



Università
Ca' Foscari
Venezia

Corso di Laurea Magistrale

in Economia e Gestione delle Arti
e delle Attività culturali

Tesi di Laurea

The Topicality of Craftsmanship: Technology and Tradition
Together for a New Concept of Craftsmanship

Relatore

Prof. Michele Tamma

Laureanda

Andrea Mariam Corrente

Matricola 871951

Anno Accademico

2019 / 2020

*Al nonno Giorgio,
mia nuova stella*

**THE TOPICALITY OF CRAFTSMANSHIP: TECHNOLOGY AND TRADITION
TOGETHER FOR A NEW CONCEPT OF CRAFTSMANSHIP**

INDEX

INTRODUCTION	4
1. A BRIEF OVERVIEW OF THE CRAFTSMAN'S LITERATURE	
1.1. IT IS TIME TO RETURN TO MANUAL SKILLS. FROM KNOWLEDGE WORKERS TO WORK KNOWLEDGE	8
1.1.1. Introduction	8
1.1.2. The degradation of white-collar work and the satisfactions of manual work	11
1.1.3. Part of a community	14
1.2. THE CRAFTSMAN STARTING FROM SENNETT	16
1.2.1. A craftsman's pride for the new professions and the culture of craftsmanship	16
1.2.2. The divorce between the hand and the head	19
1.2.3. Conclusions	22

2. THE RE-IMAGINATION OF THE PARADIGM OF THE CRAFTSMAN IN A TECHNOLOGICAL AGE

2.1. THE MEANING OF TECHNOLOGY 24

2.1.1. The two faces of technology : an attempt to define 24

2.1.2. Absence of concreteness 27

2.2. CRAFTSMANSHIP EVOLUTION 30

2.2.1. Introduction 30

2.2.2. The Maker Movement and the customization of the manufacture 33

2.3. CRAFTSMANSHIP, NEW GENERATIONS AND CITIES 37

2.3.1. Craftsmanship and new generations: an energy to be enhanced 37

2.3.2. Cities as models of sustainability 39

3. TWITTER TEXT MINING USING R: TWITTER ANALYSIS CONCERNING THE THEME OF CRAFTSMANSHIP

3.1 THEORETICAL FRAMEWORK 42

3.1.1. Text mining: main concepts 42

3.1.2. Goal setting and methods 47

3.2. MINING TWITTER: CASE STUDY	48
3.2.1. Access data, prerequisites and text preprocessing	48
3.2.2. Analysis of the extracted tweets: R programming	51
3.2.3. Conclusions, open issues and future developments	53
 CONCLUSIONS	56
 BIBLIOGRAPHY	59
SITOGRAPHY	64
CONFERENCES	66

INTRODUCTION

“Everything has a purpose, clocks tell you the time, trains take you places (...) Maybe that’s why a broken machine always makes me a little sad, because it isn’t able to do what it was meant to do... Maybe it’s the same with people,” Hugo continued. “If you lose your purpose... it’s like you’re broken”.

Movie Hugo Cabret

This sentence by Hugo Cabret from the beautiful movie by Scorsese *Hugo Cabret* (winner of five Oscar awards) poetically introduces us to the theme of artisan culture. In the movie, two young people (Hugo and Isabella, his adventure mate) who love cinema are discovering the magic of craftsmanship.¹ The main character is an orphaned son of a watchmaker who rediscovers his father's profession: repairing watches.

I discovered the world of craftsmanship thanks to the opportunity I had to take part of an incredible project of the Michelangelo Foundation: *Homo Faber 2018. Crafting a more human future* exhibit. This personal experience is the reason why I chose to focus this thesis project on the new vision of the craftsman, a profession that is faced with recent technological innovations. The modern craftsmen are strongly linked to a set of values typical of the tradition (such as manual skills and knowledge of techniques and materials), and to innovation, two opposites that meet within a figure where the impossible can be possible.

¹ A.GRANELLI, *L’attualità dell’artigianato e la sua “anima digitale”, Quaderni di ricerca sull’artigianato*, (p.99)

For at least fifteen years now we have witnessed a profound re-evaluation of craftsmanship. The most careful scholars have realized that office work is not in fact as gilded as they thought it would be and, above all, that in order to be a good carpenter, a plumber, a mechanic, one requires skills of precision and attention that most of the white-collar workers have completely lost. Craftsmanship has been re-evaluated and re-appreciated after so many years thanks to a cultural and institutional effort that has not yet seen Italy at the forefront. Certainly, our country saw part of an overall reasoning, but many of the reflections that have marked the international debate on the subject have started elsewhere, particularly in the USA. Michelle Obama launched the fashion of vegetable garden at home and in June 2009, in the midst of the economic and financial crisis that harshly hit the services and finance sector economies, and the Financial Times dedicated a long article to the craftsman's work with the title *Why Manual Work Is Making A Comeback*.²

This project starts from the inspiration offered by a brilliant man's story, Matthew B. Crawford, and from his book *Shop Class as Soulcraft: An inquiry into the Value of Work*³. It has a motorbike on the cover (a theme that is also part of the *Homo Faber 2018 space: Workshop Exclusives*), and talks about his intellectual activity, but first and foremost about his activity as a motorcycle manufacturer. Work today tends to look

² <https://www.ft.com/content/5cff7382-5ee2-11de-91ad-00144feabdc0>

³ M. CRAWFORD, *Shop Class As Soulcraft: An Inquiry into the Value of Work*, Penguin, London 2008, trad.it *Il lavoro manuale come medicina dell'anima*, Mondadori, Milano 2010.

alarmingly like factory work, which is why Crawford turned to craftsmanship.

Among the books that have contributed most to the evolution of this debate, we must mention Richard Sennett's volume, *The craftsman*⁴. The merit of the teacher at the London School of Economics was re-proposing a work idea that seemed outdated in a contemporary scenario. For the American sociologist the new craftsman has no nostalgia for the past: he rides modernity and new technologies, perhaps reinterprets ancient traditions, but what sets him apart is the ability to relate theoretical knowledge to practical knowledge, the head with the hands. According to Sennett, the figure of the contemporary craftsman must be identified in those who know how to use digital technologies with mastery, considering quality, innovation and social cooperation as fundamental values.

Starting from Sennett's work on the craftsman's figure and from the literature that feeds this debate, I propose a key for rethinking in an ethical, creative and participatory sense of the role of technology in contemporary society. We imagined a digital that no longer accompanies the individual, but rather puts itself at the service of a productive dimension in which man tends to disappear for the benefit of an artificial intelligence that puts the human figure in a corner, literally excluding it. There has been a collapse of confidence in production technologies: we discovered that "the internet is broken"⁵, it catches the attention of

⁴ R. SENNETT, *The Craftsman*, Yale University Press, London 2008, trad.it. *L'uomo artigiano*, Feltrinelli, Milano 2008.

⁵ <https://www.wired.co.uk/article/is-the-internet-broken-how-to-fix-it>

surfers thanks to fake news, it magnifies unfounded news to capture, the attention of viewers.

The topicality of the craftsmanship takes on growing importance, and this thesis wants to demonstrate it, due to the rapid evolution of technologies. Today we have replaced some *craftsman* figures with new ones. The craftsman's tradition has already shown that it can confront with the challenge of innovation. Today there is much talk of digital craftsmen, but beyond slogans and labels, Sennett's work provides interpretative horizons that are useful for outlining the society of the future, not only contemplating the issues related to the relationship between technology and craftsmanship - certainly fundamental for this essay although not inclusive - , but more generally the issues of a society conceived globally in its ethical and cultural values.

In the last chapter I have tried to give an answer through experimental data through this question: is there a link, and how significant, between the phenomenon of new technologies in the artisan world and there are traces of this on one of the main microblogging platforms in the world that is Twitter? The analyzes did not bring the expected results, but were nevertheless interesting.

This essay therefore focuses on this widespread presence of the craftsman and of his relationship with technology. The phenomenon of returning to the origins that combines artisan know-how and new technologies made available by progress occupies a position of current international interest.

CHAPTER ONE

A BRIEF OVERVIEW OF THE CRAFTSMAN'S LITERATURE

1.1. IT IS TIME TO RETURN TO MANUAL SKILLS. FROM KNOWLEDGE WORKERS TO WORK KNOWLEDGE

1.1.1. Introduction

Unfortunately, I don't have great practical skills, yet the surreal situation that arose when my Nespresso broke made me think. I immediately called the toll-free number. On the other end of the line, a human being reduced to an automaton gives me instructions, with the resigned tone of one who reads a list for the thousandth time. It is a list of obviousness. Checking that the plug is not disconnected is the most sophisticated suggestion. Thirty frustrating minutes on the phone, a spiral of *cretinism* in which we wrapped each other, only serve to reach the conclusion that the device is broken. "Where can I get it fixed?" They wouldn't but they will replace the coffee machine with another one. The idea that around the corner there could be a repairman is ridiculous, even more thinking that I can adjust the mysterious object by myself: a coffee machine. An entire consumerist civilization was built on the death of *homo faber* and they passed it off as a liberation. But this era is about to end.

This thesis has an imposing title: *The Topicality of Craftsmanship: Technology and Tradition Together for a New Concept of Craftsmanship*. To face a reflection of this magnitude, of this breadth, it is not possible not to refer to a path of at least ten years of incessant dialogues, which in the exhibit *Homo Faber 2018. Crafting a More Human Future* finds an important arrival point and which gives the opportunity to reflect in a way (I hope) original not only of what we leave behind but gives me the opportunity to consider what we could imagine in the next ten years.

