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Understanding the Battle for AI in Warfare through the Practices of Assemblage:

A Case Study of Project Maven

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Abstract

Artificial Intelligence (AI) has been widely-heralded as a revolutionary technology across a range of domains, including defence. In this sphere, its potential for automating low-cost and low-risk forms of warfighting known as “remote warfare” has given rise to fears of Lethal Autonomous Weapons Systems (LAWS). While the use of LAWS has been subject to intense speculation, far less attention has been paid to their development. Notably, cutting-edge AI innovation is not to be found in government-funded research labs or traditional defence contractors, but consumer technology companies. Because of this, unique controversies have arisen over its development. In the case of Project Maven, a US Department of Defense initiative seeking to leverage AI for automating drone footage analysis, employee protests eventually forced one of its contractors, Google, to end their involvement. Using Project Maven as a case study, this research therefore seeks to understand the development of an emerging Military-Technological Complex developing these technologies and an oppositional Civil Society Coalition seeking to regulate them.

Based on documentary analysis of key texts and five semi-structured expert interviews, this thesis uses an assemblage approach to examine the discourses surrounding Project Maven, the interplay of power between its elements, and their resulting configurations. It finds a tension between the compulsory powers of the Military-Technological Complex, exercised through structural, material relations, and the productive powers of Civil Society, exercised through the production and sanctioning of knowledge. It concludes that the development of consumer technologies for warfare and the associated emergence of a Military-Technological Complex reflects a broader unravelling of conventional ties between war, space and time.

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Contents

1. Introduction **7**

2. Theory **10**

2.1 Lethal Autonomous Weapons Systems and AI in Warfare 10

2.2 Remote Warfare 13

2.3 Assemblage 15

2.4 Research Gap 19

3. Method **20**

3.1 Research Strategy 20

3.2 Research Design 21

3.3 Research Methods 22

3.4 Limitations 23

4. Forging Alignments & Rendering Technical **24**

4.1 Problem Definition 24

4.1.1 Military-Technological Complex 25

4.1.2 Civil Society Coalition 27

4.2 Rendering Technical 29

4.2.1 Military-Technological Complex 29

4.2.2 Civil Society Coalition 31

4.3 Analysing Alignment 32

5. Authorising Knowledge and Managing Failures **34**

5.1 Authorising Knowledge 34

5.1.1 Military-Technological Complex 34

5.1.2 Civil Society Coalition 36

5.2 Managing Failures and Contradictions 40

5.2.1 Military-Technological Complex 40

5.2.2 Civil Society Coalition 41

5.3 Reasserting the will to govern 42

6. Antipolitics and Reassembly **44**

6.1 Antipolitics 44

6.1.1 Military Technological Complex 44

6.1.2 Civil Society Coalition 46

6.2 Reassembly 47

6.2.1 Military-Technological Complex 47

6.2.1 Civil Society Coalition 50

6.3 Rewiring the Military-Technological Complex 52

7. Conclusion **55**

“Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed. This world in arms is not spending money alone. It is spending the sweat of its laborers, the genius of its scientists, the hopes of its children.”

Dwight D. Eisenhower, 1953

1. Introduction

"This is actually a bit more like building the atomic bomb than building Gmail," claimed one Google worker about their contribution to the Algorithmic Warfare Cross-Functional Team, better known as Project Maven.[1] Project Maven was a US Department of Defense (DoD) initiative that sought to use Artificial Intelligence (AI) technologies for automating drone footage analysis. In 2017, when the news broke that Google was involved, more than 4,000 of its employees demanded that "Google should not be in the business of war," presumably never anticipating that their code might be used for warfighting. The Campaign to Stop Killer Robots (a global coalition of NGOs) joined them in this call, expressing concern that this was the first step towards Lethal Autonomous Weapons Systems (LAWS).[2] Although Google elected not to renew its Project Maven contract, its involvement nevertheless reflects a growing role for tech companies in an emerging "Military-Technological Complex."

Controversy surrounding Project Maven is directly relevant to the study of remote warfare, a phenomenon characterised by a shift away from 'boots on the ground' deployments towards light-footprint military interventions.[3] Technological innovation has played a critical role in this shift, enabling the US military to manage threats at low-cost and low-risk across the Middle East and Africa.[4] Replacing bodies with machines in war is feared by some to lead to Lethal Autonomous Weapons Systems (LAWS), or "killer robots."[5] Understood as weapons capable of searching for, selecting and engaging targets autonomously (i.e. without human control),[6] LAWS raise serious ethical, legal and political questions. Popular and academic preoccupation with their potential use in the future, however, risks overlooking their development in the present.

As contemporary warfare depends on new technologies, the DoD is experiencing dramatic changes in their development and procurement. AI is at the centre of this transformation. Poised to initiate "the next industrial revolution,"[7] the potential of AI in

[1] Quoted in Tarnoff, B. (2019). Tech Workers Versus the Pentagon. Jacobin. Retrieved from https://jacobinmag.com/2018/06/google-project-maven-military-tech-workers
[2] Wareham, M. (2018). Campaign to Stop Killer Robots Letter to Heads of Google and Alphabet. Retrieved from https://www.stopkillerrobots.org/wp-content/uploads/2018/04/KRC_LtrGoogle_12March2018.pdf
[3] Demmers, J., & Gould, L. (2020). The Remote Warfare Paradox. In Remote Warfare: Interdisciplinary Perspectives. E-International Relations.
[4] Ibid.
[5] Chamayou, G. (2016). A Theory of the Drone. The New Press. Chapter 23
[6] Scharre, P. (2018). Army of None: Autonomous Weapons and the Future of War. W. W. Norton. 180
[7] Ibid. 18

defence has been likened to gunpowder and the atomic bomb.[8] Notably, however, the cutting-edge AI technologies sought by the DoD are not in government-funded research labs or among traditional defence contractors, but in private technology companies (e.g. Google). Studying technology and its development has long posed a challenge to scholars of IR, but there is a clear need to do so here.[9] Especially when "solutionism" increasingly, and perhaps mistakenly, offers technological solutions to political problems.[10]

Project Maven was a staging ground in a larger battle over AI in defence. Drawing together various elements, including social actors (the DoD, tech companies, civil society campaigners), objectives (profit, safety, ethics), and discourses around a common issue, it revealed how their contestation and cooperation influences the development of AI in defence.[11] Tracing power between these elements, via their social and material relations, provokes significant intrigue. Capturing this complexity is done here using the assemblage approach. With it, the heterogeneous elements converging around Project Maven seeking to govern the development of AI in defence can be delineated into a Military-Technological Complex and oppositional Civil Society Coalition, understood as two distinct but overlapping assemblages operating in the same field.

Tech and defence elements coalescing around Project Maven indicates a porous civil-military divide. The concept of a Military-Technological Complex proposed here, understood as intensified cooperation between consumer technology companies and military actors, reflects a broader unravelling of conventional ties between war, space and time relevant to the study of remote warfare.[12]

Drawing from and contributing to empirical debates on LAWS and remote warfare and theoretical debates on assemblage and technology in IR, this thesis remedies an important gap in the literature by answering the following question:

How have practices of assemblage, as carried out by Google, the US Department of Defense, and the Campaign to Stop Killer Robots, formed a military-technological complex and oppositional civil society coalition seeking to govern the development of AI for defence from 2013 to 2020?

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[8] PAX. (2019). Slippery Slope: The Arms Industry and Increasingly Autonomous Weapons. https://doi.org/10.7748/ns.26.22.28.s35 4

[9] Leese, M., & Hoijtink, M. (2019). How (not) to talk about technology: International Relations and the question of agency. In Technology and Agency in International Relations. Routledge. 4

[10] Morozov, E. (2013). To Save Everything, Click Here: The Folly of Technological Solutionism. PublicAffairs.

[11] Li, T. M. (2007). Practices of assemblage and community forest management. Economy and Society, 36(2), 263–293. https://doi.org/10.1080/03085140701254308 266

[12] Demmers, J., & Gould, L. (2018). An assemblage approach to liquid warfare: AFRICOM and the 'hunt' for Joseph Kony. Security Dialogue, 49(5), 364–381. https://doi.org/10.1177/0967010618777890 366

This thesis proceeds with an examination of the relevant existing empirical and theoretical debates in chapter two, followed by an outline of the methods used to examine this particular case in chapter three. Chapter four, *forging alignments and rendering technical*, explores how the elements of Project Maven assembled. Chapter five, *authorising knowledge and managing failures,* examines the legitimisation and contestation of knowledge between them. Chapter six, *antipolitics and reassembly,* considers the current status of the Military-Technological Complex.

2. Theory

> *"We can often learn as much from how and why questions have been asked in other circumstances as we can from the historical answers they yielded. Other people's work is a spring-well of ideas about how to approach the world, even if it is about something we do not work on ourselves."*[13]

The case of Google as a defence contractor, via Project Maven, lies at the intersection of several academic debates. Much ink has already been spilt on the question of Lethal Autonomous Weapons Systems (LAWS), a field closely linked to a growing body of literature on "remote warfare," arguably the driving force behind the automation of warfighting. Recent years have also seen extensive debate among scholars of International Relations on how they can conceptualise the role of new technologies and their development. In this regard, the assemblage has emerged as an appropriate lens for capturing the complexity of such issues.[14]

2.1. Lethal Autonomous Weapons Systems and AI in Warfare

Debate relating to Lethal Autonomous Weapons Systems (LAWS) is a mile wide but an inch deep - vast but as-yet unsubstantiated. Ample discussion surrounds the potential political, legal and moral repercussions of deploying LAWS but there is little theoretically-informed analysis of their development. Given the revolutionary potential of such technologies, there is an urgent need to rectify this imbalance.

Political challenges posed by the deployment of LAWS on battlefields are numerous. Unlike nuclear weapons, LAWS would require no hard-to-obtain materials and be relatively cheap to develop, leading some to fear a global robot arms race.[15] Even those contending that "arms race" framing risks escalating rivalries nevertheless agree on the need to manage

[13] Lund, C. (2014). Of What Is This A Case? Analytical Movements in Qualitative Social Science Research. Human Organization, 73(3). 230
[14] Bousquet, A. (2013). Welcome to the Machine: Rethinking Technology and Society through Assemblage Theory. In M. Acuto & S. Curtis (Eds.), Reassembling International Theory: Assemblage Thinking and International Relations (p. 91+95). Palgrave Pivot.
[15] PAX for Peace. (2019). Don't Be Evil: A Survey of the Tech Sector's Stance on Lethal Autonomous Weapons. 9

the proliferation of these technologies.[16] In particular, the risk of LAWS proliferating among non-state actors seeking to "level the playing field" is severe.[17] Even among democratic states, LAWS would overcome the "bodybag" problem and thus lower the threshold for going to war.[18] In such a scenario, however, the obvious attraction of using LAWS - a 'bloodless' war between machines - is misguided. A change of footsoldiers does not alter the fundamental objective of war: "imposing and enduring costs to reveal relative capability or resolve."[19] In the absence of human soldiers to impose costs upon, belligerents may seek alternative means to demonstrate their resolve, e.g. by targeting non-military objectives and civilians.[20] Indeed, as drones have enabled the removal of soldiers from battlefields, the inability for enemies to directly reciprocate violence has instigated fears of "blowback" by other means.[21]

Political concerns aside, the legal questions raised by LAWS are momentous. Formal and informal rules have guided conduct in warfare for as long as it has been carried out.[22] Over time, International Humanitarian Law (IHL) has steadily evolved to keep up with the development of new methods of warfighting, as evidenced by bans on the use of Chemical and Biological Weapons, anti-personnel landmines and blinding laser weapons. Throughout history, however, IHL has been developed under the assumption that human intelligence is guiding conduct in combat, not artificial. As existing treaties make no reference to LAWS, it is unclear if they can be banned under the current legal framework.[23] Nevertheless, because it is impossible to confidently predict the outcomes of commands on complex AI systems, there is a possibility of LAWS running afoul of IHL.[24] Can a robot be entrusted with the ability to discriminate between legitimate targets and civilians? If it fails,

[16] Roff, H. M. (2019). The frame problem: The AI "arms race" isn't one. Bulletin of the Atomic Scientists, 75(3), 95–98. https://doi.org/10.1080/00963402.2019.1604836 97
[17] Chertoff, P. (2018). Perils of Lethal Autonomous Weapons Systems Proliferation: Preventing Non-State Acquisition. Geneva Centre for Security Policy, (2)
[18] Leveringhaus, A. (2016). Ethics and Autonomous Weapons. Palgrave Pivot. https://doi.org/10.1057/978-1-137-52361-7 14
[19] Gartzke, E. (2019). Blood and robots: How remotely piloted vehicles and related technologies affect the politics of violence. Journal of Strategic Studies, 00(00), 1–31. https://doi.org/10.1080/01402390.2019.1643329 26
[20] Ibid. 24
[21] Hudson, L., Owens, C. S., & Flannes, M. (2011). Drone Warfare: Blowback from the New American Way of War. Middle East Policy, 18(3), 122–132.
[22] International Committee for the Red Cross. (2004). What is International Humanitarian Law? In Complete International Law. https://doi.org/10.1093/he/9780199679072.003.0012
[23] Krishnan, A. (2016). The Legality of Autonomous Weapons. In Killer Robots: Legality and Ethicality of Autonomous Weapons. Ashgate. 101
[24] Lin, P., Bekey, G., & Abney, K. (2009). Robots in War: Issues of Risk and Ethics. Ethics and Robotics, 49–67. 55

who can be held accountable? Some fear LAWS subverting the Hague Convention if they can act autonomously but not assume responsibility for the consequences.[25]

The ethics of using LAWS are fraught. At first glance, there is obvious appeal in using robots to do the "dull, dirty and dangerous" work in war as in civilian life. A robot never gets tired, stressed or traumatised. Their dispassionate nature, immune to the intoxicating effects of adrenaline, may even *reduce* the risk of civilian harm in conflict.[26] From this perspective, if LAWS lessens the danger to soldiers and civilians alike, some suggest utilising them is not only judicious but an ethical imperative.[27]

Even if LAWs *could* perfectly adhere to IHL and reduce harm to both combatants and civilians, many question whether they *should*. As a simple matter of dignity, some insist that taking a human life should involve a human decision.[28] "Delegating the decision to kill to algorithms," according to Rosert and Sauer, "is inhumane and unacceptable under any circumstances."[29] A compelling argument, but potentially relativised by the fact that there are many different interpretations of human dignity and many ways it can be violated - technological or otherwise.[30]

