

The Many Roles and Phases of Innovation

More than a new idea

by Donald M. Bishop & Brandon Valeriano

When theorizing about innovation and creativity, it is common to think first of a few exemplars: men and women like Thomas Edison, Steve Jobs, Marie Curie, George Washington Carver, Norman Borlaug, Ross Perot, Grace Hopper, Thomas Watson, or Bill Gates. The Marine Corps has exemplars of its own; Victor “Brute” Krulak and Earl “Pete” Ellis are the most noted. Yet, exemplars are just the tip of the spear of innovation.

Looking at even this short list reveals that there is more to innovation than a new idea, a light bulb in the mind, a vision, or an invention. Individuals who also proved themselves to be strong organizers, natural planners, and vigorous entrepreneurs were those that built strong organizations capable of producing real innovation over a long duration.¹

Compare the success of Mark Zuckerberg, for instance, with the failure of other innovators. It was Edmund Drake who drilled the first oil well in Titusville, PA, in 1859, but he died in poverty while others became rich. Drake, unlike John D. Rockefeller, lacked the business acumen to form and lead the corporations that enriched Rockefeller and his principal division chiefs, which gave livelihoods to thousands of employees and enabled a widespread rise in the American standard of living when Standard Oil steadily reduced the price of petroleum products like kerosene and gasoline.²

There are negative examples from military history, too. LtCol Ellis is today honored as a prophet of amphibious warfare, but he died in Palau in 1923, likely of alcoholism and depression.³

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BG Billy Mitchell's vision on an Air Force would not be realized during his career.
(Photo by National Museum of the Air Force.)

It was others who shaped the Marine Corps for its role in the Pacific War two decades later. In the Army Air Corps, BG Billy Mitchell expounded his concepts of air power too aggressively; after his court-martial, it was others, his acolytes, who finally created the independent Air Force that Mitchell had envisioned.⁴

It is true that luck and timing can have as much impact on innovation as the actual idea. Innovations in frequency hopping and spread-spectrum technol-

ogy were conceived by the Hollywood actress Hedy Lamarr, who worked as a mathematician and engineer during World War II. Her intended wartime application was to encrypt torpedo control signals, but they were ignored at the time.⁵ It was decades later that others used the technology for GPS, Bluetooth, and Wi-Fi, which all became central to the third offset strategy of the U.S. military.⁶

Many roles in innovation

Visiting the Wharton School at the University of Pennsylvania for a conference on leadership, we noticed prominent banners that listed twelve different roles or functions of innovation: trailblazer, visionary, trendsetter, early adopter, change maker, achiever, expert, inventor, legend, influencer, connector, and philanthropist.⁷ The list can help enlarge our thinking about innovation. It gives testimony that innovation moves in phases, in waves, and it gives us a better sense of the variety of roles that can spark and drive innovation.

Inventor, achiever, expert, visionary, legend. These are people who innovate and originate. Drawing on military and naval examples, we can see John Browning, Werner von Braun, John Holland, Howard Hughes, Hyman Rickover, and Igor Sikorski in these roles. These men were innovators of weapons and weapons systems, but there can be other kinds of innovation too. The concentra-

tion of Marine Corps schools at Quantico by MGen John Lejeune soon after the end of World War I is now recognized as an important organizational innovation that developed new tactical concepts and educated a new generation of Marine leaders for World War II.⁸

Trailblazer, early adopter, trendsetter, change maker. These are people who implement innovations. Two of Billy Mitchell's acolytes, Carl Spaatz and Ira Eaker, pioneered aerial refueling in a 150-hour flight in 1929, just one part of Air Power's future.⁹ They went on to high command in World War II, reporting to Hap Arnold—another Mitchell disciple.

