundance or easily available assets</li><li>• Interfaces</li></ul>

Why Important?	Dependencies or Prerequisites
<ul style="list-style-type: none"><li>• Increases loyalty</li><li>• Amplifies ideation</li><li>• Converts crowd to community</li><li>• Leverages marketing</li><li>• Enables play and learning</li><li>• Provides digital feedback loop with users</li></ul>	<ul style="list-style-type: none"><li>• MTP</li><li>• Clear, fair and consistent rules without conflicts of interest</li></ul>

	Interface	Description	Internal Usage	SCALE Attribute
Uber	Driver selection	System to allow users to find and choose drivers	Algorithm matches best/closest driver to user location	Algorithm
Kaggle	Leaderboard rankings	Real-time scoreboard that shows the current rankings of a contest	Aggregate and compare results of all users in a contest	Engagement
	User scanning	System to scan for relevant users for private contests	Cherry-pick the best users for special projects	Community & Crowd
Quirky	Ratings/voting	System to vote on each aspect of the production cycle	Priorities in the features and benefits of new products	Engagement
TED	Video translation subtitles	Manage translations created by volunteers (via the vendor dotsub)	Integrate TED Talks translations seamlessly	Community & Crowd
Local Motors	Idea submitter	System to allow users to submit ideas	Algorithm to process only valid or feasible entries	Community & Crowd
	Competition creator	System to create new competitions for the community	Algorithms to streamline all steps in the competition	Community & Crowd
	Ratings/voting	System to vote on each aspect of the production cycle	Priorities in the features and benefits of new products	Engagement

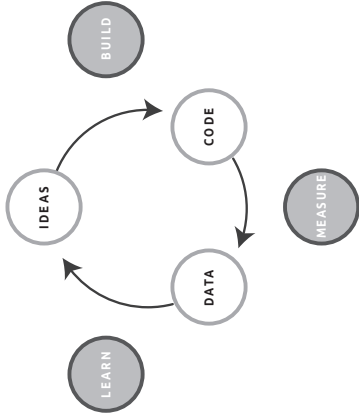


Google Ventures	Employee search	Search relevant and targeted skills/people in Google's employee database	Match GV startups with targeted Google skills/employees	Algorithms
	Resume search	System to search resumes to find relevant new hires	Match resumes with specific skill sets	Algorithms
Waze	GPS coordinates	Harvests GPS signal from every user	Traffic delays calculated in real time	Leveraged Assets
	User gestures while driving	Users spot accidents, police car sightings, etc.	Maps display resulting gestures for all users	Community & Crowd
Google	AdWords	User picks keywords to advertise against	Google places ads against search results	Algorithms
GitHub	Version control system	Multiple coders updating software sequentially and in parallel	Platform keeps all contributions in sync	Community & Crowd
	Hiring process	Incentive competitions	Narrows down candidates from large pool	Engagement
Gigwalk	Task availability	Gigwalk workers receive location-based, simple tasks when available	Matches task demand with supply of Gigwalkers	Staff on Demand

<b>Why Important?</b>	<b>Dependencies or Prerequisites</b>
<ul style="list-style-type: none"><li>• Filter external abundance into internal value</li><li>• Bridge between external growth drivers and internal stabilizing factors</li><li>• Automation allows scalability</li></ul>	<ul style="list-style-type: none"><li>• Standardized processes to enable automation</li><li>• Scalable externalities</li><li>• Algorithms (in most cases)</li></ul>

<b>Why Important?</b>	<b>Dependencies or Prerequisites</b>
<ul style="list-style-type: none"><li>• Track critical growth drivers in real time</li><li>• OKRs create control framework to manage fast growth</li><li>• Minimize exposure from errors because of short feedback loops</li></ul>	<ul style="list-style-type: none"><li>• Real-time metrics tracked, gathered and analyzed</li><li>• OKRs implemented</li><li>• Cultural acceptance by employees</li></ul>

# Lean Approach



<b>Why Important?</b>	<b>Dependencies or Prerequisites</b>
<ul style="list-style-type: none"><li>• Keeps processes aligned with rapidly changing externalities</li><li>• Maximizes value capture</li><li>• Faster to market (MVP)</li><li>• Risk taking provides an edge and faster learning</li></ul>	<ul style="list-style-type: none"><li>• Measurement and tracking of experiments</li><li>• Cultural acceptance (failure=experience)</li></ul>

