2020 Volume 9, Issue 1

Challenging Organisations and Society

reflective hybrids®

Beware of Art: ARTificial Intelligence Challenging Organizations and Society

Edited by Claudia Schnugg and Andrea Schueller

COS-journal
Peer-reviewed

Journal "Challenging Organisations and Society . reflective hybrids® (COS)"

COS is the first journal to be dedicated to the rapidly growing requirements of reflective hybrids in our complex 21st-century organisations and society. Its international and multidisciplinary approaches balance theory and practice and show a wide range of perspectives in and between organisations and society. Being global and diverse in thinking and acting outside the box are the targets for its authors and readers in management, consulting and science.

Editor-in-Chief: Maria Spindler (AT)
email: maria@cos-collective.com

Deputy Editors-in-Chief: Gary Wagenheim (CA), Tonnie van der Zouwen (NL)

Editorial Board: Ann Feyerherm (US), Ilse Schrittesser (AT), Maria Spindler (AT), Chris Stary (AT), Gary Wagenheim (CA), Nancy Wallis (US), Tonnie van der Zouwen (NL)

Guest Editors: Tom Brown (CA), Andrea Schueller (AT), Claudia Schnugg (AT)

Reviewers: François Breuer, Tom Brown, Silvia Ettl Huber, Jeff Haldeman, Ann Feyerherm, Russell Kerkhoven, Larissa Krainer, Marlies Lenglachner, Ruth Lerchster, Barbara Lesjak, Annette Ostendorf, Richard Pircher, Ilse Schrittesser, Claudia Schuchard, Andrea Schüller, Maria Spindler, Christian Stary, Martin Steger, Thomas Stephenson, Martina Ukowitz, Gary Wagenheim, Nancy Wallis, Tonnie van der Zouwen

Proofreading: Deborah Starkey

Layout: www.kronsteiner-lohmer.at

Elena Raviola

Artificial Intelligence and Creative Work: Practice and Judgement, Organizing and Structuring

New York, October 23-25, 2018. The artwork "Portrait of Edmond Bellamy" was auctioned at Christie's and sold for $432,500. The artist was "min max…", algorithm[1] created by Obvious, a collective of artists and Artificial Intelligence (AI) researchers based in Paris. They used a method called Generative Adversarial Networks (Goodfellow et al., 2014) to create images and explore the question of creativity for machines.

Paris, Spring 2020. The company Deepnews.ai was launched, after four years of research by the former journalist and news expert Frederic Filloux and a number of computer scientists in the US and in France. Deepnews.ai's core technology is a proprietary scoring system that is able to discern quality news and put them together in specialized newsletters.

Shenzen, August 2019. The annual conference on Artificial General Intelligence takes place in a luxurious hotel in the so-called Chinese Silycon Valley. In his keynote speech, the CEO of the Finnish company Curious AI presents their AGI model and speaks about AI's ability to imagine the future as the key to reaching general intelligence in machines.

1 Algorithms are instructions inscribed in a machine that tell it what to do. The Cambridge English Dictionary defines an algorithm as "a set of mathematical instructions that must be followed in a fixed order, and that, especially if given to a computer, will help to calculate an answer to a mathematical problem". Thus, as mathematical instructions, algorithms are formal and unambiguous rules that determine the machine's actions to solve a problem defined in mathematical terms. The particular type of algorithms that classify as artificial intelligence give instructions on how a machine should learn a given task, so that it can improve itself in performing it. These learning algorithms can build on logical and/or statistical models of learning and thus function in different ways, but they all remain "unambiguous specification" of how to solve the problem of learning.

Although not new (Boden, 1977), lately the debate has intensified around artificial intelligence and so-called creative work[2]: machines are reported to be able to learn to write stories and poetry, produce "paintings" (if that is the right name for it), compose music, choreograph dance, design buildings, make news and other things. AI explorations and experiments in creative fields is interesting for the AI community, as creativity is often thought of as one of the distinct human features and thus these explorations might lead to shift and controversies on the boundaries between humans and machines. In fact, shortly after the sale of the first AI-generated portrait at Christie's in October 2018, The Guardian art critic Jonathan Jones wrote that, although almost plausible, "no algorithm can capture our complex human consciousness" (Jones, 2018). Other artists working with the same algorithm, namely the Generative Adversarial Network (GAN), criticized the artwork as unoriginal, as the GAN had been used and shared in art since 2015 (Cohn, 2018). The results achieved by learning algorithms have triggered intense discussions

2 It all started with the mapping and measurement exercise promoted and carried out by Tony Blair's New Labour government in the UK in 1998. Although the term 'creative industries' has come to be highly contested, it is undeniable that there has been success in creating a new category for policy, industry and research. A consensus seems to have been reached to consider sectors like advertising, architecture, art and antiques, crafts, design, designer fashion, film and video, music, performing arts, visual arts, publishing, TV and radio as creative industries. Sometimes even computer games and software are considered as creative industries. Lately, the UK government has considered the adoption of a new classification of 'creative' industries, building on 'creative intensity', that is, the ratio by which 'creative' occupations are employed (Bakhshi, Freeman, Higgs, 2012). At the European level, since the Millennium, the European Commission has launched many initiatives to promote the creative and cultural industries, identified both as one of the fastest growing sectors of the economy and as potentially capable of fostering innovation in the economy at large (see the Cre8tv.eu research project report, 2016). In this essay, creative work, organizations and fields are used as field/empircal categories that represent belonging to the so-called creative industries. For the purpose of this essay, which is to explore the transformation of creative work practices, organizational processes and field structure, the label 'creative' is used to identify an area of empirical investigation. In short, in line with an ethnographic approach, I call 'creative' what is called as such in the field and I am thereafter interested in understanding the meanings that this label gets in practice and what it becomes associated with.

both in the media and in research about creativity and AI: Can machines be creative? Can creativity be automated? What is creativity, then? Is their work really original? This discussion is at the center of a whole field of computer science research called computational creativity.