In the early twentieth century, the new radio technology found many applications, and across America many young people toyed with crystal sets, but it was Robert Sarnoff who combined the technology of radio with the commerce of advertising to form RCA and the first nationwide radio networks, opening the "radio age" in the 1920s.¹⁰ In the 1930s, when the cowboy, Hollywood star, and humorist Will Rogers joined aviator Wiley Post on his long distance flights, he popularized the progress of aviation. Marine Corps LtCol Victor Krulak did not invent the helicopter, but he foresaw how it might work a revolution in tactics.¹¹ He encouraged experimentation at Quantico and other Marine Corps installations, drawing the attention of many more to the new rotary-wing technology.

Influencer, connector, philanthropist. These individuals widen the reach of innovation. Although Alexander de Severisky was himself an innovator in military aircraft design, his 1942 book, *Victory through Air Power*,¹² inspired a wartime Walt Disney film that integrated animation to communicate air power doctrine to millions of Americans.¹³

Sometimes sparks fly when two different innovators meet. The course of World War II was shaped when the innovator of small, shallow draft boats, Andrew Higgins, met the Marine officer, Victor Krulak, who saw the value of the bow ramp. The result of their collaboration was the Higgins boat.¹⁴

Closer to home, the California philanthropist Donald L. Bren, a Marine

Corps veteran, has energized innovation at Marine Corps University by funding Marine Corps University Foundation chairs in Military Innovation, Cyber Conflict and Security, Great Power Competition, Strategic Communications, Russian Military and Political Strategy, and Non-Western Strategic Thought. These chairs are now housed in The Krulak Center at Marine Corps University, the innovation think tank of the Marine Corps.¹⁵

To this list, we can add a few specialized functions that most fail to recognize as critical to innovation. One is evaluators: those who do the operational research that can assess the impact of innovations. These quantitative scien-

enlisting large teams of people who join them to push inventions forward. Facebook was driven by Mark Zuckerberg, but the more interesting story is the team he developed that put the idea in motion—along with the cascade of new firms, software, and applications his company's success inspired.¹⁷

Yes, these teams may be working to advance a central visionary innovation, set in motion by an Edison, Gates, or Krulak. A cascade of innovations—new inventions, organizations, and structures—follow. Many of these innovations are themselves pioneering.

Looking at Air Force history, the air power vision set in motion advances in engines, airframes, wing slats, con-

Bill Gates and Mark Zuckerberg had some big ideas, but even they may have been surprised by the unexpected direction that their innovations took.

tists and mathematicians produce the metrics and measurements that provide the proofs that innovative ideas work. They can also flag shortcomings and failures.¹⁶

Another missing function is the communicators. From unit public affairs officers; to military magazine and journal editors; to biographers of such innovators as Curtis LeMay, John Boyd, and Edward Lansdale; and to communication giants like Henry Luce of Time-Life (who did so much to promote space flight), all develop public support for innovation. Individuals—whatever their background, educations, and talents—can join and advance innovation.

Teams

If the Wharton School's list has shortcomings, the first is that it is still too personalized, elevating the role of a few "heroic" individuals. It mutes the contribution of teams: innovation units, testing teams, engineering and manufacturing groups, sales and marketing teams, maintenance depots, distribution networks, or legal units.

An innovator's insights will not go very far in generating change without

trols, instruments, navigation, navigation aids, bombsights, fuels, guns and gunsights, ground control, radar, statistical control, weather forecasting, flight safety, and hundreds of smaller innovations.¹⁸ One airframe may embody thousands of different patents. Hundreds of new procedures and skills were hammered out by assembly line innovators. This means that every maintenance lance corporal on the flight line is part of a larger web of innovation.

Bill Gates and Mark Zuckerberg had some big ideas, but even they may have been surprised by the unexpected direction that their innovations took. Many Silicon Valley firms were launched to meet a specific IT need, such as video sharing. Along the way, entrepreneurs and their teams struck out in new directions, founding such companies as YouTube, TikTok, and Netflix.