Without Holacracy	With Holacracy
Central control and authority	Distributed control and authority
Predict and plan for long term	Dynamic and flexible: changes can and are constantly occurring
Hierarchic structure OR flat, based on consensus	Neither, as everyone is the 'highest authority' in their own role and 'follower' of other roles
Interest oriented	Core goal oriented
Tension as a problem	Tension as fuel
Reorganization and change management	Natural development, evolution and movement
Job titles	Dynamic roles
Heroic leaders, employees and process supervisors	Vital people who fulfill their role
Organizing people	Organizing work
Instrumental use of human relationships to serve Organizational goals	Clear separation between people, relationships and roles

<b>Why Important?</b>	<b>Dependencies or Prerequisites</b>
<ul style="list-style-type: none"><li>• Increased agility</li><li>• More accountability at customer face</li><li>• Faster reaction and learning times</li><li>• Better morale</li></ul>	<ul style="list-style-type: none"><li>• MTP (as a gravity well)</li><li>• Self-starting employees</li><li>• Dashboards</li></ul>

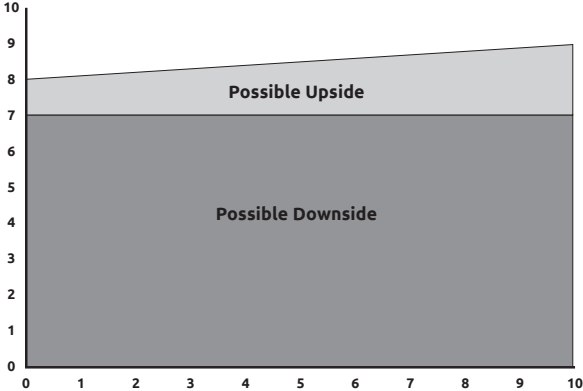
Why Important?	Dependencies or Prerequisites
<ul style="list-style-type: none"><li>• Faster conversations</li><li>• Faster decision cycles</li><li>• Faster learning</li><li>• Stabilizes team during rapid growth</li></ul>	<ul style="list-style-type: none"><li>• MTP</li><li>• Cloud social tools</li><li>• Cooperative culture</li></ul>



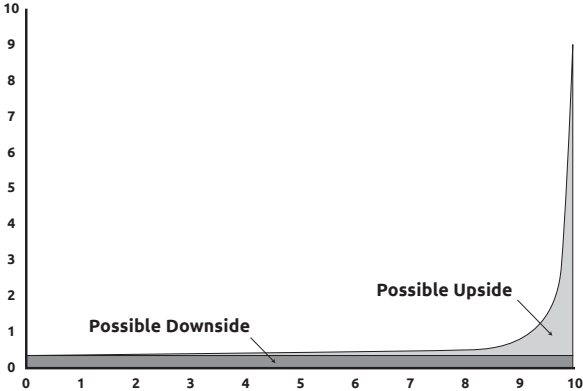
<b>Linear Organization Characteristics</b>	<b>ExO Characteristics</b>
Top-down and hierarchical in its organization	Autonomy, Social Technologies
Driven by financial outcomes	MTP, Dashboards
Linear, sequential thinking	Experimentation, Autonomy
Innovation primarily from within	Community & Crowd, Staff on Demand, Leveraged Assets, Interfaces (innovation at the edges)
Strategic planning largely an extrapolation from the past	MTP, Experimentation
Risk intolerance	Experimentation
Process inflexibility	Autonomy, Experimentation
Large number of FTEs	Algorithms, Community & Crowd, Staff on Demand
Controls/owns its own assets	Leveraged Assets
Strongly invested in status quo	MTP, Dashboards, Experimentation

Number of events per quarter						
Year	Q1	Q2	Q3	Q4	Total	Comment
2009	2	8	20	40	70	Start slowly to test and learn
2010	60	30*	80	100	270	* Slower in the summer
2011	120	100	140	160	520	Steady improvement
2012	180	150	190	200	720	Starting to reach saturation
2013	200	180	220	250	850	Some variations drive increase
					2,430	Total TEDx events over five years