Such debates, like others related to AI developments, are often accompanied by either utopic visions or dystopic scenarios about the future of humanity. On the one hand, some – entrepreneurs in the AI field, often technology developers, some creators, investors and part of the press – portray the possibilities offered by AI applications as the solution to all human problems and the tools able to empower and free people's inner creativity. On the other hand, others shout at the potential loss of jobs in all industries and at the impossibility of machines doing "real" creative work.

The debate would, however, benefit from looking at how work – by humans and machines – is actually performed and organized every day and what AI means for the way creative fields are (re)structured. The conversation in the field of AI and creativity has especially been focused on defining whether machines can "really" be creative and making utopic or dystopic imaginaries for the future, but I would like here to call for viewing learning algorithms as technical artifacts that are culturally and socially made and that in turn shape cultural and social relations. This means calling for understanding AI not only technically, but also through a practice-based, symmetrical and history-aware[3] investigation of the development and use of learning algorithms, with

3 The three adjectives "practice-based", "symmetrical" and "history-aware" have their roots inat the intersection between Actor-Network Theory (Latour 1982, 2005; Mol & Law, 1994; Callon, 1986) and Economies of Worth (Boltanski & Thevenot, 1991/2006), two social science perspectives that have been called symmetrical twins (Guggenheim & Potthast, 2012). In particular, both approaches call for investigations of the social world that focuses on actions, treats humans and non-humans symmetrically and traces associations in time and space without fixed a priori notions of causes and effects. This implies that neither AI (and associated terms, like algorithms and automation) nor creative processes, aesthetic judgment, organizations, or fields are fixed entities, and that we need to pay attention to how human and non-human agents actively compose or decompose such "things".

a distinct attention to work practices, organizing processes and field structures. Along these lines, this essay aims to identify some of the overlooked issues in the AI transformation of creative work and to frame urgent questions to investigate the conditions and consequences of this transformation.

The rest of this essay is thus structured as follows. First, I introduce a brief note on the beginnings of AI and the debate of automation of work. Then, I move on to discuss how AI and creativity have been related and develop a critique in order to move forward and ask new questions. Thirdly, I spend some space framing the two crucial questions of this essay: practice and judgement, organizing and structuring. Finally, I develop some concluding remarks.

Learning Algorithms and Automation of Work

The history of automation of work goes back, in a way, to the beginning of humankind, as archeology and literature have shown us through artefacts and mythology. From what we know about humans, it seems that we have been using tools to enhance our ability to perform tasks (We need clarification here: other what? DKS) for thousands of years. The Industrial Revolution brought the possibility to produce energy and thus to give the ability to machines to move by themselves (being autonomous) and to do this on a big scale. At the beginning, automation of work focused on bodily functions; over the last 60 years the development of artificial intelligence has shown in theory and in practice that it is possible to automatize an increasing number of intellectual activities.

The automation of routine tasks in intellectual activities, like sending a letter or formatting and printing a text, is unquestionably part of so-called white-collar work and, perhaps it could even be argued that the two have been rising together. Machines considered intelligent are now, however, learning to perform non-routine intellectual tasks and are conquering new domains, performing at the human level or above at tasks such as playing chess, steering

airplanes, driving cars, navigating ships and recognizing faces. Today the research on the possibilities of automatizing tasks of the human mind, like decision-making, is intense and has found concrete and well-spread applications in a variety of commercial, financial and legal areas (Davenport & Harris 2005, Kraus 2001). Academic projects, such as the Human Brain Project in Europe and the Human Connectome Project in the US, and industry investments spearheaded by Google, IBM, and Microsoft, lead this development. Applications of these intelligent machines in creative work is considered particularly interesting because creativity is usually treated as a unique human capability.

Scholars usually agree that the term Artificial Intelligence was coined in 1955 by John McCarthy, Assistant Professor in Mathematics at Dartmouth College in the US. Together with three colleagues, he proposed a summer research project on artificial intelligence, which should take place at Dartmouth College during the summer of 1956. In the proposal, he wrote:

> *We propose that a 2 month, 10 man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves.*
> *(http://www-formal.stanford.edu/jmc/history/dartmouth/dartmouth.html)*

This incipit of McCarthy's and colleagues' proposal summarizes the ideas, assumptions and purposes of what they called Artificial Intelligence. They gathered under the belief that a precise description of all intelligence or learning could be developed, so that it could be formalized in unambiguous rules

for a machine. One of the themes of this first project was called "randomness and creativity" and aimed at the study of an appropriate way to describe creativity and formulate precise rules for it: McCarthy and colleagues departed from the hypothesis that randomness guided by intuition could represent creativity for machines. It is indeed interesting that computer scientists believed in the possibility to inscribe into a machine a sort of creativity formula and this was driven by logic rather than by a practical understanding of creative work. The logic of logic dominating the first developments of AI – and in part also contemporary developments – seems also to be particularly suited to the current neurologizing trend, according to which, all we do can be controlled by the mind and neural mechanisms.