The political, ethical and legal concerns raised are troubling but overwhelmingly speculative. Are we jumping the (autonomous) gun? Such preoccupation with the future use of killer robots may obscure meaningful debate about their present day development. A few notable contributions from Lewis,[31] Taylor[32] and Verbruggen[33] are to be commended for grappling with the development of these systems, but this remains an under-theorised field. Presumably owing to its novelty, Project Maven has thus far evaded serious academic

[25] Krishnan, A. (2016). The Legality of Autonomous Weapons. 106
[26] Lin, P., Bekey, G., & Abney, K. (2009). Robots in War. 52
[27] Arkin, R. C. (2009). Ethical robots in warfare. IEEE Technology and Society Magazine, 28(1), 30–33. https://doi.org/10.1109/MTS.2009.931858;
Foust, J. (2013, May 15). A Liberal Case for Drones. Foreign Policy. Retrieved from https://foreignpolicy.com/2013/05/15/a-liberal-case-for-drones/
[28] Asaro, P. (2012). On banning autonomous weapon systems: Human rights, automation, and the dehumanization of lethal decision-making. International Review of the Red Cross, 94(886), 687–709. https://doi.org/10.1017/S1816383112000768 696
[29] Rosert, E., & Sauer, F. (2019). Prohibiting Autonomous Weapons: Put Human Dignity First. Global Policy, 10(3), 370–375. https://doi.org/10.1111/1758-5899.12691 372
[30] Sharkey, A. (2019). Autonomous weapons systems, killer robots and human dignity. Ethics and Information Technology, 21(2), 75–87. https://doi.org/10.1007/s10676-018-9494-0 85
[31] Lewis, L. (2019). Resolving the Battle over Artificial Intelligence in War. RUSI Journal, 164(5/6), 62–71. https://doi.org/10.1080/03071847.2019.1694228
[32] Taylor, T. (2019). Artificial Intelligence in Defence: When AI Meets Defence Acquisition Processes and Behaviours. RUSI Journal, 164(5–6), 72–81. https://doi.org/10.1080/03071847.2019.1694229
[33] Verbruggen, M. (2019). The Role of Civilian Innovation in the Development of Lethal Autonomous Weapon Systems. Global Policy, 10(3), 338–342. https://doi.org/10.1111/1758-5899.12663

scrutiny. One notable exception comes from Suchman,[34] however it nevertheless engages primarily with the deployment rather than development of this technology.

Common to these conjectural, dystopian perspectives on the future of warfare is the assumption that if LAWS technology exists, it will be used. Not a dramatic leap of faith but nevertheless it seems prudent to question what is driving the demand for these technologies in this domain; thereby drawing the line between where we stand and where some fear we are heading. LAWS will only be deployed, presumably, if there is some strategic, operational and/or tactical need for them. Understanding this will elucidate a fuller picture of why and how they are being developed. To satisfy this curiosity, we turn to the growing field of scholarship on remote warfare.

2.2. Remote Warfare

The best indication of warfare's near future can be found in its recent past.[35] With this in mind, LAWS can be contextualised by the ascendancy of "remote warfare." Defined as "a strategy of countering threats at a distance, without the deployment of large military forces," remote warfare takes a variety of forms, including the use of technological (e.g. drones) or physical (e.g. partner forces, private military contractors) proxies.[36] By considering remote warfare from strategic-political and tactical-technological perspectives, LAWS can be considered a natural continuation of technologically-enabled warfighting among risk-averse Western states.

The technologies of remote warfare - particularly drones - cannot be fully understood without attending to the strategic and political impetus for their use. "Stand-off" warfighting runs deeper than any single technology. At the turn of the millennium, Ignatieff's analysis of the "Virtual War" in Kosovo noted that Precision-Guided Munitions (PGMs) promised "speedy, risk-free victory."[37] Contemporaneously, others noted the ascendancy of of "riskless

[34] Suchman, L. (2020). Algorithmic warfare and the reinvention of accuracy. Critical Studies on Security, 00(00), 1–13. https://doi.org/10.1080/21624887.2020.1760587
[35] Harter, F., & Whittell, G. (2020, February). Kalashnikovs of Tomorrow. Tortoise. Retrieved from https://members.tortoisemedia.com/2020/02/03/kalashnikovs-of-tomorrow-ai-drones/content.html
[36] Watts, T. & Biegon, R. (2017). Defining Remote Warfare: Security Cooperation. In Remote Control. Retrieved from https://www.oxfordresearchgroup.org.uk/pages/category/conceptual-series-defining-remote-warfare 1
[37] Quoted in Sanderød, S. (2009). The Use of Air Power Today: Have New Ethical Challenges Occurred? In J. Hayward (Ed.), Air Power, Insurgency, and the "War on Terror." https://doi.org/10.4324/9780429030772-13 227

warfare"[38] and "risk-transfer militarism"[39] establishing a trend towards the asymmetrical deployment of force in Western Military operations.[40]

Patterns of risk-aversion among Western forces observed at the turn of the millennium have since accelerated. A combination of past failures, budgetary constraints, and increased political and popular scrutiny mean Western militaries exercise even greater caution in their troop deployments today.[41] Risk-aversion has not precluded military engagement entirely, but has prompted states to consider alternative means of projecting influence without committing large ground forces.[42] In his conceptualisation of "vicarious warfare," Waldman therefore notes the pre-eminence of delegating force (to proxies and partner forces) and danger-proofing personnel (through airstrikes and remotely-piloted weapons systems) in contemporary military interventions.[43] Delegation and danger-proofing respectively constitute the social and material forms of mitigating risk to US troops. Similar dynamics have been observed among other NATO members.[44] Put simply, the strategic appeal of remote warfare is perceived as efficiency: risking less and achieving more.

From a tactical perspective, the efficiency engendered by remote warfare was made possible by technological innovation. For this reason, a burgeoning field of scholarship has emerged around the technologies of remote warfare, particularly drones - "the most visible application of the information age to contemporary warfare."[45] Chamayou's seminal treatise on *Drone Theory* takes an expansive look at the political, ethical and legal implications of drone warfare, concluding that "remote war is a war of human machines against the human body… one side loses people; the other side loses toys."[46] While this analysis does consider the human impact of this technology, it remains overwhelmingly focused on the drone itself. Some argue this "fetishisation" of drone technologies (predominantly by military actors but

[38] Kahn, P. W. (2002). The Paradox of Riskless Warfare The Paradox of Riskless Warfare. Philosophy and Public Policy Quarterly, 22(3), 1–8.
[39] Shaw, M. (2002). Risk-Transfer Militarism, Small Massacres and the Historic Legitimacy of War. International Relations, 16(3), 343–359.
[40] Krieg, A. (2016). Externalizing the burden of war: The Obama Doctrine and US foreign policy in the Middle East. International Affairs, 92(1), 97–113. https://doi.org/10.1111/1468-2346.12506 101
[41] Knowles, E., & Watson, A. (2017). All Quiet on the Isis Front? Oxford Research Group Retrieved from http://remotecontrolproject.org 3
[42] Heng, Y. K. (2018). The continuing resonance of the war as risk management perspective for understanding military interventions. Contemporary Security Policy, 39(4), 544–558. https://doi.org/10.1080/13523260.2018.1494670 549
[43] Waldman, T. (2018). Vicarious warfare: The counterproductive consequences of modern American military practice. Contemporary Security Policy, 39(2), 181–205. https://doi.org/10.1080/13523260.2017.1393201 189
[44] Knowles, E., & Abigail Watson. (2018). Remote Warfare: lessons learned from contemporary theatres. Oxford Research Group. 8
[45] Horowitz, M. C. (2020). Do Emerging Military Technologies Matter for International Politics? Annual Review of Political Science, 23, 385–400. https://doi.org/10.1146/annurev-polisci-050718-032725387
[46] Chamayou, G. (2016). Drone Theory. The New Press. Epilogue

also in academia) mystifies their human relations.[47] Myopic focus on technologies alone thus risks presenting a false image of "war without bodies."[48]

Scholars of remote warfare are not alone in their tendency to perceive technology deterministically. Despite the centrality of technology to IR, its study too-often assumes it is either entirely controlled by humans or distinctly separate from human agency.[49] In line with Latour's concept of the Black Box, "technical work is made invisible by its own success," leaving us unaware of its broader significance.[50] As Flusser quipped, however, "technology has become too serious a matter to be left to technicians."[51] There is thus a need to apprehend the complex socio-technical systems that produce and are served by technologies. Or, as Hoijtink and Leese invite, to "render them political" and consider "the politics that go into technology, as well as the politics that emanate from technology."[52] In such socio-technical systems, accounting for the interaction of humans, technologies and structures invites analysis of how agency and power may be produced, distributed and transformed.[53]

2.3. Assemblage

Situated at the intersection of multiple fields of academic study, political debate and technological innovation, the LAWS development can be approached from several angles. Project Maven, as a complex and mutable amalgamation of elements - Google, the DoD, the Campaign to Stop Killer Robots, and myriad others - converging around the development of AI in defence, demands a holistic approach. For this, we turn to the assemblage.

Originally articulated by Deleuze and Guattari, the assemblage is an ontological framework denoting both the act of arranging heterogeneous elements in a complex social system and the resulting arrangement itself.[54] It can therefore be considered both a process *and* a product, a simplification necessitated by a lack of conceptual clarity in the works of Deleuze and Guattari, who offer half a dozen different definitions.[55] DeLanda nevertheless helpfully weaves a poetic, albeit incomplete, interpretation:

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[47] Ronald Shaw, I. G., & Akhter, M. (2012). The Unbearable Humanness of Drone Warfare in FATA, Pakistan. Antipode, 44(4), 1490–1509. https://doi.org/10.1111/j.1467-8330.2011.00940.x 1501
[48] Ibid.
[49] Leese, M., & Hoijtink, M. (2019). How (not) to talk about technology. 10
[50] Latour, B. (1999). Pandora's Hope: Essays on the Reality of Science Studies. Harvard University Press https://doi.org/10.1017/CBO9781107415324.004 304
[51] Flusser, V. (2011). Into the Universe of Technical Images. University of Minnesota Press. 65
[52] Leese, M., & Hoijtink, M. (2019). How (not) to talk about technology. 3
[53] Ibid.
[54] Bogue, R. (1989). Deleuze and Guattari. London and New York: Routledge. 174
[55] DeLanda, M. (2016). Assemblage Theory. https://doi.org/10.5040/9781350096769.0003 1

> "A multiplicity which is made up of many heterogeneous terms and which establishes liaisons, relations between them… Thus, the assemblage's only unity is that of a co-functioning: it is a symbiosis, a 'sympathy'. It is never filiations which are important, but alliances, alloys; these are not successions, lines of descent, but contagions, epidemics, the wind."[56]

Such a metaphysical conceptualisation is thought-provoking but of limited practical value. "Heterogeneous terms establishing liaisons" appear to fit the bill for Project Maven, itself a "co-functioning symbiosis" of public and private actors, but how can this framework be applied? Fortunately, a rich intellectual tradition of scholarship operationalising the assemblage for studying social phenomena is at hand. From this, two main issues must be considered: the process of assembling (i.e. its elements and their relations shaping it) and the resulting outcome (i.e. what it seeks to actually do).

A practical definition of assemblages comes from Abrahamsen and Williams, as "structures and networks in which a range of different actors and normativities interact, cooperate and compete to produce new institutions, practices and forms."[57] For this research, the interaction of normativities appears particularly intriguing, as it speaks to the distributed and dissipated nature of agency within a body lacking central organisation. A similarly expansive interpretation of agency is seen by Bennett's study of the electrical power grid, in which an assemblage includes not only human actors but technological, cultural and atmospheric elements, too.[58]

Dittmer elaborates that this "posthuman turn" should be considered with respect to the relational ontology of the assemblage.[59]. This means recognising the agency of wholes *and* parts, rather than either exclusively.[60] So while the heterogeneous elements themselves provoke intrigue, power in the assemblage does not lie within them but in relations *between* them.[61] Simply drawing these connections is insufficient, however, lest we undertake a "joining up exercise" rendering only thin description.[62] Thicker analysis is achieved through

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[56] Ibid.
[57] Abrahamsen, R., & Williams, M. (2011). Power and Governance: Global Assemblages and the Security Field. In Security beyond the state (pp. 89–121). 90
[58] Bennett, J. (2006). The agency of assemblages and the North American Blackout. Political Theologies: Public Religions in a Post-Secular World, 17(3), 602–616. https://doi.org/10.5422/fso/9780823226443.003.0031 445
[59] Dittmer, J. (2014). Geopolitical assemblages and complexity. Progress in Human Geography, 38(3), 385–401. https://doi.org/10.1177/0309132513501405 389
[60] Mcfarlane, C., Anderson, B. (2011). Thinking with Assemblage. Area, 43(2), 162–164. 162
[61] Dittmer, J. (2014). Geopolitical assemblages and complexity. 389
[62] Allen, J. (2011). Powerful assemblages? Area, 43(2), 154–157. https://doi.org/10.1111/j.1475-4762.2011.01005.x 156

attending to the tensions, contradictions and clashes which, paradoxically, reveal how the assemblage actually takes form.[63]

Studying the friction binding the assemblage invites analysis of its practices of in- and exclusion.[64] With respect to this, it helps to draw together Barnett and Duvall's conceptualisation of compulsory power (direct capacity to control others, through structural relations) and productive power (constitution of social actors capable of effective action, through diffuse social relations).[65] Doing so bridges the coercion of material relations with the Foucauldian persuasion of social relations. At their intersection, "productive power makes some instances of compulsory power possible and legitimate. And, in turn,... compulsory power shapes the terms of meaning that influence how actors see what is possible and desirable."[66] Power in this case is not centralised, or even distributed equally, but is "power as plurality."[67] In an assemblage such as Project Maven, featuring the complex interaction of economic incentives, ethical arguments and political norms, this holistic conceptualisation of power is highly appropriate.