Craftsmanship has been re-evaluated and re-appreciated after so many years of oblivion thanks to a cultural and institutional effort that has not yet seen Italy as the forefront. Certainly our country saw part of an overall reasoning, but many of the reflections that have characterized the international debate on the subject have started elsewhere. The rediscovery of manual work is born above all in the USA, where many people re-evaluate the value of production and self-production. Michelle Obama launched the fashion of vegetable garden at home and in June 2009, in the midst of the economic and financial crisis that hit the economies specialized in the services and finance sectors with particular hardness, *The Financial Times* dedicates a long article to the craftsman's work with the title *Why Manual Work Is Making A Comeback* (Wheeler Johnson, 2009).⁶

The inspiration to my analysis has its roots from a brilliant man's story, Matthew B. Crawford, and his book *Shop Class as Soulcraft: An inquiry*

⁶ <https://www.ft.com/content/5cff7382-5ee2-11de-91ad-00144feabdc0>

into the Value of Work, translated into Italian in 2010 for Mondadori⁷. Crawford's curriculum vitae resembles that of many other managers of his generation. Crawford held a bachelor's degree in physics from UC Santa Barbara and a Ph.D. in political philosophy from the prestigious Chicago University. In September 2001 he was nominated executive director of a research group at the George C. Marshall Institute.⁸ Crawford was on what most people would think of as the *right track*. After months of depression and dissatisfaction with the position he reached, Crawford decided to abandon his well-paid office job in Washington DC to be a motorcycle mechanic, his most intimate passion. He became owner of an old motorbike repair shop in Richmond, Virginia: the Shockoe Moto.⁹ "His short, passionate book is an effort to show that this doesn't just apply to him: the way we've come to devalue manual competence, he argues, explains why so much modern work feels empty and unfulfilling"¹⁰. According to Bukerman (2010)¹¹ *Shop Class as Soulcraft: An inquiry into the Value of Work* proposes an effective analysis of what today's concepts like *craftsmanship*, *care of the object* and *recognition* mean.

⁷ M. CRAWFORD, *Shop Class As Soulcraft: An Inquiry into the Value of Work*, Penguin, London 2008

⁸ <https://www.nytimes.com/2009/05/29/books/29book.html>

⁹ M. CRAWFORD, *Shop Class As Soulcraft: An Inquiry into the Value of Work*, Penguin, London 2008 (pp.4-5): "The wad of cash in my pants feels different than the check I cashed in my previous job. (...) It may be that I am just not well suited to office work. But in this respect I doubt there is anything unusual about me. I offer my own story here not because I think it is extraordinary, but rather because I suspect it is fairly common."

¹⁰ <https://www.theguardian.com/lifeandstyle/2010/may/08/working-hands-happiness-burkeman>

¹¹ <https://www.theguardian.com/lifeandstyle/2010/may/08/working-hands-happiness-burkeman>

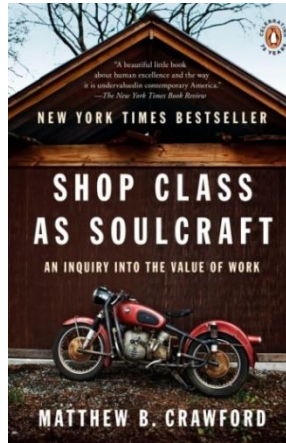


Figure 1.1: Matthew B. Crawford, Shop Class as Soulcraft

1.1.2. The degradation of white-collar work and the satisfactions of manual work

For many years we have imagined Europe, the United States and subsequently the whole world as destined to reflect on a new idea of economy in which the key resource of the competitiveness of companies and people is necessarily knowledge. For a long time, we have associated this idea of knowledge and competitiveness with a series of jobs, those of the *symbolic analysts*, who deal less - if not for nothing - with doing. As Fukuyama (2016)¹² says, “Under this new ideology, everyone must attend college and prepare for life as a *symbolic analyst* or *knowledge worker*, ready to add value through mental rather than physical labor.”¹³ Matthew Crawford should be given credit for breaking this taboo.

¹² <http://doctorpence.blogspot.com/2016/07/friday-bookreview-shop-class-as.html>

¹³ <http://doctorpence.blogspot.com/2016/07/friday-bookreview-shop-class-as.html>

The strength of Crawford's book is related to its ability to reverse consolidated points of view. The well-educated laborer –not so long ago an unimaginable designation – experiences the same transformation as a manual laborer did a century ago. According to Crawford, the postindustrial world is not in fact populated – as gurus like Richard Florida, who has polarized the idea of the *creative class*, would have it – by “bizarre mavericks operating at the bohemian fringe”¹⁴. The truth is that most white-collar office work Crawford argues, consist in abstract routine, processes and systems more alienating than the machine production denounced by Marx. As Fukuyama (2009)¹⁵ highlights, unlike the electrician who knows his work is good when you flip a switch and the lights go on, the average knowledge worker is caught in a *swamp* of evaluations, budget projections and planning meetings.

What ought to be done? Crawford asks for the restoration of shop class and generally for craftsmanship. Craftsmanship in fact means the skill to do something well and essentially for its own sake. The craftsman is a *spirited man* who can combine experience and invention, mind and hand.

This glorification of manual work seems patronizing but for the author's personal biography. Crawford considers his work more stimulating and challenging from the intellectual point of view of many other *knowledge works* he has dealt with.¹⁶ Among the many positions he held during his career, Crawford said that there was a time when he felt the distress of

¹⁴ R. FLORIDA, *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*, Basic Books, New York 2002 (p.6)

¹⁵ <https://www.nytimes.com/2009/06/07/books/review/Fukuyama-t.html>

¹⁶ M. CRAWFORD, *Shop Class As Soulcraft: An Inquiry into the Value of Work*, Penguin, London 2008 (p.5).

the assembly line: that is when, as soon as he graduated, he was hired by Ziff Corporation, where his task was to condense academic papers appeared in scientific journals around the world into short summaries. Employee Crawford was asked to write from twenty-five to thirty abstracts a day (an infinity) on topics ranging from social sciences to genetics that the company then bundled and sold in digital format. The complete reading of the text was not admissible.

As Micelli (2016)¹⁷ explains, work today tends to look alarmingly like factory work as originally designed by Henry Ford, which is why Crawford dedicated himself to craftsmanship.¹⁸ That work left him feeling *exhausted* and weirdly detached: the method that Crawford was called to put into practice consisted in fact in drawing up a summary without necessarily understanding what he was reading, starting from a synthesis proposed by the authors and completing the work thanks to a very rapid reading of some key passages. Later, he became director of a Washington think tank – where, he writes, “I was always tired, and honestly could not see the rationale for being paid at all – what tangible goods or useful services was I providing to anyone? This sense of uselessness was dispiriting. The pay was good, but it truly felt like *compensation*”.¹⁹ “After all that, turning his motorbike hobby into a job felt like a rebirth. It was

¹⁷ S. MICELLI, *Fare è innovare: il nuovo lavoro artigiano*, Il Mulino, Bologna 2016

¹⁸ S. MICELLI, *Fare è innovare: il nuovo lavoro artigiano*, Il Mulino, Bologna 2016 (p.36)

¹⁹ M. CRAWFORD, *Shop Class As Soulcraft: An Inquiry into the Value of Work*, Penguin, London 2008 (pp.4-5).

physical and concrete, with clear criteria of success and failure: the bike was there in front of him, successfully fixed or not.”²⁰

1.1.3. Part of a community

A second reflection has to do with the social dimension of doing. Crawford in his book repeatedly emphasizes the pleasure and importance of being part of a community. Being part of a community helps overcome fatigue when you are tired and is also an inexhaustible source of new knowledge. Motorcycle enthusiasts and other mechanics who do the same job are a constant stimulus to learn by comparing with those who know more and helping those who know less. The new craftsman participates in a community (physical and virtual) of passions and interests and shares what he learns, just as it used to happen in the craftsman shops of the past. Treasuring what Aldo Bonomi says “Widespread capitalism has probably reached its peak. Isolation and localism without long networks lead to marginality”²¹.

Also a decade ago, in 2011 David Gauntlett published a book with a particularly evocative title *Making is connecting*. If we do things it is not to keep them at home, it is not to remain isolated, but to enter into relationship with others. This theme of the social dimension of doing has long been underestimated, we imagined craftsmen locked up in a shop.

²⁰ <https://www.theguardian.com/lifeandstyle/2010/may/08/working-hands-happiness-burkeman>

²¹ “Il capitalismo diffuso è probabilmente giunto al suo picco. Isolamento e localismo senza reti lunghe, portano alla marginalità”.

David Gauntlett examines the place of the 21st century craftsman as he stands in relation to the Internet – most importantly, Web 2.0. He asserts that the Internet presents an unprecedented opportunity to project creativity, build connections with likeminded individuals and share one’s craft. “The motivation and the reward are basically the same thing: to be part of an active community, part of a conversation, and to feel somewhat more connected to people we know. Possibly also—but not necessarily—to come into contact with new people”.²²

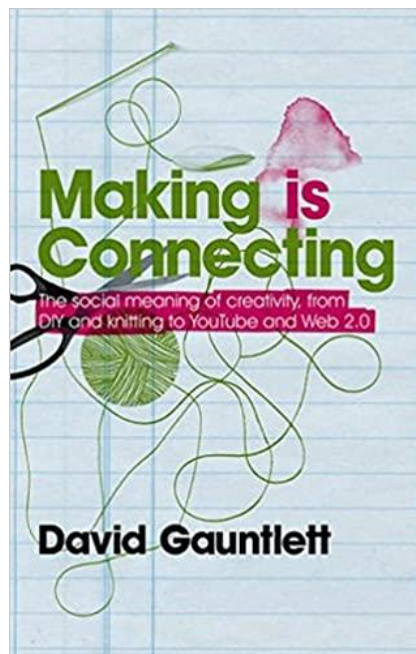


Figure 1.2: David Gauntlett, Making is Connecting

²² D. GAUNTLETT, *Making Is Connecting*, 2011 (p.97).

1.2. THE CRAFTSMAN STARTING FROM SENNETT

1.2.1. A craftsman's pride for the new professions and the culture of craftsmanship

Thomas L. Friedman - journalist of the New York Times, the three-time Pulitzer Prize winner and author of several bestsellers - discusses possible solutions to the crisis in which the United States has fallen after the financial collapse of 2008. Friedman and Mandelbaum (2011)²³ make a one great observation: "Average is officially over". Friedman argues that all that is standard is exceeded,²⁴ Americans will no longer be able to think of working in the average. It is necessary to know how to develop an advantage based on authentic abilities to continually reinvent one's professionalism to follow, accommodate, or in some cases even anticipate market demands. To increase the quality of work - says Friedman - it is important that "American workers rethink themselves as *craftsmen*, those who engaged in the production of goods and services with a distinctive trait that reflected their personal pride before the industrial revolution". Those who instead continue to behave routinely will have to adjust to below-average remuneration. The problem is that, today, with the *beef men* you do not go very far. And this presupposes the discovery or, better, the re-discovery of a more intense relationship

²³ T.L. FRIEDMAN, M. MANDELBAUM, *That Used to be Us. How America Fell Behind in the World It Invented and How We Can Come Back*, Hardcover, 2011

²⁴ T.L. FRIEDMAN, M. MANDELBAUM, "In a hyper- connected world where so many talented non-Americans and smart machines that can do above-average work are now easily available to virtually every employer, what was "average" work ten years ago is below average today, and will be further below average ten years from now"

between the individual, his work and a different social recognition of the trades.

