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Article

Commercialization: A hatch in the sociological diagnosis of our time

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Abstract: Max Weber feared a social future dominated by rational specialists "without spirit". He considered this development a possible outcome of the interplay between all-embracing commercialization (marketization, monetization) with the rationalization (bureaucratization) of structures and processes in industrialized societies. Another observation of Weber concerned the ongoing replacement of medieval religious values with secularized-rationalist and profit-oriented ones. The predominance of such values usually fosters work productivity but also raises profound questions about the changing specifics of money. They have become central to the value systems at local, regional, and global levels. Weber was pessimistic concerning the fate of commercialization. Edward A. Ross substantially contributed to the study of commercialization as part and parcel of his efforts to put a sociological diagnosis on American society after WWI. He selected and analysed a dozen constructive and destructive cases of commercialization. Talcott Parsons studied the phenomenon in detail and called it "instrumental activism". George Ritzer's study on McDonaldization as a rationalization process is an effort to put a sociological diagnosis on global society. There are open questions concerning the capacity of contemporary societies and individuals to manage innovations for coping with commercialization. The empirical reference for the discussion is SpaceX, led by Elon Musk.

Keywords: commercialization; instrumental activism; technological innovation; organizational innovation; SpaceX

1. Introduction

Commercialization is the increasing subjection of any calling or function to the profit motive [1]. The public mind cannot be united in its judgment about the complicated phenomenon that is Elon Musk. His achievements—as an entrepreneur, investor, designer, engineer, producer of electric cars, and spacecraft—are respected. He is admired as the richest man in the world. Millions of young people idolize Musk as a self-made man. Given his unusual drive for success and the variety of his success stories, it would be reasonable to interrogate the broader relevance of his deeds. The crucial questions in this large and complex context read: Is Musk actually the person who best represents the spirit of this time? What are the causes of his intense motivation for initiating and implementing innovations? And, last but not least, why are the voices criticizing his ideas, decisions, and practical activities so numerous and forceful?

The answers should take into account the scientific and societal relevance of Elon Musk's ideas and practices. No doubt, a strong element of his motivation is a desire for better quality of life among all people, societies, and human civilization. This is a motive that pops up throughout the latest of Elon Musk's biography [2]. Another strong motivation could be seeking out paths towards personal and societal development and realization. Last but not least, a very important clue for

understanding his decisions and actions can be found in the analysis of his financial status and dynamics. According to Current Affairs, Musk owned assets worth $222 billion in December 2023 [3]. This vast amount of wealth in various forms evidences the first position occupied by Musk in the ranking of rich people worldwide.

It is exactly this variety of striking achievements that provokes deep economic, political, and cultural suspicion about the originality or true value of Musk's ideas and practices. Some are due to the destructive effects on many creative and sensitive personalities. Some criticisms are a normal element of the discourse relating to tensions and contradictions in all areas of social life [4]. Lessons from history teach us that every innovation provokes such accompanying reactions. It is the task of innovators to proactively initiate or support the overcoming resistance from conservative traditional forces. The situation is not so simple, however. There is critical pressure for realistic planning in R&D and avoiding displays of false optimism in promises for great achievements in space research [5]. Deep respect is needed for the diligent efforts at upgrading the rules for economic exchange to the law, even in cases of very important innovations [6].

Taking a generalist stance, one may draw two preliminary conclusions from the discussion above. Both conclusions deal with the same subject matter but come from different points of view. The first fundamental issue concerns the core value orientation of actors' decisions and actions. The second refers to the appearance, functioning, and change of social structures. According to the sociological tradition founded by Max Weber, both processes are primarily guided by rational calculations in industrialized societies. More precisely, the overriding strategic orientation is dominated by money. Following ideas of Weber, Talcott Parsons studied the phenomenon and called it instrumental activism. It is a pattern of thinking and acting that leads individuals to dedicate themselves to activities that rationally seek "to maximize human control over the conditional elements of the life situation" [7]. The spread of instrumental activism is a process with deep roots in social evolution but most typical for the capitalist organization of economies and societies. It has two key parameters. The first is commercialization, defined in the sociological tradition as "the organization of something in a way intended to make a profit" [8]. The second is consumerism in the sense that consumption is perceived as desirable even far beyond the necessities. Starting from Western Europe, the dominance of capitalist value-normative and practical arrangements dispersed in every direction across the globe. Thus, it became a global trend shaping the orientation, decision, action, and evaluation of the actions of individual and collective actors [9] in contemporary societies. Here, the research interest is focused on the component "commercialization" of the "spread of instrumental activism" global trend. Under the present-day conditions of global markets characterized by fierce competition, the commercialization issues are of the utmost relevance for individuals and societies.

2. (Dis)Continuity in the study of commercialization

The historical background of conceptual work on commercialization is the maturation of modern industrial societies. Comparative analyses of scattered ideas could be of substantial help in this regard.