Mindful of the distribution of agency and primacy of relations to assembling, we turn to the resulting arrangement. Critically, although the assemblage is an "arrangement," it should not be interpreted as a specific body, but a means of understanding how heterogeneous elements can coalesce *without* actually forming a coherent whole.[68] "Unity across difference" in this manner gives rise to unique forms of stability and change, order and disruption.[69] Although this suggests the assemblage is a transient phenomenon, some contend they may be durable if rooted in historical connections.[70] Temporally and spatially, then, the form of assemblages is fluid or at least liable to change.[71]

If change and difference are so central to the assemblage, what brings order to the chaos? Elements of an assemblage must, presumably, coalesce around some point of convergence. Anderson and McFarlane assert that an assemblage is productive of certain

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[63] Ibid.
[64] Demmers, J., & Gould, L. (2018). An assemblage approach to liquid warfare. 369
[65] 2005, quoted in Abrahamsen, R., & Williams, M. C. (2012). Security, Politics and Global Assemblages. In Security Beyond the State (pp. 217–237). https://doi.org/10.1017/cbo9780511974441.008 221
[66] Ibid.
[67] Anderson, B., & McFarlane, C. (2011). Assemblage and geography. Area, 43(2), 124–127. https://doi.org/10.1111/j.1475-4762.2011.01004.x p125
[68] Allen, J. (2011). Powerful assemblages? 154
[69] Ibid. 62
[70] Koster, M. (2015). Citizenship agendas, urban governance and social housing in the Netherlands: an assemblage approach. Citizenship Studies, 19(2), 214–228. https://doi.org/10.1080/13621025.2015.1005951 218
[71] Allen, J. (2011). Powerful assemblages? 155

effects.[72] In the case of Abrahamsen and Williams, this is to influence what is regarded as "possible and desirable" by its elements.[73] Similarly, for Demmers and Gould, the "effect" of the assemblage is as a governance formation.[74] They follow Li in her understanding of the assemblage as unified by "the will to govern, or… the will to improve: the attempt to direct conduct and intervene in social processes to produce desired outcomes and avert undesired ones."[75] For this research, this definition can be augmented by Dafoe's conceptualisation of AI governance as, "how humanity can best navigate the transition to advanced AI systems." [76] This leaves us well-attuned to what pulls the actors in Project Maven together: the attempt to direct the transition to advanced AI systems to produce desired outcomes or avert undesired ones.

For using the assemblage as a heuristic tool, the most coherent and practicable operationalisation comes from Li.[77] In her study of community forest management, she identifies six practices of assemblage. First, *forging alignments* is the work of linking together the objectives of the elements of an assemblage by means of a shared problem definition.[78] Second, *rendering technical* involves reducing the social world to a formulaic "problem (a) plus intervention (b) will produce (c), a beneficial result." Third, *authorising knowledge* is the specification of body of knowledge, confirmation of enabling assumptions and containment of critique. Fourth, *managing failures and contradictions* means presenting failure as rectifiable, smoothing out contradictions and devising compromises. Fifth, *antipolitics* re-poses political questions as matters of technique, thus demarcating the acceptable boundaries of debate. Sixth, *reassembly* grafts new elements and re-works old ones in the assemblage. Collectively, these practices reveal how the elements of an assemblage *cohere* and *act.*[79] In the case of Project Maven, they articulate how its actors assemble into a Military-Technological Complex and antagonistic Civil Society Coalition, and how each seeks to influence the transition to advanced AI systems in the context of defence.

[72] 2011, quoted in Koster, M. (2015). Citizenship agendas, urban governance and social housing in the Netherlands. 218
[73] Abrahamsen, R., & Williams, M. C. (2012). Security, Politics and Global Assemblages. In Security Beyond the State (pp. 217–237). https://doi.org/10.1017/cbo9780511974441.008 222
[74] Demmers, J., & Gould, L. (2018). An assemblage approach to liquid warfare. 367
[75] Li, T. M. (2007). Practices of assemblage and community forest management. 264
[76] Dafoe, A. (2018). AI Governance: A Research Agenda. Centre for the Governance of AI. https://doi.org/10.1176/ajp.134.8.aj1348938 5
[77] Li, T. M. (2007). Practices of assemblage and community forest management.
[78] Demmers, J., & Gould, L. (2018). An assemblage approach to liquid warfare. 369
[79] Ibid. 368

2.4. Research Gap

This research contributes to all debates outlined above. Empirically-inspired by the burgeoning field of research on LAWS and a paucity of theoretically-informed research into their development, it links the near-future of "robot warfare" with existing practices of remote warfare. Using the analytical frame of assemblage to understand "power in complexity,"[80] it contributes not only to the academic debate around assemblage but also wider discussions concerning power, agency and technology in international relations. Theorising this under-examined but critically important phenomena in the emergence of a Military-Technological Complex will be critically important to understanding the future of AI in war. This research gap is addressed with the following question:

How have practices of assemblage, as carried out by Google, the US Department of Defense, and the Campaign to Stop Killer Robots, formed a military-technological complex and oppositional civil society coalition seeking to govern the development of AI for defence from 2013 to 2020?

Using the practices of assemblage articulated by Li, the following sub-questions have been formulated to answer it:

1. What shared problem definition(s) are produced by the actors involved?
2. What technical solutions are proposed?
3. Which new actors and discourses are included and excluded from the Military-Technological Complex and Civil Society Coalition, and how?
4. What frictions or failures emerge and how are they managed?
5. How are political questions re-posed as matters of technique?
6. What is the re-assembled form of the Military-Technological Complex and Civil Society Coalition?

[80] Ibid. 367

3. Method

> *"The term method in qualitative research is meant to imply more than a practical technique or procedure for gaining data. It also implies a data-generation and engagement process involving activities that are intellectual, analytical and interpretive."*[81]

Social research is an act of linking ideas and evidence to produce a representation of an aspect of social life.[82] Connecting ideas and evidence is the analytical frame of assemblage outlined in the previous section. It is vital that evidence is collected and analysed in a manner consistent with the analytical frame. To this end, the research strategy will be detailed here with reference to its ontological and epistemological positioning. An explanation of the research methods used will follow, concluding with an appraisal of their limitations.

3.1. Research Strategy

A research strategy sets out the means of linking evidence to concepts and theory for answering the questions posed.[83] These means must be ontologically and epistemologically consistent with what they examine. Here the ontology and epistemology of the research will be explained, with reference to the analytical frame.

The fundamental ontological divide in social science is between individualism, treating the individual as the elementary unit of social life, and structuralism, emphasising institutions beyond the control of individuals.[84] While Li notes that the assemblage signifies agency insofar as it recognises the work undertaken by certain subjects, she equally recognises it as the product of specific, enabling circumstances.[85] Furthermore, elements of an assemblage can be extremely varied, encompassing somatic, technological, cultural and atmospheric elements.[86] Traversing such an ontologically diverse landscape necessitates transcending the structure/agency debate. As a fluid arrangement of heterogeneous elements, defined by the interactions *between* them, it can be said to be ontologically holistic or, more accurately, *relational.*[87] Such ontological ambiguity does not diminish its analytical

[81] Mason, J. (2017). Qualitative Researching (3rd). SAGE Publications Ltd. 22
[82] Ragin, C. C., & Amoroso, L. M. (2011). Constructing Social Research: The Unity and Diversity of Method. SAGE Publications Ltd. 51
[83] Ibid. 24
[84] Demmers, J. (2016). Theories of Violent Conflict: An Introduction (2nd ed.). Routledge. 16
[85] Li, T. M. (2007). Practices of assemblage and community forest management. 265
[86] Bennett, J. (2006). The agency of assemblages and the North American Blackout. 447
[87] Dittmer, J. (2014). Geopolitical assemblages and complexity. 389

value, however, but allows the researcher "to attend to the agency of wholes *and* parts, not one or the other" (emphasis in original).[88]

The basic epistemological divide is between attempts at explaining and understanding the social world.[89] The former is inherently positivist and the latter interpretivist. An interpretivist epistemology is better suited to the assemblage approach, used to understand the processes of *how* assemblages are formed rather than the causes of *why* they take shape. This is supported by previous applications of the assemblage investigating *how* different agents coalesce around the issue of forest management,[90] *how* housing governance shapes citizenship,[91] and *how* private security produces new forms of security governance.[92]

A qualitative research strategy is consistent with the ontology and epistemology of the assemblage approach, as this research seeks to understand *how* different actors perceive and produce discourses concerning problems, solutions, knowledge and failures - none of which can be objectively quantified.

3.2. Research Design

Research design is the means of linking this evidence to ideas to answer the questions posed. This section therefore outlines the sampling and temporal focus of this research.

As a global phenomenon, dissipated among all the elements of the assemblage in their respective offices, parliaments, barracks, publications and meetings, there is no clearly demarcated field where the "battle over AI" is taking place. Nevertheless, this research focuses on the case of Project Maven, an archetypal manifestation of the Military-Technological Complex and Civil Society Coalition. Carefully studying a single case in this manner strengthens internal validity.[93]

The units of analysis examined include Google, the United States Department of Defence, and the Campaign to Stop Killer Robots. These were purposively sampled for their involvement in the development of AI for military purposes. This is not intended to be

[88] Mcfarlane, C., & Anderson, B. (2011). Thinking with Assemblage. 162
[89] Demmers, J. (2016). Theories of Violent Conflict: An Introduction (2nd ed.). 17
[90] Li, T. M. (2007). Practices of assemblage and community forest management.
[91] Koster, M. (2015). Citizenship agendas, urban governance and social housing in the Netherlands: an assemblage approach.
[92] Abrahamsen, R., & Williams, M. (2011). Power and Governance: Global Assemblages and the Security Field.
[93] Gagnon, Y.-C. (2010). The Case Study as Research Method: A Practical Handbook. PUQ. 2

statistically representative as this phenomenon is studied for its social scientific significance, thus requiring highly selective sampling in order to generate useful data.[94]

The temporal focus of this research is from November 2014 to June 2020. Beginning with the US Secretary of Defence Chuck Hagel proposing the Third Offset Strategy, a plan for outmanoeuvring the United States' adversaries through innovative uses of new technologies, ending in June 2020 to allow for data generation up to the contemporary status of this phenomenon. This six year period is long enough to observe changes and developments in the assemblages, particularly through the establishment, successes and failures of Project Maven.

Data collection was split into four phases of (1) contextualisation; (2) problematisation; (3) contestation; and (4) resolution. The first phase (contextualisation) focused on mapping the actors involved and their interests and capacities. The second phase (problematisation) sought to answer sub-questions 1. and 2. by focusing on problem definitions and technical solutions articulated by the actors. The third phase (contestation) sought to answer sub-questions 3. and 4. by examining tensions and contradictions between the actors and how they were publicly articulated. Lastly, the fourth phase (resolution) sought to answer sub-questions 5. and 6. by outlining the current status of the elements in their "reassembled" state.

3.3. Research Methods

Aktouf defines method as, "the logical procedure employed by a science, i.e. the set of specific practices it uses to render the development of its demonstrations clear, understandable and irrefutable."[95] This section therefore outlines the data collection techniques used.

This research relied predominantly on document analysis and qualitative interviewing for data generation. These methods are consistent with the holistic, relational ontology of the research and its desire to understand discourses, knowledge, and interactions between the units of analysis.[96]

With regards to the documents analysed, a number of key texts were chosen for Google (e.g. investor relations communications, blog posts, public statements); the DoD (e.g. speeches, strategies, directives and memorandums); and the Campaign to Stop Killer

[94] Ragin, C. C., & Amoroso, L. M. (2019). Constructing Social Research: The Unity and Diversity of Method (Third). Thousand Oaks, California: Sage. 105
[95] Aktouf, quoted in Gagnon, Y.-C. (2010). The Case Study as Research Method: A Practical Handbook. 2
[96] Mason, J. (2017). Qualitative Researching (3rd). 111

Robots (e.g. public statements, speeches, pamphlets). A variety of journalistic sources from newspapers, magazines and other companies involved in Project Maven provided contextual data.

Document analysis was supplemented by five semi-structured interviews conducted with four respondents. These triangulated the data generated from document analysis and complemented the perspectives of official sources with individual perspectives from those intimately familiar with the phenomenon. To this end, two tech workers-turned-activists who had worked on Project Maven and two members of the Campaign steering committee were interviewed.

Data generated from documents and interviews alike were coded in Nvivo 12 to six themes corresponding to the practices of assemblage identified by Li.[97]

3.4. Limitations

A combination of methodological limitations and external constraints inhibited the course of this research. Here their impact and attempts at mitigating them will be outlined.

Owing to the sensitivity of the phenomenon investigated, this research depended on publicly-available information, which was more readily-available from civil society actors. Although two of the respondents interviewed were tech workers from companies involved in Project Maven, their status as vocal critics of it meant they were closer aligned with the other two respondents, members of the Campaign steering committee. A combination of inaccessibility and constraints on time and resources precluded interviews with the 'proponents' of the Military-Technological Complex, forcing a reliance on public communications, e.g. speeches and directives. Further research on the individual perspectives of the military actors involved would undoubtedly enhance understanding of this phenomenon.

It would be remiss not to mention the effect of the global covid-19 pandemic on the course of this research. Plans to conduct ethnographic fieldwork at a number of events (conferences and arms fairs) were unfortunately cancelled. Fortunately, however, video-call technology enabled me to interview respondents in multiple countries. Although these lacked much of the nuance afforded by face-to-face interviews, they were nevertheless valuable.

[97] Li, T. M. (2007). Practices of assemblage and community forest management.

4. Forging Alignments & Rendering Technical

"Forging alignments: the will to govern as a point of convergence and fracture."[98]

"Rendering technical: framing the arena of intervention."[99]

Assemblages, for all their heterogeneity, require a point of convergence to coalesce around. *Forging alignments* in this way is "the work of linking together the objectives of the various parties to an assemblage,"[100] by a joint problem definition.[101] With this shared perception of a problem, the elements of an assemblage begin *rendering technical*, reducing it to "a diagram in which problem (a) plus intervention (b) will produce (c), a beneficial result."[102]

This chapter therefore explores how these elements coalesced around the issue of AI in defence and proposed an intervention. Frictions between the two configurations were immediate and clear, reinforcing the notion that "the assemblage is far from seamless."[103] This chapter will begin with an exploration of how the military-tech and civil society elements define the problem, followed by their proposed solutions, concluding with a comparison of the two which will set the stage for the subsequent chapter, *Authorising Knowledge and Managing Failures.*

4.1. Problem Definition

"U.S. troops should not be sent into fair fights," according to Joe Dunford, Chairman of the Joint Chiefs of Staff.[104] To ensure 'unfair' fights, the Department of Defence has long sought the latest and greatest defence technologies, traditionally, researched and developed by a dedicated and well-established "Military-Industrial Complex." Recently, however, as digital innovations have begun to outrank the physical, the DoD has turned to consumer technology companies (such as Google) to fulfil their needs. Forging new partnerships with these companies thus presented a technical problem.