Sociologist Richard Sennett is also convinced that our society needs to rediscover the ethics and qualities of ancient craftsmen: knowledge of tools, perfectionism, ability to forecast the consequences of their work, a thought aimed not only at profit. The American sociologist's writings and, in particular, his elaboration around the concept of work contained in the work *The Craftsman*²⁵ offer a fundamental contribution to start a reflection on the meaning of "doing" in today's knowledge society.

In his essay, Sennett reflects on the characteristics of craftsmanship without looking at the past. It is not a question of reviving the trades of the craftsmanship tradition: Pandora's box has been opened - writes Sennett himself - and we must get over it.

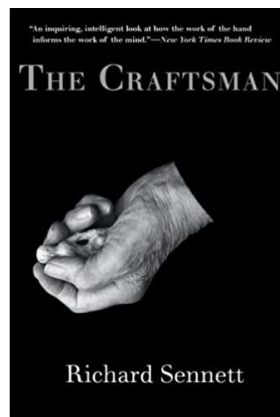


Figure 1.3: Richard Sennett, *The Craftsman*

²⁵ R. SENNETT, *The Craftsman*, Yale University Press, London 2008.

In his work the author does not refer only to the work of traditional craftsmen; while dealing with numerous examples of technical mastery (including the urbanism of the ancient Romans and the workshop of the Stradivari violin maker²⁶), Sennett looks at craftsmanship in a broader sense. Sennett does not stop at potters making mugs or Moroccan leather workers, but sees craftsmanship as an attitude that can characterize various aspects of the daily life of all of us, would it be repairing the sink or raising a child.²⁷ The carpenter, the technical operator and the orchestra director are all artisans, in the sense that *they care about the job well done for themselves*. The craftsman is the representative figure of a specific human condition: that of putting personal commitment into the things that are done. This allows Sennett to consider as equal the master carpenter - iconic representation of the good craftsman of the past - and the Linux programmer or nurse as craftsmen. Harper's (1987)²⁸ observes, "If you rush through things you can't enjoy them. And it's a challenge—no job is the same. If you had a thousand jobs in a year, not two of the thousand jobs would be the same. Even the ones that are supposed to be the same aren't. Things are broken or worn in different ways—they each have their own characteristics".²⁹

So the working hypothesis of Sennett's book is not so much that the work must or will mechanically coincide with the historical-social figure of the

²⁶ R. SENNETT, *The Craftsman*, Yale University Press, London 2008 (p.19)

²⁷ R. SENNETT, *The Craftsman*, Yale University Press, London 2008 (p.28)

²⁸ D. HARPER, *Working Knowledge: Skill and Community in a Small Shop*. Chicago: University of Chicago Press, 1987 (pp. 145-146)

²⁹ D. HARPER, *Working Knowledge: Skill and Community in a Small Shop*. Chicago: University of Chicago Press, 1987 (p.169)

craftsman, but that it must have something to do with the artisan knowledge that can be condensed into a very simple formula : take care of what you do. In Italy our language, however, does not suggest a necessary coincidence between craftsmanship and work well done. *Artigianale* can mark items of quality done with care by professionals, but it can be used to describe something raw and primitive. The *homemade* bomb is usually opposed by the *scientific* precision typical of those bombs that owe their effectiveness to the use of the most advanced technologies. When we talk about *artisanal* ice cream, we indicate a quality ice cream; with this expression, however, we refer to a figure of craftsman more committed to safeguarding tradition than creating innovative flavors. As Andrea Granelli points out, also the expression pictorial mannerism (and *manner*) - derogatory that considers the work without inventiveness, only imitative - is etymologically linked to *manier*, which in ancient French means that it is done with the hands (and therefore without head).³⁰ To find a strong link between craftsmanship and work well done, our vocabulary proposes terms such as *maestro d'arte* or *maestria artigiana*.

1.2.2. The divorce between the hand and the head

As Rajala (2008)³¹ highlights in *The New York Times*, “The hand is the window on to the mind,” Immanuel Kant wrote, and Sennett asks that we

³⁰ A. GRANELLI, *L'attualità dell'artigianato e la sua "anima digitale"*, in *Quaderni dell'artigianato* (p.113).

³¹ <https://www.nytimes.com/2008/04/06/books/review/Hyde-t.html>

not pass through that window until we have adequately studied the hand."³²

The characteristic that unites the method of most of craftsmen is the fusion between thought and technical skill. In fact, blacksmiths, goldsmiths and luthiers combine material knowledge and manual ability: mind and hand work by strengthening themselves: one teaches the other and vice versa. Hannah Arendt, the great political theorist, is convinced that "people who make things don't understand what they are doing".³³ Her standpoint – developed in *The Human Condition*³⁴ - was born shortly after the missile crisis in Cuba, when the world was on the brink of atomic war. The story had shaken her, as it had shaken everyone, but had also confirmed her deepest conviction: Hannah Arendt made a distinction between what she referred to as *animal laborans* and *homo faber*.³⁵ *Animal laborans* asks how, *homo faber* asks why. Sennett, questioning the theoretical contribution of his "teacher" who made a distinction between *doing* and *thinking*, opposes and rejects this dichotomy.³⁶ So what is wrong with the Arendtian distinction between *homo faber* and *animal laborans*? That of Hannah Arendt is a very *Greek* notion, referring to its culture and philosophical thought. The idea was that not being moved by the urgency of working for the survival was considered essential to the life of the mind and the ability to reason. It should be considered that Greek society was slave owning, and this separation was

³² <https://www.nytimes.com/2008/04/06/books/review/Hyde-t.html>

³³ R. SENNETT, (p.12)

³⁴ H. ARENDT, *The Human Condition*, University of Chicago Press, Chicago, 1958.

³⁵ H. ARENDT, *The Human Condition*, University of Chicago Press, Chicago, 1958 (p.22)

³⁶ R. SENNETT, *The Craftsman*, Yale University Press, London 2008 (p.17)

made possible in large part to delegation of labor to slaves. Greek thought went so far as to imply that the work of *animal laborans* actually rendered workers physically unable to engage an intellectual discussion or thought beyond the work of making.³⁷ Richard Sennett disagrees with Arendt's division into *animal laborans* and *homo faber*, and certainly with the Greek notion that the worker is incapable of abstract thought³⁸.

Richard Sennett proposes a viewpoint that differs from that of his teacher and seeks to balance these opposite concepts. The craftsman combines theoretical knowledge and practical ability. From this point of view, the example of the (good) woodworker is significant: he can recognize the structure that identifies each piece of wood through observation and based on this decides which technique or material to use to make highlight the veins better. While observing, recognizing and deciding, the woodworker simultaneously processes a multiplicity of information of different nature.

As Dasgupta (1996)³⁹ points out, an enlightened craftsman is someone who enjoys doing creative work, develops an *intelligent hand* and a *playful mind*. He falls in love with the materials and becomes so fluent in using his tools that he feels at one with them.⁴⁰

³⁷ ARISTOTELE, *The Metaphysics*. English translation H.TREDENNICK, Cambridge: Harvard Loeb, 1933: "We consider that the architects (...) are more estimable and know more and are wiser than the artisans, because they know the reasons of the things that are done".

³⁸ R. SENNETT, *The Craftsman*, Yale University Press, London 2008 (p.24)

³⁹ S. DASGUPTA, *Technology and Creativity*. New York: Oxford University Press, 1996

⁴⁰ S. DASGUPTA, *Technology and Creativity*. New York: Oxford University Press, 1996

But it is not just manual labor that benefits from the synergy between theory and practice. Because those who know how to govern themselves and dose autonomy and respect for the rules, says Sennett, will not only be able to build a wonderful violin, a watch with a perfect mechanism or a bridge capable of challenging the millennia, but it will also be a rightful citizen.⁴¹ As Hyde (2008)⁴² explains in an article of *The New York Times*, "This line of thought depends, among other things, upon the Enlightenment assumption that craft abilities are innate and widely distributed, and that, when rightly stimulated and trained, they allow craftsmen to become knowledgeable public persons."⁴³

1.2.3 Conclusions

The Craftsman by the American sociologist Richard Sennett threw a stone into the prejudice of advanced capitalism. It is a book that asks some crucial questions: the speed of work is really the ingredient of success? Is mass production considered the universal remedy? Can abstract knowledge be separated from the knowledge of doing? "The mistake of this economic system was based on a short-term vision" thundered Sennett in an interview with *Il Sole 24 Ore* in January 2008, when success instead requires time and *craftsmanship*, it belongs to the one who carries out work with commitment and satisfaction in a workmanlike manner and who is therefore driven to continually improve.

⁴¹ <https://www.encanta.it/luomo-artigiano/>

⁴² <https://www.nytimes.com/2008/04/06/books/review/Hyde-t.html>

⁴³ <https://www.nytimes.com/2008/04/06/books/review/Hyde-t.html>

The figure of the craftsman take us back to the *good old days*, to the moldy basements of the pre-industrial era. But for Sennett the new craftsman had no nostalgia for the past: he rode modernity and new technologies, perhaps reinterpreted ancient traditions, but what distinguished him was the ability to relate theoretical knowledge with practical knowledge, head with hands.

The whole artisan world, especially in Europe, brushed up on old pride. But few have understood that Sennett's book gave visibility to an epochal change that had long been incubating in the western world, to a systemic crisis, revealed by a persistent economic crisis and apparently with no way out, which posed disturbing questions. Does it make sense to destroy the real economy? Does it make sense to produce limitless standard objects of low value and doubtful utility when we are dangerously depleting natural resources? So, what is the way?