2.1. Max Weber: Threatening prospects of commercialization

Max Weber [10] noticed an important peculiarity of the industrialization process in Western Europe. The intellectual and organizational innovation of Protestantism affected technological development and the relationships between industrialization, economic development, politics, and religion in the region. Protestant ideology and activities have changed the value preferences in favour of the well-organized and efficient work. The rising efficiency of work was most visible in the continent's fast-growing industrial centres. The conclusion was clear: actors' participation in industrial expansion brings affluence. The strict following of religious values brings mental comfort. Therefore, per Weber, inner-worldly ideas about successful work gradually replaced traditional out-worldly religious values and norms. The emphasis on diligence, discipline, frugality, and rational calculation in ascetic Protestantism contributed to the profound enhancement of efficiency in the organization of work and, consequently, of all action fields. Functional equivalents of Protestantism can be identified in contemporary societies too [11].

The explanation for these complex processes is like the resolution of a complicated practical puzzle. Facing the challenge, Max Weber was strategically justified in his focus on the determination of changing organizations. Observations and conceptual analysis led him to the conclusion that entrepreneurs belonging to the Protestant religious community were gradually internalizing a new value-normative system that gave priority to rationally organized hard work and savings for investment. Thus, the most influential individuals and collective actors were these entrepreneurs as bearers of the spirit and practice of rational preparation and materialization of scientific, technological, organizational, etc., innovations. The continuous search for innovations is necessary in building and maintaining a full-fledged capitalist society. Weber explains: "… capitalism is identical with the pursuit of profit, and forever renewed profit, by means of continuous, rational, capitalistic enterprise. For it must be so: in a wholly capitalistic order of society, an individual capitalistic enterprise which did not take advantage of its opportunities for profitmaking would be doomed to extinction" [10]. The numerous parameters of capitalism (capitalist society), starting with the rational division of labor and reaching the culture of modern book-keeping comprise an association Weber called commercialization [10]. These capitalist value-normative arrangements spread to all directions worldwide. Max Weber praised the constructive effects of the rationalization of social relations and processes initiated by the ascetic Calvinist Protestantism. The major gains were the increased transparency in decision-making and the implementation of decisions, as well as the rise of productivity in all activities. At the same time, he was afraid of potentially pathologic effects from the spread of ascetic Protestantism. The newly developed historical situation might become dominated by "Specialists without spirit, sensualists without heart; this nullity imagines that it has attained a level of civilization never before achieved" [10].

2.2. Edward Alsworth Ross: Commercialization today and tomorrow

Weber's type of argumentation was unusual for the founding fathers of American sociology. However, most of them were quite creative in resolving methodological

and theoretical issues. For instance, the author of the first comprehensive book for academic instruction in the USA, Foundations of Sociology (1905), Edward Alsworth Ross, published a widely discussed and cited article with the provoking title "Commercialization—Increasing or decreasing?" [1]. At that time, the question might have been entirely understandable. Today the answer is quite clear. Commercialization (monetization, marketization) has conquered all action spheres, from the economy and politics through education, mass media, and health care to sports, sciences, and the arts worldwide. This could not have come about without a radical change to the status and functions of money. Georg Simmel, Emil Durkheim, and others provided the evidence that individuals over the course of millennia have been integrated in societies to a large extent by uniting visions about sacred ultimate values. The shared idea of the sacred helped define identities, situations, and solidarity. Max Weber elaborated on the topic by analysing a historical shift from the dominance of out-worldly religious values towards inner-worldly spirituality. Traditional religious values were replaced by the values of a new secular religion: striving for acquisition and accumulation of wealth and making money to make money [12]. The multidimensional task has become the guiding factor in the orientations, decisions, and actions of individuals dealing with specific cases of commercialization in different action fields. Most European sociologists have argued that the process was full of tensions and conflicts, as Weber did.

The same problem appears in Ross's studies on commercialization, but it was seen and dealt with from the opposite point of view. His basic assumption was that American society was very well integrated: "Using the ancient test relations as a dial face, the onward movement in humanity, sympathy, and charity is most cheering" [1]. Therefore, there were no reasons for serious domestic tensions or conflicts. As to international challenges, they were even less relevant for commercialization in the United States in the 1920s. This position sharply contrasts with Max Weber's critical assessments of both the achievements and failures of commercialization in Western Europe and North America during the first two decades of the 20th century. It was a period including the years of the "Great War". Without its critical assessment, one could hardly understand the long-term accumulation of potential conflicts in the social fabric of US society. These conflicts caused the national drama of the Great Depression.

When being critical about fundamental issues in Ross's understanding and study of the phenomenon of commercialization, one should recognise and respect his scientific achievements in this area. A major reason for the potential applicability of his approach to the topic of commercialization is his ability to demonstrate the large variety of dimensions within the social phenomenon under scrutiny. Briefly presented, according to Ross, there are a number of different manifestations. They range from interactions between producers and consumers to balance their diverging interests till the exploitation of younger sculptors by the well-established ones, as well as from the commercialization of the newspaper business till the commercialization of entertainment and recreation. Ross completes the description of these and more cases of identified commercialization with efforts to briefly explain the causes and consequences of each specific case [1].

