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Economic Rationality as a Software Program

In Ridley Scott's first *Alien* film (1979), a spaceship is commissioned by a company to search for suitable, economically exploitable creatures or knowledge. They soon find what they are looking for, in the form of a monstrous being that turns out to be the perfect killing machine. The company gives the order to bring the creature back to Earth at any cost, where it can then be examined and possibly used, for example, as a potent weapon. The fact that the monster kills one crew member after the other does not change the decision of the Company. In order to achieve its goals, the Company uses a software program in the form of the central computer, which controls all processes on board. This software program, called "Mother," has an absolute rule over the ship. If one wants to communicate with Mother, one has to enter a special computer room. In this room, the crew members may type in their questions. Shortly after, Mother's answers appear in diabolically green letters on the black computer screen. When Ripley, the protagonist of the film, asks Mother for help in killing the monster, Mother makes it clear that it will not do so, as the computer was advised to bring the monster home without regard for (human) losses: "Crew expendable" she reads on the computer screen. After all, economic maximization remains the central goal.

Software systems are ideally suited to apply the economic optimization calculus and put it into practice. This does not automatically have to mean that in the future spaceships will bring dangerous monsters to Earth. In the best-case scenario, software systems will be used in companies to assist employees with tedious processing tasks. This process has already begun and is expected to intensify over the next few years. Sometimes, however, employees will be replaced entirely by software-controlled optimization programs. An Oxford

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study by C. Frey and M. Osborne states that 47% of all jobs in the USA could be replaced by software programs in the future.[1]

As a customer, you can already experience digital replacement today. To describe a real case: while agreeing on a contract with an employer of an insurance company, the employer unfortunately misunderstood the agreement and entered "liability insurance plus partial coverage" instead of "pure liability insurance" into the computer system. These sorts of things of course can happen. In analogous times, the error could have been easily solved by another phone call. Instead, a cascade of software-driven activities came into action, lasting several weeks, without the possibility of stopping the process. To make a long story short: The "contract" came into effect without the policyholder having agreed to it, the debits from the account couldn't be stopped, the software-controlled correspondence was continued for weeks, uninfluenced by the fact that the policyholder's will was not complied with and he did not sign this contract. This momentum could only be stopped by the policyholder withdrawing the direct debit authorization and thus blocking the debits, which lead to hectic activities on part of the company's software, first to software-controlled notices, then to letters threatening with legal measures. Only when finally a phone call was put through to a real person, who then intervened, the process could be stopped.

The interesting thing about this process is that there was not a hint of a conflict of interest or even dissent in the verbal communications. It was clear to all the people involved that this was merely a one-time mistake. It cannot be ruled out that it was the digital incompetence of an employee in the company that triggered the problem, but for us something else is interesting: the simulation of personal interests in the form of contract conclusions, correspondence, notices, etc., all of which are carried out without a human decision-maker and yet give the appearance that a human decision-maker has initiated and been responsible for these actions in each case. However, as the company subsequently admitted, there was no such person.

A digitalization of economic practice, which would ultimately make all human decision-makers disappear, would be a path to an inhumane economy. The individual human agents would then be at the mercy of an anonymous network of software-controlled activities for which there would be no human responsibility at all. In a sense, the optimization machinery would run without a human counterpart.

Many companies, first and foremost the tech giants Amazon, Google, Facebook, etc., have gone in the opposite direction. A whole new generation

[1] Frey and Osborne (2013).

has grown up by being used to the fact that there is no longer a human counterpart in the companies or that it is at least difficult to declare one's interests to a responsible person. In the best case, someone who has a technical problem asks others on the World Wide Web who also use this product and have already overcome similar problems. In the worst case, one receives devious information that has nothing to do with the matter and leads to wrong activities. The professionalization of software-driven optimization strategies goes hand in hand with the amateurization of customer support. Vendors are increasingly succeeding in delegating responsibility for their products to their customers, who are then allowed to argue among themselves about what would be the most appropriate measure to solve one problem or another. Those who try it by telephone—mostly from the older generation—may be received in a friendly manner but are hardly ever served. The corporations have built a protective wall of organized irresponsibility around themselves; the individual customer is confronted with an anonymous system that refuses to provide information. In comparison to that, Kafka's *Castle* seems a comparatively humane place.

If this development is to be stopped and reversed, then only with the help of new legislations. These corporations are too big and their market position too dominant to hope that competition will force changes in behavior. Product responsibility must be redefined in the process of digitalization in order to block the evasion strategies of the legal and marketing departments.

Private companies need to make it clear if it is a real person or a software system one "talks" to. Furthermore, as a citizen we should be granted the right to speak to a real person. Indeed, in the digital age the right to a human communication needs to become a basic human right.

One explanation for the modest productivity progress in times of digitalization is that the products are of only modest overall economic relevance: dating apps, social media, etc. The greatest economically visible successes of digitalization are evident in the numerous start-up success stories, but also in the now pronounced global oligopoly structure of the Internet giants. In all likelihood, however, the next step of digitalization will lead out of the niches of private leisure, the gaming industry, and the communicative platforms and embrace the whole of the manufacturing industry and the distribution and production systems. It is not out of the question that it will be possible to return to the productivity successes of the early days of digitalization when Internet browsers were first used on a massive scale and the productivity rate increased by 1.03% per year between 1994 and 2004. But shortly after the turn of the millennium, productivity growth fell to historically low

levels—even in countries where digitization has been particularly rapid, such as the USA or Japan—and this has not changed to date.