CHAPTER TWO

THE RE-IMAGINATION OF THE PARADIGM OF THE CRAFTSMAN IN A TECHNOLOGICAL AGE

*"You must either make a tool of the creature, or a man of him. You
cannot make both."*

John Ruskin

2.1. THE MEANING OF TECHNOLOGY

2.1.1. The two faces of technology: an attempt to define

Given the widespread and increasingly invasive spread of technologies, today there is a great interest in the analysis of their ethics as technology today touches everyone's life. What is technology? The term technology is a compound word deriving from the Greek *tékhne-logia*, that is literally "systematic treatise on an art". As Angier (2010)⁴⁴ points out, there are considerable difficulties in translating the Greek *téchnē* into an equivalent English term. *Téchnē* describes a wider range of activities than its English counterparts. In this sense, *technique* (a term often used as a synonym) was neither different from art, nor from

⁴⁴ T. ANGIER, *Technē in Aristotle's Ethics: Crafting the Moral Life*, London: Continuum, 2010.

science, nor from any procedure or operation capable of achieving any effect, and its field extended over all activities.

With the word *technology*⁴⁵ we indicate, more than the set of single objects, the development of tools or machines with which a problem has been solved or an aspect of our daily life has been improved and therefore the logical, cultural and value organization of the actions with which man modifies the structures and material systems (even his own body), to favor his *settlement* and *sustenance*.

In this latter broad sense, technology has been expressing, since the dawn of humanity, man's desire to free himself from the fear of not being able to survive in a world where the law of the strongest seems to penalize him against other creatures more endowed with physical instruments or an environment in front of which he feels helpless and therefore sees as hostile. A technology, therefore, is summoned to remedy this "original sin" and to allow life out of the "lost paradise". It is an expression of the will and determination to survive. In this sense, even the development of the very first tools in prehistory, from the first bone needles to sew to the first clay pots, represents technological progress.

The product of technology is in fact the demonstration of the great level of knowledge of man, but solved a problem, the same solution found triggers new and more complex problems. This path never ends, it has no definitive, fully satisfying goal. It might seem a sad story, but perhaps it

⁴⁵ <https://en.wikipedia.org/wiki/Technology>

can be told differently: perhaps, as imperfect as we are compared to new technologies, we can learn something positive about our humanity⁴⁶.

In the Age of the Enlightenment therefore machines were seen as benevolent toys. In 1738, in Paris, one could admire the anthropomorphic automaton built by Jacques de Vaucanson, a mechanical inventor. His Flautist was a one hundred sixty-five centimeters automaton that played the flute.⁴⁷ The wonder that that mechanical prodigy aroused is well summed up by Voltaire, who called Vaucanson "the rival of Prometheus"⁴⁸.

One problem is that most public discourse about technology tends to polarize: those who believe technology will liberate us versus those who see it as a new oppressor. The generation of Hannah Arendt⁴⁹ could express in numbers the fear of self-destruction, in numbers so enormous to give us vertigo. In the 80s and 90s, my parents' generation was nourished by futuristic scenarios in which man would invariably be found at the center of control or conflict dynamics linked to the unrestrained growth of the role of machines in the new society.

But today there is the certainty that many promises made by technology have not occurred. We then begin to think that technology is "out of hand" (and the figure of Frankenstein leaves the *topoi* of literature to become contemporary nightmares and highly topical narrative subjects).

⁴⁶ R. SENNET, *The Craftsman*, Yale University Press, London 2008 (p.85)

⁴⁷ More precise and strictly historical information is provided by G. WOOD, *Living Dolls*, Faber and Faber, London 2002 (pp. 21-24)

⁴⁸ R. SENNETT, *The Craftsman*, Yale University Press, London 2008 (p.90)

⁴⁹ H. ARENDT, *The Human Condition*, University of Chicago Press, Chicago, 1958.

In the daily Italian newspaper *Repubblica*, Umberto Galimberti wrote that man is now powerless against technology; perhaps it is an exaggeration, but novelty has always generated fear. We can smile at the fact that the first train travelers had mixed feelings about a new means of transport: from excitement to real terror, due to the deafening noise, the vibrations and the landscape that *escapes*. Two thousand years ago - therefore- Socrates claimed that books could have destroyed people's reasoning ability: with a book there is no debate, the written word cannot be countered. There is therefore a "dark side" of technological innovation. The solution? We need to raise public awareness on these problems: not the denial of technology, but the formation of a more varied personal awareness on its use.

2.1.2. Absence of concreteness

As a French movie said a few years ago⁵⁰, "life is (not) a long quiet river" and especially in recent years we imagined a digital that no longer accompanied the individual, but rather put itself at the service of a productive dimension in which man tends to disappear for the benefit of an artificial intelligence that puts the human figure even in a corner, literally excluding him. There has been not only a collapse of trust in production technologies, but also in the tools that seemed to be friends and the natural companion for telling a product, such as for example the Internet and social networks. But we have found that the Internet is

⁵⁰ *La vie est un long fleuve tranquille*, France, 1988

broken⁵¹, it has become almost impossible to extract meanings from contemporary media society, because we are not able to say how much of what we are told is raw information, not manipulated, how much of it is propaganda and even how much of it is true.

In short, we have understood in recent years that the scenario we are confronted with is not a long, quiet river, it is something much more complicated and the future that awaits us is a future that we are called upon to build.

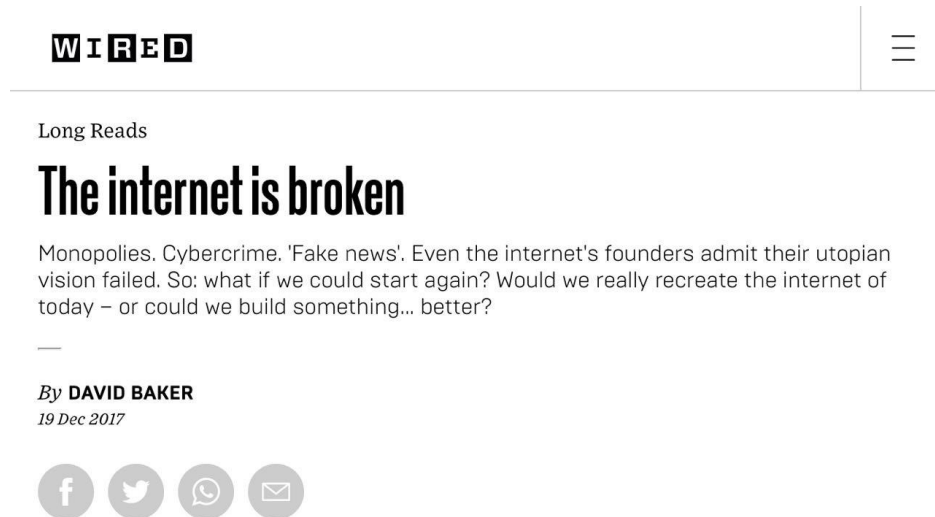


Figure 2.1 : David Baker, The Internet Is Broken

Source: *Wired*

⁵¹ <https://www.wired.co.uk/article/is-the-internet-broken-how-to-fix-it>
<https://www.technologyreview.com/2006/02/15/229667/the-internet-is-broken/>

We can understand the essence of the digital revolution with a sequence of three games. The sequence is: table football, pinball and Space Invaders. Studying this sequence, trying to feel it physically, returning to play those three games, in our mind, one after the other, one feels that, at each step, something melts, that everything becomes more abstract, light, liquid, artificial, fast, synthetic. A mutation.⁵² They are only three games, but so many things migrate in the path from the oldest to the newest⁵³.

In men a problem has arisen which is rooted in the absence of concreteness, thickness, smells, sounds that are not electronic.

The Irish writer John Waters explains in an article that appeared in the monthly *Tracce* in May 2017⁵⁴: “for our grandparents, the senses were fundamental not only for their daily physical involvement with things, but also for their thoughts: what they thought and they knew it came from their way of being in reality, from what they touched, they saw (...). Instead, we turned away from reality; our knowledge comes to us from the third or fourth hand. Technology gives us the illusion of manipulating reality, but it is an increasingly remote manipulation, in which the senses

⁵² A. BARICCO, *The Game*, Einaudi, Torino 2018 (pp.13-14): “Nel calciobalilla tu senti i colpi nel palmo della mano, i rumori sono naturali, provengono dalla meccanica delle cose, tutto è molto reale, la pallina esiste davvero, tu fisicamente fatichi, ti muovi, sudi; nel flipper qualcosa cambia, il gioco è messo sotto vetro, i suoni sono per lo più riprodotti, elettrici, la distanza tra te e la pallina aumenta, tutto viene concentrato in due tasti, che della pallina danno un lontano sentore. Il gesto delle mani, che nel calciobalilla poteva scegliere tra infinite velocità e sfumature di accosto, qui si riassume nel lavoro di due dita che conservano ancora un certo numero di opzioni, ma piuttosto limitato, e in fondo riservato ai giocatori più esperti” (pp.13-14)

⁵³ A. BARICCO, (pp. 37-40)

⁵⁴ J. WATER, *I sensi delle cose*, in *Tracce*, May 2017

are rapidly atrophying." Yes, it is not a question of nostalgia, it is the feeling that we have lost a type of relationship with reality that our grandparents had, and we and our parents did not.

This brings us back to the reading of the American Matthew Crawford, philosopher and motorcycle mechanic.⁵⁵ Crawford speaks brilliantly of unity with the reality that becomes possible not only in adjusting his bike, but also in riding it. The skill with which you take a curve, for example, depends on your knowledge of how the bike behaves at high speed, and how this knowledge permeates your body. Crawford also looks at what impact the Great Ideas of the Enlightenment can have, turning into cultural reflections. Being a motorcycle mechanic, a carpenter or a Murano glassmaker is not just a way of thinking: it is a way of being.

