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The Strategic Stack

In the modern era, tech leaders face an increasingly "VUCA" world - volatile, uncertain, complex, and ambiguous. The rise of artificial intelligence and AI agents has lowered the cost of competition. A single founder, equipped with AI tools, can now challenge incumbents once protected by scale. Meanwhile, shifts in global policy and geopolitics can upend supply chains and financial ecosystems overnight.

Strong entrepreneurial leaders sense these shifts and must ask themselves two fundamental questions:

- How can we survive in this new environment?
- What are our strategic capabilities now and where do they need to be to survive?

To help leaders with these questions, this paper introduces the concept of a *strategic stack*. The *strategic stack* is a layered view of a firm's "must have" strategic capabilities across the value chain. The *strategic stack* helps leaders assess their firm's current capabilities and identify what capabilities must be built, bought, or both (a blended approach) to survive in a changing environment. Visualizing the *strategic stack* can help leaders identify where the firm depends on others and how the firm must transform for evolutionary fitness.

The Strategic Stack

In the tech industry, the term *stack* is used frequently and flexibly. It typically refers to a layered system of technologies, capabilities, or components that together make a product, platform, or organization work.

While originally used to describe software architectures (e.g. the tech stack for an app), the term has evolved to describe everything from AI infrastructure to vertically integrated company designs.

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For this paper, the *strategic stack* refers to the layered strategic capabilities that a firm must control to achieve autonomy. While the precise components vary by industry, key layers often include:

- **Regulation**
- **Capital**
- **Services**
- **Distribution**
- **Assembly & Integration**
- **Manufacturing**
- **Skilled Labor**
- **Extraction & Processing**
- **Natural Resources**

The Strategic Stack and Vertical Integration

An extreme case study of the *strategic stack* is the vertically integrated company. Vertical integration is emerging as a key strategy among tech firms. Unlike companies that rely heavily on third-party platforms and vendors, vertically integrated firms seek to own or control key operational and technological layers of their stack from raw inputs to customer delivery (Table 1).

Table 1: Strategic Stack for the Vertically Integrated Company

• **Regulation**	High control
• **Capital**	High control
• **Services**	High control or direct ownership
• **Distribution**	High control or direct ownership
• **Assembly & Integration**	High control or direct ownership
• **Manufacturing**	High control or direct ownership
• **Skilled Labor**	High control
• **Extraction & Processing**	High control or direct ownership
• **Natural Resources**	High control or direct ownership

Building a coordinated capability stack can reduce dependency on others, insulate the firm from external shocks, improve control and resilience, and allow for unique differentiation. Table 2 is an example visualizing the *strategic stack*. With high degrees of ownership and control, this example company can easily achieve strategic autonomy, even in a volatile environment, since the company has no dependencies for "must have" capabilities.

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Table 2: Strategic Stack for Vertically Integrated Companies (Green = high control)

Regulation Direct political power over regulators
Capital Capital efficiency, non-traditional finance
Services Direct to customer sales and marketing
Distribution Direct distribution
Assembly & Integration In-house assembly
Manufacturing – High control In-house manufacturing and tooling
Skilled Labor – High control Unique culture driving efficiency and R&D
Extraction & Processing – High control Direct extraction/processing of inputs
Natural Resources – High control Direct ownership of raw inputs

Case Study: Tesla's *Strategic Stack*

Founded in 2003, Tesla is an electric vehicle (EV) company that aims to accelerate the world's transition to sustainable energy. Early on, Tesla faced a nascent EV market and limited supplier infrastructure. In that tough environment, Tesla decided to build critical components in-house, including batteries, battery technology, chips, and proprietary software systems (e.g. vehicle software). Tesla constructed the Gigafactory to produce lithium-ion batteries, reduced dependency on external suppliers, and achieved economies of scale. Tesla also developed its own vehicle software with over-the-air updates. Finally, Tesla opened retail stores and service centers. Tesla now increasingly controls its supply of lithium and other raw materials.

While Tesla had to shoulder significant capital investment and risk early on to execute large-scale manufacturing, Tesla's decision to build vertically enabled it to control core technology, drive lower costs and better battery performance, eliminate coordination delays, and drive faster innovation cycles. By controlling its strategic stack (Table 3), Tesla established a competitive edge in a nascent market category (EVs) and gave Tesla greater resilience against supply chain shocks. As a result, Tesla stayed ahead of the pack in a competitive auto market.

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Table 3: Tesla's Strategic Stack (Green = High Control)

Regulation • Influence over regulators
Capital • Tesla's tech-driven financialized capitalism • Fundraising via Elon Musk brand on social media, meme trading
Services • Tesla direct sales, direct marketing with Elon Musk brand • Over-the-air vehicle software updates • Full Self Driving (FSD) software • Proprietary Supercharger network and energy storage (e.g. Powerwall, solar) • Direct sales of services and other products (e.g. charging solutions, carbon credits)
Distribution • Transport, Tesla retail stores, customer delivery, software platform control
Assembly & Integration • Assemble parts to finished vehicle • Tesla FSD vehicle software integration
Manufacturing • Tesla Gigafactories • Custom machine tools and machinery like Giga Press die-casting machines • In-house Manufacturing Operating System software for automation • Tesla batteries, Dojo supercomputer infrastructure, custom chips

Skilled Labor
• Recruit with visionary Tesla mission
• Motivate R&D talent to innovate efficiently with
  ○ a flat org structure encouraging direct communication/collaboration across levels
  ○ an "ultra-hardcore" culture of results, adaptability, speed, and first principles thinking

Extraction & Processing • Direct mining partnership for lithium • Battery recycling for lithium, nickel and cobalt • Onsite renewable energy (solar, wind and geothermal systems)
Natural Resources • Lithium, nickel, cobalt • Solar, wind, geothermal energy

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Conclusion

In this "VUCA" modern era, entrepreneurs are both sentinels and leaders. They must harness dynamic capabilities (Teece, Pisano, & Shuen, 1997) and quickly sense shifts in the environment. As leaders, they must reassess the organization's likelihood of survival with existing capabilities and adapt and grow new capabilities.

Visualizing a company's *strategic stack* can help leaders identify core capabilities to control, new capabilities to grow, and strategic dependencies to reconfigure to ensure operations can continue. Then, leaders can effectively seize the opportunity or neutralize the threat to the organization.

Discussion Questions

1. What is the strategic stack for an AI-driven robotics company?
2. What steps would you recommend if the company wants to vertically integrate?
3. How might the strategic stack for a software-only company (e.g. SaaS) look similar to or different from a hardware company (e.g. drones)?

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RECOMMENDED READINGS

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