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The Dual- use Game

We are the sum of our choices. That's true for our private lives, in business and in times of conflict. We have to take decisions all the time. And those decisions don't get easier. On the contrary, taking them becomes increasingly difficult.

A large, white, fixed-wing drone with four rotors is flying in a clear blue sky. Below it, a robotic arm with a gripper is extended from the side of a dark blue ship's hull. The ship's hull has the words "QUANTUM SYSTEMS" written on it in white. The background is a bright blue sky with some light clouds.

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Seeing the bigger picture is thereby vital. Through new technology, we have more knowledge than ever, and everything is faster than it used to be. The key is getting the right data at the right time. Something satellites cannot do.

Drones have introduced a new element of aerial intelligence. They have evolved from niche to one of the main assets in gathering, understanding, and exploiting data – in civil surveying, disaster management, law enforcement, or defense.

Drones have become a mass product. However, they were limited to either commercial and recreational use, or to larger types only governments could afford for their armed forces. Neither side was flexible enough for dual-use cases. It had to be either-or.

Technology shaping the future

In an era marked by rapid technological advancement, global competitiveness, climate change, geopolitical tensions and conflicts the general concept of dual-use technology has emerged as a pivotal driver of innovation. Dual-use technology encompasses innovations and advancements that can serve both civilian and military applications, having the potential to significantly shape the future of various industries. Drone technology is just one example. However, despite the immense potential, the Western world faces a critical need to amplify its focus on leveraging and fostering innovation in dual-use technology for sustained economic growth, security, and societal advancement.

Figure 1:
The Vector drone can
take-off from and land
on the self-sustained
Drone Port.

This duality allows for the crossover of technologies initially developed for defense or security purposes into various commercial sectors, such as healthcare, transportation, telecommunications, and many more. That works the other way around as well. The versatility of dual-use technology lies in its ability to transcend boundaries and create multifaceted solutions that cater to diverse societal needs.

Quantum Systems is fully embracing that by bringing the synergy of commercial and defense purposes to numerous industries and professional drone operators balancing both advantages: Innovation and speed from the commercial side, battle-proven and most robust systems in the military. With the perfect synthesis of hardware, software and AI we optimize commercial businesses. We increase efficiency in decision making for our customers in various verticals from farming to mining to inspection and infrastructure construction.

We serve democratic governments in times of unprecedented geopolitical tensions and conflicts, where modern data sensor driven operations matter. Aerial intelligence becomes a decisive edge.

Dual-use has become our DNA. In general, companies delivering goods or services need to be fast to be successful. Quantum Systems always requires its engineers to prioritize speed over perfection. “Fail fast and iterate quickly” is the only way to be successful as a start-up. The ability to embrace failures as an opportunity to learn, swiftly adapt, and iterate on ideas is crucial for several reasons.

Flexible thinking ensures success

Firstly, it fosters a culture of innovation and resilience. By acknowledging that failures are steppingstones toward success, individuals and organizations are empowered to take calculated risks, explore new ideas, and push boundaries without the fear of failure paralyzing progress.