### Large Companies



### Venture Investing



<b>Joi Ito (MIT Medialab)</b>	<b>Nassim Taleb (Anti-Fragile Theory)</b>
<b>MTP</b>	
Pull over push; Compasses over maps	Focus on the long term, not just the financials and short term
<b>Staff on Demand</b>	
Resilience over strength	Stay small and flexible
<b>Community &amp; Crowd</b>	
Systems (ecosystems) over objects; Resilience over strength	Build in options; Stay small and flexible
<b>Algorithms</b>	
-	Build in stressors > Simplify and Automate; Heuristics (skin in the game, orthogonal)
<b>Leased Assets</b>	
Resilience over strength	Reduce dependency and IT; stay small and flexible; Invest in R&D; Invest in data and social infrastructure

<b>Engagement (IC, gamify)</b>	
Pull over push	Build in options; Heuristics: skin in the game
<b>Interfaces</b>	
-	Simplify and Automate; Overcome cognitive biases
<b>Dashboard</b>	
Learning over financial	Simplify and Automate; Short feedback loops; Rewards only after project completion
<b>Experimentation</b>	
Practice over theory; Risk over safety; Learning over education	Diversify; Build in hacking and stressors by yourself (fail fast and often; Netflix case w/ Chaos Monkey), especially in good times; Build in options; Risk over safety (not risk insensitivity); Avoid too much focus on efficiency, control and optimization
<b>Autonomy</b>	
Emergence over authority; Disobedience over compliance	Decentralization; Do not overregulate; Challenge senior management; Compartmentalize; Share ownership within ExO on the edges (skin in the game)
<b>Social Technologies</b>	
Emergence (peer-to-peer learning) over authority	Build in stressors

Company	Number of Investor Pitches
Skype	40
Cisco	76
Pandora	300
Google	350

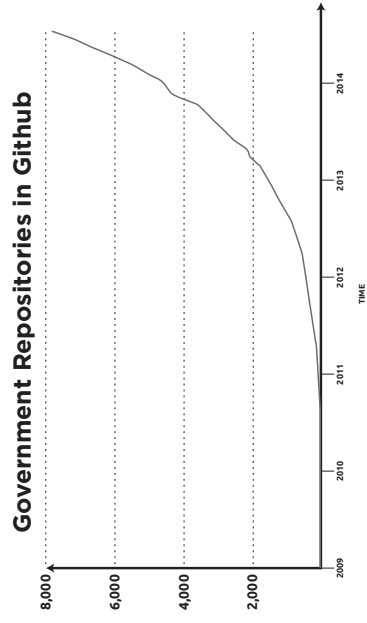
Key Partners	Key Activities	Value Proposition	Customer Relationships	Customer Segments
	Key Resources		Channels	
Cost Structure			Revenue Streams	

Credit: Alexander Osterwalder. For more on how to create effective value propositions, we recommend reading Osterwalder's new book, *Value Proposition Design: How to Create Products and Services Customers Want*.

	Authenticity	Personalization	Interpretation	Embodiment	Findability	Accessibility	Patronage	Immediacy
Uber					✓	✓		
Airbnb					✓	✓		
Topcoder					✓	✓		
GitHub		✓					✓	✓
Quirky	✓			✓			✓	
Local Motors	✓			✓			✓	
Xiaomi							✓	✓
Valve					✓	✓		
Zappos		✓			✓			
Amazon		✓	✓					
Google		✓	✓		✓			
Waze		✓			✓			
Netflix		✓				✓		

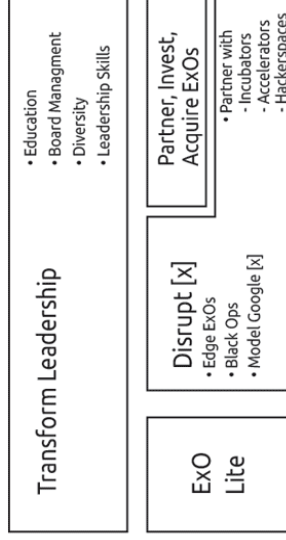


	MTP	S	C	A	L	E	I	D	E	A	S
GitHub	✓		✓			✓				✓	✓
Airbnb	✓		✓		✓	✓	✓				
Quirky	✓	✓	✓		✓				✓		
Uber	✓		✓		✓	✓	✓				
Topcoder	✓	✓		✓			✓				
Waze	✓		✓			✓	✓				
Local Motors	✓	✓	✓		✓		✓				
Supercell	✓							✓	✓	✓	✓
Google Ventures	✓			✓			✓	✓	✓		
Valve	✓							✓		✓	✓
BlaBlaCar	✓		✓		✓	✓	✓				



Credit: GitHub

1. Transform leadership.
2. Partner with, invest in or acquire ExOs.
3. Disrupt[X].
4. Implement ExO Lite internally.



Our assessment of Coca-Cola's  
Exponential Quotient—62 out of 84.