As seen from a contemporary point of view, Ross's efforts to identify and explain

a series of observable phenomena representing commercialization in his local environment were pioneering achievements. He identified such phenomena quite precisely:

- deepening social distance between producer and consumer along with declining responsibility on both sides;
- growing differentiation between principals and subordinates in major concerns;
- increasing prominence of capital in the practice of art or professions tending to subordinate artistic or professional conscience to profit;
- newspaper publishing where the capital factor constantly outweighs the service factor;
- lawyers in corporations having to judge according to the corporation interest;
- sculptors of great repute taking credit for the work of young, unknown men and reaping for themselves the proceeds and the honor;
- commercialization of entertainment and recreational activities.

Ross has developed interesting ideas about the constructive and destructive effects of commercialization practices. He assumes that among the representatives of some professional groups as "clergyman, teacher, judge, official, artist, and journalist, it is expected that lust of gain will be quite subordinated to the obligation to render a vital service" [1]. This implies that the representatives of these professional groups would be less involved in practices of commercialization. This is not a widely shared idea in contemporary societies. To the contrary, most people in advanced societies are convinced that exactly judges, officials, and journalists are particularly prone to sell information or influence. Moreover, it is nearly common knowledge that politicians and business people are champions in abusing their social positions and the rules of objectivity and ethical responsibility in favour of the gains from commercialization.

There is a theoretical and methodological difference between Ross's ideas and the modern efforts to develop and apply conceptual frameworks for systematic description and explanation of the variety of manifestations of commercialization. Ross dealt with each case of commercialization separately. Currently the trend is to study the particular phenomena of commercialization in comparison and by using overarching conceptual frameworks. Still another important difference concerns the concentration of Ross's analysis and argumentation on the microsocial level of commercialization. A contemporary research project cannot neglect the macrosocial dimension of commercialization. Currently, this means that special attention should be paid to global economic, political, and cultural processes related to commercialization. The third difference concerns the expectation of Ross that the issues concerning the negative social and moral effects of commercialization. Its current multiple causes bring about a large variety of effects.

2.3. George Ritzer: McDonaldization as successful commercialization

Thus, after having analysed the sociological classic studies on commercialization, the most natural question appears: What is the continuity of this debate in contemporary sociology? Or, is there any continuity at all? The questions are of rhetorical nature. In the preface to the tenth edition of his bestseller "The McDonaldization of the World" George Ritzer repeats his intention to continue Max

Weber's efforts to prepare a diagnosis of his contemporary times [13]. His intention turned out to be an impressive reality: "McDonaldization is the process by which the principles of the fast-food restaurant are coming to dominate more and more sectors in American society as well as of the rest of the world" [13].

There are four principles under scrutiny [13]:

- efficiency in the sense of "finding and using the optimum method for getting from one point to another";
- calculability in the sense of "an emphasis on quantity, often to the detriment of quality";
- predictability in the sense of offering foods which are "highly predictable foods that vary little from one time and place to another";
- control by means of technology, in the sense that "technologies currently dominate employees, but increasingly they will be replacing them".

These principles and the interpretation of their content and functioning by George Ritzer are a typical example of efficient transmition of social scientific knowledge to wider audiences. Ritzer's book is very well placed in the continuity and change of social reality and sociological knowledge. This mostly concerns the rationalization process identified by Max Weber as an all-embracing process in modern societies. It was a brilliant idea for George Ritzer to continue Weber's studies by checking their validity under present-day conditions. He has selected the impressive rise of the McDonalds chain of fast-food restaurants for the purpose of managing to combine ideas that are stressing the continuity and discontinuity of his vision of this fundamental social innovation. McDonaldization is a proper candidate, as it relates to key ideas by Max Weber on social rationalization. Selecting McDonald's Corporation for dealing with present-day social rationalization is compatible with the analysis of rather specific cases of social interaction, which brings about better quality of commercialization and social innovation. However, in most cases, the discussions about social innovations have concepts involved in local interactions. They concern ideas about the management of both rationality and irrationality in the rationalization processes.

The problem situation includes the capacities of individuals, groups, and organizations to balance rational and irrational practices. Official standpoints notwithstanding, average people usually know if the intended or implemented changes are expected to be favourable for them or not. The Internet has the power to spread knowledge but also institutional measures against destructive Internet. It happens that both tendencies reach the very core of commercialization. In everyday life, this activity fosters politeness and skills to resolve issues by means of negotiations and mutual understanding. However, another side of the business also fosters hypocrisy, false friendliness, and skilled strategies and tactics for maximum profit accumulation according to the circumstances.

George Ritzer's analyses show nearly on every page that profit was and remains the major motivation for radical reforms in the organization of fast-food restaurants. This is a case dealing with mature innovation wherein profit is the guiding idea behind the preparation for improving the results of reforms already carried as well as potential future reforms. The organizational openness and proven financial stability of the potential study case were and are the issues in the support of a new generation. There

are factors for the readiness of financial support to projects under the conditions of financial stabilization. As seen from another point of view, one may respect these achievements while holding profound doubts concerning aims which focus on financial success but neglect environmental protection or health care. Some traditional habits have been tested in the context of the need for healthy food. The chain restaurants may offer a menu that is incompatible with the home-made local food. Still others have tried to homogenize by excluding cultural diversity after making careful cost-benefit calculations. McDonald's fast-food restaurants have certainly been successful in uniting production and consumption as well as work and leisure.