2.2. CRAFTSMANSHIP EVOLUTION

2.2.1. Introduction

In April 2012, the weekly *The Economist*⁵⁶, in the *manufacturing* section, dedicated an article to the theme of the third industrial revolution. The connected image, which is the cover of the printed version, was revolutionary. Apparently, the illustration that opened the special article

⁵⁵ J. WATER, *I sensi delle cose*, in *Tracce*, May 2017

⁵⁶ www.economist.com/node/21553017, *The Third Industrial Revolution*, *The Economist*, 2012, April 21

represented a man seated at a desk, struggling with a keyboard connected to a somewhat strange machine, a sort of small portable factory capable of producing machines, hammers and airplanes on the same line. Read in economic terms the cover suggested, quite explicitly, the idea of a technological revolution capable of freeing production processes from the repetitive constraints that mark the logics of mass production, reconciling - finally - manufacturing and the environment.⁵⁷



Figure 3.1 The Third Industrial Revolution

Source: The Economist

⁵⁷ S. MICELLI, *Fare è innovare: il nuovo lavoro artigiano*, Il Mulino, Bologna 2016 (pp.42-43)

Technology has been accused, according to many, of various sins: it has made human relationships sterile, it has automated the work depriving it, very often, of every creativity and that has meant that many professions disappeared into oblivion.⁵⁸ “In the nineteenth century the craftsman appeared less and less a mediator and more and more an enemy of the machine”.⁵⁹ In 1851 in Hyde Park, Victorian England celebrates itself and its position as an industrial leader. While it is easy to imagine the enthusiastic welcome given to the London Exhibition, two Victorian makers and thinkers, John Ruskin (the great romantic analyst of craftsmanship)⁶⁰ and William Morris⁶¹, criticize the results attacking standardization. They organized the Arts and Crafts Movement, born from the worries for the exhausting rhythms to which the workers were subjected in the factory and for the dehumanizing effects of mechanized work provoked by the industrial revolution. The movement posed the problem of safeguarding artisan work as evidence of an authenticity that serial production had condemned to death. The machine opposed the perfect aesthetics of technical reproduction to the authenticity of the unique piece, of the defects and irregularities of the handmade product.⁶² Plagued by over-politicization and technological paranoia, the Arts and Crafts Movement failed in its intent and began fragmenting at

⁵⁸ S.CACIOPPO, J.P. CAPITANIO, J.T. CACIOPPO, *Toward a Neurology of Loneliness*, 2014, September 15

⁵⁹ R. SENNETT, (p.88)

⁶⁰ John Ruskin (1819-1900) was a prominent critic of the Victorian era, a draftsman and painter, an eminent thinker and philanthropist. His writings helped inspire the Arts and Crafts Movement

⁶¹ William Morris (1834-1896) was an artist, writer, textile designer associated with the Pre-Raphaelite Brotherhood and the Arts and Crafts Movement.

⁶² R.SENNETT, *The Craftsman*, Yale University Press, London 2008 (p.88)

the beginning of the 20th century, standing in diametric opposition to the crisis understood in 1911 by FW Taylor, for whom the obstinacy of skilled craftsmen stood in the way of progress. 63 years later, Henry Braverman was to argue that the victory of Tayloristic scientific management within industrial organization threatened to eliminate the exercise of skill from the lives of workers.

What then could still seem an intellectual hypothesis or a visionary challenge, has now become a reality: the new techniques (and new technologies) have radically changed the perspectives of craftsmanship, introducing Digital Fabrication (3D printing, laser cut, etc.) and open source projects (Arduino, etc.). In 2003, in a memorable exhibition at the Centre Pompidou – *Architectures nonstandard* - Frédéric Migayrou opened a window on the extraordinary potential of this revolution that opened up to what we now commonly call *digital mass customization*. Can digital manufacturing tools be seen as an affirmation, a victory of machines over craftsmanship? No, the killer app of the era of digital manufacturing is personalized production to the extreme, a product for a specific person. The craftsman is therefore the winner, and craftsman today can be anyone with a good idea and the stubbornness to make it happen.

2.2.2. The Maker Movement and the customization of the manufacture

Homo Faber 2018 exhibit comes at a time when what has already been dubbed *The Maker Movement*, a true Community of Creators (the

artigiani del digitale as they are often called in Italy) is already a cultural force that is explored in books and exhibitions. So Matthew Crawford is not an individual case. According to the philosopher who abandoned a white collar job to work as a motorcycle mechanic, we were convinced that the so-called *concept works* are more rewarding⁶³. Understanding how machines work makes people autonomous and individually free. Of course, those who do it themselves can make mistakes, but the curiosity that springs from trying to understand and decipher the material world that exists makes us reappropriate it. According to Mark Frauenfelder, the editor-in-chief of *Make* magazine, there must be a process of liberation from a life of simple passive consumers who are enchanted by marketing and communication techniques of companies.⁶⁴ Making something yourself is not simply a hobby: doing things makes us aware because it is a way to have an active experience with the material dimension.

The advent of the Internet allowed the Makers Movements to create online communities and led to the offshoring of services⁶⁵: it is indeed possible to share X-ray consultations with doctors from around the world or have services of surveillance even hundreds of miles away.

⁶³ M. CRAWFORD, *Shop Class As Soulcraft: An Inquiry into the Value of Work*, Penguin, London 2008, trad.it *Il lavoro manuale come medicina dell'anima*, Mondadori, Milano 2010.

⁶⁴ M. FRAUENFELDER, *Made by Hand*, Penguin Group USA, 2010 (p.30).

⁶⁵ A. S. BLINDER, *Offshoring: The next Industrial Revolution?* In *Foreign Affairs*, March – April 2006; <http://www.foreignaffairs.com/articles/61514/alan-s-blinder/offshoring-the-nextindustrial-revolution>

The article that marked the debate –also mentioned in Stefano Micelli’s book⁶⁶- was published in 2010 by Chris Anderson, the then director of the American magazine *Wired*. The title was curious: *In the Next Industrial Revolution, Atoms are the New Bits*.⁶⁷ The important message that Anderson communicated in the text is that, like the internet has revolutionized and democratized publications, music and communications, now new tools and new technologies are revolutionizing and democratizing manufacturing, the tangible world, greatly expanding the number of participants in the production. Anyone with a good idea and some knowledge of the subject can design their own object on the computer and produce it thanks to a 3D printer, a laser cutter, a numerically controlled machine, tools that, starting from the digital file, create the product. In his article, Chris Anderson claims that the next industrial revolution will be headed by small companies that will have the ability to customize products. The Web will allow them to operate internationally by using technologies and forms of distribution that will have no spatial and temporal borders. The relationship with the customer will also be more direct and interactive, and the consumer will not only be the simple receiver of offers but will participate actively to the production chain thus conditioning the final product.

⁶⁶ S. MICELLI, *Futuro Artigiano. L’innovazione nelle mani degli italiani*, Marsilio Editore, Venezia 2011.

⁶⁷ *In the Next Industrial Revolution, Atoms are the new bits*, www.wired.com/magazine/2010/01/ff_newrevolution/



In the Next Industrial Revolution, Atoms Are the New Bits



Figure 3.2: Chris Anderson, In the Next Industrial Revolution, Atoms Are the New Bits

Source: Wired

In conclusion, a nice article by *The Guardian* recently highlighted the possibility that “Craft has the power to save us all – a wooden spoon at a time”⁶⁸. There are two aspects that should be put under scrutiny: first of all, unfortunately, wooden spoons will not save our economy; secondly, the role of craftsmanship is often relegated to be a hobby (this is the categorization of the news).

⁶⁸ <https://www.theguardian.com/commentisfree/2018/sep/02/craft-mindfulness-welldoing-creative-industry>



Figure 3.3 : Rhik Samadder, Craft has the power to save us all – a wooden spoon at a time

Source: The Guardian

2.3. CRAFTSMANSHIP, NEW GENERATIONS AND CITIES

2.3.1. Craftsmanship and new generations: an energy to be enhanced

Gilberto Luppi⁶⁹ argues that the family is leading young people to look at craftsmanship with some diffidence, and that the school system tends to send negative messages.⁷⁰ "My opinion is that in our education system professional schools have always been neglected and considered a bit of a parking lot for young people who were unable to attend high schools and universities"⁷¹, underlines Marco Accornero, secretary general of the

⁶⁹ President of Lapam - Confartigianato Modena- Reggio Emilia

⁷⁰ https://www.repubblica.it/economia/rapporti/osserva-italia/le storie/2017/02/08/news/l_allarme_degli_orafi_i_giovani_non_vogliono_fare_gli_artigiani-157832222/

⁷¹ "La mia opinione è che nel nostro sistema educativo le scuole professionali siano sempre state trascurate e considerate un po' un parcheggio per i giovani che non riuscivano a frequentare i licei e le università"

Union of Craftsmen of the Province of Milan. The opposite of what happens in Germany, which has an enviable training system for craftsmen and where experts earn the title of "masters"⁷².

Robert Schwartz was a great promoter of the technical education of the United States. In his report *The Pathways to Prosperity*, he made two things abundantly clear: one is that USA has failed to provide most of young people with the preparation they need to be successful, and two, that failure comes with perilous economic and social consequences. I underline this report because it focuses on Switzerland as the model to refer to for the technical educations. The foundation that promoted *Homo Faber 2018. Crafting a More Human Future* is a Swiss foundation and perhaps it is no coincidence that this relationship points to this country as a model, in particular for the construction of human capital up to the challenges that await us.

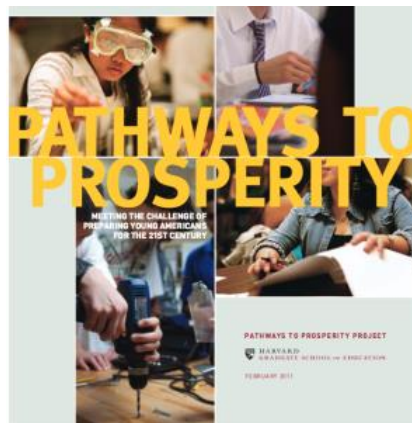


Figure 3.4: Robert Schwartz, *The Pathways to Prosperity*

⁷² <https://www.avvenire.it/economia/pagine/artigiani>

Times have changed. In particular, the entire training and education system, the Italian schools and universities have proved unable to deal with reality and have stiffened in defense of courses of study organized according to obsolete methods and perspectives. Traditional professions (the lawyer, architect and teacher), which until a few decades ago allowed economic security and often a springboard for social ascent, now show a saturation that is difficult to change in the future.⁷³ The economic crisis and the obstacles to undertake activities in the context of university studies carried out has created a difficult situation that could in fact turn into an opportunity.