MTP	S	C	A	L	E	I	D	E	A	S
✓				✓	✓			✓	✓	

Haier's Exponential Quotient—68 out of 84.

MTP	S	C	A	L	E	I	D	E	A	S
		✓			✓	✓	✓	✓	✓	✓

Xiaomi's Exponential Quotient—74 out of 84.

<b>MTP</b>	<b>S</b>	<b>C</b>	<b>A</b>	<b>L</b>	<b>E</b>	<b>I</b>	<b>D</b>	<b>E</b>	<b>A</b>	<b>S</b>
✓	✓	✓		✓	✓	✓	✓	✓	✓	✓

The *Guardian's* Exponential Quotient—62 out of 84.

MTP	S	C	A	L	E	I	D	E	A	S
✓	✓	✓			✓	✓	✓			✓

GE's Exponential Quotient—69 out of 84.

MTP	S	C	A	L	E	I	D	E	A	S
	✓	✓		✓	✓	✓	✓	✓	✓	✓



Amazon's Exponential Quotient—68 out of 84.

MTP	S	C	A	L	E	I	D	E	A	S
✓		✓	✓	✓	✓	✓		✓	✓	✓

Zappos Exponential Quotient— 75 out of 84.

MTP	S	C	A	L	E	I	D	E	A	S
✓		✓	✓		✓	✓	✓	✓	✓	✓

Tangerine's Exponential Quotient—69 out of 84.

MTP	S	C	A	L	E	I	D	E	A	S
✓		✓			✓	✓		✓	✓	✓



# Collaborative Economy Honeycomb Version 1.0

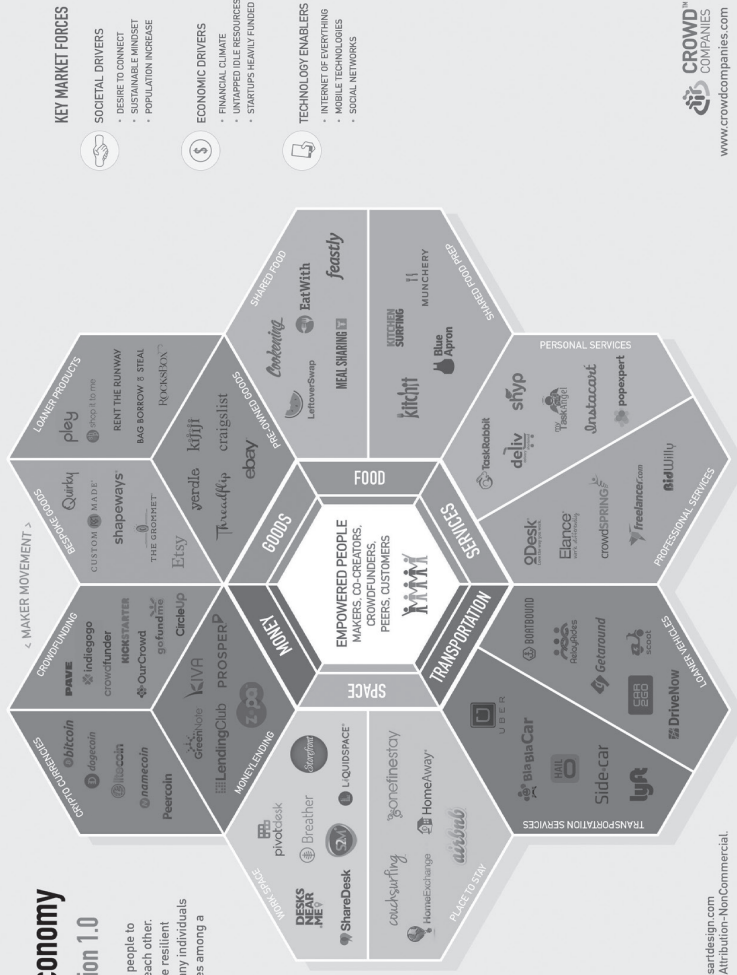
The Collaborative Economy enables people to efficiently get what they need from each other. Similarly in nature, honeycombs are resilient structures that efficiently enable many individuals to access, share, and grow resources among a common group.