With all due respect to these achievements owing to McDonald's business strategy and practice, one should respect the achievements of other individuals, groups, and organizations as well. Some of them have offered even more impressive solutions in larger contexts. The works of Taylor [14] should be remembered first and foremost. The problem is not in a lack of citations. Taylor and his methods of measurement and organization of work were mentioned in Ritzer's book on "McDonaldization of Society" several times. Taylor's impact on the introduction, maintenance, and permanent improvement of assembly lines in Ford's factories was fully recognized.

But the bold emphasis on the pioneering achievements of the fast-food chain is intellectually unfair and practically misleading. The structure and functioning of the McDonalds restaurants literally copied the structure and functioning of the assembly lines in industry as invented and practically realized in the Ford T Model production by the tandem of Henry Ford and Fredrick W. Taylor. Therefore, to define global changes in major social structures and behavioral patterns as due to the organizational changes in McDonald's fast-food restaurants provokes a rather different standpoint. It takes for granted that these profound changes in structure and behavior came about primarily due to radical innovations in the organization of industrial production. The real breakthrough was the invention and massive expansion of assembly lines in car production and, later, in the electronics industry, with the production of electronic components, electronic devices, etc. In all these structural changes, commercialization of products was the central achievement well in advance of the commercial kitchens [13].

Ritzer's detailed discussion of the rise, advantages, and irrationalities of the rationalization process [13] of the commercial (or commercialized) kitchen is a good starting point for a well-focused discussion. Its conceptual core is the building of a generalized and well differentiated concept of commercialization by basically following the definition cited at the beginning. The best way to dive into the details of commercialization as a concept is to link it to specific structures and processes. There is no better candidate for that purpose than social innovations. Bureaucratization (Max Weber's preference) is a perfect case for testing the analysis and argumentation behind the intricacies of commercialization. The research interest of Ross is also focused on commercialization as a major social process. Referring back to Weber's example of social change, George Ritzer takes the development of effective commercialization in the form of innovative fast-food restaurants as the core of the discussion. In all these rather specific cases, the central issue is money in a wide variety of manifestations. Money and the market calculations have become the most influential organizational

factors for stability and the profound social changes dominated by instrumental activism, or, in this version, of commercialization.

Thus, the value-normative and behavioural shift from ultimate religious value orientations to instrumental market-based orientations caused tremendous advances in the human command over the natural and social world. In present-day global society, instrumental activism predominates with a view to the specifics of this historical type of society. In this controversial context, the concept of commercialization might be particularly useful in efforts to improve the capacities of individual and collective actors to manage technological and organizational innovations. The variety of opinions reflects the relevance of issues, which are being presented as constructions of relationships. One of the topics for discussion concerns the content of the stages of innovation and the and the key notion of processes. Therefore, the decisions about the aims, means, content, and stages of the innovations will be further identified, described, and explained in the paradigm of social interaction [15]. The scheme will guide the analysis of the gigantic innovation that is being implemented by Elon Musk's company SpaceX program for flight to Mars (see **Figure 1**):

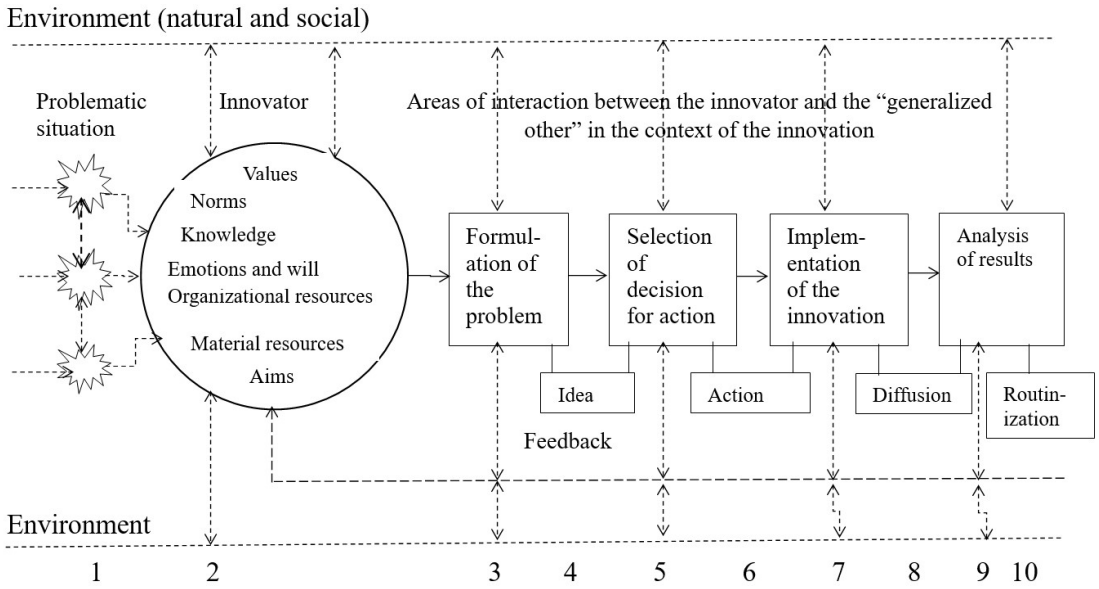

Figure 1. Key indicators of commercialization in the innovation process.
Source: Author's design.

