LETHAL AUTONOMOUS WEAPON SYSTEMS (LAWS). ON THE ETHICS OF AUTOMATION IN THE MILITARY FROM THE PERSPECTIVE OF SOCIAL SYSTEMS THEORY

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But where control is increased
So is risk.
Niklas Luhmann (1991: 103)

Security is like a screw without an end.
Isaac Asimov (1992: 365)

Abstract. The debate about weapon systems that function "autonomously" on artificial intelligence is giving a new impetus to the old question about the role of automation in social systems.[1] This is especially true for the debate on *Lethal Autonomous Weapon Systems* (LAWS), i.e., autonomous systems designed to kill in the context of warlike conflicts. This article provides an insight into how artificial intelligence automation can be modelled in social theory, referring in particular to Niklas Luhmann's systems and communication theory. From this modelling, conclusions arise with regard to ethical questions in the military context. As a first step, following Elena Esposito, I examine how artificial intelligence automation participates in communication processes and where its limits lie. Following that, ethical questions are discussed step by step. First, the problem of violating human dignity will be considered. In the context of organisations—and especially military organisations—the question of accountability always arises. Accountability refers to social roles and their corresponding communication processes. Machine processes, however, cannot replace accountability. Furthermore, five aspects are discussed which arise from the perspective of the codified moral programme of *Innere Führung* in relation to artificial

[1] This text focuses on my considerations that emerged from the discussions in the research group "Study of ethical concerns regarding MUGS employment in operational context" of the Estonian Military Academy (EMA). I would like to thank Kairi Talves, Eleri Lillemäe (EMA) and Wolfgang Koch (Fraunhofer FKIE) for the very productive exchanges and excellent collaboration within this research group. The research group worked within the framework research project "Integrated Modular Unmanned Ground Systems" funded by the European Union.

intelligence automation. These are trust in technology, time frame, standardisation of assisting information, communicative attribution as action, and building media competence, including moral routines. With recourse to Luhmann's concept of risk, the importance of implementation processes and learning is pointed out at the end. Overall, this paper is about raising questions, i.e., about problematising. It is not about formulating definitive answers.

Keywords: Lethal Autonomous Weapon Systems (LAWS), Artificial Intelligence (AI), automation, digitalisation, Sociology of Technology, Social Systems Theory, structural coupling, artificial communication, moral communication, accountability, ethical learning, ethical neutralisation, Innere Führung, human dignity, risk management, security, trust in technology

1. On a train

Passengers on a train can work, make phone calls, send e-mails, watch films, meet in the on-board bistro, or simply daydream to the accompaniment of music. The "simplification in the medium of causality"[2] (Luhmann 1991: 97) works and increases the degrees of freedom of communication, either by bridging space and time as a medium of dissemination (*Verbreitungsmedium*) or by freeing up time for communication. If a train unexpectedly stops on the tracks, technology stops functioning and proves to be an "installation" (Luhmann 1991: 98; Halfmann 1996: 126), i.e., an *objet trouvé* in the landscape. In this case, the audience would even intensify communication, discuss Deutsche Bahn, which is known for such failures, tweet diligently about the mishap, or commune in the on-board bistro (if this is not coincidentally also down).

These processes would take place in the same way if instead of a person, there was a sensor-based algorithm in the driver's cab that controlled the train via satellite connection. Nothing would change for the passengers. They could behave exactly as they do now. If an installation character emerged, people would also grumble about the railroad as a social organisation system. Human control of trains does not protect against the risks of standstill, failure of doors, air conditioning or toilets, or against accidents.

[2] Quotations from sources in German have been tacitly translated into English. At the request of the author an in-text referencing style is used.

So where does the problem actually lie when it comes to an extensive automation of complex activities that have formerly been performed by humans? Is it that performance roles (*Leistungsrollen*) are being dismantled and inclusion in society is increasingly taking place via public roles (*Publikumsrollen*)? This point has been controversially discussed with regard to consequences of digitisation in the labour market, especially since the startling "Oxford Study" (Frey, Osborne 2013) (problem of being banished from the performance role). Is it because we do not appreciate competition from other "actants" as defined by Bruno Latour? That "a machine-like construction of certain social systems would insult the greatness of human beings" (Luhmann 1966: 37)? Or will artificial communicators take a place beside human consciousness, to which sociological systems theory has so far solely ascribed the role of irritating communication (Baraldi et al. 2021: 116)? Will future society function without humans, since artificial equivalents to consciousness are entering into communication (problem of functional equivalence)? Or is it because accountability will be difficult to attribute – a question that arises especially in a situation where a technical medium turns into an installation and there occurs damage that must be compensated for, such as loss of time or injury? In the case of damage and errors, it must be possible to identify addresses that can be held accountable (problem of accountability). Or is it because we generally do not trust "the robots" because they are increasingly taking on the character of non-trivial machines whose output is no longer only dependent on input and cannot be predicted with certainty? What emerges here is the problem of controllability. To what extent can artificial intelligence automata still be controlled communicatively (problem of control)?

These problems obviously refer to each other. In all cases, it is a matter of questioning the role of humans in the society.

2. Argumentation and terminology

Ron Arkin and Gurav Sukhatme define "autonomy" in the context of machines as follows:

> *In its simplest form, autonomy is the ability of a machine to perform a task without human input. Thus, an "autonomous system" is a machine, whether hardware or software, that, once activated, performs some task or function on its own.* (Arkin, Sukhatme 2015: 2)

The choice of the term "autonomy" suggests anthropomorphic interpretations due to its metaphorical content. In order to avoid a view that is anthropomorphic from the outset, the term "artificial intelligence automation" is used following Wolfgang Koch (2022). This avoids the term "autonomy" and emphasises the aspect of artificiality. Artificial intelligence automation refers to technical systems that can operate autonomously in a variety of ways, but are constructed and programmed. As a rule, such systems are not completely transparent to their users. This is even truer for networked systems. If necessary, even developers need the help of additional systems to establish comprehensibility. However, this does not mean that the systems in question act in a "self-willed" way. For example, neural networks can be controlled by model-based algorithms. The latter are based on a mathematical model, operate in a more strictly controlled way, and surround the neural network like a cage (AI in the box or "machine in the machine" according to Luhmann 1991: 103). The concept of an "ethic by design" is also metaphorical. What is meant by this is that systems of rules are implemented, which is possible as long as they exist as a list of instructions (such as the rules of engagement). As soon as a "specification" can be formulated, "programmers consider how it can be fulfilled." (Baecker 2021: 149) An early example of "ethics" implemented via a programme code is Isaac Asimov's laws of robotics (Misselhorn 2019: 50).