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[98] Li, T. M. (2007). Practices of assemblage and community forest management. 268
[99] Ibid. 270
[100] Ibid. 265
[101] Demmers, J., & Gould, L. (2018). An assemblage approach to liquid warfare: AFRICOM and the 'hunt' for Joseph Kony. 368
[102] Li, T. M. (2007). Practices of assemblage and community forest management. 265
[103] Ibid. 267
[104] Garamone, J. (2016). U.S. Troops Should Not Be Sent Into Fair Fights, Dunford Says. Retrieved from https://www.defense.gov/Explore/News/Article/Article/744390/us-troops-should-not-be-sent-into-fair-fights-dunford-says/

For civil society actors involved in humanitarian disarmament, the application of AI for defence posed a serious threat. So while the DoD forged partnerships with industry to channel AI innovation towards its own ends, particularly with Project Maven, civil society sought to influence the same process. By contrast, however, civil society regarded this issue and its solutions in political rather than technical terms.

4.1.1. Military-Technological Complex

"To overcome challenges to our military superiority," declared the US Secretary of Defense Chuck Hagel in 2014, "we must change the way we innovate, operate, and do business."[105] Noticing tides of change lapping at his feet, Hagel recognised that new ways of war required new ways of business. From his perspective, the problem of AI in defence was one of access: the technology existed, but was out of reach of the DoD. Cooperation with new industrial partners would be essential to developing these new technologies and, in turn, maintaining American military superiority.

To understand why the Department of Defense needed to forge new alignments with industry, it helps to consider previous practices of military research and development (R&D) and their (un)suitability for purpose. In the post-WWII era, a "Military Industrial Complex" emerged among the civilian industrial conglomerates (e.g. Boeing and General Motors).[106] Simultaneously, significant public investments into military R&D boomed and led to several technologies now commonplace in the civilian sphere, such as GPS.[107] In fact, this cross-pollination of public funding and technological innovation between the military and civilian spheres transformed Silicon Valley's from a "landscape of fruit orchards into a hub of electronics production and innovations."[108]

At the conclusion of the Cold War, the Military-Industrial Complex lost its *raison d'etre.*[109] Fifty-five billion dollars of acquisitions and mergers followed, as many engineering companies parted with their defence businesses, consolidating the defence industry into five "titans."[110] Concurrently, DoD procurement practices became cumbersome and convoluted, resulting in $46bn wasted between 2001 and 2011 on weapons systems that never entered

[105] Hagel, C. (2014). Reagan National Defense Forum Keynote. Retrieved from https://www.defense.gov/Newsroom/Speeches/Speech/Article/606635/
[106] Lynn, W. (2014). End of the Military-Industrial Complex: How the Pentagon Is Adapting to Globalization. Foreign Affairs, 93(November / December), 107–110.
[107] Ibid.
[108] O'Mara, M. (2018, October 29). Tech's Military Tradition. New York Times.
[109] Lynn, W. (2014). End of the Military-Industrial Complex: How the Pentagon Is Adapting to Globalization.
[110] Ibid.

production.[111] Most acquisition programmes took years or even decades to reach the battlefield.[112] Tightening belts and a slow production line blunted the technical edge of the Military-Industrial Complex. Today, most R&D investments are dominated by the private sector.[113]

By 2014, when Hagel announced the Third Offset Strategy, it was clear that digital technologies were the future of defence. As the leader of Project Maven Jack Shanahan noted, "the future battlespace is constructed of not only ships, tanks, missiles, and satellites, but also algorithms, networks, and sensor grids."[114] Hagel obliquely referred to LAWS with his warning that the US army "could one day go into battle confronting a range of advanced technologies that limit our freedom of maneuver."[115] Deputy Secretary of Defense Bob Work, by contrast, was more explicit: "10 years from now if the first person through a breach isn't a fricking robot, shame on us"[116] Moreover, the official DoD directive on LAWS declared its intention to develop autonomous weapons with "appropriate levels of human judgment" that would satisfy "the law of war, applicable treaties, weapon system safety rules, and applicable rules of engagement."[117] From this, it appears the problem was perceived not in the technology itself but in developing it to a certain standard. It could not do so alone.

Technological innovation took centre stage in the Third Offset Strategy but would require new actors, by Hagel's own admission:

> "[The] DoD no longer has exclusive access to the most cutting-edge technology or the ability to spur or control the development of new technologies the way we once did. So we will actively seek proposals from the private sector… those firms and academic institutions outside DoD's traditional orbit."[118]

Technology companies, by contrast, were not as public in their intentions of working with the DoD. Despite Silicon Valley's government-funded roots, its radically different working culture

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[111] Weisgerber, M. (2014, November). Slow and Steady is Losing the Defense Acquisition Race. Government Executive. Retrieved from https://www.govexec.com/feature/slow-and-steady-losing-defense-acquisition-race/

[112] Allen, G. C. (2017, December). Project Maven brings AI to the fight against ISIS. Bulletin of the Atomic Scientists. Retrieved from https://thebulletin.org/2017/12/project-maven-brings-ai-to-the-fight-against-isis/

[113] Lewis, L. (2019). Resolving the Battle over Artificial Intelligence in War. RUSI Journal, 164(5/6), 62–71. https://doi.org/10.1080/03071847.2019.1694228 63

[114] Weinbaum, B. C., & Shanahan, J. N. T. (2018). 35.- Intelligence in a Data-Driven Age. Joint Forces Quarterly, 90(3rd Quarter), 4–9. 5

[115] Hagel, C. (2014). Reagan National Defense Forum Keynote.

[116] Work, B. (2015). Reagan Defense Forum: The Third Offset Strategy. Retrieved from https://www.defense.gov/Newsroom/Speeches/Speech/Article/628246/reagan-defense-forum-the-third-offset-strategy/

[117] US Department of Defense. (2012). Directive 3000.09 (pp. 1–15). Retrieved from https://www.esd.whs.mil/portals/54/documents/dd/issuances/dodd/300009p.pdf 3

[118] Hagel, C. (2014). Reagan National Defense Forum Keynote.

of “disruption” and willingness to “fail fast, fail often” were institutionally alien to the DoD.[119] Beyond these normative issues, many technology companies regarded the Pentagon as too small a customer to work with, especially given the bureaucracy involved.[120] Similarly, the huge sets of training data required to make useful machine-learning algorithms are hard to come by for defence purposes.[121] Notably, well before Project Maven was even established, Google was making significant inroads in robotics development but appeared unwilling to work with the Pentagon, however it was unclear whether this was driven by ideological or market considerations.[122] Nevertheless, it was clear that for many tech companies the problem was perceived in a technical manner similar to the DoD: the issue was not necessarily developing the technology but establishing the partnerships.

4.1.2. Civil Society Coalition

The issue of “robot arms control” was familiar to civil society well before Project Maven’s formation in 2017. The Human Rights Watch (HRW) arms division was studying the issue of LAWS as early as 2010, in conjunction with civil society groups conducting research on the issue of armed drones - a clear sign of its relevance to scholars of remote warfare.[123] It was not long until HRW was approached by a group of roboticists who had established the International Committee for Robot Arms Control (ICRAC) in 2009. Billed as a “not-for-profit association committed to the peaceful use of robotics in the service of humanity and the regulation of robot weapons,” they were technically knowledgeable but lacked the expertise, experience and networks in international diplomacy HRW held.[124]

In October 2012, HRW assembled a small team of other non-governmental organisations concerned about removing human control from the use of force to co-found The Campaign To Stop Killer Robots (“The Campaign” hereafter). At this embryonic stage, the coalition was born of both necessity and strategy. In Campaign Coordinator Mary Wareham’s words:

> “When we started to look at this concern, we realised that we [HRW] were going to have to cooperate with other non-governmental organisations to have a sustained civil society campaign to get a new treaty… We’re a large NGO, but the arms division is a small part of

[119] Tama, J. (2015). There’s no app for that: Disrupting the military-industrial complex. Brookings, (July). 19
[120] Taylor, T. (2019). Artificial Intelligence in Defence: When AI Meets Defence Acquisition Processes and Behaviours. RUSI Journal, 164(5–6), 72–81. https://doi.org/10.1080/03071847.2019.1694229 76
[121] Ibid.
[122] Tama, J. (2015). There’s no app for that: Disrupting the military-industrial complex. 30
[123] Research interview with Mary Wareham, June 2020
[124] Ibid.

> Human Rights Watch and our impact is multiplied by working with other, like minded non-governmental organisations."[125]

Fellow member of the Campaign steering committee, Frank Slijper of PAX, elaborated that coalitions are "more the rule than the exception" when working on campaigns of this sort; "you're much more effective if you're one voice towards the international community."[126] The forging of alignments around a perceived *political* problem at this nascent stage thus appears an organic process.

Those attending the first official meeting of the Campaign were unified by "a shared concern about fully autonomous weapons," according to Laura Boillot of Article 36.[127] An all-star lineup of more than thirty civil society organisations attended this inaugural meeting. As well as HRW, ICRAC, and Article 36, fellow human rights heavyweights such as Amnesty International, PAX and the Nobel Women's Initiative entered the fray.[128] The presence of Drone Wars UK and Mines Action Canada similarly evidence the relevance of this issue to wider questions of remote warfare and arms control. The "shared concern" Boillot alluded to was apparently self-evident to those in attendance. In her opening remarks, Wareham questioned, "I was meant to talk about why we want to campaign to stop killer robots, but I'd like to switch the question and ask why anyone would not want to campaign to ban killer robots?"[129] These members of the assemblage were evidently unified by a belief in the fundamentally *wrong* nature of LAWS (the "ugh" factor, as they put it).[130] Nevertheless, to win over wider support they articulated the problem in legal, ethical and moral terms.

Legal concerns played a central role in the Campaign from the start. LAWS, the Campaign argued, may "lack the human judgment necessary" to adhere to IHL and human rights law, and an "accountability gap" leaves ambiguities over who would be legally responsible for their actions.[131] That said, this research found no evidence of any tech workers legitimately concerned their work would render them legally accountable for war crimes.

More prominent in the Campaign's messaging were ethical concerns, which also held far greater purchase with tech workers. LAWS cross a "moral threshold," according to the

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[125] Ibid.
[126] Research Interview with Frank Slijper, June 2020
[127] Human Rights Action Centre. (2013). Report on the NGO Conference on the Campaign to Stop Killer Robots. (April), 1–23. Retrieved from http://stopkillerrobots.org/wp-content/uploads/2013/03/KRC_ReportNGOconf_22Apr2013FNL.pdf
[128] Ibid.
[129] Ibid.
[130] Goose, S. 2013, quoted in Ibid.
[131] The Campaign to Stop Killer Robots. (2020). The Threat of Fully Autonomous Weapons. Retrieved from https://www.stopkillerrobots.org/learn/

campaign, and as non-human actors they lack "the inherently human characteristics such as compassion that are necessary to make complex ethical choices."[132] Philosopher Peter Asaro rebuked the ethical argument that the "perfect" killer robot may minimise civilian harm by asserting the likelihood of a robot being used in this way is far lower than the probability of dangerous systems proliferating.[133]

Inherent to the concerns outlined above was the perception of a *political* rather than technical problem. Understandably, given the nature of the organisations involved at this early stage, discussions focused on the political elements to be overcome. Interestingly, however, "people working in science and technology" (i.e. tech workers) were identified as a potential constituency *opposing* a ban.[134] In actuality, many of these tech workers shared the Campaign's concerns. A 2015 open letter which has now been signed by more than 4500 roboticists and tech workers asserted that "just as most chemists and biologists have no interest in building chemical or biological weapons, most AI researchers have no interest in building AI weapons."[135] Connections between the tech community and nongovernmental organisations were therefore not formally or deliberately drawn, but were nevertheless beginning to assemble.

4.2. Rendering Technical

4.2.1. Military-Technological Complex

From the Third Offset Strategy, AI technologies were clearly considered imperative to maintaining American military strength. Incapable of mandating cooperation between private industry and the military, however, the DoD had to rely on persuasion rather than coercion to acquire the technologies it sought.[136] Accordingly, the "solution" for the DoD appeared to be becoming better in building relationships with contractors. And so it began courting tech companies with new contracting processes.

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[132] Ibid.
[133] Asaro, P. 2013, quoted in Human Rights Action Centre. (2013). Report on the NGO Conference on the Campaign to Stop Killer Robots.
[134] Ibid.
[135] Walsh, T. (2015). Autonomous Weapons: An Open Letter from AI & Robotics Researchers. Retrieved from Future of Life Institute website: https://futureoflife.org/open-letter-autonomous-weapons
[136] Fiott, D. (2019). Innovating and Offsetting? The Political Economy of US Defence Innovation. The Political Economy of Defence, 377–397. https://doi.org/10.1017/9781108348058.017 388

In April 2015, then-Secretary of Defense Ash Carter delivered a speech at Stanford University - the first visit to Silicon Valley from a Secretary of Defense in twenty years.[137] Centred around innovation, the speech culminated in the announcement of the Defense Innovation Unit Experimental (DIUx). This new DoD body, located in Silicon Valley ("a nexus of innovation"), would work to "strengthen existing relationships and build new ones; help scout for new technologies; and help function as a local interface for the department."[138]

In addition to the DIUx, the Defense Innovation Advisory Board (DIB) was established the following year. This collection of Silicon Valley luminaries, chaired by Eric Schmidt (formerly of Alphabet Inc., the parent company to Google), were assembled to provide the Pentagon access to "the brightest technical minds focused on innovation."[139] Drawing industry voices like Schmidt into the assemblage suggested that with the right expertise, the challenges of developing AI for defence could be overcome. The role of the DIB in legitimising the DoD's endeavours in this field will be elaborated in the following chapter: *authorising knowledge & managing failures.*

Forging alignments with tech companies accelerated dramatically in 2017 with the creation of the Algorithmic Warfare Cross Functional Team (AWCFT). Better known as Project Maven, the AWCFT sought "to accelerate DoD's integration of big data and machine learning… to tum the enormous volume of data available to DoD into actionable intelligence and insights at speed"[140] Specifically, its goal of automating the "Processing, Exploitation and Dissemination [PED] for Tactical Unmanned Aerial Systems" meant using Machine Learning to automatically analyse drone footage for objects of interest, freeing up human analysts for higher-level work.[141]

It is important to note that those leading Project Maven in the DoD were not selected on the basis of technological expertise but their skill in building relationships.[142] Although the role of Google was not public at this early stage, a public "industry day" hosted by the DoD in

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[137] Kaplan, F. (2016, December). The Pentagon's Innovation Experiment. MIT Technology Review. Retrieved from https://www.technologyreview.com/2016/12/19/155246/the-pentagons-innovation-experiment/

[138] Carter, A. (2015). Drell Lecture: "Rewiring the Pentagon: Charting a New Path on Innovation and Cybersecurity" (Stanford University). Retrieved from https://www.defense.gov/Newsroom/Speeches/Speech/Article/606666/drell-lecture-rewiring-the-pentagon-charting-a-new-path-on-innovation-and-cyber/

[139] Carter, quoted in Shalal, A. (2016, March 2). Former Google CEO Schmidt to head new Pentagon innovation board. Reuters UK. Retrieved from https://uk.reuters.com/article/us-usa-military-innovation/former-google-ceo-schmidt-to-head-new-pentagon-innovation-board-idUKKCN0W421V

[140] Work, R. O. (2017). Establishment of the Algorithmic Warfare Cross-Functional Team (Project Maven). Retrieved from https://www.govexec.com/media/gbc/docs/pdfs_edit/establishment_of_the_awcft_project_maven.pdf

[141] Ibid.

