Wisdom

in the Context of Globalization and Civilization

Henryk Krawczyk and Andrew Targowski

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PREFACE

Every person undertakes various types of activities that result in intentional or unexpected effects. Thanks to this, each person also creates various organizational structures to achieve better or worse aims. This monograph presents a whole range of such structures ranging from a typical team through various types of communities to several of the most influential contemporary civilizations. The advantages and disadvantages of developing such structures and the possibilities of their improvement in the name of shared values are discussed in the book. What is more, attention is drawn to the difficulties of developing and implementing ambitious developmental strategies that are wisdom-based.

Through science, humans have gained the ability to understand and explain many natural phenomena and predict the consequences of various events. Science allows us to understand the world; on the other hand, it discovers new and previously unknown research and cognitive areas. What is more, for most of life's problems, apart from rational action (logos), it is necessary to use intuition or motivation (ethos-based actions). It turns out that the proper integration of these approaches leads to more appropriate decisions and brings more satisfaction to a person. Such behaviors are generally wise behaviors of a human being.

This book seeks to answer the question - what is wisdom, and how should it be used in everyday life? A model of wisdom is presented in which wisdom is described by three attributes: knowledge, qualifications (skills), and inspirations leading to consciously controlled processes of correct assessment in a situation and the correct choice of solutions in the context of the art of living. For each attribute, we can specify a set of characteristics, describing and categorizing them. The synergy of the attributes of wisdom and, consequently, the corresponding characteristics determine the possibilities of conscious, wise action.

Such action enables the further development of the human mind, which, along with the development of civilization, has more and more possibilities; it also allows for expanding and deepening the scope of human cognition. These possibilities describe different categories of minds that additively integrate and are used by the learner, for example, in wise thinking, deciding, and acting. Based on the categories of minds and the role of attributes of wisdom in their creation, a wisdom power index is proposed,

which can be empirically determined. An additional measure of wisdom is the so-called quotient of wisdom, which, in addition to quotients of intelligence and emotions, is a critical supplement and strengthening of the rational and intuitive possibilities of thinking and learning. Eventually, a logos-oriented definition of success is defined, considering the quotients of intelligence, emotions, and wisdom.

Achieving satisfaction in the implementation of human endeavors grows with the square of the power of wisdom. This means that a much higher power of wisdom results in a noticeable increase in satisfaction. This is even more evident when building a wise civilization. We then express satisfaction by ensuring sustainable development, which results in a higher quality of life. Ensuring a high quality of life requires the use of wise people in order to formulate appropriate goals and appropriate strategies as well as taking appropriate actions promptly. Otherwise, the development of the world may be chaotic and generate various types of serious threats, including the deterioration of the civilizations in which we live.

A final part of this book involves the creation of the fundamental elements of a science of wisdom, which has thus far been neglected, just as Aristotle said about 2,400 years ago that people are unwise because they do not know the purpose of their lives. Being modern and educated people, after 2,400 years, we should strive to be wiser as well. The science of wisdom should indicate new efficient, and satisfaction-oriented rules of human conduct that will eliminate the world's greatest threats. Unfortunately, the current civilization we are creating is full of paradoxes and is causing us many different types of problems.

Our necessary task at this stage of wisdom development is to gather the right knowledge about so-called user cases that describe the circumstances of using wisdom in our lives, which we call seeds of wisdom. They can be associated with famous and outstanding people, representatives of various professions, and or wise solutions encountered in our communities. This book describes many such cases. This type of content can be stored in so-called cognitive containers (including Big Data and Big Wisdom), which, thanks to the available tele-information services, will enable their assessment and the verification of many statements made in the book. It is a work for generations, yet we urge the reader to take up this challenge without delay. It deals with researching, developing, teaching, and popularizing wisdom among people and their civilizations, especially the new global civilization that we are dealing with in the 21st century, which has become a great challenge for us.

Henryk Krawczyk and Andrew Targowski

CHAPTER ONE

EVOLUTION OF COGNITION FROM DATA TO WISDOM

Abstract

The purpose of this chapter is to synthesize the development of humankind, which has been supported by brains and minds that create different levels of cognition. *The methodology* is a transdisciplinary, big-picture view of human development on Earth. *The findings* show that wisdom is knowledge-supported right judgment and choice within the context of the art of life. *Practical implications:* civilizational changes and shifts triggered by leaders have a significant impact on human life; knowledge helps people understand such changes and shifts, but wisdom helps them adapt to the changes and shows how to apply or reject the changes skillfully. *Social implications:* wise people should support wise society and civilization. *Originality:* this approach offers a new understanding of the complexity of wisdom, which is the essential human virtue.