Niklas Luhmann was early to point out that automation magnifies problems that typically show up in social structures. As it turns out, automation sheds "a new light" on the problems of these social systems (Luhmann 1966: 98). In a situation in which automata acquire new qualities and fulfil their functions more or less automatically in complex environments, this is true once again. Because the military is concerned with the possibility of using lethal force, the implementation of artificial intelligence automation in military organisations is of particular political and ethical relevance.

The military is a functional system of society (Luhmann 2005b: 128) whose communication follows the code "Destroy organisational destructive capacity organisationally? Yes/No" (Dammann 2022). The military functional system is internally differentiated into various military organisations, i.e., into national, subnational or supranational as well as transnational organisations capable of violence, which may well be structured very differently. Regular, professional armies are only one form of this organisational diversity, and even these differ in their structures and programmes. The "corporate philosophy" (Ohm 2010: 43) of *Innere Führung* is typical of the German armed forces. At the same time, the code of the military system reflects that it is tailored to political conflict environments, i.e. to the ability to resist a political demand for commitment presented in the medium of physical violence.[3] Only when such resistance is present does war begin (Clausewitz 1952: 532). Russia's war of aggression against Ukraine is an ideal case in point. It shows that having military capabilities at the ready in order to refuse to accept a political communication presented in the (symbolically generalised) medium of violence must still be counted as part of the core of public services.

The problems of artificial intelligence automation—banishment from the performance role, functional equivalence, attributability, control—take on a special colouring in the context of the military. For example, removing a soldier from the front line of a battle through the use of functionally equivalent combat apparatuses would be considered a positive thing because the soldier's life is no longer in immediate danger. On the other hand, old problems appear in a new light. These are, in particular, decision-making and accountability in the context of controlling new weapon systems, as well as the social and individual interpretation of soldiering as an action (*Handeln*) rather than experience (*Erleben*). Transhumanist experts such as Ray Kurzweil (2014) and Nick Bostrom (2014) warn us of Terminator-like scenarios in which an artificial superintelligence that has escaped control launch a campaign of destruction against humanity. Such scenarios are problematic beyond methodological considerations because the assumption of an 'autonomous' technological evolution is sociologically insufficient (Esposito 2002: 38–39; Halfmann 1996: 97–106; Popitz 1995: 78–138; Spreen 2018: 49–54). Moreover, such disaster scenarios, which are quite popular in the media, can evoke unconscious fears of the 'uncanny' (Freud 1970) which are prejudicial to sober reflection. However, if artificial intelligence automation is modelled in an elaborate social theoretical framework, critical issues are bound to emerge. In such a framework, there can occur a practice-relevant ethical questioning of new computer technologies and their opportunities and risks.

In the following, particular reference is made to the toolbox of sociological systems theory, which goes back to Niklas Luhmann. A lively discussion is also held among the followers of the systems theory about the status of "social robots", "intelligent" algorithms and computer systems and data-processing media. In addition, Luhmann does not understand humans—conceived as a

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[3] A conflict is the unity of the difference of two mutually contradictory communications and unfolds as a negative version of double contingency, "I do not do what you want if you do not do what I want." (Luhmann 1984: 531) The code of conflict communication is encoded by the distinction of "non-yielding/yielding" (Messmer 2003).

system of consciousness with autopoiesis based on thoughts and the ability to perceive—as part of society, but rather ascribes them to society's environment. This "anti-humanist" view, so to speak, implies a certain distance from a hidden normative or even unconscious-emotional attitudes but opens up a space for ethical observation precisely because of this (Scholl 2010).

Since ethical considerations in the space are thus opened up, recourse is made to the concept of *Innere Führung* (inner leadership), which is constitutive for the German Bundeswehr as a democracy-integrated army, and according to which, the use of force in war must be legally and ethically accountable to individual actors (Dörfler-Dierken 2014: 152). "The more lethal and far-reaching the effect of weapons becomes, the more decisive is the question of whether there are people behind the weapons who know what they are doing." (Baudissin 2006, 230) Moral judgement is explicitly part of the core of *Innere Führung*. The fundamental value system is that of the Constitution of the Federal Republic of Germany. The ethical foundations mentioned in detail are human dignity, freedom, peace, justice, equality, solidarity, and democracy. They are obliged to comply with international law and the rules of engagement (Bundesministerium für Verteidigung & Führungsstab der Führungsstab der Streitkräfte 2008: 10, 33). This presupposes that they see themselves as active agents and can be addressed as such, i.e., that they can be held responsible. "Soldiers must always be able to live and act in a self-responsible manner and be able to assume responsibility for others." (Bundesministerium für Verteidigung & Führungsstab der Streitkräfte 2008: 19) *Innere Führung* requires soldiers to maintain a "human attitude", especially when dealing with complex technology.

Following Cristina Besio (2018), *Innere Führung* can be understood as an organisational re-specification of moral communication. Accordingly, *Innere Führung* would be seen as a codified moral programme that the Bundeswehr carries along in order to make the specific complexity of warfare and combating manageable in terms of humanistic and democratic values "while at the same time following orders and making quick decisions in conflict situations." (Schmidt 2021: 337; cf. Ohm 2010: 44) Moreover, addressing a soldier's personal conscience and individual accountability means that it is a re-specified morality "borne by the personnel" (Besio 2018: 49).[4] *Innere*

[4] Organisations attribute decision-making and accountability to individuals. However, they cannot avoid the problem of shared responsibility (Luhmann 1966: 102–115; Tacke, Drepper 2018: 73, 109). In the context of the Bundeswehr, the problem of shared responsibility already arises with a command. An order is a communicated decision that, in the context of *Innere*

Führung is, thereby, a reaction to the experiences of "total state" and of war crimes and crimes against humanity of the last world war (Ohm 2010: 42). The "moral purpose of this concept" is to "internalise a stop rule in every soldier that prevents him from committing war crimes." (Hellmann 2015: 199) *Innere Führung* thus provides an ethical framework for moral judgements. This framework affects all members of the German armed forces and is characteristic of the organisational and leadership culture of the Bundeswehr. With regard to new technologies, *Innere Führung* is currently subject to a discursive meta-reflection that revolves around the question of its adaptation to new military technologies such as "drones, robots and cyborgs".[5]

Luhmann (1966) has pointed out that automation in social organisational systems does not require any special ethics, as long as it can be seen as functionally equivalent to manual problem solving. Decisions produced by a social system should be the same with or without automation. To put it bluntly, one can say with Luhmann that the ethical problem lies in whether and to what extent it is possible to "ethically and legally neutralise" artificial intelligence automation within the framework of the division of tasks and interaction between humans and technology (Luhmann 1966: 20). For an approach focussing on ethics, this raises the following question: under which conditions is artificial intelligence automation compatible with *Innere Führung* as an example of a codified moral programme in the military sphere?