It may very well be that it will be only the expansion and consequent interconnection of digitization processes in manufacturing, distribution systems, and the service industry which will give us a productivity boost. If this productivity boost takes place in a resource-conserving and sustainable manner, that would of course be preferable. However, users and customers must not pay the price in form of anonymization and loss of control. Digital humanism insists that digitalization be used for the benefit of people and that individuals not be reduced to mere cogs in a standardized and anonymized software-controlled optimization machine.

The digitalization strategies of traditional service companies in the financial industry are an ultimate test for this. Since the last major global economic crisis, the financial sector has been under massive pressure to change. There is no way around a redimensioning of the financial industry, especially in its centers in the USA and the UK.

It is obvious to look for the answer to this challenge in comprehensive digitalization. There is nothing wrong with this if it is used to clearly assign responsibility within companies, to control and eliminate economic inefficiencies, and to simplify communication with the customers. This includes a high degree of transparency. However, mails or letters written by software systems must be marked as such, as communication is based on trust.

Internally, digitalization should be combined with a dismantling of small-scale incentive programs. The realization is slowly spreading that the small-scale, optimization-oriented control of employee behavior through incentive systems is an overall failure. It destroys intrinsic motivation and damages trust and the willingness to cooperate. It degrades the individual employee to a mere instrument in the hands of optimization strategists, who now believe, with the digital possibilities, that they have a comprehensive control mechanism at their disposal. Successful economic practice must break away from these software-driven optimization models. As paradoxical as it may sound, economic success can only be achieved in the long term if all participants, customers, and employees alike are taken seriously as agents and are intrinsically motivated to contribute to success.

At this point, an excursion to economic theory is necessary. The term "Pareto efficiency," named after the Italian scientist Vilfredo Pareto, can be explained as follows: a distribution (of goods, income, etc.) is Pareto efficient if no person could be made better off without making at least one person worse off. In other words: as long as it is possible to make at least one person better off without making another person worse off, the distribution is not

Pareto-efficient. The demand for Pareto efficiency means that people should be made better off as long as it is not at the expense of others. This is a reasonable demand, which, however, has the consequence that—given the case that no no else is disadvantaged—the improvement of those who are already well off is also advocated by this. The demand for Pareto-efficient distributions presupposes freedom from envy. Since envy is irrational, this feeling should not prevent one from accepting the principle of Pareto efficiency.

There is a relationship between economic markets and Pareto efficiency: Ideal markets—i.e., markets characterized by transparency in terms of the costs and benefits of the offers, competition between suppliers, and low transfer costs—lead to Pareto-efficient distributions. As it is highly underdetermined, the Pareto efficiency criterion has a serious drawback. It gives no information about which distribution of Pareto-efficient options one should choose. For example, if there is a cake of a given size to distribute among several individuals, and each of those individuals (e.g., children at a birthday party) is so hungry that they would prefer to eat the whole cake by themselves, then while each of the following distributions of that cake is Pareto efficient (because no one can be made better off without making another worse off), some are more equitable and others are unacceptably inequitable: (1) one child gets the whole pie, (2) one child gets half the pie, the other half is divided equally among the remaining children, (3) all children get an equal piece, etc.

In the zero-sum game, every distribution is Pareto efficient: if ethical evaluation is limited to Pareto efficiency, then criteria of justice or fairness cannot be taken into account. However, there is much to suggest that a reasonable theory of justice should be compatible with the criterion of Pareto efficiency, that is, the criterion of justice should be formulated in such a way that just distributions are also Pareto efficient, but quite obviously many Pareto-efficient distributions are not just, as the cake example made clear.

Yes, paradoxically, there is also a fundamental conflict between freedom and optimization, as the Harvard economist Amartya Sen proved with his Liberal Paradox. There is no possibility of taking individual preferences into account through collective decisions in such a way that both individual rights of freedom and Pareto efficiency are secured. There are always constellations of interests in which one has to decide: in favor of optimization rights and against liberty rights or vice versa. As a rule, priority should be given to the rights of freedom—optimization calculations are not compatible with this.

Economic rationality in the sense of optimizing agents who make use of digital technologies must remain within the limits required for a humane

order. In other words, optimization calculations make sense if they remain subject to human purpose and culturally embedded.

The fear of an economic rationality that has become inhuman is a recurring motif in science fiction films. This is also the case in the film *Blade Runner 2049* (Denis Villeneuve. USA, 2017), the sequel to Ridley Scott's film *Blade Runner*. The villain of this film is not a monster, but the businessman whose company manufactures obedient robots that are used to colonize new worlds. He may appear at first to be a hip und smart businessman, but at a second glance it becomes clear to us that his sole concern is his economic success. He not only exploits his robots—the film has constructed as being sentient beings—shamelessly but is also ready to kill them without hesitation when they are no longer of use to him. Just as its predecessor *Blade Runner* by Ridley Scott, *Blade Runner 2049* can be read as criticizing a worldview in which economic optimization is placed above humanist values such as justice and solidarity.