From the beginnings, artificial intelligence as a field has expanded significantly and it has gone through different cycles of optimism and pessimism. In the sixty years after McCarthy's summer research project, this term successively came to include technologies for an increasing number of tasks, like natural language processing, speech recognition, game-playing, robotics, intelligence knowledge-based systems (Susskind & Susskind, 2016). The history of AI could be divided in two seasons: 30 years of what can be called an AI Spring, culminating in the '80s with their hopes for the role of machines in the future of humanities, and about 30 years of what can be called an AI Winter, "a period during which AI seemed to stall (Susskind & Susskind, 2016:183). Over the last few years, however, AI seems to have come to a renewed Spring (see Czarniawska & Joerges, 2020, for an insightful and comprehensive review) and many technologists and non-technologists contribute to the hype. As such, some ride on it, others wait until it's over, and a few have the privilege of asking questions tracing automation from the design of AI to its consequences. The reflective hybrids that this special issue calls upon belong to those privileged ones and have the duty to raise naïve questions that open up boundaries of technologies and make development more democratic, questions such as: What automation? What for? Why? In what way? For whom?

AI and Creativity: Taking stock and moving on

Margaret Boden is usually recognized as the mother of this community, as she had already focused on creativity in her 1977 textbook *Artificial Intelligence and Natural Man*. Boden (1998) argued even the most technologically-oriented AI cannot ignore creativity as a key feature of human intelligence, and in turn creative AI might be useful to psychologists to understand human creativity.

This area of research, where artists and psychologists are active alongside computer scientists, has greatly contributed to experiments with new computational models in creative processes (e.g. Dahlstedt & Nordahl, 2001) and has extensively debated what creativity is and how it can be modeled (see e.g. Boden's model of combinatory, exploratory and transformational creativity, 1998). As Boden (1998) herself recognized, one of the key issue in this research is the evaluation of creativity: "how can a computational system know when its outputs are worthy of the term *creative*?" (Cardoso et al., 2009: 19). Evaluation mechanisms are indeed programmed into creative AI in different more or less autonomous ways, but what do these technological inscriptions of values carry and what are their consequences? If we shift the focus from optimizing the functionality of algorithms to understanding them as a culturally- and socially-made artifact, we see that creative processes and aesthetic judgement unfold in the midst of collective practices of valuation, where things are collectively made valuable and worth is established, assessed, maintained and contested (Kornerberg et al., 2015). Rather than defining whether machines can "really" make art or "really" be creative, this essay aims at framing urgent questions and calling for further research and debate on how AI reshapes practices, organization and fields of creative work.

Research on the creative fields has highlighted, from different perspectives, the struggles between aesthetic and professional autonomy on the one hand, and managerial practices of control and marketization on the other hand (Hesmondhalgh and Baker, 2011). To put it in Banks' words (2007: 6), the "artistic desires for creative autonomy and independence exist in uneasy tension

with capitalist imperatives of profit-generation and controlled accumulation" (2007: 6). These struggles have been portrayed under different terms: art and commerce (Caves, 2000; Banks, 2007), culture and commerce (Slater and Tonkiss, 2001), creativity and commerce (Negus and Pickering, 2004), art and capital (Ryan, 1992). In organization studies, organizations in which different, often competing, logics, like culture and commerce, coexist have been called pluralistic organizations. The concepts deployed to depict plurality in pluralistic organizations have flourished over the last few years: to mention a few, institutional pluralism (Kraatz and Block, 2008), institutional logics (e.g. Thornton et al. 2012), competing rationalities (Cloutier and Langley, 2007), and pluralistic contexts (Denis et al., 2007). The relation between different logics, rationalities and contexts is often portrayed as a tension – see for example the literature on new public management and the abundant studies on health care and other professional organizations (e.g. Reed & Anthony, 1992; Power, 1999; Schedler & Proeller, 2002; Hughes, 2003; Hammerschmid & R.E. Meyer, 2005).

Studying applications of learning algorithms in creative work is particularly interesting and relevant as the encounter between a mathematically instructed agent and an artistic (human) agent might give rise to a number of challenges. What happens there? How and where might the encounter develop? How is that encounter organized? In particular, three key aspects of creative fields, highlighted by organizational and sociological research, raise crucial questions in relation to AI developments and applications and potentially offer important insights for other fields of work.

(1) First, creative work is often subject to complex and ambiguous processes of evaluation: To establish what is good and what is bad, what has aesthetic and symbolic value vs economic value is barely possible – if not undesirable – with standardized and universal measures (Becker, 1982; Bourdieu, 1996). Given the unambiguous set of mathematical rules that need to be inscribed in algorithms, it is, thus, interesting to explore how

these rules relate to the ambiguity that characterizes practices of creative production.