[142] Allen, G. C. (2017, December). Project Maven brings AI to the fight against ISIS.

October 2017 was attended by more than 300 industry and academic partners - a clear sign of DoD enthusiasm for forging alignments with the tech industry.[143]

Beyond the concrete goals of Maven, it had an important underlying purpose as a "pathfinder" mission, the "spark that kindles the flame front of artificial intelligence across the rest of the [Defense] Department," according to its leader Lt. Gen. Jack Shanahan.[144] Its founding memo emphasised agility: "after successful *sprints* in support of Intelligence, Surveillance, Reconnaissance (ISR) PED, the AWCFT will prioritize the integration of similar technologies into other defense intelligence mission areas"[145] (emphasis added). The Pentagon was thus framing the solution as being to move faster and work closer with industry in adopting and integrating algorithmic technologies.

For the DoD, then, just as the "problem" of integrating AI technologies was a logistical one, the proposed solution was equally practical. Initiatives like the DIUx, DIB and Project Maven indicated that with enough energy and skill, it could forge the necessary alignments with tech companies to acquire these technologies. Elements gathering around the problem of AI in defence from this perspective were thus already crystallising as its solution - closer cooperation.

4.2.2. Civil Society Coalition

It follows from a shared belief in the political nature of the problem among civil society that the solution would be a political endeavour. Civil society was interested in rendering the issue *political* rather than technical, raising awareness of what it considered inherently unsolvable issues with AI in defence.

At the Campaign launch in 2013, its demand was explicit: "a pre-emptive and comprehensive ban on the development, production, and use of fully autonomous weapons… through an international treaty, as well as through national laws and other measures."[146] Notably, its call does not specifically target AI or even AI-enabled weaponry but simply *autonomous* weapons. AI is understandably what many fear to enable the "cognitisation" of machines, i.e. making them faster and smarter than humans at certain

[143] Pellerin, C. (2017). Project Maven Industry Day Pursues Artificial Intelligence for DoD Challenges. DOD News, 1–5. Retrieved from https://www.defense.gov/News/Article/Article/1356172/project-maven-industry-day-pursues-artificial-intelligence-for-dod-challenges/

[144] Quoted in Allen, G. C. (2017, December). Project Maven brings AI to the fight against ISIS.

[145] Work, R. O. (2017). Establishment of the Algorithmic Warfare Cross-Functional Team (Project Maven).

[146] Human Rights Action Centre. (2013). Report on the NGO Conference on the Campaign to Stop Killer Robots.

tasks.[147] With respect to this, the solution articulated by the Campaign is thus not so much technical but *political.* Campaign coordinator Mary Wareham elaborated:

> "We're not just talking about a single weapon but a whole way of warfighting. And we're talking about systems, not just weapons, so that's why the campaign call is both framed in a negative sense and a positive sense… "Ban killer robots" is understood by everybody, but the softer, more nuanced approach is to say we are working to retain meaningful human control over the use of force and that's the part that involves any type of weapons system you can imagine."[148]

Humanising the issue in this manner offers a powerful counterpoint to technical perceptions of this issue. In doing so, the Campaign can appeal to a broader constituency. As its Silicon Valley lead Marta Kosmyna told an audience of Silicon Valley tech workers:

> "The campaign is not anti-tech, we're not anti-AI, we think robots are really cool. We just think that when you take them to that level where you have a system that's lethal… take a minute and pause and think through some of the unintended consequences that these weapons can have."[149]

In rendering a political solution rather than a technical one, the Campaign was explicit in what it sought to ban and could therefore appeal to a broader base for support. While it was widely recognised that AI would enable automation in this context, its proposed solution avoided mentioning that specifically. Relative to the DoD, civil society was having a wider debate about the morality and ethics of killing, and what could be considered acceptable conduct in warfare. To resolve this, clear standards had to be set and enforced.

4.3. Analysing Alignment

Evidently, the elements of both assemblages perceived a problem. There was, however, a profound disparity in how it was perceived by the DoD and technology companies, on the one hand, and civil society, on the other. Their respective framing revealed the compulsory, material power of the DoD, seeking to issue sizable contracts for new technologies, and the productive, social power of civil society, seeking to highlight the ethical issues involved. Compulsory power in the Military-Technological Complex was influencing actors via DoD resources. Civil society productive power, by contrast, was defining "the (im)possible, the

[147] Scharre, P. (2018). Army of None. 19
[148] Research Interview with Mary Wareham, June 2020
[149] Kosmyna, M. (2019). Marta Kosmyna Silicon Valley Lead at Ethics in Tech Community Night. Retrieved from YouTube website: https://www.youtube.com/watch?v=iMUTTa_l4z8

(im)probable, the natural, the normal, what counts as a problem."[150] Tension between the two helped bind the elements of these assemblages in their different configurations.

Identifying the vast potential of AI technologies in defence, the DoD perceived a technical problem of byzantine contracting processes hindering their ability to procure it from tech companies. The technical solution to this technical problem was an agile and fast-moving process (in Project Maven), facilitated by bodies tasked with paving the way for deeper cooperation (the DIUx and DIB). For the DoD, it was convenient to emphasise the technical elements of this issue and sideline the numerous legal, ethical and political issues. By framing this as a technical question of unlocking the potential of the private sector, the DoD was able to set the boundaries of debate to exclude broader questions of what these developments might mean for the development of AI. It was assumed the technology *should* (or at least *would*) be used, it was simply a question of how it *could.*

Identifying the same vast potential of AI technologies in defence as the DoD had, the Campaign was aghast. Instead of perceiving a technical issue regarding a technical solution, their framing of a fundamentally political challenge suggested an issue greater than an individual project or company. By drawing on the existing civil society movement around remote warfare and other disarmament campaigns, the Campaign was able to situate the development of AI here in a wider context of what could be considered permissible in warfare. From their perspective, the political problem thus deserved a political solution: a legal treaty retaining meaningful human control over the use of force. Precisely because it *could* occur*,* it *should not* be allowed.

A few conclusions can be drawn from this process of forging alignments and rendering technical. First, there was a clear tension between the political and technical dimensions to the assemblage, which do not necessarily lie neatly with the political and technological actors. Second, the stakes were extremely high for all involved. Frictions between the elements were therefore obvious and profound. In general, these different elements were not necessarily interacting on precisely the same issues, at least not in their framing, which prompts us to consider how their differing interpretations can be reconciled (or not) between these assemblages.

[150] Barnett, M., & Duvall, R. (2005). Power in international politics. 55

5. Authorising Knowledge and Managing Failures

"Authorising knowledge: assimilating science and containing critique."[151]

"Managing failures and contradictions: presenting failure as the outcome of rectifiable deficiencies; smoothing out contradictions…; devising compromises."[152]

Assemblages containing different elements with individual objectives can be characterised by their tensions as much as their commonalities. For this reason, the Military-Technological Complex worked hard to draw on expert knowledge to legitimise its actions and provide an appearance of cohesion. Understanding productive power here in the Foucualdian sense of "what can or cannot be said in a given configuration of knowledge," attending to how these discourses are challenged helps reveal where authority lies.[153] For this reason, "fuzziness, adjustment and compromise are critical to holding the assemblages together."[154]

This section thus explores which discourses are authorised and excluded from the Military-Technological Complex, with reference to the experts and civil society critiques. From this, it will then examine how failures are managed, contradictions smoothed and compromises devised - or not, as the case may be.

5.1. Authorising Knowledge

5.1.1. Military-Technological Complex

"Because we have different missions and different perspectives, sometimes we're going to disagree," admitted Defense Secretary Carter at Stanford when announcing the creation of the DIUx. He continued, "but I think that's okay. Because being able to address tensions through our partnership is much better than not speaking at all."[155] Aware of the challenges that lay ahead, Carter knew the DoD would have its work cut out reconciling tensions between the defense and tech community. Nevertheless, he was optimistic: "there can be

[151] Li, T. M. (2007). Practices of assemblage and community forest management. 273
[152] Ibid. 270
[153] Stone, B. E. (2017). Power. In S. David (Ed.), Understanding Foucault, Understanding Modernism. https://doi.org/10.1017/CBO9781107415324.004 p. 246
[154] Li, T. M. (2007). Practices of assemblage and community forest management. 279
[155] Carter, A. (2015). Drell Lecture: "Rewiring the Pentagon: Charting a New Path on Innovation and Cybersecurity" (Stanford University). Retrieved from https://www.defense.gov/Newsroom/Speeches/Speech/Article/606666/drell-lecture-rewiring-the-pentagon-charting-a-new-path-on-innovation-and-cyber/

great ideas that come out of candid conversation."[156] Project Maven, as a flagship effort, was certain to host some candid conversations.

In a New York Times article titled "Eric Schmidt's Pentagon Offensive," the former Alphabet Inc. Chairman was quoted as telling a four-star general, "you absolutely suck at machine learning… I could solve most of your problems."[157] Secretary Carter took Schmidt at his word and asked him to Chair the new Defense Innovation Board (DIB) in 2016.[158] Here he oversaw a body of "distinguished leaders with a track record of leading large, innovative organizations or conducting groundbreaking research" tasked with providing "independent advice to the Secretary of Defense and other senior leaders on catalyzing innovation in DoD."[159] Their expertise was supplemented by regular "listening sessions" with industry, where the DoD was "taking care to include not only experts… but also AI skeptics, DoD critics, and leading engineers who have never worked with the department before"[160] Critique was thus welcomed, albeit within the confines of an officially-sanctioned forum.

Later, in a testimony delivered to the House of Representatives Armed Services Committee, Schmidt endorsed Project Maven as "the most successful DoD effort to deliver AI to date."[161] He noted, however, that the greatest successes the DoD had achieved in this domain - including Maven, the exemplar - were "largely developed outside of the mainstream DoD processes for developing and fielding capabilities."[162] Concluding his assessment, Schmidt declared "deeper focus, closer collaboration, more resources, and a sense of urgency are needed to solve problems of significance to the U.S."[163] Ethical concerns received no mention. Expertise thus confirmed that challenges here could be overcome by moving faster and collaborating closer.

Just as tech experts went to the Pentagon, the Pentagon went to Silicon Valley. Speaking at an Nvidia GPU conference, Lt. Gen. Jack Shanahan declared, "let the machines

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[156] Ibid.
[157] Conger, K., & Metz, C. (2020, May 3). 'I Could Solve Most of Your Problems': Eric Schmidt's Pentagon Offensive. New York Times.
[158] Ibid.
[159] Defense Innovation Board. (2020). Our Story. Retrieved from https://innovation.defense.gov/About1/
[160] Defense Innovation Board. (2019). Public Listening Session. Retrieved from https://media.defense.gov/2019/Jun/07/2002142324/-1/-1/0/DIB_PUBLICLISTENINGSESSION_03.14.2019.PDF 6
[161] House Armed Services Committee. (2018). Statement of Dr. Eric Schmidt. Retrieved from https://docs.house.gov/meetings/AS/AS00/20180417/108132/HHRG-115-AS00-Wstate-SchmidtE-20180417.pdf
[162] Ibid.
[163] Ibid.

do what machines do well, and let humans do what only humans can do."[164] Similarly, researcher Gregory Allen credited the way Maven imitated tech sector techniques of iterative development for its success.[165] Incorporating and co-opting the knowledge and practices of the tech sector was arguably as important as the technology itself. To this end, Allen downplayed the technology in his framing of Project Maven as simply automating a bureaucratic task:

> "I have been among those advocating for the US military to increase its use of advanced AI technologies and to do so in a cautious and ethically conscious manner. Project Maven, which performs a non-safety-critical task that is not directly connected to the use of force, is exactly what I had hoped for."[166]

Problematically, not everyone party to the assemblage considered Project Maven a "non-safety-critical task." Not least some of those developing it.

5.1.2. Civil Society Coalition

Civil society was more than willing to fill in the areas where the DoD was reluctant to entertain debate. As discussed in the previous chapter, civil society had been investigating the legal, ethical and moral issues posed by LAWS since at least 2009. Project Maven reconfigured their discourse by bringing its technological elements to the fore.

The Campaign members held a long tradition of campaigning and were well-rehearsed in its practices. Its coordinator Mary Wareham, for example, is co-laureate of the Nobel Peace Prize for her work on the International Campaign to Ban Landmines. When asked about the structure of the Campaign, member of the steering committee Frank Slijper drew parallels with similar coalitions formed to ban landmines (1997) and cluster munitions (2008).[167] Beyond the organisational structure, the experience of those involved helped frame this Campaign as the latest iteration in a strong heritage of arms control campaigns, allowing it to command significant influence from the outset. In Wareham's words: "we've already established this principle that victim-activated weapons are not okay [via the treaty

[164] Caulfield, B. (2017). AI and Machine Learning to Revolutionize U.S. Intelligence Community, Pentagon Official Says. Retrieved from Nvidia Blog website: https://blogs.nvidia.com/blog/2017/11/01/gtc-dc-project-maven-jack-shanahan/
[165] Allen, G. C. (2017, December). Project Maven brings AI to the fight against ISIS. Bulletin of the Atomic Scientists.
[166] Allen, G. C. (2018, June). AI researchers should help with some military work. Nature World View. Retrieved from https://www.nature.com/articles/d41586-018-05364-x
[167] Research Interview with Frank Slijper, June 2020

banning antipersonnel landmines], it's just being reiterated in different forms, and this is again what we're coming back down to - uncontrollable effects."[168]

Evidently, the Campaign shared certain characteristics with previous movements, but the mobilisation of tech workers in support was novel. In response to the news that their technology was being used for military purposes, more than 4,000 Google employees signed an open letter titled "our employer shouldn't be in the business of war."[169] By declaring that the contract "puts Google's reputation at risk and stands in direct opposition to our core values," they joined a well-established tradition of arms control campaigning, bringing with them valuable expertise about the technological elements, raising the profile of the issue and bolstering calls to ban LAWS.