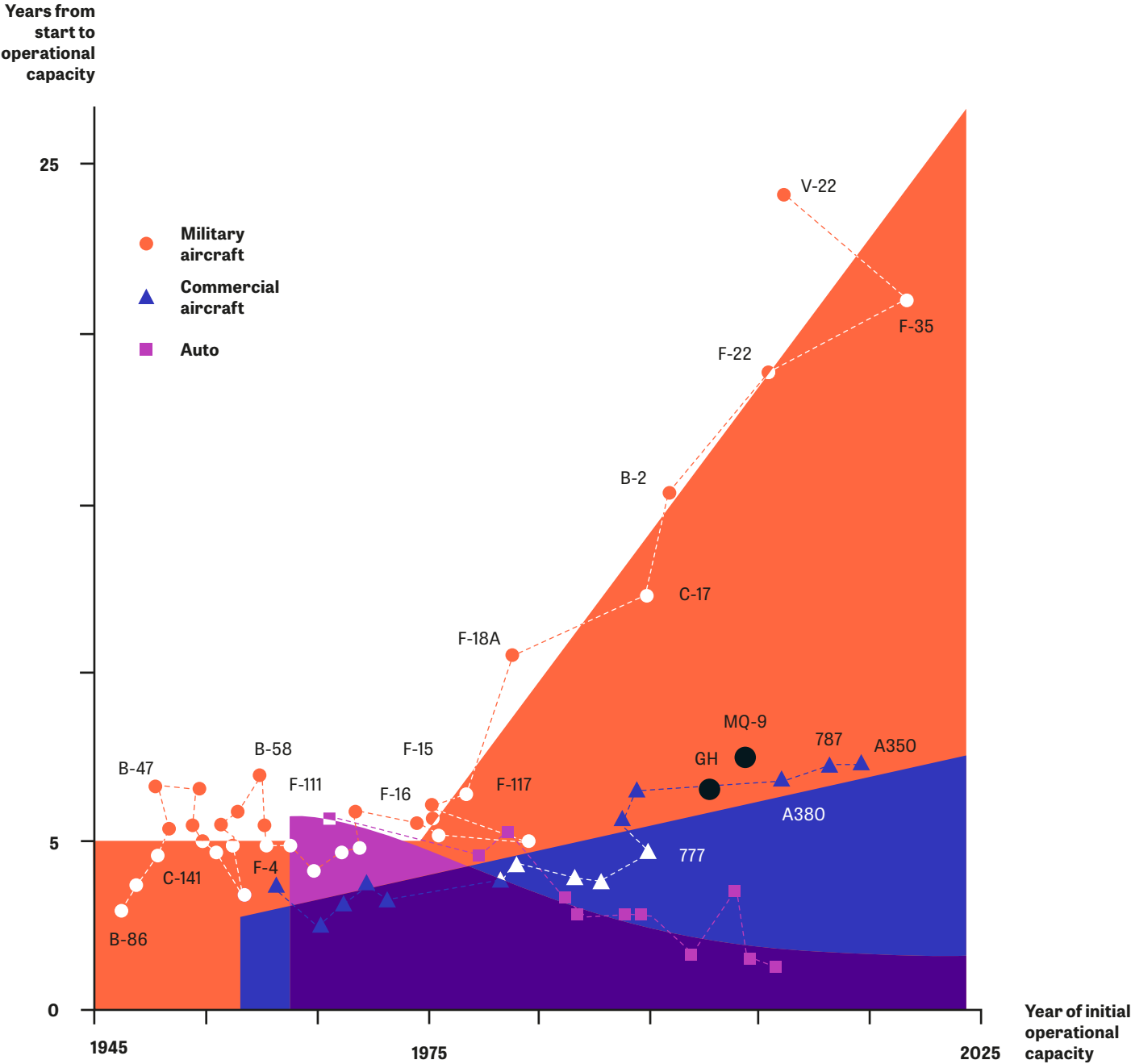
Secondly, it accelerates the learning process. Swift iterations allow for the incorporation of feedback and real-world insights into the development cycle. This iterative approach ensures that products, strategies, or innovations evolve in alignment with market demands and user needs, enhancing their relevance and efficacy.

Moreover, failing fast and iterating quickly minimizes the cost of failure. Early identification of flaws or inefficiencies enables timely course corrections, reducing the waste of resources, time, and effort in potentially unfruitful endeavors.

Ultimately, this approach fuels agility and adaptability, enabling individuals and organizations to stay ahead in a rapidly evolving landscape by consistently refining and enhancing their offerings.

This approach could and should be adopted within the defense sector as well which is not the case for the majority of the large and well-established players in that market. It demands incentivization for proactive movement. Fortunately, a feasible and proven model exists: every other industry in the world. Whether they sell automobiles, smartphones, furniture, or beverages, most companies receive payment only upon delivering a final product. Companies ought to self-finance their research and development, efficiently engineer new products, and subsequently offer them “off the shelf” to government partners. Correspondingly, the government should aptly compensate companies undertaking risk and bearing the costs of technological development. Companies like SpaceX have successfully shown how this works.

Figure 2:
Greenwalt, William
& Patt, Dan,
“Competing in Time:
Ensuring Capability
Advantage and
Mission Success
through Adaptable
Resource Allocation.”
Hudson Institute,
February 2021



Usually, the operation of a defense company is on sales revolving around current systems or they opt to await direct government orders for designated R&D initiatives, which they are compensated for. Why should they innovate on their own if every contract gets paid for no matter how long it takes and how expensive it gets? In the end the intended outcome is a topic of national security and must not fail, no questions asked. To illustrate, the leading technology corporations today, whose earnings significantly surpass those of the top defense firms, allocate approximately 10–20% of their revenue towards research and development. Comparatively, emerging or medium-sized technology startups invest around 60% or 70%. In contrast, major defense corporations allocate only 1–4% to research and development.¹

Innovative spirit for the defense sector

Now let’s take this innovation dilemma and combine it with the primary falsehood in the discourse on defense spending, saying that we’re confined to a binary choice: either achieving “more with more” or settling for “less with less.” This is a fallacious dilemma; innovative technology enables achieving greater outcomes with fewer resources. The perceived standstill in the defense sector is not unavoidable, and we are not obliged to embrace it. Today’s military systems and defense companies should mirror the innovative spirit of Tesla rather than the traditional approach of Ford and embody the forward-thinking ethos of Apple rather than the outdated model of Nokia.