(2) Second, what will be successful both in artistic and commercial terms is very difficult to predict, despite many attempts. In very simple terms, trying to predict and at the same time influence what the audience and the critics will like to read, watch and perhaps buy has been the full-time job of editors, directors, producers, and other mediators. For a number of years, increasingly sophisticated learning algorithms have been used to make predictions by means of logical or statistical extrapolation, built in their learning model. These are used both in recommendation systems, like the Amazon's or Tripadvisor's "You might be also interested in…", and in the actual making of creative products, like in many Netflix produced series.

(3) Third, creative organizations and fields are usually organized as hybrids, where multiple competing logics, values and interests coexist (e.g. Denis et al., 2007; Jarzabkowski et al., 2009; Thornton et al., 2012). The literature reports on struggles between art and commerce (Caves, 2000; Hesmondaghl, 2007; Florida, 2002) and ways of organizing to balance or integrate the two logics (Davis & Scase, 2000; Howkins, 2002; de Monthoux, 2004; Eikhof and Haunschild, 2007). Scholars have investigated how digital technology contributes to disassembling and reassembling the established ways of organizing in the creative industries (Mangematin, Sapsed and Schüßler, 2014) and to bring about novel forms of organizing, new collaborations, new expertise (Raviola and Norbäck, 2013) as well as new actors in the field, like global technology companies (Google, Facebook and the likes) and a new wave of so-called creative entrepreneurs. I believe, however, that the investigation of the development and use of learning algorithms in creative work needs a specific effort to develop new theoretical sensitivity and new methodological tools that are suitable to study and understand the making of society in what has been called the fourth industrial revolution.

In line with viewing AI as a culturally- and socially-made technical object, I would like here to frame two questions for investigations of AI in creative work at large, that would lead us to understand its wider conditions and consequences:

1. How is creative work practiced and judged in the midst of AI applications?
2. How is creative work reorganized and how are creative fields restructured in the midst of AI applications?

Practice and Judgement

Artists and other creative workers are concerned with building artifacts that convey complex meanings, playing with ambiguities and exploring the liminal region between opaque mystery and interpretability. In contrast, the focus in AI is on task competence, that is, on demonstrably accomplishing a well-defined task. To "demonstrably accomplish" means to show, either experimentally or by means of mathematical proof, that the AI system can accomplish a task. A "well-defined task" means a simple, concisely defined objective that is to be accomplished using a given set of resources, where the objective often has "practical" (i.e. economic) utility (Meatas, 2001).

Many AI systems currently in use in creative work rely on human interventions to guide the programs in evaluating different aesthetic paths and the results of their work. So, designers, artists, journalists and musicians are often involved as observers giving feedback to the machine in its working process. There are, however, attempts at developing learning algorithms performing creative work by learning from existing creative products, like advertisement videos, painting images or texts, but producing results without human interventions. In all these cases, the encounter between artists' ambiguous meanings and mathematical (logical or statistical) rules raises a number of empirical questions: How are the ambiguity of creative work, rarely problematic in

arts, and the precision of mathematical rules negotiated and compromised? How are these algorithms written in the compromising process and how do they further write themselves as they are working? How do these algorithms interact with creative workers? How do they function as organizing devices both during their development and during their working?

Let's take performing arts as an example. They are interesting here, among other reasons, because they have been considered the emblematic example of what the economist Baumol called the "cost disease". Baumol argued that in labor-intensive sectors of the economy, like performing arts, advancements in technology do not produce a decrease in their production costs: To perform Beethoven's Symphony No. 9 you need the same number of musician today as in the XIX century. So, what is the role of AI in performing arts? Music has indeed developed in strict connection to technology and available techniques and materials have been shaping music practice and taste over time and space. Music creation has experienced the deployment of AI in different forms and processes since the 1950s. Different models, like GAN and genetic algorithms, are used in music composition and improvisation.

Recently there have been several experiments, led by researchers, dancers and big and small technology companies (like IBM), to try to write learning algorithms that are also able to produce dance movements and choreography. Learning algorithms are used in different ways in choreography, for example (1) to generate choreography, in interaction with artists (e.g. the machine learning tool for choreographers generated by Google Art & Culture), (2) to read movements and produce corresponding music (e.g. the Yamaha's AI system to transform a dancer's movements into piano music), (3) to dance with a human dancing partner (e.g. the project "The most human" by Swedish choreographer Robin Jonsson and his robot Alex). The use of AI in choreography raises issues of understanding the body and its movement, aesthetic judgment in practice and ultimately the boundaries of the human.

In AI developments and applications in and for creative work, many questions remain to investigate around the everyday practical interactions between creative humans and machines. For example, questions around which tasks are automatized and what happens in the formalization of those tasks into machines; questions about how expertise evolves and is distributed in new collaborations between computer scientists and creatives; questions about how aesthetic judgement is performed and (perhaps) displaced during the creative process and questions around new ways of negotiating and compromising different ways of valuing and evaluating work in the everyday situations.

Reorganizing Work and Restructuring Fields

As new collaborations and intersections with other fields are established, new technologies not only enable artists to explore new creative processes and create new forms of aesthetics (Franco, 2017; Taylor, 2014; Patterson, 2015). They also trigger the construction of new fields of artistic production, like new media art and time-based media art, and the shifting of boundaries of existing fields of practice. The development and deployment of learning algorithms in artistic work intersect the general development of AI in society. Much of the global development of AI is driven by large global technology companies, like Google, Facebook, Microsoft and IBM, which have also made efforts and investment to be present in the AI and Art sphere, like in many other spheres of economic and social life. In June 2016, for example, Google launched the Magenta project (https://magenta.tensorflow.org/), a crowd-sourced open source research project exploring and developing machine learning for creative processes. Questions thus arise on how creative work gets reorganized and how fields of artistic practices at local and global level are transformed when new technologies, new norms and new organizations enter the scene.