For this purpose, we should first clarify how artificial intelligence automation can be functionally understood in the context of communication. In doing so, we draw on Elena Esposito's multi-level model which, in turn, follows Luhmann (chapters 3–5). From this theoretical clarification, specific problem definitions arise for an ethical evaluation of artificial intelligence automation in the military context. Along with the four problems (performance role, attributability, functional equivalence and control) that refer to each other, the following will be discussed: the problem of violating human dignity through the use of autonomous systems (chapter 6); requirements that arise from the perspective of *Innere Führung* (chapter 7); and risk management through implementation (chapter 8). The paper concludes with a summary. The aim is to provide an insight into how artificial intelligence

Führung, does not exonerate either the giver or the receiver of the order from moral questions, because an order can be refused on ethical grounds under certain conditions, "Disobedience does not exist if an order is not obeyed that violates human dignity [...]." (§ 11 para. 1 sentence 3 Soldiers' Act [Gesetz über die Rechtstellung der Soldaten])

5 This is the subtitle of the corresponding yearbook *Innere Führung* (*Jahrbuch Innere Führung*).

automation can be modelled in a military context from a social theoretical perspective, and what issues will arise. The primary aim is to open up questions, i.e., to problematise. It is not about finding unambiguous answers. The temptation of definitiveness to provide security must be resisted, especially in the field of security studies (Schulz 2022).

3. Machines in communication

Luhmann reformulates the relationship between an individual and society as a structural coupling of consciousness and communication. Consciousness (in our context one can read "people") is therefore not part of the communication system called "society" but belong to the environment of society because both are autopoietic and self-referential closed systems. Consciousness operates by means of thinking, society by means of communication. For Luhmann, thus, society is not based on the integration of people, but on communication. It is neither determined by human consciousness—by people's opinions, attitudes or perceptions, for instance—nor by the physical-bodily conditions of human existence. However, consciousness does have the capacity to make perceptions, i.e., to open a gateway to sensory experience. Society cannot perceive (Luhmann 1985: 445). Mental systems and social systems can "not exist and operate without the other" (Luhmann 2005c: 31) since they mutually presuppose each other.

Communication means making utterances (*Mitteilungen*) of an informational character that are understood. Understanding means that communication – e.g., a statement of a partner in an interaction context or a statement of a newscaster on TV – is observed with respect to the difference between information and utterance. The observation pays attention either to the information content (what?) resp. the other-referential aspect of communication, or to the utterance (who, how?) resp. the self-referential aspect of communication. Or it connects information and utterance to each other according to difference observation (Baecker 1992: 260f.). Consciousness, i.e., human beings, is involved in this process of understanding insofar as communications and information must firstly be perceived—heard, seen or read—and secondly must be thought about. For communication, therefore, "sufficient consciousness must always be available" as an environmental prerequisite (Luhmann 2009a: 106).

The key here is that communication begins with understanding. Understanding "is actually the beginning of the whole process." (Luhmann 2009a:

63) "Communication takes place only when an understander [...] sees that somewhere there is a difference between communication and information." (Luhmann 2009a: 63) Opening a web page or providing information is not yet communication because "communication is made possible from behind, as it were, in opposition to the timing of the process." (Luhmann 1984: 198)

However, the emergence of increasingly complex data-processing machines and programs raises the question of whether the assumption "that social systems are coupled only to consciousness and to nothing else" (Luhmann 2020: 260) does not fall short. This is prompted by the fact that computer programs or algorithms are not simply unobtrusive dissemination media but rather compute input that, thus, produce output that is neither identical to any information fed into them nor can easily be attributed to a personal or organizational addressee of communication. When the difference between information and utterance is observed, it is no longer possible to ask who selected and uttered the information in question and for what reasons (Esposito 1993: 350). In the case of multiple networked and embedded data processing, such as on the Internet, this is even more true (Halfmann 1996: 144). Especially in Web 2.0 and in the age of "Googlisation", algorithms generate new and surprising information from networked user activities. These are like a collective mirror, i.e., "a mirror in which everyone sees not him- or herself but the other observers communicating – generating a kind of 'virtual double contingency'." (Esposito 2017: 260)

Even before the (official) launch of the Internet in 1995, Elena Esposito raised the question regarding the discussion of "the so-called 'thinking machines'": "can and must the premise be held against computers that all information processing must be attributed to a consciousness?" (Esposito 2017: 260) "If the computer manipulates information, must it be claimed that it thinks?" (Esposito 1993: 345) Esposito answers this question negatively because data processing by programs and algorithms is machine-like and technical. The sociologist of technology Jost Halfmann (1996: 123–139) makes a similar argument. Seen in this light, the irritation of communication based on technical data processing always presupposes an intermediary consciousness that makes it possible to understand the artificially generated information in some way and, thereby, complete a communicative operation.

The father of this idea is philosopher John Searle, to whom Esposito also refers (e.g., 1993: 350; 2001: 243). With the help of the thought experiment of the "Chinese room", Searle illustrates the limits of automation: there is a person in a room, in front of him a stack of paper on which Chinese characters are printed but which this person does not understand at all. The person in the room does not even have to know that they are Chinese characters. Two more stacks of paper are now handed in from outside. One stack, again, contains incomprehensible characters, the other instructions written in a language that the person can understand. With the help of these instructions, the person can link the elements of the other two stacks in a purely mechanical way to finally place the results in an output tray. The symbols that come in are called "questions" outside the room. The symbols that the person inside the room hands out are called "answers". Searle also assumes that the linking rules are salient and the linking is error-free. The answers that come out of the room are indistinguishable from those of a native Chinese speaker. The person in the room is processing an input into an output over a database in a regulated way. Searle's conclusion is that if running a suitable computer program—algorithmic symbol processing—in the experiment described is not enough "to understand Chinese, then it is not enough for any other digital computer." (Searle 1986: 31–32) One could also put several people in a gym and have them process symbols in parallel according to rules (neural network or "Chinese gym"). Outsiders could do something with the output (connect communicatively) without the group in the gym coming up with any understanding of meaning (Searle 1990).