In this visual representation, this economy is organized into discrete families, sub-classes, and example companies. To access the full directory of 9000+ companies visit the Mesh Index at [meshing.it/companies](http://meshing.it/companies) managed by Mesh Labs.

By Jeremiah Owyang  
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With input from:  
Neal Gorenflo (@Gorenflo),  
Lisa Gansky (@Instigating),  
Sherwin Pishavar (@sherna),  
Mike Walsh (@mwalsh),  
Brian Solis (@briansolis),  
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and Vision Critical (@visioncritical).

Design by Vladimir Mirkovic [www.transparrdesign.com](http://www.transparrdesign.com)  
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Key Opportunity	Implications and Actions
Migrate to an MTP	Change or expand your brand or mission statement to encompass an MTP, which is critical if you want to leverage a community and keep your team focused externally.
MTP communities	In many industries, interest-based communities (e.g., Quantified Self, Maker Faire, DIYbio, TechShop, Bitcoin) are growing fast. Join them, sponsor them and learn from them—before your competition does.
Disruptive ExOs in your industry	As Marcus Shingles found in the CPG world, several dozen disruptive ExOs are already in operation in every industry. Find them and then partner with, invest in or acquire them.
Leveraged Assets and Staff on Demand	If you have a large workforce or asset base, develop strategies to mitigate inertia and “old” thinking by moving to Staff on Demand and Leveraged Assets, as well as leveraging Community & Crowd. This will increase the (innovation) metabolism and adaptability of your company.
Information-based products and services	Find new products and services that are (fully) information-based for scalability. If they aren't yet available, develop them.
Death of the five-year plan	Strategic planning is giving way to data-driven predictive analytics, a strong product vision and purpose (MTP). Increasingly, the past cannot be extrapolated to the future. Constant experimentation at the edges of the organization will drive just-in-time

(cont.)	planning functions. Move to a one-year planning cycle.
External innovation	As Peter Diamandis has said, "If you are relying on innovation solely from inside your organization, you are dead." Find ways to leverage Community and/or Crowd for innovation; investigate co-innovation and Crowd Companies and let your employees loose.
Explore new business models	Micropayments will enable entirely new business models to appear in established industries. The same is true for the emergence of the DIY (Maker) and P2P (Sharing) movements. Finally, as data becomes the new oil, many business models will be transformed from hardware to software to services.
Explore other innovation types	Most CEOs see innovation as product innovation. But there is also process innovation, social innovation, organizational innovation, management innovation, business model innovation, etc. Technology and products are no longer the only drivers for innovation. [See Doblin's 10 Types of Innovation, briefly outlined in Chapter Eight.]
Accept that there are limits to quantification, data and rationalization	There remains a place and role for intuition, personal vision and gut feelings. Because the future is to a large degree unknowable, most key strategic decisions still rely on intuition. Gut feelings can sometimes serve as a compass in an uncertain world, especially when solving a problem you're passionate about.
Automate and measure different processes in all departments	Using free code/algorithms optimized within the GitHub or GitLab social platforms and the vast data available, classic throughput or process-based models will be substituted by performance-based models (e.g., cost per sale).

Key Opportunity	Implications and Actions
Product personalization	Complete personalization of products and services based upon individual customers (right size, taste, language, behavioral data, contextual data, sensor data, transactional data and, possibly, DNA or neuroprofile). Neuromarketing should not only be used to measure attention, motivation, intention, brand and effectiveness, but also as a way to personalize in areas like entertainment, sports and food.
AI monitoring of social media	AI monitoring of your company's social media designed to provide FAQ/help, information, communication and personal assistance when needed. It also alerts the right people when further action is necessary. (See Ekho.me as an example.)
Real-time behavioral dashboards	Real-time aggregated customer data providing insights into the behavior and emotions of customers, enabling matching of products and services with those customers (hyper-narrowcasting) and gauging demand for new concepts. Social and mobile media as the zeitgeist and thus the triggers for validated innovation.
MTP Community as sales force	If you can align with an MTP community, that community can then operate as a sales force for your organization. This implies a convergence of MTPs across the whole ecosystem of a company over time and results in a company with a MTP congruent with the MTPs of all of its external communities.
Vendor Relationship Management—extension of intention economy	The age of CRM is over, replaced by Vendor Relationship Management (VRM), a term coined by Doc Searls from Harvard University. VRM is an extension of the intention economy, and VRMs offer the ultimate in customer-driven.