Let's take publishing as an example. Publishing is usually classified as one of the media industries and it refers to all possible outlets, like books, newspapers, magazines and websites. For the purpose of this proposal the focus is on news publishing, as this field has long been affected by digitization and this is one of my areas of empirical expertise. The rise and spread of digital technologies in journalism, allowing us first to simply publish news online, then to share them on social media and now to automatize the prioritizing of news, have challenged existing professional norms and practices. Robot journalism is now on the agenda of many news organizations as a new phase of digital journalism, not least for its promises of efficiency. What is perhaps most interesting about the development of automation and AI in the news field is its transformation from a mature field with major newspapers as traditional actors and a relatively stable audience to a reemerging field with a lot of new entrepreneurs (blending tech and editorial competences), traditional actors in crisis yet trying to innovate and powerful giants, like Google and Facebook, which are new to the field, but have become inevitable points of passage for anyone else both technologically (for their platforms) and financially (they fund a lot of news innovation even by traditional newspapers). At the intersection between journalism and AI, new expertise has emerged, and many entrepreneurs have worked to sell their editorial and technological solutions for other purposes than news reading. Fact-checking has, for example, come to be a new category of actors whose technology-intense services have been offered and used in politics and NGO contexts.

Therefore, AI developments and applications in creative work also raise a number of important questions about their consequences for the organization and definition of fields, questions about who is in and who is out, questions about how new categories are constructed and performed and questions about relations of power between actors in the field.

Conclusions

Almost all sectors of society are crossed by the promise of radical change through AI and a group of new AI experts is growing. This essay calls for viewing AI as a culturally- and socially-made technical object and for a practice-based, symmetrical and history-aware investigation of its development and application in creative work. My aim here has been to frame some urgent questions along two crucial intertwined lines: practice and judgment, organizing and structuring. I would like to conclude here on what this might mean in terms of methodology and thus join others' appeal for the necessity of interdisciplinary research on AI (Sloane and Moss, 2019).

I see it as necessary to combine methods from our different disciplines – humanities, social sciences and technology – to develop a new research toolkit enabling us to *zoom-in* on the very practice of creative work, including the technical making of AI, and *zoom-out* to explore and trace connections beyond the very specific practice of creative work (Nicolini, 2009). In order to *zoom-in*, close collaborations between researchers (technological, social and human scientists) with workers on the floor are needed. Efforts to *zoom-out* will need to blend competence in artistic and computer science research with fieldwork techniques that are common in ethnographically-inspired (Atkinson, 2001) organization studies (Czarniawska, 2008), political science and legal ethnography (Arvidsson, 2013).

These zooming-in and zooming-out are indeed privileged journeys for some of us working on the boundaries of different fields, and at the same time might also be uncomfortable and disorienting. Some of us moving in and out, for example, are, like myself, social scientists that have been shadowing AI across different sectors and have developed some sort of interactional expertise with technologists. I recognize myself as a (hopefully reflective) "hybrid" at the periphery of AI developments, observing AI experiments and discourse with curiosity and strangeness and trying to find openings to get in, hoping to pose naïve questions and give voice to new perspectives. To paraphrase the

call for this special issue, if technology is the answer, I have here tried in my hybridity to deconstruct its matching with the question of creativity and to call for opening the black box of creative work. When I first heard about the portrait of Bellamy, sold at Christie's in 2018, I got very curious indeed and ready to ask a battery of naïve questions. When I read about deepnews.ai and other experiments – at about the same time as the Cambridge Analytica scandal – I started to wonder about democratic consequences, positive and negative, of making news with AI, using my knowledge of the news field to zoom-out. But when I finally got to Shenzen and hung out for almost a whole week among technologists, AI gurus and entrepreneurs, however, I realized that the liminality of the hybrid position, which might facilitate reflection at times, for the possibility to look across boundaries, might also be filled with anxiety, for not belonging, for being "othered" and for not being expert in a society of experts, thus making reflexivity difficult.

References

Atkinson, P., Coffey, A., Delamont, S., Lofland, J., & Lofland, L. (Eds.). (2001). Handbook of ethnography. Sage.

Bakhshi, H., Freeman, A., & Higgs, P. L. (2012). A dynamic mapping of the UK's creative industries.

Banks, M. (2007). The politics of cultural work. Springer.

Boden, M. (1977). Artificial Intelligence and Natural Man. Sussex: Harvester.

Boden, M. A. (1998). Creativity and artificial intelligence. Artificial Intelligence, 103(1-2), 347-356.

Boltanski, L., & Thévenot, L. (1991/2006). On justification: Economies of worth. Princeton University Press.

Callon, M. (1986). Some elements of a sociology of translation: domestication of the scallops and the fishermen of St. Brieuc Bay. The Sociological Review. Special issue: Power, action, and belief: A new sociology of knowledge, 32, 196-223.