The Chinese room does not operate in the medium of meaning but simulates the same through a highly elaborated "enclosed causality" (Halfmann 1996: 126). When it operates internet-based and networked, it is an "invisible machine" (Esposito 2001). The idea of robots carrying around a monad of consciousness in a body analogous to humans is anthropomorphic and outdated.

However, Luhmann's externalisation of consciousness also gives reason to think about the emergence of functionally equivalent "rivals" that are also structurally linked to communication. In terms of social theory, Bruno Latour and Actor Network Theory (ANT) provide ammunition for this. Latour fundamentally symmetrises humans, animals, things, and artefacts, and includes all these "beings" in society (Latour 1998; Lösch et al. 2001: 13). In systems theory-inspired texts, this view emerges as a question about "entities" that "might participate in communication (society) in non-human ways." (Harth, Lorenz 2017: 15) At the same time, from such a symmetrical perspective, the reproach is directed at systems theory that it carries a "bias towards human consciousness" (Harth, Lorenz 2017: 17), ergo is itself still built in a humanistic way.

> *Algorithms, especially through their concrete performances (differentiation, learning, and decision-making), seem to challenge formerly exclusively humanly occupied spaces of social reproduction.* (Harth, Lorenz 2017: 17)

Functional competitors appear at the coupling point of consciousness and communication when speculating about the “inclusion of non-human communication participants” that “intervene powerfully in society as post-human control instances” (Dickel 2018: 56) and are structurally coupled with communication via a “social interface” (Miebach 2011).

This discussion illustrates above all that it is very important to think again about the relationship between consciousness and data processing under the conditions of the technological present and its future possibilities, for post-human discourses and posthuman ethical debates open up very quickly. It should be noted that the terms used not only in developer discourses, such as “intelligence”, “learning”, “decision-making”, or even “moral machines”, “social robots”, or “neural networks”, all stem from a metaphorical way of speaking (Bendel 2019a: 15). The sociology of technology follows this view when it conceives of technology as a bounded causality (Halfmann 1996), noting that, for example, “learning” or “decision-making” have different implications in technical contexts compared to social ones.

It is precisely from this perspective that locates people in the environment of society, as Luhmann recommends and also consistently holds, that the importance of appropriate social-theoretical modelling of artificial intelligence automation becomes apparent. Does consciousness seem dispensable for communication, as there are functionally equivalent structural couplings of communication with other environmental systems? Does consciousness appear as a variable that can be substituted in principle? Would communication be possible without it? From there, it is no longer such a stretch to flag up the dissolution of society into a robot civilisation as an ethical demand, as some transhumanist authors suggest (Spreen 2018).

4. Pseudo-structural coupling

The question of a structural coupling between communication and information-processing technical systems must, therefore, be methodologically closely controlled. “It is [...] about the relation of computer technology to the meaning-processing systems of consciousness and communication.” (Halfmann 1996: 134) Esposito (1993, 2001, 2017) offers a very useful approach. Communication, i.e., society, is not merely influenceable “via sound phenomena, via the optical signs of writing as such." (Luhmann 2020: 261) It is not merely a vast archive of signs processed, regrouped, or rewritten by bots. Accordingly, Esposito points out that all signs, even computer-generated ones, must be understood by someone at some point before they can participate in communication. However, invisible machines are certainly attributed as "quasi-persons" in the context of Internet-based communication, for example (Esposito 2001: 248). Accordingly, she speaks of a "proliferation of pseudo-structural couplings through which the system irritates and dynamises itself." (Esposito 2001: 251) This means that communication can allow itself to be irritated by automata, thus making itself "independent of a selective synchronization with the operations of mental systems." (Esposito 2001: 251) This irritation goes back to the intransparency of interfaces. One always remains on the surface, so to speak. Even contemporary developers feel this way with trained neural networks because they can no longer trace these in detail (they are too complex); however, their functioning can be made transparent retrospectively through the imaging techniques of *Explainable AI* or *XAI* (Weitz 2020). Complex data-processing systems, thus, appear to be a "mystery" (Esposito 2001: 251). This mystery, however, must not be reified in social theory; it remains a pseudo-structural coupling.

> *Through the mediation of computers, society has created for itself a new form of intransparency and potential irritation, which, however, remains on a 'second level' because sooner or later it presupposes a re-synchronization with a psychic event: sooner or later someone has to understand what the computer is saying.* (Esposito 2001: 251)

For Esposito, technical communication systems that can generate surprising information despite internal determination—especially algorithms that operate on the basis of Web 2.0, such as Google's *PageRank* algorithm (Esposito 2017)—can, thus, affect communication by irritating it. Consciousness can do the same. The irritation of communication is to be valued positively in terms of systems theory because "communications [...] are not about a distribution of stocks, but about a dosage of surprises." (Luhmann 1971: 43)

Algorithms as well as consciousness are, themselves, not part of society but belong to its environment. Algorithms irritate communication precisely because these are technically determined (bounded causality), but cannot be irritated themselves because these simply operate in a 'superpositivist' way, so to speak, in front of themselves. This, thus, suggests a multilevel model of communication (so already Esposito 2001). At the first and primary level, we find double contingency with consciousness on both sides, "each refer to the contingency of the other." (Esposito 2017: 255) This is the level on which Luhmann's communication theory is based (Luhmann 1984: 148–190), that is, "communication in whose environment only consciousnesses occur." (Fuchs 1991: 17) On the second level, "virtual contingency" is found. This is the case, for example, with robotic dolls involved in interaction in a mirror-like fashion. Ultimately, this is a projection.