1.1 Introduction

The purpose of this chapter is to synthesize the development of the human brain and mind as tools of thinking, decision-making, and behavior at the level of advanced cognition as wisdom. In order to undertake this investigation, one must begin with the investigation of how the planet Earth began its existence, which, in consequence, led to the rise of life and humans.

The decay of uranium and its presence in rocks indicates that Earth was created about 4.6 billion years ago. One question that arises is why our nebula was crystalized so fast, for it occurred after just 10 billion years since the Big Bang; comparatively, it took 14 billion years for Orion's nebula to crystalize, and this process is still unfinished. Perhaps one of our neighbor stars became a supernova and was so powerful in gravitation that it pulled

our galactic cloud to it, accelerating its crystalizing process into what is now the solar system.

In 1859, the British biologist Charles Robert Darwin (1809–1882) defined the theory of biological evolution on Earth, the key mechanism of which is natural selection (Darwin, 1859). This means that stronger, better-adapted organisms overcome weaker organisms. As the anthropological research indicates, a bacterium was the first living organism on Earth about 3.6 billion years ago. It was a very simple organism without the complex structures that animals and people have who can reproduce themselves. Again, one can ask how those bacteria were created. It is probable that the atmosphere, land, and oceans were the main (and still are) fundamental parts of Earth from its very beginning. The simple molecules of nitrogen, carbon dioxide, ammonia, methane, and water were basic elements of those fundamental parts. Energy, however, was and still is needed to form more complex components from these molecules. Energy emanated from volcanos, warm creeks and rivers, lightning, and ultraviolet light coming from the Sun. By this process, simple molecules transformed into complex ones and in such a way, life was created about 3.5 billion years ago. It is probable that in the same way, life could be created on other planets which are beyond our reach.

This very simple cell-oriented organism created simple animals like jellyfish about 800 million years ago. Within the next 200 million years (or 600 million years ago), organisms with shells developed, creating kingdoms of planktons and animals with numerous subgroups. Life took place in water, where gravity is less and moving is lighter than on land, which requires more energy especially during periods of bad weather.

However, life in the seas was so developed that it became dangerous, and the animals sought rescue on land. About 450 million years ago, animals such as scorpions, spiders, and primitive insects, driven by the instinct of the earliest form of "wisdom," began to move to land. Meanwhile, about 370 million years ago skeletal fish, including sharks, began to develop. These fish had limbs in the form of agile fins, which after going ashore, turned into paws and the hands and legs of animals and later, people. Dolphins, on the other hand, do not have fins because they evolved from land to water.

The first animals on the land of Earth were reptiles, from which mammals emerged (about 50 million years ago) and, at an earlier point, dinosaurs. Mammals were not outcompeted by these big reptiles because they were able to hide better and adapt to the environment, meaning they were more intelligent (wiser) in their own way. The largest reptiles in the form of dinosaurs became extinct about 65 million years ago due to a

collision of a large comet with Earth, which darkened the sky with a great dust and caused cooling as a result of heat isolation from the Sun. Smaller organisms, however, survived because they were able to adapt to these surprising and difficult living conditions.

If the dinosaurs did not become extinct, then mammals would probably be secondary animals on Earth; however, when those huge animals died, a favorable safe space on Earth was created for the further development of mammals. Mammals began to develop better eyesight, more efficient hands, and, most importantly, a larger brain compared to the size of their bodies. That is why the eyes, hands, and brain were instrumental to the success of people on Earth in competition with other animals: people have been and are, wiser than animals.

The further evolution of mammals into humans proceeds as follows (Asimov, 1991, p. 3–29):

- Forty million years ago a man-like creature (*Australopithecus*) emerged with nails and not claws, which facilitated the manipulation of arms and legs. Their descendants are monkeys, and the protoplasts are lemurs from Madagascar, with a skull of 500 cm^3.
- Thirty million years ago man-like monkeys (*Hominidae*) emerged, such as those living on the rocks of Gibraltar.
- Seventeen million years ago great apes (*Gigantopithecus*) emerged, with a height of 216 cm and a weight of about 500 kilograms. Today, gorillas represent this species of monkeys. They had the largest brains of the animals that lived at that time. The gorilla's brain weighed 482+ grams, the chimpanzee's, 378 and the orangutan's, 336. While dolphins, walruses, and whales have larger brains, they live in water and are unable to develop techniques and technologies. Although elephants have large brains, they also have a large body, and in proportion to their body, they have smaller brains than the great monkeys and are less intelligent.
- Five million years ago hominids appeared, similar to modern people. The first ones were small, about one meter tall, and their brains weighed less than a gorilla's—only 420 grams (a little more than chimpanzees). Hominids are thought to have arisen as a division from the chimpanzee species. Because their body was smaller than the chimpanzee, the ratio of brain weight to body weight was twice as large as the chimpanzee and four times greater than that of a gorilla. Because of this, hominids were smarter than the great monkeys. Also, these hominids could walk upright, as we walk now, while the great monkeys are four-footed. Therefore, they are less