Cardoso, A., Veale, T., & Wiggins, G. A. (2009). Converging on the divergent: The history (and future) of the international joint workshops in computational creativity. AI Magazine, 30(3), 15-22.

Caves, R. E. (2000). Creative industries: Contracts between art and commerce (No. 20). Harvard University Press.

Cloutier, C., & Langley, A. (2007). Competing rationalities in organizations: A theoretical and methodological overview. Cahiers de recherche du GéPS, 1(3), 1-35.

Czarniawska, B., & Joerges, B. (2020). Robotization of Work?: Answers from Popular Culture, Media and Social Sciences. Edward Elgar Publishing.

Czarniawska-Joerges, B. (2007). Shadowing: and other techniques for doing fieldwork in modern societies. Copenhagen Business School Press DK.

Dahlstedt, P., & Nordahl, M. G. (2001). Living melodies: Coevolution of sonic communication. Leonardo, 34(3), 243-248.

Davenport, T. H., & Harris, J. G. (2005). Automated decision making comes of age. MIT Sloan Management Review, 46(4), 83.

Davis, H. and Scase, R. (2000). Managing Creativity: the dynamics of work and organisation. Open University Press, Buckingham.

de Monthoux, P. G. (2004). The art firm: Aesthetic management and metaphysical marketing. Stanford University Press.

Denis, J. L., Langley, A. And Rouleau, L. (2007). Strategizing in pluralistic contexts: rethinking theoretical frames. Human Relations, 60(1):179-215.

Eikhof, D. R., & Haunschild, A. (2007). For art's sake! Artistic and economic logics in creative production. Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 28(5), 523-538.

Florida, R. (2002). The economic geography of talent. Annals of the Association of American geographers, 92(4), 743-755.

Franco, F. (2017). Generative Systems Art: The Work of Ernest Edmonds. Routledge.

Guggenheim, M., & Potthast, J. (2012). Symmetrical twins: On the relationship between Actor-Network theory and the sociology of critical capacities. European Journal of Social Theory, 15(2), 157-178.

Hammerschmid, G. & Meyer, R. E. (2005). New public management in Austria: local variation on a global theme? Public Administration, 83(3):709–733.

Hesmondhalgh, D., & Baker, S. (2011). Toward a political economy of labor in the media industries. The handbook of political economy of communications, 381-400.

Howkins, J. (2002). The creative economy: How people make money from ideas. Penguin UK.

Hughes, O. E. (2003). Public Management and Administration – an Introduction. Basingstoke: Macmillan.

Jarzabkowski, P., Matthiesen, J. and Van de Ven, A.H. (2009). Doing which work? A practice approach to institutional pluralism. In T. Lawrence, R. Suddaby and B. Leca (eds.) Institutional Work. Cambridge, UK: Cambridge University Press.

Jones, J. (2018). A portrait created by AI just sold for $432,000. But is it really art? The Guardian. Retrieved from: https://www.theguardian.com/artanddesign/shortcuts/2018/oct/26/call-that-art-can-a-computer-be-a-painter

Kornberger, M., Justesen, L., Madsen, A. K., & Mouritsen, J. (Eds.). (2015). Making things valuable. Oxford University Press, USA.

Kraatz, M. S., & Block, E. S. (2008). Organizational implications of institutional pluralism. The Sage handbook of organizational institutionalism, 840, 243-275.

Kraus, S. (2001). Automated negotiation and decision making in multiagent environments. In ECCAI Advanced Course on Artificial Intelligence (pp. 150-172). Springer, Berlin, Heidelberg.

Latour, B. (2005). Reassembling the social: An introduction to actor-network-theory. Oxford university press.

Latour, B., & Woolgar, S. (1982). Laboratory Life. The Social Construction of Scientific Facts.

Mangematin, V., Sapsed, J., & Schüßler, E. (2014). Disassembly and reassembly: An introduction to the Special Issue on digital technology and creative industries.

Mateas, M. (2001). Reading hal: Representation and artificial intelligence. Stanley Kubrick's, 105-26.

Mol, A., & Law, J. (1994). Regions, networks and fluids: anaemia and social topology. Social studies of science, 24(4), 641-671.

Negus, K., & Pickering, M. J. (2004). Creativity, communication and cultural value. Sage.

Nicolini, D. (2009). Zooming in and out: Studying practices by switching theoretical lenses and trailing connections. Organization studies, 30(12), 1391-1418.

Patterson, Z. (2015). Peripheral vision: Bell labs, the SC 4020, and the origins of computer art. MIT Press.

Power, M. (1999) The Audit Society. The Rituals of Verificaton. Oxford: Oxford University Press.

Raviola, E., & Norbäck, M. (2013). Bringing technology and meaning into institutional work: Making news at an Italian business newspaper. Organization Studies, 34(8), 1171-1194.

Reed, M. & Anthony, P. (1992). Professionalizing management and managing professionalization: British Management in the 1980s. Journal of Management Studies, 29(5):591–613.

Ryan, B. (1992). Making Capital from Culture. Berlin: De Gruyter.

Schedler, K. & Proeller, I. (2002). The new public management: a perspective from Mainland Europe. In K. McLaughlin, S. P. Osborne & E. Ferlie (eds.) New Public Management: Current Trends and Future Prospects. London: Routledge. Pp. 163–180.

Sloane, M., & Moss, E. (2019). AI's social sciences deficit. Nature Machine Intelligence, 1(8), 330-331.