It is an obvious point but nevertheless worth stating: "conscientious tech objectors"[170] protesting against the military applications of their work were critically important to highlighting the technological issues with LAWS. In addition to the legal, political and ethical issues, there were many reasons to be concerned about the technology itself. Laura Nolan, a former Google employee who resigned in protest, succinctly explained: "we could build robots that can kill today. We cannot build a safe robot, that can't be hacked, that works predictably in most or all situations, that is free of errors, and that can reliably manage the complexities involved in international law and the laws of war."[171] This is particularly salient given the stark disparity in expertise between those building the technologies and those responsible for regulating them. In the opinion of Liz O'Sullivan, who worked at another Maven contractor:

> "There's this significant divide; there's the people who want the weapons… and the ones selling that technology, who claim that they can eliminate bias, and then the rest of civil society and boots-on-the-ground developers saying "wait a minute, I don't think that sounds right." But there's a power imbalance so you hear the rhetoric of the people who have the power and not the ones who are trying to challenge that assumption… It's very dire the

[168] Research Interview with Mary Wareham, June 2020

[169] Shane, S., & Wakabayashi, D. (2018, April 4). 'The Business of War': Google Employees Protest Work for the Pentagon. New York Times. Retrieved from https://www.nytimes.com/2018/04/04/technology/google-letter-ceo-pentagon-project.html

[170]Garsd, J. (2019). When Technology Can Be Used To Build Weapons, Some Workers Take A Stand. Retrieved from NPR website: https://www.npr.org/2019/05/13/722909218/when-technology-can-be-used-to-build-weapons-some-workers-take-a-stand

[171] Nolan, L. (2019). Why tech workers should oppose #KillerRobots. Retrieved from The Campaign to Stop Killer Robots website: https://medium.com/@stopkillerrobots/technological-reasons-to-oppose-autonomous-weapons-e3147c657246

> imbalance of information and knowledge between the legislators and what we actually do on the industry side."[172]

As well as holding expertise in the intricacies of these technologies, tech workers were conscious of the wider political issues. Despite Gregory Allen's claim that Maven was "a non-safety-critical task that is not directly connected to the use of force," Laura Nolan was under no illusions: "Maven was not killer robots but it was the automation of military surveillance [and] that is part of the kill chain."[173] Political awareness of this sort was a highly significant critique given that Google is a multinational corporation. For Laura Nolan, who worked in Dublin, "the US military is not our military… nor is it a force we should automatically support as a matter of patriotism."[174] Frank Slijper concurred that for many multinational tech companies, leadership "will generally tend to be American - what is normal for them is not necessarily normal for the large majority of [international] employees."[175] Proving Slijper's point, Nolan's opposition derived less from the technological reasons not to develop LAWS and more from an aversion to what she considered "a very unjust style of warfare and a very unjust series of wars" carried out by the USA.[176]

In any case, the expertise offered by the tech workers who voiced their concerns publicly was greatly appreciated by the Campaign. Speaking at a UN side event, Nobel Peace Laureate and member of the Campaign Jody Williams declared that the controversy arising at Google over Project Maven "gave us something to then go back to Microsoft and Intel and the other major tech companies."[177] An entire section of the Campaign website now calls upon tech workers to "hold your company, industry and peers accountable for the research they undertake and the customers they work with."[178]

Mobilising these workers sets this campaign apart from its predecessors. Prior to the US election in 2016, according to Moira Weigal, "the tech industry was more likely to be the target of protests than it was to organise them."[179] Today, however, Silicon Valley workers are shedding the "Californian Ideology" of free market economics and counter-culture

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[172] Research Interview with Liz O'Sullivan, May 2020
[173] Research Interview with Laura Nolan, May 2020
[174] Nolan, L. (2018, November 12). Jeff Bezos is wrong, tech workers are not bullies. Financial Times. Retrieved from https://www.ft.com/content/f4bd1860-e230-11e8-a8a0-99b2e340ffeb
[175] Research Interview with Frank Slijper, June 2020
[176] Research Interview with Laura Nolan, June 2020
[177] The Campaign to Stop Killer Robots. (2019). Press Conference. Retrieved from YouTube website: https://www.youtube.com/watch?v=mQEh-03U7ak&t=2447s
[178] The Campaign to Stop Killer Robots. (n.d.). Tech Workers: The World Needs You. Retrieved from https://www.stopkillerrobots.org/tech/
[179] Weigal, M. (2017, October 31). Coders of the world, unite: can Silicon Valley workers curb the power of big tech? The Guardian.

libertarianism.[180] As one Google employee insisted: "libertarianism is the ethos of the *leaders* of these big tech companies, not the rank and file… we stood up because we believe workers should have a voice" (emphasis in original).[181] Many "conscientious tech objectors" who voiced concerns over Project Maven continue to play an active role in the Campaign today. Laura Nolan and Liz O'Sullivan left their jobs as a result of Project Maven and have since spoken at campaign events around the world, serving as "tech sector champions" to deepen engagement with industry.[182]

Further expert support for the Campaign came from UN Secretary General Antonio Guterres, who unambiguously told the Convention on Conventional Weapons (CCW) that LAWS are "politically unacceptable, morally repugnant and should be prohibited by international law."[183] Because of this, Wareham likened Guterres to his predecessor Kofi Annan, a leading voice supporting the movement to ban landmines, indicating the UN Secretary-General is influential in raising the need for a treaty banning killer robots to be negotiated.[184]

Expertise and support from the tech sector helped to legitimise and strengthen the claims of the Campaign considerably. They were not, however, the goal in itself, which tech workers themselves were keenly aware of. In an address to an expert panel at the UN CCW, former Google engineer Amr Gabr declared:

> "Tech companies are massive private organizations that enforce decisions and outcomes through code. Not laws, not deliberation, not police, not militaries… However when these decisions fail to protect human lives it is governments and regulatory bodies who will also be held accountable and responsible. This is where the public interest, employee interests, state, and UN interests align in my opinion."[185]

Tech workers and other Campaign allies, such as Antonio Guterres, thus helped play a legitimising function. By reflecting a broad and expert support base, emphasising technological concerns and embracing the political arguments, they lent credibility to the cause.

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[180] Barbrook, R., & Cameron, A. (1996). The Californian ideology. Science as Culture, 6(1), 44–72. https://doi.org/10.1080/09505439609526455
[181] Tarnoff, B. (2019). Tech Workers Versus the Pentagon. Jacobin. Retrieved from https://jacobinmag.com/2018/06/google-project-maven-military-tech-workers
[182] The Campaign to Stop Killer Robots. (n.d.). Tech Workers: The World Needs You. Retrieved from https://www.stopkillerrobots.org/tech/
[183] Guterres, A. (2019). Tweet. Retrieved from https://twitter.com/antonioguterres/status/1110232038081204224
[184] Research Interview with Mary Wareham, June 2020
[185] Gaber, A. (2018). Transcript of UN Remarks. Retrieved from http://repositorio.unan.edu.ni/2986/1/5624.pdf

5.2. Managing Failures and Contradictions

Discourses advanced and knowledge authorised by the Military-Technological Complex were at direct odds with the Campaign to Stop Killer Robots and their newfound allies in the tech community. How these would be reconciled - or not - in the case of Project Maven is instructive in revealing the exercise of power by each configuration.

5.2.1. Military-Technological Complex

A very public struggle over Maven followed the open letter signed by Google employees. In fact, this fallout was perhaps the defining characteristic that makes this case so valuable for revealing the resilience of the Military-Technological Complex. Through the response to these protests we see how the assemblage seeks to ”present failures as the outcome of rectifiable deficiencies in technique, to smooth out contradictions and to devise compromises.”[186]

When its workers first complained, the CEO of Google’s cloud businesses (those responsible for Maven) Diane Greene tried to quell dissent by emphasising the “non-offensive” nature of this work.[187] Perhaps unsurprisingly, this did little to alleviate concerns. As the controversy grew, management recognised ethical concerns but highlighted their complexity, asserted that ethical principles would guide future work, and re-emphasised the limited scope of this project.[188] Recourse to technique rather than substance in this manner had limited impact.

Eventually, sustained pressure from Google workers (and wider civil society) prompted Greene to declare Google would not seek renewal for its Project Maven contract. Declaring that “Google Cloud’s initiatives around AI are relatively new” and that “AI is a disruptive technology that allows for unprecedented uses,” Greene emphasised its novelty in her decision, essentially framing it as a learning process.[189] Rather than constituting an outright “failure” in the Military-Technological Complex, however, Google’s withdrawal was carefully managed. Greene insisted that Google would not cancel its contract entirely, as some had demanded, but simply not renew it: “I would like to be unequivocal that Google Cloud honors its contracts.”[190] Even here, in perhaps the most noteworthy failure of the

[186] Li, T. M. (2007). Practices of assemblage and community forest management. 277
[187] Quoted in Tarnoff, B. (2019). Tech Workers Versus the Pentagon.
[188] Ibid.
[189] Greene, D. (2018). Incorporating Google’s AI Principles into Google Cloud. Retrieved from https://www.blog.google/products/google-cloud/incorporating-googles-ai-principles-google-cloud/%0A
[190] Ibid.

Military-Technological Complex as an assemblage, Google devised a mutually-convenient compromise between its own employees and the DoD.

The DoD, for its part, steadfastly emphasised the successes of this project and its wider significance beyond immediate deliverables. During the early stages of Maven (prior to controversy breaking out at Google), Lt. Gen. Shanahan downplayed the hurdles encountered as typical of "any disruptive effort within the defense community."[191] Even much later, after Google had cut ties with the Pentagon, Shanahan re-asserted that Maven was a "pathfinder" for producing a "product delivery pipeline."[192] Looking to the future in this manner served to frame the split as a learning experience for the next project, smoothing over this failure as transient.

5.2.2. Civil Society Coalition

In the case of Project Maven, the Campaign to Stop Killer Robots had no failure to manage. Successfully pressuring Google into not renewing its Project Maven contract, through sustained and coordinated action with tech workers, constituted a resounding victory. Problematically, however, the reassembly of the Military-Technological Complex (detailed further in the next chapter) evidenced its resilience. Google's departure from the Military-Technological Complex was only one battle in a larger war. Victory was not to be taken for granted.

The Campaign recognised there was more work still to be done. Responding to the news Google would not seek renewal for its Project Maven contract, it welcomed the development but invited other "responsible companies" to "publicly support the increasing calls for states to urgently negotiate a new treaty to prohibit fully autonomous weapons."[193] Instead of managing failures, civil society was managing *success.* Perhaps more accurately, it was seeking to manage expectations following success. Sceptical of the principles Google had announced, Mary Wareham commented at a UN side event: "Political declarations, principles, promises of transparency, codes of conduct, we've heard this all before. For us, we need binding international law in the form of a new treaty."[194] Rather than devising

[191] Quoted in Dobkin, A. (2017, November). DoD Maven AI project develops first algorithms, starts testing. Defense Systems. Retrieved from https://defensesystems.com/articles/2017/11/03/maven-dod.aspx

[192] Shanahan, J. (2019). Lt. Gen. Jack Shanahan Media Briefing on A.I.-Related Initiatives within the Department of Defense. Retrieved from https://www.defense.gov/Newsroom/Transcripts/Transcript/Article/1949362/lt-gen-jack-shanahan-media-briefing-on-ai-related-initiatives-within-the-depart/

[193] The Campaign to Stop Killer Robots. (2018). Google, other companies must endorse ban. Retrieved from https://www.stopkillerrobots.org/2018/05/google/

[194] The Campaign to Stop Killer Robots. (2019). Press Conference. Retrieved from YouTube website: https://www.youtube.com/watch?v=mQEh-03U7ak&t=2447s

compromises that smooth over the contradictions, the Campaign drew attention to the work still to be done.

5.3. Reasserting the will to govern

The containment of critique and management of failures in an assemblage ultimately reasserts the will to govern.[195] In this regard, Project Maven served as something of a lightning rod for critique.

As the visible face of an often-intangible phenomenon, Project Maven became a staging ground in a much larger battle, revealing a deep tension between the compulsory, material powers of the DoD and the productive, social powers of civil society. Its supporters praised it as a model to emulate for future public-private cooperation, with immense material rewards, while its detractors attacked it as an archetypal example of the ethical risks posed by these technologies. The contestation and authorisation of knowledge here can therefore be considered profoundly important to future applications of this technology in this domain.

For the DoD, the near-instant successes of Maven were warmly received. A welcome shakeup to the traditionally convoluted and glacial processes of defence contracting, it reaffirmed to many not only the critical importance of close collaboration with the tech sector but also the potential rewards. The role of the DIB - and particularly its chairperson Eric Schmidt - in championing the importance of cooperation in this regard has been vital to reasserting the DoD's ability to direct the development of this technology. Expert knowledge was thus strategically used to downplay the political and foreground the technical in the Military-Technological Complex.

Reverse dynamics are visible among civil society actors. Those involved in the Campaign from its early days benefited from a rich tradition and body of knowledge in disarmament campaigns. Tech workers presented a novel source of support after Maven triggered their mobilisation and prompted wider engagement with the ethics of their work. A combination of the Campaign's pre-existing expertise in international diplomacy and tech workers' technological expertise has established a force to be reckoned with. As a result, the Campaign has strategically drawn upon expert knowledge to frame this as a political and ethical issue first and foremost.

Differences in what was accepted as expert knowledge among different members of the assemblage ultimately proved untenable. A fracture was inevitable. The storm emerging out of Project Maven laid bare the fragility of the Military-Technological Complex. Alignment

[195] Li, T. M. (2007). Practices of assemblage and community forest management. 276

between these actors was revealed to be weak and the early successes they had achieved unstable. We turn now to what followed.

6. Antipolitics and Reassembly

"Antipolitics: reposing political questions as matters of technique; closing down debate about how and what to govern…; encouraging citizens to engage in debate while limiting the agenda."[196]

"Reassembling: grafting on new elements and reworking old ones; deploying existing discourses to new ends; transposing the meanings of key terms."[197]

Practices of antipolitics and reassembly show how assemblages evolve into something new. From the failures and contradictions identified in the previous chapter, it was clear that the previous configuration was unsustainable and change was inevitable. Fortunately, as mutability and fluidity are fundamental characteristics of any assemblage, this heuristic tool is well-equipped to account for such change in Project Maven. *Re*assembly is precisely that: a reconfiguration.

