6

A Different Military–Industrial Complex

When it comes to the development and production of new weapons, new platforms, and new systems, the IDF benefits from a uniquely close relationship with the country’s aerospace and military industries because of the dominance of its reservists in their management, research departments and labor force.[[1]](#endnote-1) Regardless of the ownership of the different firms, some entirely private, others entirely state-owned, and some in-between, employees cannot ever forget that what they design, develop, and produce maybe exported (as is increasingly the case) but will also be used by themselves if mobilized for war or by their sons and daughters—and that adds a compelling special meaning to the term “cost-effective” insofar as better equipment can reduce casualties.

An engineering development project leader who served as commander of a reconnaissance detachment during the First Lebanon War in 1982 said that during the war he was sent behind enemy lines to observe and report, a very risky mission: “I thought to myself, he said, there must be another way to be able to look ‘on the other side of the hill’ without exposing soldiers to such a risk.”[[2]](#endnote-2) When he came back from the war, he initiated the development of a series of tactical drones to accomplish the reconnaissance tasks without risking soldiers.

Aside from the emotional aspect, there is the sheer *quality* of the communications between the IDF customer and military suppliers staffed in great part by IDF reservists. All over the world such communications must be carefully calculated and guarded, even secretive, because huge amounts of money are involved, because any military acquisition can easily become politically controversial, and because, where corruption is absent, there are a great many bureaucratic rules to guard against improprieties and ensure strict impartiality—a factor especially important in the US, where almost any major purchase can trigger lawsuits by the disappointed contenders.

Under whatever terminology, military purchasing anywhere begins with a “request for proposals,” which triggers intense efforts by would-be suppliers to understand what the military customer *really* wants. That is crucial because it happens not rarely that the military purchaser is not allowed to freely specify what it wants because the defense ministry would object for political reasons, or the finance or industry ministry object for industrial reasons, so that the military purchaser must compromise its own preferences to accommodate broader defense, financial, or industrial priorities.

The major navies, for example, almost invariably prioritize “air capable” ships that resemble real aircraft carriers as much as possible. Defense ministry officials on the other hand are apt to fear the size/cost growth of anything with “air” in its name, so they might force the navy to issue a request for proposals for a classic destroyer. But the offer of a warship that just happens to have a big deck with a hangar behind it is more likely to win a contract than one offering a true destroyer with weapons fore and aft and a modest helicopter pad. (Indeed, that is how the label “through-deck destroyer” was invented—to describe what was in a reality a small aircraft carrier).[[3]](#endnote-3)

The above is a highly simplified version of a very difficult problem—the terminological traps are usually more subtle, making interpretation more difficult. Often, obscure details in a Request for Proposals (RFPs) are designed to favor a specific contractor —usually one’s own traditional domestic supplier in the European Union countries. They are all supposed to select a Europe Union supplier strictly on merit, but the larger countries typically have their own entrenched local supplier, which is often a resonant national institution — Beretta for pistols and rifles, Rolls Royce for jet engines, Dassault for aviation, Kraus-Maffei for tanks and other armored vehicles — all faithful suppliers, and less sentimentally, providers of well-paid jobs for retired military officers and procurement officials. European efforts to achieve scale and efficiency in military procurement have been intense and have required countless conferences in such cities as Paris and Venice, and numberless working lunches and even harder-working dinners, but results have been elusive – the same “national” suppliers are still very much in business, supplying their own captive market with equipment good, bad, or worse.

In the US everything is different of course because, as everybody knows, the US is ruled by laws. One of those laws happens to be the “Buy America Act” to discourage foreign competition in defense procurement, but that still leaves at least two contenders for any RFP, and their lobbyists, friendly home-state congressmen, Washington offices, and consultants fight it out with a regiment of lawyers on each side ready to challenge any adverse decisions.[[4]](#endnote-4)

In both the European Union and the United States therefore, there is no possibility of a frank, full, and continuous dialogue between military buyers and industrial suppliers. That is very unfortunate because the design of weapon systems rests on technologies that may change quickly, and the performance required of them may change quickly as well because of the arrival of something different on the other side, or because expected conflict patterns have changed.

Hence, the entire weapon development process should be very fluid to accommodate changes quickly enough; otherwise, by the time the weapons system is actually produced and delivered to the armed forces, it may no longer fit changed military requirements, or even be obsolescent. But any such fluidity is drastically restricted by contractual obligations and detailed specifications that cannot just be changed as needed, without formal and very detailed “change orders” that require elaborate renegotiations, conducted by exchanging legally vetted correspondence, so that lawyers participate at each step, not just engineers and cost analysts.