2.3.2. Cities as models of sustainability

I conclude this thesis with a theme that concerns Italy and Europe in general, and it was at the center of *Homo Faber 2018. Crafting a More Human Future*. Let's take as an example Brooklyn Navy Shipyards: they are the former military shipyards of New York, once warships were made here, now this entire portion of New York has become the capital of new craftsmanship. The project to relaunch many European cities passes through settlements and production logics that are at the center of the exhibition. We cannot continue to buy objects produced elsewhere (at low cost) and to produce objects of which we do not see the recipient. It is no coincidence that people like Dale Dougherty, founder of the *Maker*

⁷³ S. MICELLI, *Futuro artigiano – L'innovazione nelle mani degli italiani*, Edizioni Marsilio Editore, Venezia 2012.

Faire, and Richard Sennett have dedicated themselves to the theme of the city in the last years of their research.



Figure 3.5: Brooklyn Navy Shipyards

The theme of the FabLabs fits into this discourse. FabLab (Fabrication Laboratories) are not only small workshops where low-cost prototypes or 3D statuettes are made. Aiming for a more sustainable future, the FabLab in Barcelona originated the concept and movement of the FabCities, a global network of cities capable of producing locally. The network was born in Barcelona in 2014, thanks to an initiative of the municipal administration that asked itself: would it be possible to produce 50% of everything the city needs in the city? The FabLab answered this call.

It means rethinking our way of living, consuming, moving beyond producing. If we want to imagine a company that compares itself in the difference and that imagines to re-establish original ties through a work idea that sees the artefacts at the center of a dialogue, we need this type of work in our everyday life.

CHAPTER THREE

TWITTER TEXT MINING USING R: TWITTER ANALYSIS CONCERNING THE THEME OF CRAFTS

3.1. THEORETICAL FRAMEWORK

3.1.1 Text mining: main concepts

The Internet has brought a real overthrow in our life: today we undoubtedly live in a digital world. As Kontopolous, Berberidis, Dergiades and Bassiliades (2013)⁷⁴ explain the emergence of Web 2.0 has drastically altered the way users perceive the Internet, by improving information sharing and collaboration.⁷⁵ This has created a fertile ground for the development of *social networks* (Facebook, MySpace), real showcases where you can talk about yourself and *listen* to what others have to say. What essentially characterizes them, rather than the ability to promote further relationships, is that they enable users to articulate and make their social networks visible⁷⁶. It can therefore be seen that social networks move on different levels: on the one hand they invest in aspects of personal identity on the net and the whole system of self-relationships with others, on the other they modify the public sphere,

⁷⁴ E. KONTOPOLOUS, C. BERBERIDIS, T. DERGIADES, N. BASSILIADES, *Ontology-based sentiment analysis of Twitter posts*, 2013.

⁷⁵ D.J. SKIBA, *Web 2.0: Next Great Thing or Just marketing hype?*, 2006.

⁷⁶ *Journal of Computer Mediated Communication*,
<https://onlinelibrary.wiley.com/journal/10836101>

lending itself to multiple uses such as political communication, information or marketing. Parallel to social networks is the development of *microblogging*, web based services that offer the possibility to publish small content in the form of text messages, but also images, videos, quotes, notes.

As Titter and Fuchs (2014) explain⁷⁷, this combination of sharing platforms and content generated from below has stimulated web users to interface with each other with increasing frequency, with the aim of exchanging content of textual nature (posts, blogs, messages) and multimedia (photos, video). Users of social platforms such as Facebook, Twitter, Instagram and Youtube, discuss a multitude of topics, from sports to music, reaching everything that arouses their interest, including politics⁷⁸. Researchers and entrepreneurs attempted to exploit this huge amount of data for a myriad purposes, including: the monitoring of epidemics (Lampos and Cristianini, 2012⁷⁹) and, more generally, public health (Del Vigna, Petrocchi, Tommasi, Zavattari, Tesconi, 2016⁸⁰), the management of emergency situations (Avvenuti, Del Vigna, Cresci,

⁷⁷ D.TRITTER, C.FUCHS, *Social media, politics and the state: protests, revolutions, riots, crime and policing in the age of Facebook, Twitter and Youtube* (vol.16), Routledge, 2014.

⁷⁸ D.TRITTER, C.FUCHS, *Social media, politics and the state: protests, revolutions, riots, crime and policing in the age of Facebook, Twitter and Youtube* (vol.16), Routledge, 2014.

⁷⁹ V.LAMPOS, N.CRISTIANINI, *Nowcasting events from the social web with statistical learning*. *ACM Transactions on Intelligent Systems and Technology*, 2012.

⁸⁰ F.DEL VIGNA, M. PETROCCHI, A.TOMMASI, C. ZAVATTARI, M.TESCONI, *Semi-supervised knowledge extraction for detection of drugs and their effects*. In 2016 8th International Conference on Social Informatics (2016)

Marchetti, Tesconi, 2015⁸¹), the fight against crime (Yar, 2012⁸²), marketing (Tuten and Solomon, 2014⁸³) and many others. Social data have also aroused considerable interest for political and sociological analyzes.

The resulting emerging fields are *opinion mining* and *sentiment analysis*. Although the definitions of opinion and sentiment are linguistically very different from each other, the two fields are usually combined under the same umbrella or even used as synonyms. Both fields use text mining, a technique that uses Natural Language Processing (NLP) techniques to transform the free, unstructured text of documents/databases into structured and normalized data. Text is everywhere: from newspaper articles to academic papers, from online forums to emails, from content in blogs to those in social media.

Research in the field of sentiment analysis and opinion mining has undergone a sudden acceleration in just a few years. Liu and Zhang (2012)⁸⁴ offer an extended overview of all techniques for the detection of opinions and feelings within text documents. In particular, the work focuses on the various natural language processing processes, concluding with an analysis of the procedures related to spam detection. Jindal and

⁸¹ M. AVVENUTI, F. DEL VIGNA, S. CRESCI, A. MARCHETTI, M. TESCONI, *Pulling information from social media in the aftermath of unpredictable disasters*. In 2015 IEEE 2nd International Conference on Information and

⁸² M. YAR, *E-Crime 2.0: the criminological landscape of new social media*. Information & Communications Technology Law, 2012.

⁸³ T.L. TUTEN, M.R. SOLOMON, *Social media marketing*, Sage (2014).

⁸⁴ B. LIU, L. ZHANG, *A survey of opinion mining and sentiment analysis*. In "Mining Text Data", Springer, 2012 (pp.415-463).

Liu (2008)⁸⁵ warn us about the spam problem. In the first lines of the article we read: “there is no quality control, anyone can write anything on the Web”. In the same paper, a case study relating to a set of reviews from Amazon⁸⁶ is illustrated, on which the authors try to determine which are true and which are false (*spam detection*). Finally, Pang and Lee (2002)⁸⁷ take in exam a set of film reviews; the authors perform *Opinion Mining* experiments using *Machine Learning* techniques. Fundamental to this research were the projects of Datalytics⁸⁸, which deal with politics⁸⁹, but also with the the World Cup⁹⁰.

Twitter, the most online microblogging service, enables its users to send and receive text-based post, called *tweets*, consisting of up to 280 characters⁹¹. The strict character limit od tweets forces users to be concise and eventually more expressive than with social networks and blogs. Twitter has always been characterized as the most immediate social media: tweets represent the broadest cross-section of society at an international level. The technique used in this last chapter investigates the relationships between the words in the tweets, using text mining, linguistic/mathematical technology for the study of a huge amount of

⁸⁵ N. JINDAL, B.LIU, *Opinion Spam and Analysis*. In Proceedings of the International Conference on Web Search and Data Mining, 2008 (pp.219-230).

⁸⁶ <https://www.amazon.it/>

⁸⁷ B.PANG, L.LEE, *Thumbs up? Sentiment Classification using Machine Learning*. In Proceeding of the ACL-02 conference on Empirical methods in natural language processing, 2002 (pp.79-86).

⁸⁸ <https://www.datalytics.it/>

⁸⁹ <https://www.datalytics.it/elezioni-europee-twitter/>

⁹⁰ <https://www.datalytics.it/mondiali-2014-azzurri-twitter/>

⁹¹ <https://en.wikipedia.org/wiki/Twitter>

texts. As Gupta and Leahl explains in their paper (2009)⁹², its peculiarity lies in the fact that it can extract unknown, hidden information.

Many researchers works on the field of opinion mining with social networks have been published. Maynard and Funk (2011)⁹³ the authors try to determine the political orientation of Twitter users in the period prior to the 2010 British elections; while Go, Bhayani and Huang (2009)⁹⁴ try to determine the opinion expressed by the tweets using supervised learning algorithms associated with the detection of emoticons.

The aim of the chapter is to introduce the concept of Twitter text mining. The chapter is structured in two main parts:

- Approach to the problem:
 - Description of the objectives and the methods adopted;
 - Presentation of the tools available to extract the published tweets (streaming API).
- Case study and implementation scheme:
 - Collection and manipulation of data and how data is obtained from the Twitter API;
 - Explanation of the analysis made and the results obtained.

Then, I find the conclusions on the work done, open issues and future developments.

⁹² V. GUPTA, G. S. LEHAL, *A survey of Text mining Techniques and Applications*, Journal of Emerging Technologies in web Intelligence, vol. 1, No.1, 2009.

⁹³ D. MAYNARD, A.FUNK, *Automatic detection of political opinions in Tweet*. In *The Semantic Web*, Workshops ESWC, 2011 (pp.88-99).

⁹⁴ A. GO, R. BHAYANI, L.HUANG, *Twitter Sentiment Classification using Distant Supervision*. In CS224N Project Report, Stanford, 2009 (pp. 1-6).

3.1.2 Goal setting and methods adopted

This section describes the approach used and what are the reasons for choosing to deal with this problem in a certain way, following the paper written by Dossis, Amanatidis and Mylona (2015)⁹⁵.

Unlike other platforms such as Facebook, Instagram, Wikipedia or blog, Twitter is the only one to be used in almost all the different areas of study: from medicine to marketing, passing through the policy. The first feature that makes it so popular is the percentage of public profiles, the content of which can be directly consulted by researchers through the streaming API (Application Programming Interface) provided by Twitter itself, is decidedly higher than all the other social media.

Using the streaming API, you get a whole series of data concerning users that go well beyond the actual text of the tweet. As defined in the previous paragraph, tweets are often classified through hashtags which allow them to *be found* and read by a wider audience. The latter link together topics of discussion from users who do not know each other directly, but who are united precisely by expressing an opinion on a topic of common interest.