This section therefore answers how political questions are re-posed as matters of technique and the resulting, re-assembled form. Given the overarching goal of 'locating power in complexity', we can expect this rearrangement to reflect the material and social effects of compulsory and productive power within the assemblages.

6.1. Antipolitics

6.1.1. Military Technological Complex

When Google cut ties with the DoD, the Military-Technological Complex did not cease to exist. AI technologies remained a top priority for the DoD and its work in developing and procuring them still required legitimising and justifying, albeit with new discourses. Such a long-term perspective was evident in Lt. Gen. Shanahan's description of Google's departure as a "canary in a coal mine," expressing relief "that it happened when it did as opposed to on the verge of a conflict or a crisis where we're asking for help."[198] In this regard, Project Maven presented a steep learning curve for the DoD. Controversy surrounding it raised the

[196] Li, T. M. (2007). Practices of assemblage and community forest management. 265
[197] Ibid.
[198] Quoted in Mitchell, B. (2019, November 19). Google's departure from Project Maven was a 'little bit of a canary in a coal mine.' Fedscoop. Retrieved from https://www.fedscoop.com/google-project-maven-canary-coal-mine/

profile of the issue among tech workers, civil society, and the broader public, but it also taught the DoD how to avoid a repeat.

Several Military-Technological Complex proponents attempted to depoliticise this issue by invoking notions of patriotic duty. Michael Bloomberg deemed Google's decision "a defeat for US national security [and] patriotism."[199] Similarly, Amazon CEO Jeff Bezos asked, "do you want a strong national defense or don't you? I think you do. So we have to support that… if big tech is going to turn their backs on the Department of Defense, this country's in trouble."[200] Meanwhile at Microsoft, facing similar controversies over its provision of Hololens Augmented Reality headsets to the US Army, CEO Brad Smith declared, "we believe in the strong defense of the United States and we want the people who defend it to have access to the nation's best technology."[201] Eric Schmidt even described Lt. Gen. Shanahan as "a real American hero" for his work on Maven.[202] Chairman of the Joint Chiefs of Staff Joseph Dunford concurred in a succinct message to Silicon Valley: "hey, we're the good guys."[203]

Invoking a patriotic discourse can be considered an attempt at closing down debate surrounding the development of AI for military purposes. Military service in the US has long been valorised as "the definitive demonstration of citizenship, the most heroic, the most dangerous, and the most selfless."[204] As previously noted, such arguments may find little resonance among international employees for whom the US military is not their military. As one Google worker insisted, even those who did not support cancelling the Maven contract saw this as a weak argument, as Google is an international company, and of those who did, many come from "regions of the world where the American military has been extremely destructive."[205] There was no escaping the strength of feeling among those workers now aligned with civil society. Its original elements could no longer cohere and a reassembly was inevitable.

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[199] Quoted in Nolan, L. (2018, November 12). Jeff Bezos is wrong, tech workers are not bullies. Financial Times. Retrieved from https://www.ft.com/content/f4bd1860-e230-11e8-a8a0-99b2e340ffeb

[200] Quoted in Mehta, A. (2019, December 7). Bezos: Country 'in trouble' if tech firms turn from DoD. Defense News. Retrieved from https://www.defensenews.com/smr/reagan-defense-forum/2019/12/08/bezos-country-in-trouble-if-tech-firms-turn-from-dod/

[201] Smith, B. (2018). Technology and the US military. Microsoft on the Issues, 1–5. Retrieved from https://blogs.microsoft.com/on-the-issues/2018/10/26/technology-and-the-us-military/?mod=article_inline

[202] The Economist. (2020, May). Business lessons from the Pentagon. The Economist. Retrieved from https://www.economist.com/business/2020/05/28/business-lessons-from-the-pentagon

[203] Quoted in Doubleday, J. (2018, December 6). Dunford implores Google: "We're the good guys." Inside Defense. Retrieved from https://insidedefense.com/daily-news/dunford-implores-google-were-good-guys

[204] Shapiro, 1994, quoted in Coy, P. G., Woehrle, L. M., & Maney, G. M. (2008). Discursive Legacies: The U.S. Peace Movement and "Support the Troops." Social Problems, 55(2), 161–189. p.161

[205] Tarnoff, B. (2019). Tech Workers Versus the Pentagon.

6.1.2. Civil Society Coalition

In June 2018, Google aligned itself with civil society with the announcement that it would not renew its Project Maven contract. CEO Diane Greene acknowledged that Google would not pursue the contract again because of the backlash the company had experienced.[206] For those conscientious tech objectors who blew the whistle on Project Maven, Greene's decision appeared a resounding victory. A week later, Google announced ethical principles to guide its future work in this domain.[207] These included a commitment not to design AI for "weapons or other technologies whose principal purpose or implementation is to cause or directly facilitate injury to people" and "technologies whose purpose contravenes widely accepted principles of international law and human rights."[208]

Ethical principles reposed political questions as a matter of technique by providing clear guidelines for future work. Despite Greene's insistence that Google's contribution to Maven was for "non-offensive purposes," it would be difficult to reconcile a commitment not to work on weapons with any future involvement in the Algorithmic *Warfare* Cross-Functional Team (as Maven is formally known). Similarly, deferring to "widely accepted international human law and human rights" intended to circumvent ethical and political debates around future work in favour of a neutral arbiter. Notably, the list of applications Google would not work on included a clause that "as our experience in this space deepens, this list may evolve," leaving the door open for further debate in the future.[209]

Not all of civil society was satisfied that ethical principles would be sufficient. These principles were, after all, written and adopted by Google unilaterally. No regulatory mechanisms or external oversight were included, leaving it to Google to interpret and implement them as they saw appropriate. In the absence of any external control, principles like "be socially beneficial" and "avoid creating or reinforcing unfair bias" appear ambiguous and, to some, of dubious value. Laura Nolan was extremely sceptical:

> "A lot of these companies come out with ethics policies as a cheap way to make it look like they're doing something. Google's one is so vague that it's very hard to tell what would and would not be allowed under it… And no-one can really see how they are implementing that

[206] Conger, K. (2018, June 1). Google Plans Not to Renew Its Contract for Project Maven, a Controversial Pentagon Drone AI Imaging Program. Gizmodo. Retrieved from https://gizmodo.com/google-plans-not-to-renew-its-contract-for-project-mave-1826488620
[207] Conger, K. (2018, June 7). Google Backtracks, Says its AI Will Not Be Used for Weapons or Surveillance. Gizmodo. Retrieved from https://gizmodo.com/in-reversal-google-says-its-ai-will-not-be-used-for-we-1826649327
[208] Google. (n.d.). Artificial Intelligence at Google: Our Principles. Retrieved from https://ai.google/principles/
[209] Ibid.

> policy. Policy that doesn't really have any process or oversight or transparency around it - what's the point?"[210]

As Frank Slijper concurred, "having a policy is one thing and implementing it is another."[211] While a commitment not to develop weapons sounds unequivocal on first reading, Slijper noted that, "the line between what is lethal or potentially lethal or non-lethal is not a black and white area, there is always a grey area in between."[212] Similarly, reference to international law and human rights in these principles appears laudable, but as Peter Asaro observed, "the international norms surrounding… drone surveillance are all contested and debated in the international sphere."[213]

The scepticism invited by the ambiguity of these principles was vindicated when Kent Walker, Google's Senior Vice President for Global Affairs, later declared that the decision not to renew their Maven contract was "focused on a discrete contract" and should not be interpreted as "a broader statement about our willingness or our history of working with the Department of Defense."[214] Recourse to technique in the form of vague principles may therefore have limited impact in closing down debate, as the door remained open to future DoD work. As Laura Nolan summarised: "self-regulation is no regulation."[215]

For the Campaign, Google's departure from Project Maven was just one victory in a much larger battle. Ultimately, for Mary Wareham, "the companies are not within the immediate scope of the Campaign… we're going after governments as governments are the ones that negotiate, adopt and regulate through [a] multilateral instrument."[216] Any ethical principles are thus insufficient to quell their concerns. From their perspective, in the absence of a legally-binding treaty banning fully autonomous weapons, the issue remains unresolved.

6.2. Reassembly

6.2.1. Military-Technological Complex

The departure of Google from Project Maven constituted a reassembly of the Military-Technological Complex. Despite the negative publicity associated with Maven,

[210] Research Interview with Laura Nolan, June 2020
[211] Research Interview with Frank Slijper, June 2020
[212] Research Interview with Frank Slijper, June 2020
[213] Quoted in Conger, K. (2018, June 7). Google Backtracks, Says its AI Will Not Be Used for Weapons or Surveillance.
[214] Quoted in Mitchell, B. (2019, November 19). Google's departure from Project Maven was a 'little bit of a canary in a coal mine.'
[215] Research Interview with Laura Nolan, June 2020
[216] Research Interview with Mary Wareham, June 2020

however, many companies were willing to pick up where Google left off. New companies and discourses were incorporated into the assemblage and its form was altered.

Clarifai was another tech company contracted to work on Maven. Its involvement became public shortly after Google decided not to renew its contract. Notably, Clarifais's CEO Matthew Zeiler was unfazed by the bad press which followed, declaring "the goal for our contribution to Project Maven - to save the lives of soldiers and civilians alike - is unequivocally aligned with our mission [as a company]"[217] Embracing the patriotic discourse, Clarifai became a visible element of the Military-Technological Complex. In Zeiler's words, "we believe in putting our resources toward society's best interests, and that includes America's security."[218]

Around the same time, data analytics company Palantir reportedly took on the work left by Google in Maven. Like Clarifai, it had no qualms delivering such controversial work. In fact, co-founder Peter Thiel called upon the FBI and CIA to investigate Google for its "treasonous" decision not to work on Maven.[219] Three Palantir executives went on to form Anduril, a tech company focused on "remaking" defence contracting "by incorporating the latest innovations of Silicon Valley into warfighting technology."[220] In addition to the former Palantir executives, Anduril boasts of an "elite team of industry experts" hailing from high-profile tech companies, such as SpaceX, Tesla and Google, as well as traditional defence contractors, such as General Atomics.

Anduril co-founders Palmer Luckey and Trae Stephens vocally criticised Google's decision not to renew its Maven contract, insisting "if tech companies want to promote peace, they should stand with, not against, the United States' defense community."[221] Notably, however, they recognised and even shared many of the concerns of those conscientious tech objectors at Google, but disagreed on the appropriate solution:

> "We agree with many others that the decision to take a human life should not be made without human direction. But an essential part of ensuring that technologies are used ethically is ensuring that the terms are not dictated by authoritarian regimes. For the United States to

[217] Zeiler, M. (2018). Why We're Part of Project Maven. Retrieved from https://www.clarifai.com/blog/why-were-part-of-project-maven
[218] Ibid.
[219] Sandler, R. (2019, July 15). Peter Thiel Says CIA Should Investigate Google For Being "Treasonous." Forbes. Retrieved from https://www.forbes.com/sites/rachelsandler/2019/07/15/peter-thiel-says-cia-should-investigate-google-for-being-treasonous/
[220] Quoted in Fang, L. (2019, March 9). Defense Tech Startup Founded by Trump's Most Prominent Silicon Valley Supporters Wins Secretive Military AI Contract. The Intercept. Retrieved from https://theintercept.com/2019/03/09/anduril-industries-project-maven-palmer-luckey/
[221] Quoted in Ibid.

> set ethical norms and assert a moral high ground, it must first hold the technological high ground."[222]

The following year, in March 2019, Anduril won a Maven contract.[223] Their involvement in this drone surveillance technology resonates with Luckey's vision of the future of warfare, one in which soldiers are "superheroes" with "perfect omniscience over their area of operations, where they know where every enemy is, every friend is, every asset is."[224] For better or worse, Anduril has a reputation in this domain, having previously developed an autonomous border surveillance system for US Customs and Border Protection.[225] Evidently, it is comfortable adopting and perpetuating a 'patriotic' discourse to justify its defence work.

Changes on the industry side of the Military-Technological Complex were mirrored in the DoD itself. True to his vision of Maven as the "spark that kindles the flame front of artificial intelligence across the rest of the [Defense] Department,"[226] Lt. Gen. Shanahan went on to lead the Pentagon's Joint Artificial Intelligence Centre (JAIC) when it was created in June 2018. In its founding memo, Shanahan wrote that the JAIC was established for "accelerating the delivery of AI-enabled capabilities, scaling the Department-wide impact of AI, and synchronizing DoD AI activities to expand joint force advantages." Essentially, the JAIC intended to do for the entire DoD what Project Maven had done for drone footage analysis.[227] In doing so, the JAIC was fulfilling a vision proposed by Lt. Gen. Shanahan a year prior: that the DoD "should never buy another technological platform without artificial intelligence capabilities baked into it."[228]

Now that the spark of Project Maven has kindled the flame of the JAIC, the DoD is rolling out its AI technologies for applications beyond the battlefield. These include tracking

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[222] Luckey, P., & Stephens, T. (2018, August 8). Silicon Valley should stop ostracizing the military. The Washington Post. Retrieved from https://www.washingtonpost.com/opinions/silicon-valley-should-stop-ostracizing-the-military/2018/08/08/7a7e0658-974f-11e8-80e1-00e80e1fdf43_story.html

[223] Fang, L. (2019, March 9). Defense Tech Startup Founded by Trump's Most Prominent Silicon Valley Supporters Wins Secretive Military AI Contract.

[224] Quoted in Ibid.

[225] Hatmaker, T. (2018, June 11). Palmer Luckey's defense company Anduril is already leading to arrests at the southern border. Tech Crunch. Retrieved from https://techcrunch.com/2018/06/11/anduril-lattice-sentry-palmer-luckey/

[226] Quoted in Allen, G. C. (2017, December). Project Maven brings AI to the fight against ISIS.

[227] Quoted in Tucker, P. (2018, December 14). Project Maven Overseer Will Lead Pentagon's New AI Center. Defense One. Retrieved from https://www.defenseone.com/technology/2018/12/project-maven-overseer-will-lead-pentagons-new-ai-center/153555/

[228] Quoted in Dobkin, A. (2017, November). DoD Maven AI project develops first algorithms, starts testing.

wildfires, hurricanes and assisting with humanitarian disaster relief.[229] Recent news reports suggest the tools developed as part of Maven are being repurposed towards an algorithmic surveillance system for tracking the spread of covid-19.[230] Clearly, the AI technologies involved can be repurposed towards different ends than those originally envisaged - a core concern of those Google workers protesting. Implementing Maven technologies in more benign circumstances such as these suggests the DoD is seeking to repair the negative reputation it has earned for its AI integration. If effective, this may improve the likelihood of tech companies being willing to work with it in the future. According to Shanahan's own description of JAIC work in humanitarian and disaster response:

> "One of the most important benefits of this NMI [National Mission Initiative] is that it is an inspiring, societally-beneficial, life-saving mission that is not only whole-of-government but whole-of-society… It offers a unique opportunity to combine DoD efforts with industry and academia in a new type of public-private endeavor to operationalize AI to solve our most challenging problems."[231]

Old technologies are thus reworked to new ends but via the same means - enlisting tech companies. As a dynamic and ongoing process, it requires constant work to legitimise and justify. For this reason, civil society remains highly relevant.