That makes every agreed change very slow—slower still if there are disagreements, limiting greatly what can be done to keep weapon systems under development up to date. While the replacement of old-design components with better new ones may seem mere commonsense, it still requires the renegotiation of the contract—without it, nothing can happen, and what does happen is indeed mostly nothing, because everybody is so fearful of reopening procurement contracts (perhaps triggering demands for a competition by the unsuccessful contender) that as the development process continues, more and more components slide into obsolescence as months give way to years, or even decades. That explains how it can happen that ultra-advanced jet fighters, handed over with great fanfare, can arrive for squadron service with some electronic components less capable than those found in some contemporary toys. Worse, the entire design may no longer satisfy military requirements, even though it was “ultra-modern” fifteen or twenty years earlier when the contract was signed.

In Israel, by contrast, the active-duty IDF people doing the buying and the mostly reserve IDF people doing the selling—or rather the research, development, fabrication, testing, evaluation, modification, and retesting—do actually talk to each other all the time, before and after the actual contract is signed, with no lawyers in between except when all the work has been done, and final contracts can be drawn up. There is no waiting for contracts to be renegotiated to pursue design changes—which are essential to keep everything up to date as many components change—and there is no waiting for periodic “progress reviews.”

There are instead informal channels of coordination between the IDF unit doing the buying and the industrial teams working to develop or actually produce equipment, with a single coordinating institution in the middle: the Administration for the Development of Weapons and Technological Infrastructure (known by its Hebrew acronym *MaFat*) jointly formed by the Ministry of Defense and the IDF to coordinate them, and all state-owned entities engaged in the R&D and production of IDF equipment: Israel Military Industries, Israel Aerospace Industries, *Rafael* Advanced Defense Systems, the Institute for Biological Research, and the Space Agency.

The MaFat director, a full member of the general staff, is a brigadier general, but his civilian suit indicates the hybrid position. MaFat’s brief is to preserve the IDF’s qualitative edge in weapons and infrastructures by directing domestic R&D projects and joint projects with foreign partners, and by nurturing exceptional manpower for them, not least through the Talpiot program. Its internal structure reflects the diversity of the disciplines MaFat is supposed to coordinate: applied science is the province of its Technological Infrastructure and Research Unit, which is supposed to supply useful applications for the R&D projects it has prioritized; the Space Administration is tasked with the R&D, manufacture, launch, orbit placement, and subsequent operation of all satellites; the missile-defense directorate overviews all anti-missile R&D projects in cooperation with its US counterpart, DoD’s Missile Defense Agency (MDA); the drone directorate’s brief is to advance UAV capabilities and technologies; and a variety of other units are in charge of budgeting, one-off projects, and liaison with foreign partners.[[5]](#endnote-5)

All this suggests a classic, multilayered, stove-piped, and compartmented bureaucracy, properly structured to do all the things bureaucrats like to do, which is to read papers and move them on from office to office, without actually doing anything very much, which might go wrong and attract criticism. But so far, the MaFat has been no such thing because its head (since 2016) is the notoriously headstrong anti-bureaucrat Brig. Gen. (Res.) Dr. Daniel Gold, a “Talpion” whose imperious direction of the *Iron Dome* project became the subject of a full-scale investigation, which condemned his countless administrative violations while recognizing he had achieved wonderful results, with miraculous rapidity, at very low cost.

MaFat was born out of a 1971 debate between the IDF and the Ministry of Defense over the fire-control system needed for the new battle tank—Israel’s first such effort—whose development had just started to eventually produce the *Merkava* tank*.* Then the question was whether it would have to be imported, as with the diesel engine whose local design and production was unimaginable, or whether Israel’s fledging electronic industry was up to the task.[[6]](#endnote-6) The unexpected outcome of this debate, which featured the Office of the Chief Scientist of the Ministry of Defense on one side and the IDF’s weapon development department on the other, was a decision to merge the two into a joint civilian-military R&D unit (and also to go ahead with a domestic fire-control apparatus for the tank). This was the forerunner of what became MaFat in 1982 when Minister of Defense Ariel Sharon added the Procurement and Manufacturing directorates to the joint R&D unit. The great innovation in MaFat’s structure lies in its hybrid nature – its head attends both IDF General Staff meetings as if he were a general, and the defense ministry’s staff meetings of department chiefs as if he were an administrator. Indeed, he is both a general in the reserves and a civilian administrator.[[7]](#endnote-7)

Another part of the defense establishment, *Rafael*, the Armament Development Authority mentioned earlier, also experienced a revolutionary metamorphosis, in fact several. It was formed early in 1948 as the “Science Corps” to gather individual scientists to try to invent things that could help the desperately overtaxed fighting units in one way or other—but no miracles are recorded. In 1952, with a bit of funding, the Science Corps became the Research and Design Directorate‬, with both a research element and weapons-development unit. It was reorganized in 1958 as *Rafael*, after the Hebrew acronym for “Authority for the Development of Armaments,” and later further renamed as the current *Rafael* Advanced Defense Systems Ltd., incorporated as a limited company in 2002. Even though still entirely state-owned, as a self-standing company it can be a fair competitor for the country’s private companies.