Legend:

1: A potential innovator registers a problematic situation,

2: The potential innovator identifies and compares research problems,

3: The innovator identifies the most promising research problem (from his/her point of view),

4: The innovator develops ideas about the problem's resolution,

5: Preparation for problem solving through a cognitive and/or practical innovation,

6: Action for problem solving,

7: Problem resolved,

8: Diffusion of the cognitive and/or practical results of the commercialized innovation,

9: Analysis of results and recommendations,

10: Routinization.

The numerous innovations suggested and implemented by Elon Musk will be further analyzed by using a soft version of constructivist approaches to dynamic phenomena.

3. Elon Musk: Ambitions, achievements, and failures in SpaceX commercialization

In contrast to the time of Max Weber, today the vast majority of European and North American entrepreneurs typically see issues of religiosity as private, without any direct impact on their professional activities as a rule. This is the background of the secularized rules of professional conduct followed by Elon Musk [2]:

1) Question every cost,
2) Have a maniacal sense of urgency,
3) Learn by failing,
4) Improvise.

Weber interpreted the economic achievements and failures in industrialized societies prior to the First World War as monetary processes in the first place. To make the point clear enough, a brief analysis of the relationships between entrepreneurs, their employees, and markets will be made in secular terms. The value-normative situation in Musk's companies can be best exemplified by Musk's colourful language [2]: "Then he (Elon Musk) threw a metal ball at one of the Armor Glass windows, to show it wouldn't break. To his surprise, it cracked. 'Oh my fucking God!' Musk said. 'Well, maybe that was a little too hard.'"

3.1. A potential innovator registers a problematic situation

At the beginning of the 21st century, NASA and the Russian space agency were in deep crises. The tremendous size and weight of the space rockets then in use posed fundamental problems. Their fuel was heavy, expensive, and thus inefficient. There was an urgent need to re-use parts of launch vehicles, primarily the rocket engines. In the USA, a special problem was caused by the necessity to introduce new models of efficient vehicles in order to replace Space Shuttle Columbia. The Russians could serve American programmes with somewhat outdated rockets but were out of funding for new projects. So, the very talk about manned flights to Mars seemed to be meaningless. At the same time, new actors (mostly China) more and more frequently made clear their aspirations for taking part in the colonization of outer space [16]. New strategies, new technologies, and new organizational forms were needed for coping with the multidimensional critical situation. In their search for solutions, NASA's experts started to consider the potentials of public-private partnerships in efforts to intensify the study of outer space and to exploit its resources.

At the same time, the talented young workaholic Elon Musk was searching for a promising field of professional realization. The public debate about the study and exploitation of outer space did correspond to his ambitions and talents as researcher, designer, engineer, and entrepreneur. The focused efforts to colonize Mars as a symbolic part of outer space were intriguing. As a potential innovator, Elon Musk was

aware of the high intensity of complex problems facing a return trip from Mars. The possibility of failure in his efforts to resolve the immense task was overwhelming, since the young man didn't have any specialized knowledge or relevant skills to apply. The risk of being involved in an accident was extremely high. However, due to his participation in the first version of PayPal's software, Musk received his first million dollars. They could be invested in research and development. Having no secured institutional support or funding, Elon Musk relied on information about launch vehicles from the public library in Palo Alto.

3.2. The potential innovator identifies and compares research problems

The strategic task was overcoming the delay in the colonization of Mars. This delay had many reasons, related to several determinants of social interaction. The intended long flights and particularly the required repairs in outer space provoked a series of discussions about the environmental effects on the crew, travelling specialists, and tourists [17]. The relevance of economic factors could be best exemplified by the experience of Russia. Having been one of the two leading actors in space launches decades earlier, during the 1990s the country was practically out of the business because of financial reasons. As to the political determination of space flight, it was indeed present in all decisions and in all stages of the implementation of these decisions. The same held true for the cultural impacts of knowledge, values, and norms. The ultimate goal was humanistic—to secure a safe habitat for humankind in case of a catastrophe on Earth. The instrumental goal was and remained building less expensive rockets by reducing their weight and by producing reusable launch vehicles. Lighter rockets could support the budget of the SpaceX project by allowing larger cargo for longer space flights. The intention for self-fulfillment was an intrinsic part of the motivation [2].

3.3. The innovator identifies the most promising research problem (from his/her point of view)

Collecting information about the problem areas announced by NASA for research and management, Musk noticed that the problem area of "flights to Mars" was hardly being covered by any projects. On the occasion of the establishment of his SpaceX company, intended to prepare flights to Mars, Musk formulated the point in programmatic style: "I wanted to hold out hope that humans could be a space-faring civilization and be out there among the stars" [2]. A strong will and motivation for achievement lurked behind this statement. The choice of building and using spacecraft was well founded, considering Musk's personal qualities. He had been influenced by the predominant interest of young people from his generation towards software. However, like some others, he had experience and a genuine interest in working on hardware too. This balance of personal interests was a very important asset in the building of launch rockets.