<i>(cont.)</i>	marketplaces (e.g., Uber, BlaBlaCar). Consumers own their own personal data and expose demand and purchasing intentions with different vendors in the cloud, mostly in real time. CRM is initiated by companies, VRM by customers
Differential real-time pricing models	Real-time monitoring will allow for the institution of real-time pricing to maximize pricing based on real-time demand (e.g., airline tickets). AIs will prove extremely valuable in this transition.
Crowdsourced online marketplaces for marketing materials	Using online marketplaces to crowdsource TV commercials (Tongal), logos and banners (99 designs), or any marketing expertise (Freelancer).
PR & marketing will have to aim a lot further out to place business memes	Due to accelerated pace of change it is mandatory to look further into the future to launch marketing and PR campaigns by identifying when a meme is booming (predictive planning) or, even better, when it first emerges.
Lean Startup prototyping and testing	Using the Lean Startup method to test and validate assumptions around new campaigns and new products via advanced testing and prototyping forms, such as A/B-testing concepts in Google AdWords and landing pages, social media monitoring, neuro-feedback in retail stores of test groups, customer development interviews, crowdfunding, and testing in virtual worlds such as High Fidelity. In sum: a data-driven and continuous testing approach to marketing.
New revenue models	More subscriptions versus one-off sales due to access versus ownership trend; more apps; more connected products and more cradle to cradle and Circular Economy; more freemium models (free and paid—e.g., the horribly named.

(cont.)

“tryvertising”). New fee models, such as API fees, platform licensing, syndication fees and virtual goods

Key Opportunity	Implications and Actions
AI accounting	Automatic A/P, A/R software-enabling automatic reminders and payment; automatic tax management; and AIs watching for errant behaviors in transaction flows.
Taxation without borders	Governments are getting their act together regarding tax havens, which will likely continue to face ever-closer scrutiny in the coming years.
Digital payment solutions	More than 60,000 merchants already accept Bitcoin, which we predict will hit Wall Street in late 2014 and will most likely be mainstream by 2016. This is in addition to the growing impact of Square and PayPal. Micro-transactions will drive orders-of-magnitude increases in the sheer number of transactions needing to be processed, tracked and audited.
Crowdfunding / crowd lending	New ways of getting financed for products or services by leveraging the crowd (e.g., Gustin, Kickstarter, angels and Lending Club), especially to demonstrate market demand for a product or service.
Cash flow measurement	Discounted Cash Flows will be replaced by Options Theory as a preferred mechanism.

Key Area to Track	Implications and Actions
BYOX	Bring your own devices, technology, services and sensors to the company, providing a lot more data and resulting in more possibilities and innovation.
Cloud access	Access to social technologies, data and services everywhere, independent of location (cloud access).
AI assistants	Artificial intelligence to manage appointments, planning, information, help/FAQ, etc. (Google Now, Watson, Siri).
Big Data security	The world is becoming rapidly digitized, making it highly hackable, which in turn results in an explosion of security threats. For this problem, Big Data solutions (e.g., Palantir) are needed to detect breaches and make data secure.
Quantum computing and security	Leveraging quantum computing for security (decoding encryption with, paradoxically, secure quantum encryption).
Legal	Many industries (including banking, medicine and the law) mandate that client information be kept within enterprise walls and on enterprise servers. The developments listed above will place extreme, even unbearable, stress on this requirement.

Key Opportunity	Implications and Actions
Externally driven IT	Leverage external community (developers) and partnerships (startups, SaaS, companies) for new services/products and open platforms with open APIs (remix datasets, open source standards) and provide own metadata (access, remixing).
Business intelligence (BI)	Data management systems that use methodologies, processes, architectures and technologies to transform raw data into meaningful and useful business information (more effective strategic, tactical and operational insights and decision-making). A key heuristic: if you operate in a highly uncertain environment, make it simple (not too many variables); if you operate in a predictable environment, make it complex (use more variables to manage BI).
Realignment of customer data ownership	Customers will own their own data (such as Personal or Respect Network) and then provide access to parts of it (for relevant and beneficial services) only to those authorized to receive the information.