The approach used (following Dossis, Amanatidis, Mylona's steps⁹⁶) is to collect tweets with specific hashtags and carry out studies relating to the topic in question. In this thesis I talked about craftsmanship; the tweets

⁹⁵ M. DOSSIS, D. AMANATIDIS, I. MYLONA, *Mining Twitter Data: Case Studies with Trending Hashtags*, The 4th Advanced Research in Scientific Areas, November 2015

⁹⁶ M. DOSSIS, D. AMANATIDIS, I. MYLONA, *Mining Twitter Data: Case Studies with Trending Hashtags*, The 4th Advanced Research in Scientific Areas, November 2015

containing the hashtag #craftsmanship were therefore extracted, to understand if the craftsmanship is perceived more tied to tradition or innovation.

3.2. MINING TWITTER: CASE STUDY

3.2.1. Access data, prerequisites and text preprocessing

In the previous paragraphs, the concept of ease of downloading individual tweets through the use of streaming API was mentioned. Twitter offers an API (Application Programming Interface)⁹⁷ service with which it is possible to connect to the Twitter servers to obtain a list of tweets in an editable format and on which certain operations can be carried out. The Twitter APIs are created to create *applications*⁹⁸ that allow you to replicate the features on your Twitter web page, such as, for example, viewing the tweets of the users you follow, viewing the set of followers or following, searching for tweets for contents, etc. They have limitations for downloading large amounts of data and, in general, for obtaining all available data: they allow a researcher to get an overview of

⁹⁷ The Application Programming Interface (API) represents, in general, a programming interface that has the purpose of allowing other entities (such as libraries, software, users) to perform a set of actions on a given platform

⁹⁸ <https://developer.twitter.com/en/apps>

what is tweeted with a limitation of 1500 messages, created in the last fifteen days of the research⁹⁹.

As a first step, we confirm what are we looking for and why. We therefore want to inspect the latest posts related to craftsmanship and create a word cloud that allows us to highlight the frequency of the words most associated with craftsmanship. The analysis of the opinions expressed online on the subject of craftsmanship was carried out in May 2020, in particular the tweets published in reverse chronology were taken from 5 May to 20 May 2020. The period was chosen arbitrarily and coincides with the period of writing this thesis. Choosing another time period would likely have led to other results, but the time may not be as relevant. Unfortunately, the limit imposed by Twitter on the number of searches did not allow the search to be replicated, in a different period of time.

The analysis was carried out following a process divided into two interdependent phases. The first phase of the analysis process saw the collection of tweets (#craftsmanship). In total 1500 tweets were collected and retweets were manually removed. The second phase of the process saw the development of statistics related to the topic in question supported by software R. To analyze Twitter texts, I chose R because it offers a wide variety of options to do lots of interesting things.

⁹⁹ This restriction means that if a topic is widely discussed, users can track the activity till the 1500 message. When the same discussion ceases, the messages will appear only if there is a message in the last fifteen days prior to the search.

As Massaro and Gon (2018) explains in their paper¹⁰⁰, raw data acquired needs to be pre-processed before launching an analysis. The preprocessing steps we manually made were tokenization, stop words removal and stemming. *Tokenization* is used to break a character sentence into words or other meaningful tokens, perhaps by removing certain characters such as punctuation marks. *Stop words removal* is a phase aimed at the identification and removal of stop words. They are the words that frequently appear in the text without having much content information (prepositions, conjunctions, pronouns, articles), they do not contribute to the analysis and hence are dropped during preprocessing step. *Stemming* is the process to take a derived word back into its root form.

3.2.2. Analysis of the extracted tweets: R programming

Once the word list is obtained, we plotted the top ten words by measuring the repetition rate of each word. This was my output:

¹⁰⁰ M. MASSARO, M. GON, 4. *Metodo e analisi qualitativa dei risultati del Forum Turismo in Friuli Venezia Giulia*, in F.MARAGON,, M. GON, M. MASSARO, A. MORETTI (a cura di), *Processi partecipativi nella progettazione turistica*, Udine, Forum, 2018 (pp. 43-50)

	word	freq
craftsmanship	craftsmanship	498
quality	quality	62
design	design	41
made	made	40
beautiful	beautiful	37
work	work	37
make	make	28
new	new	23
know	know	23
fine	fine	22

Figure 4.1: Top ten words

It is interesting to highlight that, although the tweets containing the #craftsmanship have been extracted, the word craftsmanship does not necessarily appear in the tweet text.

Then, the most common *text summarization* technique was used: the word cloud, which highlights the words that most frequently appear in the analyzed text. In this type of representation, the words with a higher frequency are represented with larger characters, thus giving a visual representation to the concepts most repeated in the analyzed text. Figure 4.2 below gives an example of this representation and how the data in Figure 4.1 are displayed in the word cloud.

case is much higher (35%). This data is indicative of how the figure of the craftsman is still much more tied to the idea of the handmade, and therefore to the traditional idea, compared to the figure of the contemporary craftsman connected to the role of new technologies.

As Massaro and Gon (2018)¹⁰¹ suggest, the previous analysis on the frequency distributions of the different words within the analyzed texts can be useful to connect some themes; however, to give depth to the research, a second analysis called co-occurrences would be required, which deepens the interconnections of terms based on their presence within specific text units, normally in pairs of sentences. Unfortunately it was not possible to follow this approach for various reasons, first of all the fact that the output of R which provides the list of tweets extracted according to the queries set in the API offers other information (such as retweet, date and time, if has been marked as favorite, ..) which make the tweet text too *dirty* for automatic analysis. For this type of operation, *ad hoc* software would be needed, which are not currently open-source available.

3.2.3. Conclusions, open issues and future developments

In this chapter I have tried to give an answer through experimental data through this question: is there a link, and how significant, between the phenomenon of new technologies in the artisan world and there are

¹⁰¹ M. MASSARO, M. GON, 4. *Metodo e analisi qualitativa dei risultati del Forum Turismo in Friuli Venezia Giulia*, in F.MARAGON,, M. GON, M. MASSARO, A. MORETTI (a cura di), *Processi partecipativi nella progettazione turistica*, Udine, Forum, 2018 (pp. 43-50)

traces of this on one of the main microblogging platforms in the world? The analyzes did not bring the expected results but were nevertheless interesting.

Following the method for sentiment analysis exposed in the paper by Ortigosa, Martin and Carro, it would have been interesting:

- To extract information about the users' sentiment polarity (positive, neutral or negative), as transmitted in the message they write¹⁰²;
- To model the user' usual sentiment polarity and to detect significant emotional changes.

During my work of text mining, several difficulties emerged. Here the most relevant:

- First of all, the limit of free tweets that can be extracted (1500) do not allow to organize an in-depth research. Making a greater number of requests and therefore increasing the number of data analyzed (in more periods during the year), would have allowed not to limit this study to a superficial level.
- Data collected from Twitter are often very noisy, wrongly spelt and unstructured. For instance, tweets always contain abbreviations with high percentage. So data preprocessing is the most time consuming.

¹⁰² B.H.KASTHURIARACHCHY, K. DE ZOYSA , H.L. PREMARATNE, *Enhanced bag-of-words model for phrase-level sentiment analysis*, IEEE Int Conf on Advances in ICT for Emerging Regions, 2014 (pp.210-214).

- It is important to underline that all the analyses previously exposed were carried out by adopting free and open source tools, and therefore they were subject to limitations with respect to investigations carried out by exploiting the possibilities offered for a fee. Different instruments and greater skills in the IT and linguistic fields could lead to better outputs both in terms of precision and in terms of variety.

CONCLUSIONS

We live in times of crisis. But what is really a *crisis*, what hidden meanings does this word hide? In ancient Greek, *crisis* means transformation - indeed choice, relevant decision (often indicates the decisive phase of a disease). It comes from the verb *krino* which means to distinguish, to judge and does not have in its ancient meanings neither passivity, the yielding expectation of inevitable facts nor the concept of catastrophic event. The word written in Chinese is composed of two signs (wei-ji): one representing danger and the other the opportunity. John F. Kennedy in his *Indianapolis address to African Americans* (1959) reaffirms the profound meaning of crisis: what seems at first glance to be a catastrophe can become a great opportunity.

Fordism, the economic and social paradigm born from the important innovations of the second industrial revolution, has shown more than a few cracks in recent years. The lack of attention to the specificity of the person, the tendency to impose homogeneity and standardization on the tastes and preferences of the demand, are all characteristics that have pushed to hope for its rapid overcoming. For many years, in truth, we have limited ourselves to calling this great change simply "post-Fordism": something that would have surpassed mass production whose specific character, however, was not yet identifiable. Today the profound technological transformations that are characterizing the ways of production allow us to focus on the distinctive elements of this change. Digital manufacturing technologies are playing an important role,

guaranteeing potential for variety and customization. We are rapidly moving from a culture of standardization, which the Ford T has expressed in an exemplary way, to a culture of variety, whose emblem is the 3D printer.

New technologies are now leading to a rapid cancellation of traditional works, *in primis* in manufacturing. But being an artisan does not mean rejecting the new that advances, but using more current tools, materials and methods that are more in line with modernity. In the current context, artisans are all those who create something through their wits. Call them makers, *new craftsmen*, *digital artisans* or with any other name, one thing is certain: craftsmen, if they learn to properly exploit new technologies, will be able to fully reap the benefits that the digital revolution offers. Many have noticed it and the initiatives aimed at emphasizing that artisan manufacturing is still the best way to overcome the current economic and employment crisis and reconstruct the *value of know-how*. The extent of unemployment - especially youth unemployment - has reached dramatic dimensions yet there are no craftsmen on the market. We have begun to decree the primacy of scientific-knowledge over that artisan-practice, "as if theory could automatically translate into economic value". As Sennett observes, "material culture is important" in the sense that the evils contained in Pandora's box can really be made less frightening: "it is possible to achieve a more human material life, if only the process of doing is better understood"¹⁰³.

¹⁰³ R. SENNETT, *The Craftsman*, Yale University Press, London 2008 (p. 17).

The essential weight in influencing the trajectory that we are going to undertake in the coming years depends on the investment in human capital that we make in the new generations. If we imagine today a large investment in technical schools, if we imagine giving a different value to training projects that have been objectively sacrificed in recent years, if we will invest in this direction, the future that we will face is a future that will look more or less like to the objects seen in the *Homo Faber 2018. Crafting a More Human Future* exhibition, an example of how we can bring to the forefront a different idea of work, production and consumption.