3.4. The innovator develops ideas about the problem's resolution

The first strategy suggested by Musk for the development of the rocket project was focused on building a single spacecraft for the flight to Mars. A reduction in

weight compared to the then-used launch rockets would be the major problem to resolve. The rockets themselves had to have a lower weight so that the available additional space could be used for carrying heavier cargo. Arguments against this strategy were manifold—starting from accusations of economic inefficiency up to the immense technological challenges. Musk and his followers decided on a different resolution to the problem with a two-step programme. The first step consisted of the design, production, and use of a series of orbital launch vehicles that grew increasingly larger in size and included reusable parts.

Implementing this strategy, SpaceX became the champion among fierce competition for increasing the efficiency of aggregates and modules of spacecraft. In the conceptual framework of innovations, Elon Musk's time for dramatic performance was over. Knowingly or not, he followed the principles of Protestant rationalism, "focused on one key metric: what it cost to get each pound of payload into orbit. That goal of maximizing boost for the buck would guide his obsession with increasing the thrust of the engines, reducing the mass of the rockets, and making them reusable" [2]. His programme's similarity with the principles and practices of Western European Protestantism was made easier because of his particular socialization and personal preferences: "… most techies who came of age in the 1990s gravitated to software more than hardware. They never knew the sweet smell of a soldering iron, but they could code in ways that made circuits sing. Musk was different. He liked hardware as well as software. He could code, but he also had a feel for physical components, such as battery cells and capacitors, valves and combustion chambers, fuel pumps and fan belts" [2].

3.5. Preparation for problem solving through a cognitive and/or practical innovation

The organizational preparation of the project for return flights to Mars started with the establishment of the company SpaceX. It was basically funded by Elon Musk's private capital. Two trips to Russia were intended to identify prototypes and organize a creative transfer of knowledge and skills. The most fundamental cognitive issue concerned the project's strategy for organizational division into two parts. The decision was chiefly made according to financial calculations. The strategic task of return trips to Mars could be understood as an effort to build one big spacecraft to use for the trip. The second strategy was preferred by Musk, who argued in favour of the gradual construction of larger and larger launch vehicles. This was for several reasons. Thus managed, the project would become economically profitable by using the produced rockets for supplying international stations, space tourism, putting satellites into orbit, and helping with the design and construction of the large spacecraft intended to fly to Mars and back. The first elements of the company's infrastructure, logistics, and training of personnel were designed, and construction had begun or was on the agenda. In this way, the Falcon 9 rocket was used to bring supplies to the International Space Station. The Dragon version of the same rocket was used for transporting the station's team. The Starlink network is the best organized system of some 4000 satellites, which provides the most comprehensive picture of events taking place on the surface of the Earth. Starship testing is regarded as the final stage in preparation

for a manned flight to Mars. The construction and use of this spacecraft would complete the SpaceX programme.

3.6. Actions for problem solving

Elon Musk is a talented organizer. He managed to attract dedicated young people for participation in all stages of work on the SpaceX project. The young people were highly creative and responsible people to listen to his suggestions. Though some may have seemed irrational, they turned out to be quite innovative. Most of these employees did not leave the company in a crisis situation. They proved themselves serious enough. The first three Falcon models failed. Between 2008 and 2009, SpaceX was on the brink of bankruptcy, and the workload was extremely high. Only Musk's stamina and inventiveness saved jobs. Finally, after the successful Falcon 9 test in 2009, recognition came in all its desirable forms. The rockets, having passed testing, were offered services covering the demand of telecommunication satellites or the supply of food to the International Space Station.

All activities for resolving the problem were carried out under strict financial control: "Musk was laser-focused on keeping down costs. It was not simply because his own money was on the line, though that was a factor. It was also because cost-effectiveness was critical for his ultimate goal, which was to colonize Mars. He challenged the prices that aerospace suppliers charged for components, which were usually ten times higher than similar parts in the auto industry" [2]. Musk had personal control over product quality: "From the very beginning of his career, Musk was a demanding manager, contemptuous of the concept of work-life balance. At Zip2 and every subsequent company, he drove himself relentlessly all day and through much of the night, without vacations, and he expected others to do the same… With his weak empathy gene, he didn't realize or care that correcting someone publicly—or, as he put it, 'fixing their fucking stupid code'—was not a path to endearment." [2].

3.7. Problem resolved

Elon Musk had to cope with a fundamental problem that concerned the strategy of SpaceX: his firm decision about the advantages of dividing the task to prepare for the return flight to Mars in two stages. The decision was empirically tested, and the conclusion is unmistakably clear. The strategy to focus on rocket building first was confirmed in a most impressive way. Twenty years since SpaceX was established, the company has 294 rocket launches under its belt. Some 256 of these launches were followed by successful landings. Currently, there are 9 different models of rockets offered by SpaceX for market supply. In this way, the burning need for spacecraft has been radically satisfied. The various SpaceX offerings may serve the needs of most individual clients. Major demand comes from potential satellite clients or satellite-driven services. SpaceX is in an excellent position to answer it on a large scale, with the company's fleet of 4000 satellites and intentions to upgrade that number to 40,000. This unique capacity is a strong asset against the competition but also a kind of curse, considering the complicated state of international relations at present. "If Musk had been the type of person who could pause and savor success, he would have noticed that he had just brought the world into the era of electric vehicles, commercial space

flight, and reusable rockets. Each was a big deal" [2].