Key Opportunity	Implications and Actions
Open Source R&D	Leverage community and crowd for R&D and product development (e.g., Quirky) as well as the collective intelligence and assets from hackerspaces, such as TechShop and BioCurious (Leveraged Assets, JIT supply).
Leveraging M&A	Invest in, partner with or acquire startups/companies and leverage them to enable R&D and product development (big companies as investment funds).
VRM R&D	Based on an intention or idea, a completely automated R&D and product development process can be fully driven by the community (collective purpose), just like CRM for sales purposes.
Brain-stimulated ideation	The use of brain stimulation technologies (tDCS, TMS, tACS) and hybrid learning (the brain directly connected to the cloud) to improve ideation and enhance capabilities (the optimal brain state: flow hacking, reduce/relieve stress, think faster, improve working and learning memory). A futuristic concept that is quickly becoming real.
Virtual reality testing	The use of virtual worlds to test, prototype, experiment and learn, such as Philip Rosedale's High Fidelity. Leveraging tools like Oculus Rift for visualization, Gravity Sketch tablets for design and Leap Motion for interaction. The arrival of disruptive 3D printers for testing in virtual worlds with gesture interfaces
Constraint-based design (AI)	Letting AIs design innovation, within particular constraints.

<b>Key Opportunity</b>	<b>Implications and Actions</b>
Decentralized or outsourced production	Digital production and unbundling of production steps, freeing the company to focus on its core competencies (customer relationships, R&D, design and marketing). Accomplished by leveraging OEMs (e.g., PCH International, Flextronics, Foxconn) or through the use of 3D printers, robots and nanotech/stacks (see Tesla).

Recyclable materials / circular economy	Production materials that can be recycled and reused multiple times. Salvaging of faulty products through the systematic extraction of raw materials. This feeds on the decentralized production model above. Using bio-nanocomposites and nanocellulose for biodegradable packaging.
Nanomaterials and nanomanufacturing	Manufacturing and using materials made from engineered atoms and molecules (e.g., carbon graphene and carbyne), designed with specific shape, size, surface properties and chemistry to enhance reactivity, strength and electrical properties. The Materials Project as an open source database of materials and their properties.
3D and 4D printing	Self-assembly of products on location; quick prototyping and repair services.
AI production monitoring	Leverage sensor data, algorithms and AI to detect early faults in production and resolve them long before the product comes to market, thus radically reducing repairs, returns and recalls.
Customizable and programmable robots	Easily programmable and customizable robots for manufacturing, helping workers or removing the need for them to do repetitive and heavy tasks altogether (e.g., Baxter, Unbounded Robotics, Otherlab).
Sustainable production and logistics	Greener and more self-sufficient production driven by robo-transport, sensors, AI, flexible solar panels and perovskite solar cells. Nanomaterials (graphene) that can be added to buildings, vehicles, machines and equipment. Transformation in Logistics (road, water and air transport).
Autonomous transport and delivery	Leveraging autonomous vehicles (e.g., Google's self-driving car) and drones (e.g., Matternet) for the transport and.



(cont.)	delivery of supplies and products, especially in remote areas
Full supply chain tracking/ monitoring	Internet of Things sensors used to monitor the entire supply chain. Location, status, preservation and safety of most substances can be monitored (chemical substance traces, pollution, quality of life).
Biological production	Biology has the unique trait of being software that can create its own hardware. Leverage bio-based materials and synthetic biology as alternative means of production. Bio-production remains difficult to scale, but in the medium term promises to transform current production methods.

Key Opportunity	Implications and Actions
Fractional IP	IP will become more and more relevant due to the speed of new developments and devices, resulting in fractional IPs (patents for small portions).
Open sourcing patents	Just like Tesla did with its electric car patents, open sourcing IP will enable the creation of a much larger innovation ecosystem in which, by default, your organization will be the center. It pre-empt competition and insources innovation.
Reduced IP relevance	In an accelerating world, by the time you file a patent, it's out of date.
Rise of IP insurance	Formalized structures to protect against IP infringement.
Smart contracts	Legal clauses embedded as code; instant activation of consequences and outcomes; personalized legal systems.
Fluid legal contracts	Flexible and real-time legal contracts, constantly adapting to new data, stats and insights (e.g., current SCRUM contracts but more advanced).
Dangerous regulatory structures	As technology outpaces our ability to regulate, regulatory agencies become irrelevant; even worse, they become neo-Luddites.