BIBLIOGRAPHY

A.GRANELLI, *L'attualità dell'artigianato e la sua "anima digitale"*, *Quaderni di ricerca sull'artigianato*

M. CRAWFORD, *Shop Class As Soulcraft: An Inquiry into the Value of Work*, Penguin, London 2008, trad.it *Il lavoro manuale come medicina dell'anima*, Mondadori, Milano 2010.

A.S. BLINDER, *Free Trade's Great, but Offshoring Rattles Me*, in *Washington Post*, May 6, 2007

R. FLORIDA, *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*, Basic Books, New York 2002

R. FLORIDA, *The Future of the American Workforce in the Global Creative Economy*, *Cato Unbound*, June 4, 2006

M. ROSE, *The Mind At Work Valuing the Intelligence of the American Worker*, Penguin, New York 2005

D. GAUNTLETT, *Making Is Connecting*, 2011

R. SENNETT, *The Craftsman*, Yale University Press, London 2008, trad.it. *L'uomo artigiano*, Feltrinelli, Milano 2008.

D. HARPER , *Working Knowledge: Skill and Community in a Small Shop*. Chicago: University of Chicago Press, 1987

A. TILGER, *Work: What it Has Meant to Men Through The Ages*, Harcourt, New York 1930

H. ARENDT, *The Human Condition*, University of Chicago Press, Chicago, 1958 (p.22)

ARISTOTELE, *The Metaphysics*. English translation H.TREDENNICK, Cambridge: Harvard Loeb, 1933.

S. DASGUPTA, *Technology and Creativity*. New York: Oxford University Press, 1996.

S. MICELLI, *Futuro artigiano – L'innovazione nelle mani degli italiani*, Edizioni Marsilio Editore, Venezia 2012.

S. MICELLI, *Fare è innovare: il nuovo lavoro artigiano*, Il Mulino, Bologna 2016

T. ANGIER, *Technē in Aristotle's Ethics: Crafting the Moral Life*, London: Continuum, 2010.

A. SMITH, *An Inquiry into the Nature and Causes of the Wealth of Nations*, William Strahan, March 9, 1776

T.L. FRIEDMAN, *Average Is Over*, in *International Herald Tribune*, October 2010.

T.L. FRIEDMAN, M. MANDELBAUM, *That Used to be Us. How America Fell Behind in the World It Invented and How We Can Come Back*, Hardcover, 2011

G. WOOD, *Living Dolls*, Faber and Faber, London 2002.

M. WARNER, *The Making of Pandora*, in M.WARNER, *Monuments and Maidens: The Allegory of Female Form*, Vintage, New York 1996.

J. BERNSTEIN, *Oppenheimer: Portrait of an Enigma*, Duckworth, London 2004.

A.PAIS, *J. Robert Oppenheimer. A Life*, OUP USA, 2007.

A. SEN, *The Argumentative Indian: Writings on Indian History, Culture and Identity*, Penguin, London 2005.

S.CACIOPPO, J.P. CAPITANIO, J.T. CACIOPPO, *Toward a Neurology of Loneliness*, 2014, September 15

- G. ANDERS, *L'uomo è antiquato. Considerazioni sull'anima nell'epoca della seconda rivoluzione industriale*, Bollati Boringhieri, Torino 2003.
- M. BANZI, *Getting started with Arduino*, make Books, 2009.
- F. FERRAROTTI e G. TALAMO, *Il lavoro che cambia. Mestieri tra identità e futuro*, Gangemi Editore, Roma 2007.
- S. SRINARAYANA, *A Framework for Creating hybrid-Opens Source Software Communities*, in *Information Systems Journal*, 12, 2002.
- PLATONE, *Teeteto, Menone, Alcibiade, Simposio, Repubblica*, in *Opere complete*, vol.2, Laterza, Bari 1971.
- A. BARICCO, *The Game*, Einaudi, Torino 2018.
- M. FRAUENFELDER, *Made by Hand*, Penguin Group USA, 2010 (p.30).
- M. RANIERI, *Lavoro e nuove tecnologie: dall'uomo artigiano alla formazione digitale*, in V. BOFFO (a cura di), *Di lavoro e non solo: sguardi pedagogici*, Simplicissimus, Milano 2012.
- P. HIMANEN, *The hacker ethic and the spirit of the information age*, Vintage digital, 2010.
- C. ANDERSON, *In the Next Industrial Revolution. Atoms Are the New Bits*, in *Wired*, January 2010.
- C. ANDERSON, *Makers. The New Industrial Revolution*, Crown Publishing, 2012.
- A. GRANELLI, *Artigiani del digitale*, Luca Sossella, Roma 2010.
- C. LEVI-STRAUSS, *La pensée sauvage*, Plon, Paris 1962, trad.it. *Il pensiero selvaggio*, Il Saggiatore, Milano 1996.
- N. GERSHENFELD, *How to Make Almost Anything. The Digital Fabrication Revolution*, Foreign Affairs, Volume 1, Number 6, November/December 2012.

R.H. COASE, *The Nature of the firm. The problem of Social Cost*, University of Chicago Press, 1960

D.J. SKIBA, *Web 2.0: Next Great Thing or Just marketing hype?*, 2006.

D.TRITTER, C.FUCHS, *Social media, politics and the state: protests, revolutions, riots, crime and policing in the age of Facebook, Twitter and Youtube* (vol.16), Routledge, 2014.

V.LAMPOS, N.CRISTIANINI, *Nowcasting events from the social web with statistical learning. ACM Transactions on Intelligent Systems and Technology*, 2012.

F.DEL VIGNA, M. PETROCCHI, A.TOMMASI, C. ZAVATTARI, M.TESCONI, *Semi-supervised knowledge extraction for detection of drugs and their effects*. In 2016 8th International Conference on Social Informatics (2016)

M. AVVENUTI, F. DEL VIGNA, S.CRESCI, A.MARCHETTI, M.TESCONI, *Pulling information from social media in the aftermath of unpredictable disasters*. In 2015 IEEE 2nd International Conference on Information and Communication Technologies for Disaster Management, 2015.

M. YAR, *E-Crime 2.0: the criminological landscape of new social media*. Information & Communications Technology Law, 2012.

T.L. TUTEN, M.R. SOLOMON, *Social media marketing*, Sage, 2014.

B. LIU, L.ZHANG, *A survey of opinion mining and sentiment analysis*. In "Mining Text Data", Springer, 2012.

N. JINDAL, B.LIU, *Opinion Spam and Analysis*. In Proceedings of the International Conference on Web Search and Data Mining, 2008.

B.PANG, L.LEE, *Thumbs up? Sentiment Classification using Machine Learning*. In Proceeding of the ACL-02 conference on Empirical methods in natural language processing, 2002.

V. GUPTA, G. S. LEHAL, *A survey of Text mining Techniques and Applications*, Journal of Emerging Technologies in web Intelligence, vol. 1, No.1, 2009.

- D. MAYNARD, A.FUNK, *Automatic detection of political opinions in Tweet*. In *The Semantic Web*, Workshops ESWC, 2011.
- A. GO, R. BHAYANI, L.HUANG, *Twitter Sentiment Classification using Distant Supervision*. In CS224N Project Report, Stanford, 2009.
- M. DOSSIS, D. AMANATIDIS, I. MYLONA, *Mining Twitter Data: Case Studies with Trending Hashtags*, The 4th Advanced Research in Scientific Areas, November 2015
- K. DANCHEVA, *Holistic Twitter Research*, Master Thesis New Media & Digital Cultures, Utrecht University, 2013
- M. MASSARO, M.GON, *4. Metodo e analisi qualitativa dei risultati del Forum Turismo in Friuli Venezia Giulia*, in F. MARANGON, M.GON, M. MASSARO e A.MORETTI (a cura di), *Processi partecipativi nella progettazione turistica*, Udine, Forum, 2018
- B.H.KASTHURIARACHCHY, K. DE ZOYSA , H.L. PREMARATNE, *Enhanced bag-of-words model for phrase-level sentiment analysis*, IEEE Int Conf on Advances in ICT for Emerging Regions, 2014.
- B. EVERITT, T. HOTHORN, *An Introduction to Applied Multivariate Analysis with R*, Springer, 2011.
- Y. ZHAO, Y.CEN, *Data Mining Applications With R*, Academic Press, 2013.
- G. ESPA, R. MICCIOLO, *Problemi ed esperimenti di statistica con R*, Apogeo, 2008.
- S. IACUS, G. MASAROTTO, *Laboratorio di statistica con R*, McGraw Hill Companies, 2007.
- A. PAGANONI, F. IEVA, V. VITELLI, *Laboratorio di statistica con R. Eserciziario*. Pearson, 2012.
- N. MATLOFF, *The Art of R programming*, No Starch Press, 2011.

L. TORGO, *Data Mining with R. Learning with Case Studies*, Chapman & Hall/CRC, 2011.

SITOGRAPHY

about.twitter.com

adilmoujahid.com

arduino.cc

avvenire.it

corriere.it

cran.r-project.org

botteghedigitali.it

brandwatch.com

developer.twitter.com

doctorpence.blogspot.com

economist.com

en.wikipedia.org

encanta.it

fablabitalia.it

focus-lab.it

ft.com

geojson.org/

help.twitter.com

homofaberevent.com

ilsole24ore.com

lifewire.com

linkiesta.it

medium.com

onlinelibrary.wiley.com

report.rai.it

repubblica.it

rstudio.com

spectator.org

storiadiinternet.wordpress.com

technologyreview.com

theguardian.com

tracce.clonline.org

twitter.com

wired.co.uk

wired.com

CONFERENCES

Stephen Hoskins e Lucy Johnston, *Crafts in the digital age*, Talks @ Homo Faber 2018, Venice, 29th September 2018

Rainald Franz, *Traditional skills VS the digital world*, Talks @ Homo Faber 2018, Venice, 24th September 2018

Stefano Micelli, *Artigiani in un mondo post-industriale*, Talks @ Homo Faber 2018, Venice, 19th September 2018

M. Heidegger, *La questione della tecnica*, Talks@ Technische Hochschule in Munich, 18th November 1953