3.8. Diffusion of the cognitive and/or practical results of the commercialized innovation

The spread of patterns for the design, construction, and use of orbital launch vehicles developed and tested in the SpaceX project have been most impressive. These long-term and globally relevant achievements make the project attractive and have been the subject of dissemination and diffusion. This applies to the multidimensional innovation of public-private partnerships as well. Competitive interest in colonizing the space will not decline. Thus, the ideas and practices of Musk and his staff will continue to intensify in their spread.

3.9. Analysis of results and recommendations

The start of the SpaceX programme by Elon Musk signalled a decisive move from discussions on the possibility of space travel to Mars to practical colonization of the planet. The aim seemed to be clear to the young, talented, and ambitious leader. But he had no specialized knowledge or skills. The fact that Elon Musk managed to overcome this barrier by introducing a series of technological and organizational innovations should be carefully analysed by decision-makers in the fields of secondary and university education. Rationally guided creativity is not an illusion. One should not expect that the extreme creativity of Elon Musk could be doubled or quintupled by recruiting trainees for courses on creative design and project management. However, markets do positively react to all manner of innovations, even those limited to precision or slightly changing colours.

It is surprising to notice how isolated the struggles of the talented and ambitious young industrialist and entrepreneur Elon Musk were with the local and state administration, according to his biography. This phenomenon might be due to the readiness of Musk to adapt to the requirements of administrators. Another explanation has to do with the way Elon Musk has argued with policymakers by stressing the national and international relevance of his work. Undoubtedly, the most rational policy recommendation is for mutual respect towards SpaceX. It should transfer into optimum relationships between local and state administrations and innovators from all action areas, in all action spheres, and in all age groups.

3.10. Routinization of the innovation

The routinization of the breakthroughs achieved by Musk's SpaceX in the field of rocket building and use is widely known. SpaceX launch vehicles supply the ISS, offer space tourism, install satellites, and provide subscriptions to use Musk's satellite network. One may take it for granted that there will be intensive public interest in the return flights to Mars promised by Musk. These achievements will be celebrated and routinized in the flights which will follow the same route. Likewise, specialists will routinize the memories of this historical event in museums and academic lectures.

4. Concluding remarks

The achievements made by SpaceX as a company and personally by Elon Musk

are unique. Even in spite of a highly unlikely forthcoming bankruptcy for the company, the multidimensional constructive experience of SpaceX deserves study and dissemination. The experience is a public asset since Musk's ideas are future-oriented and highly competitive. As seen from a different point of view, Musk's personal story as a successful, self-made man is a strong source of motivation for creativity, responsibility, and hard work. This last point is particularly relevant for the value-normative and practical unity of the analysed efforts to put a diagnosis on contemporary societies by paying special attention to processes and structures of the commercialization (monetization) of social life.

Both similarities and differences in the views of Max Weber, Edward Ross, George Ritzer, and Elon Musk are related to intellectual traditions, impacts of the local context, and personal preferences. In the context of the broader social environment, Musk's interests, knowledge, and action were very substantially determined by the challenges of technological development. More precisely, he managed to turn these challenges into a factor fostering inventiveness, innovation, flexibility, risk-taking, responsibility, and good habits for communication and cooperation with other people or organizations. This story is a perfect example of rewarded abilities to properly read and understand the requirements of the economic situation. The outcome is that SpaceX is by far the global leader among private companies serving the market for spacecraft. Due to his extreme sensitivity to the volatility of markets and ability to take calculated risks, Elon Musk succeeded in building a highly respectable technological and economic empire. However, Musk's readiness to take on intense, calculated risks might just as easily meet unpredictable technological, economic, political, and cultural circumstances similar to the critical situation for SpaceX in 2008. Depending on circumstances, the resilience of economic systems based on commercialization might be rather strong or limited. The same holds true for the resilience of political systems thriving on the same basis. The events related to Musk's decision to withdraw his fleet of satellites from military activities are a clear signal as to how powerful the political determination of the technological and economic situation might be. In interviews, he used to repeat the point about the potential implications of value-normative integration.

The integration of a society based on commercialization could reach great heights under certain circumstances. Such a general situation might allow individuals like Elon Musk the freedom to be distinctive and extraordinarily productive. The open concerns about the limits of commercialization might be supported by relevant economic, political, and cultural actors. With his obsession to carefully identify real and potential sources of profit and drive to work hard in order to increase the capital to be invested for a new cycle of accumulation, Elon Musk seems to be the ideal capitalist entrepreneur, according to Weber's vision: "Man is dominated by the making of money, by acquisition as the ultimate purpose of his life. Economic acquisition is no longer subordinated to man as the means for the satisfaction of his material needs" [10]. Such an identity would not be fully adequate for Musk because it would only correspond to the central part of his activities. His biography and particularly his interviews present a person with a strongly humanistic value-normative identity, as well as a rich emotional life. Musk is not a Frankenstein-like character in the sense of "specialist without spirit" or "sensualist without heart".