Susskind, R. and Susskind, D. (2016). The Future of the Professions. How Technology Will Transform the Work of Human Experts. Oxford, UK: Oxford University Press.

Taylor, G. D. (2014). When the machine made art: the troubled history of computer art. Bloomsbury Publishing USA.

Thornton, P.H., Ocasio, W. and Lounsbury, M. (2012). The Institutional Logic Perspective: A New Approach to Culture, Structure and Process. Oxford: Oxford University Press, 2012.

About the Authors

Johannes Braumann heads Creative Robotics at the University of Art and Design Linz. He is co-founder of the Association for Robots in Architecture and the main developer of the intuitive robot programming environment KUKA | prc, which is used by more than 100 universities and 50 companies worldwide. The focus of his work is the development of methods of robotics for new user groups. Thereby, Creative Robotics cooperates closely with the Innovation Center Grand Garage and develops innovative robot processes for (and with) SMEs and craft businesses.

Sougwen Chung is an internationally renowned artist and a pioneer in the field of human-robot collaboration. In her work she artistically explores and researches ways to work with machines and the potential of artificial intelligence in creative cooperative processes. Chung has been artist-in-residence at distinguished organizations like Nokia Bell Labs, is a former research fellow at MIT's Media Lab and was selected as the Woman of the Year in Monaco in 2019 for achievement in the Arts & Sciences.

Elisabetta F. Jochim is creative AI lead at Libre AI and co-founder at Cueva Gallery. She has a background in Arts and Humanities and extensive experience in project management working with heterogeneous teams in dynamic environments. Finding her passion in the intersection of technology and art, she explores how artificial intelligence can enhance human creativity. Her interests focus on digital aesthetics, human-computer interaction, human and machine creativity, and society.

Paola Michela Mineo is an Italian visual artist: her research is rooted in relational art, but she uses an interdisciplinary language that ranges from performance art to photography, from the purest sculpture to installations. She graduated in Architecture at the Polytechnic of Milan and Athens; she reinterprets the concept of human cast and fragment, transforming them from

an anatomical copy to a real pieces of personal identity portraits. She has exhibited her work in various museums, and is always committed to extracting beauty from the darkest social realities.
For further information see: http://www.paolamichelamineo.com
Contact: info@paolamichelamineo.com

Elena Raviola is Professor in Business and Design at the university of Gothenburg. She is recipient of the Tortsen and Wanja Söderberg Professorship in Design Management at the Academy of Design and Crafts Gothenburg and Director of the Business and Design Lab. Her research incorporates artificial intelligence and design, and its implications of work processes, most importantly on creative work. Her main research interest lies in understanding the role of technology and other material artifacts in organizing professional work, especially in news production. She was visiting researcher at Stanford, Bocconi University, Harvard, and Sciences Po, and worked at Jönköping International Business School and Copenhagen Business School.

Claudia Schnugg is independent researcher and curator in the field of art and science. Her work focuses on analyzing the effects of art in organizational and social settings, including change processes and new technologies. As advocate of artscience collaboration, she has been the catalyst for numerous projects. Claudia is working with leading scientific institutions, tech corporations and cultural partners. She researched at JKU in Linz, Copenhagen Business School, UCLA Art|Sci Center+Lab, and at European Southern Observatory, Chile. She headed the Ars Electronica Residency Network and was first Artistic Director of Science Gallery Venice. Her most recent book is "Creating ArtScience Collaboration" (2019).

Andrea Schueller is an independent business consultant, executive coach and lecturer at various universities specializing in generative change and transformation, organizational design, systemic identity, social innovation, creative emergence. Over the years she has qualified in various fields and applies her work shapeshifting in different contexts pursuing the red line of fostering embodied consciousness development through fresh presence and

holistic working designs. She is teaching trainer for Group Dynamics with the OEGGO (Austrian Association of Group Dynamics & Organization Consulting) which she chaired and served as a Board Member (2012-2018). She is a co-founder of COS Collective.
See more: www.cos-collective.com, andrea@cos-collective.com

Christian Stary is professor for Business Information Systems at the University of Linz, Austria. His research areas include Interactive Design of Sociotechnical Systems, Business Process Management, Conceptual Modelling and Knowledge Management. He is responsible for several European research projects, such as TwinTide, dealing with method transfer in UI design and evaluation. He is member of the editorial board of international cross- and interdisciplinary journals, among them UAIS published by Springer. He is one of the founders and chair of the Competence Center on Knowledge Management, the ICKM (Int. Council on Knowledge Management), and organizer of several academic events on interactive systems, business process and knowledge management. He is also a co-founder of COS Collective.

Liselotte Zvacek is management consultant, leadership coach and lecturer at different universities in Austria; teaching trainer (train the trainer) of OEGGO (Austrian Society of Group Dynamics and Organisational Development) and member of the board of OEGGO (2000-02 and 2012-18); facilitator at the Graduate School of Business of Stanford University (USA) 2011-15; member of the faculty of the Hernstein Institute; member of NTL (National Training Laboratories Institute, USA), photographer. She is a co-founder of COS Collective.
www.cos-collective.com, liselotte@cos-collective.com

Next New Action
(3d)

Assess your creative potential for leadership and consulting

COS Curriculum
Creators for Organisations & Society
25 days & 1d/8h coaching for master's piece

Creating my Master's piece
Writers space *
Photography & Film *
Freestyle *

* choose one – or more (optional)

Craft your ideas and developments and bring them into the world. Act!