6.2.2. Civil Society Coalition

Beyond the decision taken by Google not to renew its Maven contract, the impact of civil society on the reconfigured assemblage was striking. As previously noted, even those contractors brought in to replace Google in Project Maven conceded that life and death decisions in war should not be delegated to machines. Even though Google formally 'left' the Military-Technological Complex and the Campaign has moved on to bigger objectives, their influence endured.

Following the controversy that arose over Project Maven, a discourse of ethics is now playing a much greater role in the Military-Technological Complex. "To underscore our focus on ethics, humanitarian considerations, and… AI safety," announced Lt. Gen. Shanahan in

[229] Shanahan, J. (2019). Statement before the Senate Armed Services Committee Subcommittee on Emerging Threats and Capabilities on "Artificial Intelligence Initiatives." Retrieved from https://www.armed-services.senate.gov/imo/media/doc/Shanahan_03-12-19.pdf

[230] Aaron Gregg; Erica Werner. (June 4, 2020 Thursday). Pentagon's coronavirus plan includes millions for missile tubes and body armor; Critics accuse the Defense Department of moving too slowly, question some of its spending priorities. Washington Post Blogs . Retrieved from https://advance-lexis-com.proxy.library.uu.nl/api/document?collection=news&id=urn:contentItem:602B-H3H1-JB4M-V023-00000-00&context=1516831

[231] Shanahan, J. (2019). Statement before the Senate Armed Services Committee Subcommittee on Emerging Threats and Capabilities on "Artificial Intelligence Initiatives."

2019, “JAIC is working closely with the Defense Innovation Board (DIB) to foster a broad dialogue and provide input into the development of AI principles for defense.”[232] In September 2019, Shanahan announced that the JAIC would be hiring a dedicated ethicist for this purpose.[233] It remains to be seen how meaningful these actions will be longer-term, but the incorporation of such rhetoric into the Military-Technological Complex demonstrates the lasting influence of civil society in its newly-reassembled form.

While the Campaign continues to encourage tech workers to support its cause and question the uses of their work, it faces a new challenge in the rise of “bespoke” contractors like Anduril. A large part of the success achieved in mobilising workers at Google comes down to the fact that those workers were not necessarily aware of their company’s defence contracts: “most people assumed, or had been told, that Google doesn’t do military work,” according to Laura Nolan.[234] As Frank Slijper elaborates, “if you apply for a job with Raytheon, you know you’re going to build bombs and missiles, but if you apply for a job with Google or Amazon then probably you have a bit of a different idea of what your work will look like.”[235] External pressure on these companies is more effective for the same reason. At Google, according to Slijper, “the majority of their income comes through people like you and me, who ensure massive interest from advertisers… and so they are - especially since Project Maven - very well aware of any potential [public] backlash.”[236] Conversely, however, for defence-tech companies like Anduril with no commercial businesses beyond Government contracting, public pressure may hold less sway.

Pressuring tech companies alone remains as impractical as it is undesirable for the Campaign, for whom the overarching goal remains a legally binding treaty. Tech sector support is welcome but their sights are set elsewhere: the international community. As Campaign coordinator Mary Wareham noted, “we’re not attempting to create a treaty by only working through the tech sector.”[237] Governments are the ones who will ultimately decide on the fate of LAWS, according to her, “because that’s who gets to launch, negotiate, adopt, sign, ratify and implement international treaties.”[238]

In the reassembled form of the Military-Technological Complex, civil society (and in particular The Campaign) perhaps has less direct influence. The ease with which Google

[232] Ibid.
[233] Todd Lopez, C. (2019). DoD Seeks Ethicist to Guide Artificial Intelligence Deployment. Retrieved from Department of Defense News website: https://www.defense.gov/Explore/Features/Story/Article/1950724/dod-seeks-ethicist-to-guide-deployment-of-artificial-intelligence/
[234] Research Interview with Laura Nolan, June 2020
[235] Research Interview with Frank Slijper, June 2020
[236] Research Interview with Frank Slijper, June 2020
[237] Research Interview with Mary Wareham, June 2020
[238] Research Interview with Mary Wareham, June 2020

was replaced proves the limits of their power in this regard. Their effect - and, similarly, that of Google - is thus more of a 'legacy' insofar as it has prompted a turn in the DoD towards prioritising the ethics of these technologies and responsible development, particularly vis-a-vis great power rivals. Of course, however, the durability of this remains to be seen.

6.3. Rewiring the Military-Technological Complex

Examining the practices of antipolitics and reassembly in this context reveal a new form for the Military-Technological Complex. Bridging the divide between the material power of the DoD and social power of civil society, a new breed of "defence-tech" companies like Anduril have carved out a niche as bespoke contractors. Having drawn engineering talent from both traditional defence companies and Silicon Valley, they exclusively but openly court defence contracts, invoking a discourse of patriotism without risking the alienation of a wider consumer market. The ease and speed with which they began providing this work speaks to the significant power of the DoD and, in turn, the resilience of the Military-Technological Complex as an assemblage.

Underlying this entire process is a constant tension between the predominantly compulsory power of the DoD and the predominantly productive power of civil society. Sizeable contracts provide a compelling material incentive for many tech companies to provide the technologies sought by the DoD, but are in conflict with the ethical pitfalls publicised by civil society. In some ways, each mimics the other. As the DoD has adopted a discourse of patriotism to assuage ethical concerns, civil society has underlined the material risk to businesses with large consumer markets seen to be enabling these developments in warfare.

As a result, the civil-military industrial divide appears more porous than ever, raising valuable questions about contemporary warfare. Project Maven exemplifies a certain fluidity, in that its technologies were originally developed for the consumer market, weaponised by the DoD for drone footage analysis, and are now being "re-legitimised" through their transfer back into the civilian sphere for humanitarian and public health purposes. Such a process arguably reflects a late-modern - or liquid modern - blurring of the boundaries between war and peace, military and civilian, public and private.

A blurring civil-military distinction in this regard must be understood in the context of a geographically and temporally expanding militarism observed in the rise of "unending"[239]

[239] Duffield, M. (2007). Development, Security and Unending War: Governing the World of Peoples. Polity.

and "everywhere"[240] wars. Similarly, in Graham's conceptualisation of the "battlespace" of cities, he observes it "has no front and no back and no start or end… the concept… thus works by collapsing conventional military-civilian binaries."[241] Common to these suggestions that conventional ties between war, space and time are coming undone, however, is a focus on their *practice.*[242] The ascendancy of the Military-Technological Complex suggests that the nebulous expansion of warfare across space and time not only pertains to how it is practiced but also how its means are developed and procured. It is not a stretch to suggest that this expansion, in turn, risks normalising new imaginations of violence.[243] And given that "violence needs to be imagined in order to be carried out," one wonders where this normalisation may lead.[244]

Conceptualising the Military-Technological Complex as an assemblage is particularly appropriate in the context of liquid modernity. Absent of rigid, 'arboretic' structures, it takes shape in a manner consistent with Bauman's interpretation of sociality, "spreading rhizomically and sprouting formations of varying degree of durability, but invariably unstable, hotly contested and devoid of foundation to rely on."[245] Fluidity of formation and re-formation in this regard, however, should be regarded as "a feature of state power, not a bug."[246] Instead of the state standing separately to the private sphere, it is intimately embedded within it and continually reproducing its power through it.[247]

Lastly, directly relevant to this "undoing" of conventional warfare and fluidity of the military-civilian divide is Foucualt's 'boomerang', which suggests the practices - and technologies - of peripheral subjugation inevitably return to the centre.[248] Or, as Marx suggested, the scenario of "war [being] developed earlier than peace."[249] Indeed, many have

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[240] Gregory, D. (2011). The everywhere war. Geographical Journal, 177(3), 238–250. https://doi.org/10.1111/j.1475-4959.2011.00426.x
[241] Graham, S. (2009). Cities as battlespace: The new military urbanism. City, 13(4), 383–402. https://doi.org/10.1080/13604810903298425 389
[242] Demmers, J., & Gould, L. (2018). An assemblage approach to liquid warfare: AFRICOM and the 'hunt' for Joseph Kony. 366
[243] Graham, S. (2012). When life itself is war: On the urbanization of military and security doctrine. International Journal of Urban and Regional Research, 36(1), 136–155. https://doi.org/10.1111/j.1468-2427.2011.01026.x p. 138
[244] Schröder, I. W., & Schmidt, B. (2001). Introduction: Violent Imaginaries and Violent Practices. In Anthropology of Violence and Conflict (pp. 1–24). London and New York: Routledge. 9
[245] Bauman, Z. (2016). Liquid Modernity Revisited. In Die Zwischengesellschaft. https://doi.org/10.5771/9783845251813-11 p.193
[246] Tréguer, F. (2019). Seeing like Big Tech: Security assemblages, technology, and the future of state bureaucracy. In D. Bigo, E. Isin, & E. Ruppert (Eds.), Data Politics: Worlds, Subjects, Rights. London: Routledge. 157
[247] Mitchell, 1991, quoted in Ibid.
[248] Graham, S. (2009). Cities as battlespace: The new military urbanism. City, 13(4), 383–402. https://doi.org/10.1080/13604810903298425 391
[249] Quoted in Chamayou, G. (2016). A Theory of the Drone. The New Press. chap. 22

noted the ways in which the United States' war on terror has already "come home to roost" in the form of widespread surveillance[250] and militarised police forces.[251] One of the most overt and egregious examples can be seen in the recent use of an MQ-9 Predator drone for surveilling Black Lives Matter protests in Minneapolis.[252] It is not known whether this drone was utilising the technologies developed in Project Maven. But nor is it hard to imagine.

[250] Moltke, H. (2019, May 29). Mission Creep: How the NSA's Game-Changing Targeting System Built for Iraq and Afghanistan Ended Up On The Mexico Border. The Intercept. Retrieved from https://theintercept.com/2019/05/29/nsa-data-afghanistan-iraq-mexico-border/

[251] Kommena, N., & Kirk, A. (2020, June 5). Why are some US police forces equipped like military units? The Guardian. Retrieved from https://www.theguardian.com/world/2020/jun/05/why-are-some-us-police-forces-equipped-like-military-units

[252] Koebler, J., Cox, J., & Pearson, J. (2020, May 29). Customs and Border Protection is Flying a Predator Drone Over Minneapolis. Vice. Retrieved from https://www.vice.com/en_us/article/5dzbe3/customs-and-border-protection-predator-drone-minneapolis-george-floyd

7. Conclusion

"There is nothing predestined about the impact of AI," according to Google's guidelines for the Responsible Development of AI.[253] Indeed much of the story of AI in defence remains to be written, however it is hoped that this research has not only addressed an important research gap but also emphasised the importance of grappling with these issues.

Just as there is nothing predestined about the impact of AI, there was nothing predestined about the way Project Maven played out. The formation of a Military-Technological Complex here has been bitterly contested, the product of a lengthy process which began well before controversies arose in 2017. Since at least 2014, the DoD has sought to develop, purchase and field AI technologies to maintain superiority. Recognising it could not do so alone, it went to considerable effort to establish partnerships and facilitate cooperation with consumer technology companies at the cutting edge of AI development. In addition, it carefully cultivated amenable, expert opinions to legitimise these moves, framed its failures as learning experiences, and adapted its methods and advanced new discourses - particularly concerning patriotism - to justify its measures. A continual strategy of downplaying the political and emphasising the technical has been deployed throughout, lending the Military-Technological Complex an impression of coherence. All the while, this has been enabled by the immense, compulsory power granted by the material resources of the DoD, and structural relations they engender.

For proof that there was nothing predetermined about Project Maven, consider the tireless efforts of civil society in raising the alarm over these developments. A broad coalition of different organisations, unified by a shared concern about the loss of human control from warfare, have highlighted to tech workers the ethical repercussions of their defence work. In turn, many tech workers have bolstered the cause of the Campaign by providing valuable expert input. Although the tech sector is neither the goal of the campaign nor the means to achieve it, the decision of Google not to renew its Project Maven contract has had a 'legacy' effect in the Military-Technological Complex, forcing others to recognise and address questions of ethics in this work. In this regard, civil society had an important role in exercising its productive power through systems of knowledge and meaning pertaining to ethical concerns about LAWS.

In addressing these issues, this thesis has shed light on the development of LAWS and contributed to contemporary discussions surrounding remote warfare. There remains,

[253] Google. (2018). Responsible Development of AI. Retrieved from https://ai.google/static/documents/responsible-development-of-ai.pdf

however, work to be done. In particular, further study into the role of new, dedicated defence-tech contractors who appear to have fewer qualms about the ethics of this work is urgently needed. Additionally, comparative studies into similar dynamics in other countries involved in the development of LAWS (e.g. Russia, China) may bear interesting results. More generally, however, as AI technologies are set to proliferate and affect much more than just defence, there is an urgent need to interrogate their development and question how they may cause harm. Understanding this, after all, is the first step to countering it.

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- that this Master of Arts thesis in Conflict Studies & Human Rights does not contain material from unreferenced external sources (including the work of other students, academic personnel, or professional agencies);
- that this thesis, in whole or in part, has never been submitted elsewhere for academic credit;
- that I have read and understood Utrecht University's definition of plagiarism, as stated on the University's information website on "Fraud and Plagiarism":

"Plagiarism is the appropriation of another author's works, thoughts, or ideas and the representation of such as one's own work." (Emphasis added.)[1]

Similarly, the University of Cambridge defines "plagiarism" as *" ... submitting as one's own work, irrespective of intent to deceive, that which derives in part or in its entirety from the work of others without due acknowledgement. It is both poor scholarship and a breach of academic integrity."* (Emphasis added.)[2]

- that I am aware of the sanction applied by the Examination Committee when instances of plagiarism have been detected;
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[1] https://students.uu.nl/en/practical-information/policies-and-procedures/fraud-and-plagiarism
[2] http://www.plagiarism.admin.cam.ac.uk/what-plagiarism/universitys-definition-plagiarism