> *Algorithms allow the machine to react to the behaviour of the user, and this in turn allows the user to project onto the machine his or her own contingency and meanings more efficiently than in the interaction with a mute doll.* (Esposito 2017: 257–258)[6]

On the third level, networked, web-based algorithms come into play, parasitically evaluating (collective) user behaviour and generating information that no-one thought of before (virtual double contingency or artificial communication). "You do not observe how another (like yourself) observes, you observe through the algorithm what others can also observe in communication." (Esposito 2017: 260) Algorithms do not learn anything about the world, users, or content; they only "learn" from themselves. An algorithm "only learns to work better" (Esposito 2017: 262). This virtual double contingency has limits, however, because

> *no algorithm, however high is its self-learning ability, can generate possibilities that are not implicit in the data supplied. No algorithm can independently generate contingency, but the contingency that the algorithm processes can also be the result of the interaction of human beings with the algorithm.* (Esposito 2017: 262)

In the second and the third case, one is dealing with communication that "if one may say so, operates unilaterally consciously" (Fuchs 1991: 20), that is, with communication "in whose environment computers (participatively) appear alongside consciousnesses." (Fuchs 1991: 17) Artificial intelligence systems can irritate communication but cannot understand what is being said or expressed so they cannot finalise communication operations. Following Esposito and Fuchs, it is, thus, argued here that this fundamental constellation has not changed until today and that the social-theoretical inflation of

[6] The participation of puppets in communication, especially in social settings with a high participation of children (as audience at a Punch and Judy show), is already addressed by Peter Fuchs in his now three decades old but amazingly up-to-date treatise on computers in communication, "For even the crocodile speaks and thus can be spoken to." (Fuchs 1991: 14)

consciousness-analogue structural couplings in the debate on the status of AI systems seems rather transhumanist-enthusiastic.[7]

Functional equivalences refer to specific tasks and do not imply qualitative analogy—in this case, underlying "hardware".[8] Searle's thought experiment makes it clear that the ability to process data does not at all mean that the data-processing system understands what it is doing.

One example of virtual contingency (second level) would be interaction between Robbie and Gloria as described by Isaac Asimov in *I, Robot* (Asimov 1993: 9–25). Robbie is addressed by Gloria as a person, even as a human being, even though she knows it is a machine. Asimov describes a system of interaction in which one partner is a programmed robot, but participates in communication only insofar as it is understood by Gloria. Robbie performs a role in which it seems structurally coupled (included) to the communication (the interaction system) because it is able to irritate that communication. But this is only because Gloria picks up that irritation and continues the communication. If Robbie were networked and its algorithm adapted to this, we would be dealing with virtual double contingency (third level). However, a computer-based communication network does not appear in the novel; rather, typewriters are used (Asimov 1993: 150).[9] If Gloria were also a robot, it would not be communication in the sociological sense because it does not take place in the medium of meaning and no-one understands what is being said, thus the unity of the three selections (information + communication + understanding) would not be accomplished.

It seems likely that the social theoretical tendency to treat algorithmic "artificial intelligence" data processing more or less the same as operations of consciousness (= inflation of structural couplings) might also have something to do with the everyday attribution of "actions" or "decisions" to complex machines—analogous to the "Gloria" case. However, the pointualisation of selectivity (= attribution of actions and decisions) can occur just "rightly or wrongly" (Luhmann 2009b: 3). From the perspective chosen here, this is done wrongly because it is merely a matter of attributions to "quasi-persons". The attribution stays within the framework of "pseudo-structural" couplings. The attribution of agency to systems of artificial intelligence automation takes

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7 It could be discussed to what extent animals, or at least higher animals, are included in communication processes, e.g., in the context of interaction systems (Fuchs 1991: 21, footnote 70).

8 Trust and mistrust, for example, are also functionally equivalent (Luhmann 1973: 78).

9 The story first appeared in 1940 in *Super Science Stories* magazine.

place from the position of understanding and simulates "pseudo-structural" couplings. Machine communication contributions have to be understood sometime and somewhere and technical systems are not able to do this (at least not yet). The structural couplings "artificial intelligence automation/communication" and "consciousness/communication" are not completely alike because automation does not operate in the medium of meaning. This also means that technical systems that can take ethical guidelines into account, or even provide them in an assisting manner, remain machines that need to be understood. Even "ethical robots" are only a metaphor.

With regard to the problem of the performance role, it should, thus, be noted that with Luhmann and Esposito, there is no complete displacement of human consciousness from systemic communication processes. Of course, this is also true in the military sphere. The idea of a division of tasks between soldiers and machines, a process of working hand-in-hand (Luhmann 1966: 61; Schimank 1986) or even the fusion of body and technology—i.e., a "cyborg soldier" (Gray 2014; Spreen 2015; 2017)—seems more appropriate.

5. Human dignity and LAWS

In ethical debates, it is quite common to hold the position that fully automated artificial intelligence systems—so-called *Lethal Autonomous Weapon Systems* (LAWS)—killing humans in war violates the dignity of the victims. In a European Parliament resolution of 12 September 2018, passed by a large majority, LAWS was understood to mean weapons "lacking human control in critical functions such as target selection and engagement" (OJ C 433, 23.12.2019: 86, 4). The aim is to ensure "meaningful human control over the critical functions of weapon systems." (OJ C 433, 23.12.2019: 86, 2) However, the positions of individual member states are very different. Globally, this is even truer.[10]

The background to this debate on regulation is the fact that no automaton understands what it is doing. In principle, it cannot adopt a "human attitude" for itself because it has no consciousness. A machine that kills an enemy combatant without being involved in meaningful communication cannot reflect on this act in an understanding way. It performs a mere technical operation.

10 An overview is provided by Dahlmann & Dickow 2019: 17–23.

From Luhmann's perspective, automation is considered functionally equivalent to human action in a social organisation if the results, i.e., decisions, are equivalent. "The decision must be the same as in manual production." (Luhmann 1966: 19) The audience[11] of an organisation may not care whether the decision was made by a machine or processed step by step by employees. The main thing is that it is correct. Or, to return to the example brought at the beginning, the important thing is that the train arrives on time with working air conditioning, doors, restaurant bar and toilets.

> *The type of 'device' on which programmes are executed, the machine or the human brain, is irrelevant for the 'logic' and the correctness of the conclusion, because premise and conclusion are connected to an invariant relation.* [...] *A pensioner can be indifferent as to whether his pension is calculated by a machine or by a clerk (as long as it is calculated correctly!); indeed, even more: it has to be indifferent to him; for his claim is not to an action of a human brain, but to money, to a result, not to a procedure.* (Luhmann 1966: 46f.)