But by then *Rafael’s* transformation into a veritable innovation machine had already been accomplished: still a very small organization as compared to its peers, it had somehow developed a slew of new weapons: the *Python* series of air-to-air missiles; the *Spike* family of fire-and-forget, surface-to-surface missiles; the *Popeye* very long-range air-to-ground missile, which is believed to be the basis of a nuclear-armed, submarine-launched cruise missile; the *Iron Dome* system for the low-cost interception of even cheaper rockets, but expensive missiles also*; Trophy*, the first active defense system for armored vehicles in the West (preceded by Russia’s *Drozd* and *Arena)*, the world’s first operational unmanned surface vehicle; and *David's Sling*, an anti-missile system of much longer range than *Iron Dome*.

If any one individual can be credited for transforming a group of worthy scientists and devoted administrators who had already accomplished much (including the development of the country’s first and remarkable *Shafrir* air-to-air missile) it was Moshe “Musa” Peled, a retired major-general and an odd exception to the engineers who preceded and followed him in the job. An officer who had played a large role in turning heroic defense into sweeping victory on the Golan Heights in October 1973 as commander of an armored division of reservists equipped with mostly upgraded World War Two vintage Sherman tanks, the long-retired Peled seemed an odd choice when he was appointed president of *Rafael* in 1987. It was only in the world of armor officers, including American, European, and Russian, that his 1973 campaign was widely recognized as a true classic—an offensive that drove back across the border much larger Syrian forces equipped with more and better tanks, by sheer dynamic momentum, kept up by responding to any pause caused by exhaustion or enemy resistance by sending forward any force in hand, large or small, to keep up the drive.[[8]](#endnote-8)

In his new post, Peled mounted another persistent offensive, this time against bureaucratic proclivities and tendencies to play it safe.[[9]](#endnote-9) He did not think it worthwhile to pursue incremental innovation—of the kind that accounts for 90% or more of R&D spending worldwide, which minimizes the risks of failure by sticking to the improvement of existing platforms and weapons, to obtain somewhat better weapons, sensors, warship, aircraft, but surrendering any chance of real breakthroughs. Peled demanded “macro-innovation” or nothing, high-risk leaps into the truly new, which might fail of course. He reportedly told his engineers: “If every project result in a success it means you are not daring enough. I would expect an overall failure rate of 50%.” [needs source]

That was Peled’s way of fighting any relapse into mediocre normality at a time when he feared that *Rafael* might lose its poverty-sharpened edge because its exports were bringing in much more money than ever before, adding to rising IDF funding. It had acquired its first decent headquarters building complete with new furniture, a far cry from a past of extreme scarcity. Peled’s offensive was successful: instead of sliding into well-funded corporate mediocrity, *Rafael* became more of a risk taker than ever before, and not only technologically: its managers went out on the longest possible limb to engineer-develop the *Iron Dome* system before any government funding had been authorized.

1. The state-owned Israel Aerospace Industries, or IAI; *Rafael*, the Hebrew acronym for "Authority for the Development of Armaments" officially Advanced Defense Systems Ltd, and the private Elbit Systems whose proprietary technology includes the F-35’s chief advance, its helmet-mounted display system. [↑](#endnote-ref-1)
2. As told to Edward Luttwak. [↑](#endnote-ref-2)
3. In Japan’s case the distortion caused by the aircraft-carrier taboo is extreme: its *Izumo*-class vessels are actually fair-sized aircraft carriers at 27,000 tonnes full displacement, but their international categorization is DDH, indicating a destroyer with some air capability, which in Japanese is further reduced to *goei-kan* which merely means “escort.” [↑](#endnote-ref-3)
4. Almost all big military purchases are “home-state” because the components of major weapon systems are very deliberately purchased from as many different Congressional districts as possible, certainly those of House or Senate members of the Armed Services Committee or the Defense sub-committee of the Appropriations committee. [↑](#endnote-ref-4)
5. See information on MaFat on the MOD website: <http://www.mod.gov.il/Departments/Pages/Research_and_Development_Agency_Mafaat.aspx>. [↑](#endnote-ref-5)
6. Uzi Eilam, *Eilam’s Bow* (Tel-Aviv: Miskal, Yedioth Aharonoth, Chemed Books, 2009), 153-162. (H) The book was published also in English as *Eilam’s Arc: How Israel Became a Military Technology Powerhouse* (Sussex Academic Press, 2011). [should note only the English language book here; are the page numbers the same?] [↑](#endnote-ref-6)
7. Eilam, *Eilam’s Bow*, 354-370. [check page numbers in English edition] [↑](#endnote-ref-7)
8. In the Patton Museum of Kentucky’s Fort Knox, high temple of the armor fraternity, Peled’s photo is displayed alongside those of Patton, Erwin Rommel, Creighton Abrams, Marshal Georgy Zhukov and Israel Tal*.* [↑](#endnote-ref-8)
9. Eilam, *Eilam’s Bow*, 374-378. [check page numbers in English edition] [↑](#endnote-ref-9)