Group in collective flow
(5d)

Deep dive generative group dynamics

Flow peer group
(3 x 1d)

Your homebase for orientation, integration & individual learning

Whole System:
Co-Creating new structures for collaboration
(2,5d)

Futuring, working with large groups and networks for transformational change

COS Conference active participation
(2,5d)

Engage on stage, show your intention and action for organisations & society

Integrating somatic intelligence in high performance teams
(4d)

Awaken somatic intelligence for generative change

The COS-Certified Curriculum "Creating Organisations & Society"

New Creations in Organisations & Society originate in the undivided source of sensing, feeling, thinking. Acting from there we make a difference. In this curriculum you will touch the source, develop your inner world and come out with new resources for action in the outer world. It's challenging for you and others!

We designed the curriculum for **mindful people** who:

- Wish to live and work closer to their calling and aspiration.
- Desire to go on a journey of transformation and tangible action.
- Want to intentionally achieve better, more creative results in the organisations they own or work for.
- Change their surroundings collaboratively, mindfully and powerfully.
- Direct intention and generative power towards shared development.
- Enter uncharted territory.

Here and now modules address individual, group and organisational learning spaces and offer learning on the spot in the here and now. You practice presencing and learn how to intervene in the moment – here and now. This is where immediate change happens.

Flow and grow together through action learning. You come closer to yourself, develop ways to generatively hold your many facets, connect with others in this way and manifest your actions from a fresh, supportive social network. A learning through experiencing and acting, experiencing and acting …

Craft and manifest: During your learning journey you are continuously crafting your own masters' piece. This artistic, scientific or freestyle „piece

of work“ is your gift and your challenge to yourself and to Organisations & Society: The one you work or live in or the one you are intending to create. A project development, a new business idea, a book, a new way of working and living.

Your calling triggers and shapes your learning journey throughout all modules. We support you in making a pearl-chain, your intentional learning process is the pearl string. – Beautiful!

COS Certified Curriculum: Creators for Organisation & Society

For more information please contact:
Dr. Andrea Schueller: andrea@cos-collective.com
Dr. Maria Spindler: maria@cos-collective.com

Costs approx.: € 5.600,– + VAT

Become a Friend & Member of COS!

Join the COS movement and become a Friend & Member of COS! COS is a home for reflective hybrids and a growing platform for co-creation of meaningful, innovative forms of working & living in and for organizations and society, between and beyond theory and practice. We invite you to become an active member of COS.

Being a part of COS you have access to our products and happenings. As a Friend & Member, you carry forward the COS intention of co-creating generative systems through mindful, fresh mind-body action. Let's connect in and for novel ways around the globe!

Access points for your participation & future contribution are:

- Mutual inspiration & support at the COS-Conference
- Development & transformation at COS-Creations Seminars
- Creative scientific publishing & reading between and beyond theory and practice
- COS LinkedIn Virtual Community
- And more …

The Friend & Membership fee is € 200,00 + 20 % VAT for 2 years.

Your 2 years COS Friend & Membership includes:

Free access to all Volumes and all Issues of COS online-Journal: www.cos-collective.com

- Conference fee discount of 25 %
- COS-Creations: Special discount of 20 % for one seminar of your choice during the membership period.

Please send your application for membership to office@cos-collective.com

Join COS, a Home for Reflective Hybrids

The future is an unknown garment that invites us to weave our lives into it. How these garments will fit, cover, colour, connect and suit us lies in our (collective) hands. Many garments from the past have become too tight, too grey, too something…and the call for new shapes and textures is acknowledged by many. Yet changing clothes leaves one naked, half dressed in between. Let's connect in this creative, vulnerable space and cut, weave and stitch together.

Our target group is reflective hybrids – leaders, scientists, consultants, and researchers from all over the world who dare to be and act complex. Multilayered topics require multidimensional approaches that are, on the one hand, interdisciplinary and, on the other hand, linked to theory and practice, making the various truths and perspectives mutually useful.

If you feel you are a reflective hybrid you are very welcome to join our COS movement, for instance by:

- Visiting our website: www.cos-collective.com
- Getting in touch with COS-Creations. A space for personal & collective development, transformation and learning. Visit our website: www.cos-collective.com
- Following our COS-Conference online: www.cos-collective.com
- Subscribing to our newsletter: see www.cos-collective.com
- Subscribing to the COS Journal: see www.cos-collective.com
- Ordering single articles from the COS Journal: www.cos-collective.com
- Becoming a member of our LinkedIn group: go to www.linkedin.com and type in "Challenging Organisations and Society.reflective hybrids" or contact Tonnie van der Zouwen: office@cos-collective.com

The Journal with Impact

The Journal "Challenging Organisations and Society . reflective hybrids® (COS)" is the first journal to be dedicated to the rapidly growing requirements of reflective hybrids in our complex 21st-century organisations and society. Its international and multidisciplinary approaches balance theory and practice and show a wide range of perspectives in and between organisations and society.
Being global and diverse in thinking and acting outside the box are the targets for its authors and readers in management, consulting and science.

www.cos-collective.com
ISSN 2225-1774