Thus, if one consults Luhmann, the use of automation within the coded programmes of social organisations is unproblematic as long as these organisations make decisions that remain within the ethical and legal framework—which includes accountability for errors. Of course, this also applies to military organisations. Accordingly, a special law for the use of automation in organisations is superfluous as long as there is a general legal framework for handling errors (Luhmann 1966: 47, 99). Automation is principally contextualised by Luhmann in terms of organisational sociology.

This perspective assumes that LAWS are integrated into a meaningful communication of the military organisational system (hand-in-hand division of tasks). This implies that accountability attributable to a human actor in a social role does not disappear (problem of the performance role as well as problem of attributability). Luhmann points this out in very clear terms. "Automation is no more an excuse [...] than human failure." (Luhmann 1966: 81) The latter also applies if machines were able to irritate communication (virtual contingencies), as concluded by Esposito. Organisations cannot do without accountability. Accountability and the "liability for errors" cannot be abolished; without them, "everyone could act as he pleases" (Luhmann 1966: 113).

For computer-based processes, one can say that they absorb uncertainty. They calculate a result from an unknown data situation. This is even truer

[11] In the meaning of clients or the public role.

for artificial intelligence systems. This means that they also bear a responsibility. "Responsibility is inherent in every contribution to the absorption of uncertainty, including that made by the machine." (Luhmann 1966: 105) However, responsibility (*Verantwortung*) is not congruent with accountability (*Verantwortlichkeit*) "in the sense of liability for errors" (Luhmann 1966: 105) because the latter is assigned to social roles in a complex process. As a rule, accountability is spread over several shoulders so that it can rarely be attributed directly to one person. Therefore, when the attribution of accountability is discussed in the context of the automation of military systems and especially weapon systems, this does not pose a fundamentally new problem; it merely appears in a new light (Esposito 2021: 131).

The discussion about the relationship between fully automated weapon systems and human dignity is consequently not a technical problem because "technical improvements cannot solve this problem." (Dahlmann, Dickow 2019: 19) It is about accountability within the framework of a social system of organisation. If accountability for the use of LAWS does not exist or if conditions are deliberately created that make it easier to disguise them, their use cannot be justified. In confusing civil war-like "new wars" with sometimes rather diffusely organised actors, "opportunities" for the irregular use of such weapon systems could quickly arise[12].

A legally binding determination that certain weapon systems violate human dignity would also mean that these systems would be incompatible with *Innere Führung* and, thus, "probably not an option for the Bundeswehr" (Dahlmann et al. 2021: 5). Before that, however, it would have to be clarified what "LAWS" exactly means. For if there is a clearly attributable accountability to social roles in the use of such weapon systems, are these strictly "autonomous" weapon systems at all?

From Luhmann's contextualising perspective, artificial intelligence automation is not primarily a question of technology ethics but a question of organisational sociology and, in this framework, at best a topic of organisational ethics. The means of the military is violence, i.e., the injury and killing of people and the destruction of things. In principle, it is hard to see why technical apparatuses, including artificial intelligence systems, should not play a role in the context of the military application of means as long as the factual, legal and ethical framework is observed. This also applies to LAWS. The assumption that "autonomous" weapon systems would *in principle* violate

[12] See the 2021 UN report on the conflict in Libya (Majumdar Roy Choudhury et al. 2021: esp. 17).

human dignity is not very convincing from this perspective (cf. Birnbacher 2016: 120). That war and violence should not be, but rather peace—that is another matter.

But LAWS are also a communication problem. The question is how the use of such weapon systems can be understood. Should their use be understood as a communication that annuls the unity of the species, i.e., dehumanises the enemy? At least in democratically constituted states, moral discourses about recognition, respect and 'the good' are of considerable importance. Therefore, one would do well not to avoid the problem of attributability in relation to the operations of LAWS. In the context of humanitarian missions, it should be considered how the local population understands the use of such weapon systems (because of cultural differences) as this may play a role in the legitimacy of such missions.

From a Luhmannian perspective, the question can be raised whether lethal artificial intelligence weapon systems require separate legal regulation at all, because the focus is on the decision-making output of the social organisational system, in this case military organisations. Do we need laws for LAWS? Are existing regulations on the use of weapons in war sufficient to judge the use of LAWS? Under which organisational and communicative preconditions would such a neutralisation be convincing?

6. Automation and *Innere Führung*

Mastery plays an important role in the internal organisational communication of the military (problem of control). It is not without reason that the military and discipline are related by choice because, in war, all kinds of friction and, in particular, hostile influences are to be expected, so planned and reliable behaviour on the part of soldiers represents a value in itself. Artificial intelligence automation should, therefore, also remain controllable from a military point of view. The Handbook of *Innere Führung* from 1957 already points out

> *that this technology – which has arisen from a cold scientific spirit – demands precisely not only the robot-soldier who can 'operate' it, but rather the controller who uses it appropriately. The human attitude in which the machine is handled ultimately determines its effect.* (Bundesministerium für Verteidigung & Führungsstab der Bundeswehr 1957: 38)

Innere Führung conceives a soldier's relationship to (weapons) technology as the relationship of agents to means that are to be subservient to their purposes

(Bundesministerium für Verteidigung & Führungsstab der Bundeswehr 1957: 39). The concept of competence used, however, means more than mere appropriate operation. Rather, it aims at an independent, creative and responsible "citizen in uniform" who expresses a "human attitude" and is capable of ethical self-reflection. Accordingly, the decisive question is "whether there are people behind the weapons who know what they are doing." (Baudissin 2006: 230, see also above) In particular, attributability and accountability are not allowed to be suspended by the use of new technical means (Dörfler-Dierken 2014; Haase et al. 2014: 136; Hellmann 2014)[13].

In order to be able to attribute accountability to themselves, soldiers must also be able to perceive themselves as agents in a cloud-based, networked combat enriched with artificial intelligence systems. From a systems theory perspective, if a soldier shoots at a target, an observer considers him an agent who makes the decision: to shoot or not to shoot. This observer can be the soldier himself, it can be another consciousness, or it can be communication processes that thematise the soldier's behaviour in some form, i.e., evaluate it according to military, political, ethical or legal considerations (Luhmann 2005a; 2009b).