<p>Regulation as an economic development mechanism</p>	<p>Huge advantages will be conferred on those countries or regions that drive the future of regulatory systems. For example, if a small country fully legalized robotic cars, a great deal of R&amp;D would be transferred there. ExOs will lobby their governments heavily for competitive regulatory environments.</p>
<p>Regulatory capture</p>	<p>Big organizations with deep pockets will increasingly resort to lobbying for favorable legal environments to create walls around their domains. Although lobbying is the prevalent escape route for large organizations today, it is not a sustainable strategy.</p>

Key Opportunities	Implications and Actions
Digital job interviews and meetings	Job interviews and collaboration leveraging video (Skype), telepresence (Double Robotics) or virtual reality (Oculus Rift or High Fidelity) for virtual meetings, as well as testing to enable the growing global Staff on Demand workforce. Social networking skills will increase in importance, as will internships and a focus on real life skills testing.
Hire employees who ask the right questions	We're moving into a world of open data, open APIs and even open source (deep learning) algorithms. If all that is free, what is unique? Machines (AI) are great for providing answers, but humans are better at asking the right questions. HR policies will focus on people who can ask them and cultivate an environment where questions, perspectives, art and culture are more deeply respected.
Hire based on potential, not just on track record and/or resume	Due to accelerated change, work experience will prove much less important. A prospect's potential is more important than IQ, features or competencies. Potential is tracked by intrinsic motivation, purpose (match with MTP), engagement, determination, curiosity, insight and risk literacy (statistics). It is also about (un)learning and adaptability. Over time, these tools can also be applied to Staff on Demand (e.g., Tongal) and Community & Crowd.

DNA/neuro recruitment and team formation	Recruitment and team formations based on DNA profiling (suitability for the job based on particular hormones, neurotransmitters and health risks) and neuro profiling (right attitude, emotions, focus, truth-telling, passion, avoiding cognitive bias). AIs will recommend which people should work together and how to form teams for different tasks.
Peer learning and coaching	Programming software schools such as MIT and France's Ecole 42 have no faculty, relying instead on peer learning; such institutions are highly cost-effective. HR will copy these models for better knowledge-creation and skills-transfer between employees.
P2P reputation systems	Internal and external reputation measured by communities (Mode, GitHub, LoveMachine, Klout, LinkedIn, etc.).
Personal development dashboards and MTP alignment	Dashboard with data analytics, serious gaming and predictive insights into the development of the workforce, such as the OKRs, serendipity or learning KPIs, performance reviews, P2P reputation systems, MOOCs, etc. Big Data leveraged to identify anomalies, including outlier ratings by colleagues. Gamification leveraged for Engagement and alignment with the corporate MTP will be measured/tracked.
Quantified Employee/teams	Employee and team health monitoring provides actionable insights based on body health (fatigue, concentration, movement, rest and relaxation), thus helping to avoid mistakes, stress, productivity loss and burnout. Employee DNA, biome and biomarkers used to minimize health risks, resistance to flu, etc.

Neuroenhance-  
ment

Neurotechnology used to improve mood, employee capabilities (accelerated learning, focus, reading, sleep, mental state, avoiding cognitive bias) and help combat social phobias (nervousness and fear of contact or connection). Tools and services that help with the mental well-being of employees, such as Happyfy and ThriveOn. Combined with sensors, these tools teach wellness, resilience and other core life skills; they also measure their impact.

	Age (years)	2011 valuation	2014 valuation	Increase
<b>Haier</b>	30	\$19 billion	\$60 billion	3x
<b>Valve</b>	18	\$1.5 billion	\$4.5 billion	3x
<b>Google</b>	17	\$150 billion	\$400 billion	2.5x
<b>Uber</b>	7	\$2 billion	\$17 billion	8.5x
<b>Airbnb</b>	6	\$2 billion	\$10 billion	5x
<b>Github</b>	6	\$500 million (est.)	\$7 billion	14x
<b>Waze</b>	6	\$25 million	\$1 billion (in 2013)	50x
<b>Quirky</b>	5	\$50 million	\$2 billion	40x
<b>Snapchat</b>	3	0	\$10 billion	10,000x +