A second shortcoming of the list is that its focus on individuals perhaps shorts the importance of the larger environment of enterprise and profit in democratic, contract-based societies.¹⁹ Abraham Lincoln, as far back as 1859, hailed how the patent system "added the fuel of *interest* to the *fire* of genius."²⁰

By interest, he meant profit. The history of military innovation is a history of partnership between the armed Services on one hand and corporations and contractors on the other. It was the *Vought F4U Corsair* that kept back the Chinese at the Chosin Reservoir and the *Bell Boeing V-22* that now carries Marines into combat. When the threat of IED's made evident the need for Mine-Resistant Ambush Protected vehicles in Iraq and Afghanistan, it was a dozen corporations that designed vehicles and competed for the contracts.²¹

The prospect of profit leads corporations to find, hire, and develop creative people; partner them with employees who are experienced veterans; innovate; and compete to produce the best product. The potential for profit also leads venture capitalists to fund innovations.

Every Marine an innovator

The Marine Corps must move beyond the skewed historical view of innovation that gives credit to a few individuals and lean into the idea that innovation is collaborative, and it requires evaluation and communication. Facing future challenges, for instance, a spirit of “every Marine an innovator” could help the Corps focus on how it needs the contributions of all to grow stronger.²²

The *Marine Corps Gazette*, the *U.S. Naval Institute Proceedings*, and *Joint Force Quarterly* are performing their valuable functions as forums for new and innovative ideas as they discuss and debate expeditionary advanced base operations (EABO), so are the cutting edge websites like *War on the Rocks*, *The Strategy Bridge*, and *The Landing*.

The vision of the *38th Commandant's Planning Guidance*—especially its focus on EABO inside the weapons engagement zone—is creative and innovative.²³ So is the guidance provided by *Force Design 2030*, which calls for “an ambitious force wide transformation.”²⁴ It also provides an example of how successful innovation cascades down. Think of the many kinds of follow-on implementation these documents require. The Commandant challenges Marines across the Corps—in every specialty, every theater of operations,



The Navy and Marine Corps have experimented with HIMARS, re-purposed to contest sea denial. (Photo by Petty Officer 2nd Class Matthew Dickinson.)

and both up and down the chain of command—to innovate.

Among dozens of examples, the Navy and Marine Corps are considering the design, acquisition, and deployment of new vessels.²⁵ Repurposing weapons like HIMARS for anti-sea denial is another form of innovation.²⁶ A new generation of seaplanes may play a role.²⁷ So might airships.²⁸ The traditional platforms that transport MEUs may be too vulnerable to deploy inside or near the first island chain, so the Navy and the Marine Corps must be creative to find new ways to move through contested waters.²⁹ The need to seize small islands without a traditional amphibious landing offers yet another example of the need for new and innovative operational concepts.³⁰

There are many other areas the CPB leads to demands for new innovations. EABO will not allow the luxury of “a golden hour” to evacuate casualties; the Navy medical corps must reconfigure itself for “mobile, farther-forward surgery.”³¹ The need to provide assured communications is shooting adrenaline into communications Marines.³² Supplying many different small detachments operating inside the WEZ calls for new logistic delivery methods including UAVs.³³ Relationships with allies and partners will be as critical

as before, but bilateral relationships will take a new shape—relying less on big bases.³⁴ The entire EABO concept requires a revision in thinking about naval campaigns,³⁵ and evolving Marine Corps cooperation with the Navy and the Coast Guard will shake up old habits.³⁶ On the horizon must be new innovations about integrating operations in the information environment and civil affairs into campaigns.³⁷ All these changes, moreover, require advances in training and education.³⁸

New-generation “Krulaks” will always be helpful, but working through all the coming challenges driven by an innovative concept will owe as much to doers as to thinkers; to seasoned Gunner Sergeants and young riflemen; to old salts and young sailors; to those on the flight line and in the operations centers as well as those in the air; skippers and crews of little ships as well as deep draft combatants; and Marine Raider team NCO's as well as MEU commanders. Sparks of innovation can animate the Marine Corps when all understand there is a multitude of roles that one can play. Necessity may be the mother of invention, and a few gifted thinkers may conceive large innovations, but it is organizations, processes, and teams that produce outcomes that change the world.

Notes

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