One can imagine a decision-maker surrounded by screens in a command vehicle being shown the information "80 per cent probability of enemy military vehicle". This decision-maker now has the option of instructing agents involved in the networking. But the ultimate question is still: to shoot or not to shoot? How should the uncertainty—which is expressed as a percentage—be dealt with? The vehicle noticed could perhaps also be a civilian one in which refugees are moving.

Basically, it is not an argument to reject corresponding technology with reference to uncertainty in decision-making situations for all action is subject to conditions of uncertainty; there is no other way. In the everyday "normal course" of events, we

> *do not have the possibility [...] to always start again from the beginning, [for example] to always ask the communicator why he said that and not something else, what his selection horizon was and so on. We cannot keep digging into what has already passed. Time is running out, but we can say yes and no. [We] can say that we don't believe it, or ask for explanation in a limited way.* (Luhmann 2020: 292)

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13 See chapter 5.

This option to say yes or no is a form of uncertainty absorption that allows us to connect operationally, that is, to continue.

Luhmann's description by and large also applies to any soldier trapped in assistance systems. The only difference is that this soldier should not address the assistance system as an alter ego with consciousness. This is because the assistance system does not engage in communication but integrates automatically processed sensor data into an artificial intelligence-generated situation picture. He is in a situation of virtual double contingency or artificial communication (Esposito 2017) but has the option to say yes or no, thus to shoot at the indication "80% hostile" or to proceed otherwise.

If we take the framework of *Innere Führung* as a basis, then the soldier must remain a master of the apparatus, i.e., he must observe or see himself as an agent and not as an experiencer, and also be observed as such. On the other hand, a fully artificial environment, such as a submarine-like command system in a vehicle, invites an interpretation in which a human being is seen as a passive appendage of a "mega-machine". Under such an interpretation, the soldier would think of himself as a wheel in the machine, i.e., as a mere function in an artificial dispositive that aims to "replace all natural and human possibilities with its own one-dimensional, rigorously programmed system." (Mumford 1977: 683)

However, attributing the handling of technology as an experience should be avoided. From the perspective of *Innere Führung* and its underlying canon of values, at least the following problem areas arise.

Trust in technology: To what extent is artificial-sensual reproduction of an environment sufficient? The engineers' claim is to enable a situation picture that actually supports the users and does not potentiate uncertainty (technical complexity reduction). The digital battlefield should reflect a real battlefield. However, this task can only be solved pragmatically since in principle, it is impossible to construct a god-machine that sees everything and knows everything. In the context of implementation and practice-oriented optimisation, "trust in technology" (Wagner 1994) must be built. Trust reduces uncertainty, but does not liberate us of risk (Luhmann 1973).

Time frame of decisions: Probability images of reality pose the question of trust anew because they deliver uncertainty as information[14]. An artificial

[14] The user obtains "certainty about their own uncertainty" (Brosziewski 2015: 24). This uncertainty can be absorbed by further information-gathering or by decision-making, or by a combination of both.

environment imposes on the soldierly user the "problem of risky advance payments" (Luhmann 1973: 23).

One option would be to decide to postpone a decision, i.e., to decide about the decision (reflexive decision-making process, Luhmann 2009b: 24–26) in order to obtain further information (such as: send drone, periodically repeat target identification, query further observers). However, since in the case of conflict, it must be assumed that the opponent also perceives the decision-maker or at least his avatar in the field, there are narrow limits to this option ("time is running out"); but even a reflexive decision-making process takes time.

Standardisation of assisting information: A technical standardisation that implements a clear idea of what exactly is meant by such a percentage is desirable. Information should be understood in the same way by all systems. This makes it easier for soldiers to deal with such systems and reduces the likelihood of misunderstandings.

Responsibility and accountability in acting: In our scenario, the uncertainty of information opens the situation up for a decision that can and should be attributed as "responsible and accountable action". This means that soldiers-users should trust the system as well as technology. They should be sure that they can act legally and in accordance with the values for which they are fighting.

Self-efficacy: In addition, it is important that soldiers will not lose trust in their self-efficacy. Self-efficacy is what will allow them to perceive themselves as responsible. What is at stake here is "ego-strength" and communicative competence that allow soldiers to "consciously endure role ambivalences" (Habermas 1978: 114). And it is ultimately about role ambivalences in the described scenario; trust in oneself is the prerequisite for being able to make decisions and act. The competence that is meant here in particular is "media competence" in the sense of Dieter Baacke (1996; 1999) because it is about dealing with a medium that reveals itself (Esposito 1993; Halfmann 1996). This points to training and to the fact that a generation of practicable moral routines is likely to be helpful. Moral routines enable action and counteract inhibiting decision-making dilemmas as well as moral avoidance strategies in particular (Schmidt 2021: 335–336).

Learning processes in organisational ethics: In organisations, we are dealing with structures of shared responsibility. The concept of *Innere Führung* formulates a considerable demand for autonomy for all levels of hierarchy, not only in tactical terms (*Auftragstaktik*), but also in ethical and moral terms. However, structures of shared responsibility in organisations are also subject to change. In particular, the ethical challenges arising from technological innovations are addressed by the concept of *Innere Führung* from the outset. It is therefore necessary to have discourse spaces of moral-ethical reflection and processual learning (not only) in relation to new technological challenges (Schluchter et al. 2021). There is a need for institutionalised discourse opportunities focused on ethical learning, both within the organisation and with politics and civil society, because the military organisation is tied to politics (Kohl 2009), and in the context of *Innere Führung* also to civil society ("citizen in uniform")[15]. The purpose of this learning is to integrate artificial intelligence automation into the ethical and legal framework of the organisation as well as society. From the perspective of the organisation and its social environment, decisions must still be made "correctly" (= ethical neutralisation).

With reference to *Innere Führung*, the problem of an ethical neutralisation of artificial intelligence and automatic systems in the context of networked operations can be divided into at least six sub-issues that should be considered. The focus is on the question of how "human attitude" can be implemented in the context of military operations enriched with artificial intelligence automation so that the results of human-technology interaction continue to comply with the ethical and legal framework. Increasing digitalisation, networking and automation ultimately push for the increased technical and ethical competence of soldiers in order to prevent "anomic" behaviour of artificial intelligence automata, i.e., to lead them operationally (Spreen 2014: 49–50).