So, what is next? A drone today is a bit like what a smartphone was just over a decade ago: a well-known device but widely underestimated in terms of innovation and business potential.

The deployment of a drone will soon be automated. No more tiresome process of taking a car to the intended operations area, then physically setting up your drone, preparing and uploading a flight plan, charging and pre-heating your batteries followed by manually pressing buttons on a controller to get airborne. Upon landing the same in reverse. All to get a high-resolution, ideally real-time aerial shot. Quantum Systems is pushing to become the world leader in AI powered aerial robotics. No more operators needed, and human interaction reduced to a minimum. We call it Drone Port.

¹ Maucione, Scott. “DoD’s Kendall wants more research spending from industry.” Federal News Network, November 2015, <https://federalnewsnetwork.com/defense/2015/11/kendall-wants-research-spending-industry/>.

Figure 3:
Drones from Quantum Systems serve a variety of use cases and scenarios already.

- 1 Disaster management
- 2 Defence
- 3 Precision farming
- 4 Construction industry
- 5 Border protection
- 6 Mining Industry

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”



We're shaping the future of automated drone deployment to provide customers aerial intelligence when it matters. Anytime and anywhere. Drones will soon be automatically deployed to monitor borderlines, battlefields and provide public safety organizations with a cutting-edge advantage. Once operational and fielded in a military and public safety context we envision to use the same core technology and bring our dual-use advantage into commercial businesses like farming, mining and linear infrastructure scenarios by providing aerial intelligence for better decision making.

Aerial intelligence when it matters

Our aim is to bring this future into existence, nurturing safer communities globally. We strive to ensure universal access to air support, believing that safety is a fundamental right for everyone across the globe.

Our connected network of Drone Ports will turn aerial intelligence into a data as a service model. A little bit like google maps on your phone today. But real time. Aerial intelligence when it matters.

That said, Quantum Systems is one of a slew of innovative companies pioneering a new model, based on the following principles:

The convergence of military and civilian technologies fosters a fertile ground for innovation. Ideas and discoveries from defense research often have civilian applications, accelerating technological progress across industries and vice versa. Leveraging dual-use technologies promotes cost efficiency and economies of scale. Investments made in defense research can yield breakthroughs that have lucrative commercial applications, stimulating economic growth and competitiveness. Innovation in dual-use technologies will push the boundaries of what's technologically feasible. Advancements in fields like materials science, AI, energy and propulsion, driven by defense needs, have cascading effects across industries, propelling technological evolution.



It has to be the Western imperative to enhance innovation in dual-use technology. While the West has historically been at the forefront of technological innovation, the landscape is evolving rapidly. To maintain and strengthen our position, Western nations must prioritize the development and integration of dual-use technologies.

The journey towards harnessing the potential of dual-use technology is not without its challenges. Concerns regarding ethics, privacy, and misuse of technology demand thoughtful consideration and regulatory measures. Striking a balance between innovation and ethical boundaries is crucial in ensuring responsible technological advancements.

Moreover, fostering a culture of innovation requires a concerted effort to overcome bureaucratic hurdles, encourage risk-taking, and support entrepreneurs and startups working in dual-use technology domains.

In conclusion, dual-use technology stands as a cornerstone for driving innovation, economic growth, and societal progress. The Western world, with its rich history of technological innovation, holds the potential to lead this transformative journey. By investing in R&D, fostering collaborations, nurturing talent, and creating conducive regulatory environments, Western nations can harness the full potential of dual-use technologies. Embracing this future of innovation not only bolsters economic prosperity but also ensures technological advancements that positively impact global societies, security, and well-being.

The challenges ahead are gigantic, but so are the rewards if we are successful: continued peace and a prosperous free democratic world.■

Figure 4:
By building a network of Drone Ports, Quantum Systems will become the provider for realtime aerial intelligence.