Although some groups of specialists with educational backgrounds in the natural sciences clearly see social problems requiring technological solutions, this is not the dominant vision in contemporary advanced societies. The profiles of emblematic leaders in technological development worldwide [18] do not correspond to Weber's pessimistic vision about the worldview of the people who were expected to guide the commercialization of today.

Ross has organized his article as a juxtaposition of the still strongly commercialized action spheres and examples of already de-commercialized ones. These examples include the de-commercialization of marriages (no more payments for brides), de-commercialization of religion (church services are offered free of charge), and de-commercialization of government (the introduction of fixed taxes). In all these specific cases, individuals and institutions developed more sophisticated mechanisms for replacing the traditional forms of commercialization. One would be on sound ground to say that commercialization is present or directly dominates on every structural level and in all action spheres in contemporary societies. That is why the definition of commercialization suggested by Ross has tremendous potential for guiding studies and management of contemporary and future science and society.

The continuity of key ideas from Max Weber's intellectual heritage through George Ritzer's study on the McDonaldization of society concerns the causes, content, and consequences of social rationalization. This continuity has been regularly stressed in Ritzer's own writings as well as in the secondary literature [19]. The vision of self-improving rationalized market exchange links Ritzer's conception of society's McDonaldization with Elon Musk's philosophy and practices of rationalization in the design, production, marketization, and use of spacecraft as well as electric cars and trucks. However, Weber dealt with the organizational rationalization of economic, political, and cultural structures predominantly on a regional (Western Europe) or partly global (world religions) level. George Ritzer specified the idea of rationalization by focusing on its four parameters, applying this conceptual scheme in the study of processes that allow for the same pattern of explanation. Most of them, if not all, belong to the area of consumption and services. The ideas of organizational rationalization initiated by Elon Musk concern production processes first and foremost.

The conclusion is obvious. Instrumental activism in the form of commercialization (monetization, marketization) is a strong global process with a plethora of manifestations. Core processes of rationalization in the form of commercialization are present in all such manifestations, particularly in innovations. Specific conceptualizations should be prepared for local iterations of commercialization. This double-sided approach should be specially applied in the study of complex processes like Elon Musk's SpaceX programme.

The specifics of the rationalization of R&D in the implementation of the innovation under SpaceX might be briefly presented in this way:

- Specific demand for the new product was identified;
- A timeline for commercialization, in the sense of the innovative product's first contact, was created;
- Elon Musk carefully coordinated the aims of each strategy with the financial resources available;

- This coordination was tested at the start and end of each stage of the project;
- Financial coordination occurred between SpaceX, Tesla, Boring, SpaceX Dragon, Falcon Heavy, and Super Heavy Starship.

There have been tensions between the ideas and practices of Elon Musk, on the one side, and rapidly changing contemporary dynamics due to the interplay of rational and irrational decisions and processes, on the other. His statements about the future have been quite optimistic, yet his readiness to take risks has been too strong from time to time. His reactions to the remarks and actions of colleagues also tend to be rude. The puzzle is fundamental: What are the moving forces behind the development of present-day national societies and global societies? Answers have been attempted in a plethora of ways. Some of them are notoriously one-sided by stressing one or several key factors. Most often, this is a technological breakthrough on the basis of scientific progress. Another preference concerns the growth of scientific knowledge and its impact on rationalization of all activities. Large-scale changes in social structures and action patterns accompany or follow major innovations in the economy, politics, and culture. Destructive potentials determine the present-day critical situation of global commercialization. Elon Musk has presented them in an interesting way: "From 2007 onwards, until maybe last year, it's been nonstop pain. There's a gun to your head; make Tesla work; pull a rabbit out of your hat; then pull another rabbit out of the hat. A stream of rabbits is flying through the air. If the next rabbit does not come out, you're dead. It takes a toll. You can't be in a constant fight for survival, always in adrenaline mode, and not have it hurt you. But there's something else I've found this year. It's that fighting to survive keeps you going for quite a while. When you are no longer in a survive-or-die mode, it's not that easy to get motivated every day" [2]. Generalizations about the critical global situation sound ever more disappointing: "We're entering a 'new world disorder'. We can no longer afford to focus on the big issue at hand because there are many interrelated issues at play" [20].

Therefore, the contemporary entrepreneur is expected to have learned about the many dimensions of social reality [21]. In this respect, Elon Musk demonstrates a striking ability to avoid monocultural strategies for private and professional realization and development. Knowledgeable modern entrepreneurs are very willing to lead the rational management of technological and organizational processes. In this sense, they are the authentic legacy of Weber's vision about the desirable future organization. The condition is general and specialized education. In all European societies, the general level of education is attained under weakened state supervision. Some additional education and training in the area of commercialization would be a fine enhancement of citizens' professional knowledge and skills. However, one should not forget Karl Mannheim's warning: "The more we think about the best forms of planning, the more we might arrive at the decision that the most important spheres of life one should deliberately refrain from interference, and that the scope for spontaneity should rather be kept free than distorted by superfluous management" [22].

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