7. Risk management through implementation

Modern high technology is always risky, and as Luhmann explicitly emphasises, especially with computer technology. Risks exist not because systems do not function properly ("installation"), but because they do. "But where control is increased so is risk." (Luhmann 1991: 103 in reference to Hölderlin) The fact that increase in control means an increase in risks can be made plausible. For example, Franz-Xaver Kaufmann pointed out in his book "Security" that

[15] One example of this could be the FCAS process on the "responsible use of technologies" (https://www.fcas-forum.eu/en/protocols).

> *the development of technical potential [causes] an increase in the risk of antagonistic relationships, in the sense that technology increases the 'stakes', i.e., the possible amount of damage per conflict: Without fist wedges or knives, scuffles are less likely to end deadly. At the same time, the use of technical means makes the antagonistic situation more unclear, the behaviour of the opponent more 'uncertain'. The development of technology thus makes possible additional 'securities' (protection) and additional 'uncertainties' at the same time.* (Kaufmann 1970: 77)

In regard to risks, Luhmann points out that dealing with high technology is a social process. In practice, it has to be tested again and again and re-regulated in a learning process. These practices and everyday social forms, which Luhmann understands as a structural coupling between society and technology, are a source of risks (Luhmann 1991: 109, 110)[16]. However, in a highly technological society, it is in principle unavoidable to take such risks but they must be answered for. The "burden of decision" (Baraldi et al. 2021: 202) must be shouldered. Luhmann also draws attention to the fact that a "dramatisation of opposition" is not very helpful for making decisions (Luhmann 1991: 93–94). He thus also comes close to the assessment of Asimov who found the post-Romantic dramatisation of the "uncanny" automaton motif inappropriate (Asimov 1992: 327)[17].

Technological risks are inescapable because the "systems are too complex for scientific prognosis" (Luhmann 1991: 104). Even containment technologies are still technology and do not escape risk (Luhmann 1991: 104). However, this means that "risk can thus be mitigated, if not eliminated, by introducing the technology (and only in this way)" (Luhmann 1991: 100). If one wants to make artificial intelligence automation as "safe" as possible, one must introduce it, observe how it is used, and learn from it. This also applies to AI systems in the military sector. Trust in technology can be built up gradually within the framework of "the principle of small steps" (Luhmann 1973: 43). Trust then means reducing complexity by using the time dimension. It leads to more 'security'.

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[16] The counter term to technology is not nature, but society. The structural coupling of technology and society is, therefore, not precisely one within the framework of double contingency, for technology is the material—or in the case of the digital, the invisible—realisation of "non-communicative operations" (Luhmann 1991: 108).

[17] Here, let us mention E. T. A. Hoffmann's *Der Sandmann* from 1816 or Mary W. Shelley's *Frankeinstein or The Modern Prometheus* from 1818. The motif of the uncanny automaton continues to this day.

From a pragmatic point of view, it is therefore advisable to handle AI-controlled weapon systems with caution in order to be able to learn. What is generally true here—even *without* explicit reference to automation—is that mistakes do happen. It is given. This is why managing the risk of errors is of great importance for social and especially for sovereign organisations (Luhmann 1966: chapters 8 & 9). However, there is not a finish line where increasing trust in technology makes technical risks disappear. 'Security' is not the counterpart of 'risk' (but 'danger'). Security merely means managing risks, but at the same time taking them up to a certain degree (Foucault 2004: 18–20). One could also say with Asimov, "Security is like a screw without end." (Asimov 1992: 365)

8. Summary

From a social theoretical perspective, technical systems that are "operated", as defined by Esposito, are not to be rejected in principle. This also applies to weapon systems. Technical systems that are operated are not "autonomous" in the strictest sense of the word, but rather "semi-autonomous".

Of central ethical importance is the relationship between artificial intelligence automation and the control programme of a respective military organisation, with the emphasis on the latter. If the use of largely automated systems appears problematic, this is most certainly due to the programming of a respective military organisation. These levels must, therefore, be kept apart. Artificial intelligence automation must be implemented in such a way that the results/decisions in which it is involved do not run counter to the overall socially embedded programme of social organisation. That they are ethically "neutralised" means that their use remains within the general ethical framework of the organisation and society in question.

Ethical neutralisation is only possible, however, if accountability is not systematically circumvented or concealed. Automation cannot be an excuse. Against the background of the sceptical-critical perception in the public and the culturally rooted "uncanny" feelings that are activated in the context of LAWS, it is all the more true that the problem of accountability should be addressed proactively. But the assumption that artificial intelligence and automated weapon systems would *in principle* violate human dignity must be rejected.

From the perspective of *Innere Führung*, the focus is also on the question of how a "human attitude" can be implemented in human-technology interaction. To ensure this, attention should be paid to the aspects of trust in technology, time frames of decisions, standardisation of assisting information, attribution as responsible and accountable actions, building media competence including moral routines and organisational ethical learning.

Technological risks are not a principal argument against artificial intelligence automation because, firstly, they cannot be avoided ("safety is a screw without end") and, secondly, they can only be minimised if the technology is implemented into society. Such pragmatism also implies that foreseeable risks must be ethically assessed prior to introduction or discussed and weighed up during development and also after introduction with the participation of social stakeholders. The objective is the ethical neutralisation of new technologies both at the level of an organisation and its environment. It is quite likely that this neutralisation in the context of artificial intelligence automation can only be obtained as a process because technology is constantly evolving and social complexity excludes a binding moral consensus[18].

The basis for all this is an appropriate understanding of artificial intelligence automation. Science fiction author Philip K. Dick was very concerned with the question of the limits of machine automation, and so his short story *Variant Two* ends with the machines preparing for war against their own kind after they have eliminated humans (Dick 1995) for war is what they were programmed for. They lack the possibility to think about the meaning of war, to consider peace and coexistence with functional equivalents. What the science fiction author warns against is, therefore, a misconception of machine possibilities.

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[18] Here, one can think, for instance, of the different cultural moral understandings briefly mentioned above (chapter 5). Luhmann argues, in general, that in the context of the functional differentiation of world and society, a "comprehensively binding morality" cannot be expected. Such a universal morality *should not* even be striven for. First, because it proves to be a "disturbing factor" for functional differentiation. Second, because it evokes conflicts and thus cannot be 'comprehensively' binding (Luhmann 1984: 317–325).

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