efficient and absorb heat through their backs, which are parallel with the ground. However, the head of hominids is located higher than the head of the monkeys, and it is easier to see food and danger. From this period, the skeleton "Lucy" was found in 1974 in east Central Africa. Here, most probably, "humankind" was born.

- Two million years ago, *Homo habilis* appeared in eastern Africa, where Tanzania lies today. Although they were a creature under one meter tall with a lower body weight and thus a better ratio of brain weight (weighing up to 700 grams) to body weight, they were a creature more intelligent than hominids. They also had a rounder head and longer hands. Their legs were like ours today and their bones were thin. The jaws were less massive than hominid's and looked less threatening than the jaws of great monkeys. However, what shaped their evolution was their ability to use tools for stone processing as well as hunting animals. From then on, *H. habilis* became a hunter and did not eat carrion. Thus, they had to be smarter than the animals they hunted for. Tools began to develop their brain, including their intelligence and wisdom.
- One point six million years ago *Homo erectus* emerged, with a height of approximately 182 cm and a weight of approximately 68 kg. Of course, their brain increased—to a weight of 1.12 kg. They used tools and even hunted large mammoths in groups, which required wise decisions based on effective communication within the hunting group. This was the first species of the genus *Homo* that left Africa and reached the Pacific and some of the islands in Southeast Asia, such as Java or even around today's Beijing.
- Five hundred thousand years ago, *H. erectus* invented fire, and, because glaciers took water from the Pacific Ocean, they could easily move to Indonesia and Australia. Fire protected them from darkness and cold, thanks to which they became more universal throughout the environment. Their brain could also solve more complicated problems.
- Three hundred thousand years ago, *Neanderthals* lived in present-day Germany. Their body was a little stronger and their head was a little larger than ours, while the weight of the brain was the same. This gave them a better decision-making capacity compared to *H. erectus*.
- Two hundred thousand years ago, there appeared *H. sapiens*, a contemporary human with a more well-proportioned figure than *Neanderthals*. These new "Europeans" were the so-called *Cro-Magnons*, who came from the East. According to modern opinion,

some of them interbred with *Neanderthals*, but they did so reluctantly. More importantly, the newcomers communicated more effectively starting at about 50,000 years ago thanks to a developed symbolic language not present in animals (Chomsky, 1965), which they used to communicate with each other and which was more developed than the existing inhabitants (Corballis, 2011, p. 56); by this means, *H. sapiens* defeated them (about 30,000 years ago) and erased them from the list of inhabitants of what would become Europe, which, if true, confirms the thesis that communication between people was decisive for the development of the brain and factors related to the formation of knowledge, including information and wisdom.

- Fourteen thousand years ago, dogs were domesticated and used during hunting. In this way, people used the services of animals for the first time.
- Eight thousand years ago, the Ice Age ended and the Sahara Desert was formed. In the area of modern Iraq, cereals and barley began to be used to feed people and animals, which resulted in an increase in the population, estimated at five million worldwide. Water supplies were used to irrigate, which supported better agricultural productivity and led to the beginnings of the accumulation of wealth for the owners of this type of system. To protect their wealth, wealthy people concentrated in one place, leading to the development of cities as a state with an administration and army. In this way, a human was wise to secure their property and pass it on to posterity. Humans also began to politicize to keep people under control.
- Six thousand years ago, the Sumerian civilization, the first civilization in the world, was created in the fertile delta of the Tigris and Euphrates rivers with the king and priests, who became manipulators of knowledge and wisdom, or knowledge of subordinate society.

Since the creation of Sumerian civilization, we humans have discussed the development of human civilization, which in the twenty-first century enters its seventh millennium of existence. Its development closely depends on the development of human cognition, that is, information and the ability to conceptualize, learn, and develop knowledge and wisdom. The central apparatus of human cognition is the human brain, which has developed remarkably since (or 3.5 billion years ago) the emergence of the first life on Earth, which was a simple bacterium without a cell nucleus. Figure 1.1 illustrates this long process of the transformation of bacteria into animals

and finally into human beings, thanks to life's ability to preserve and improve itself, that is, life's intelligence and capacity to make wise decisions.

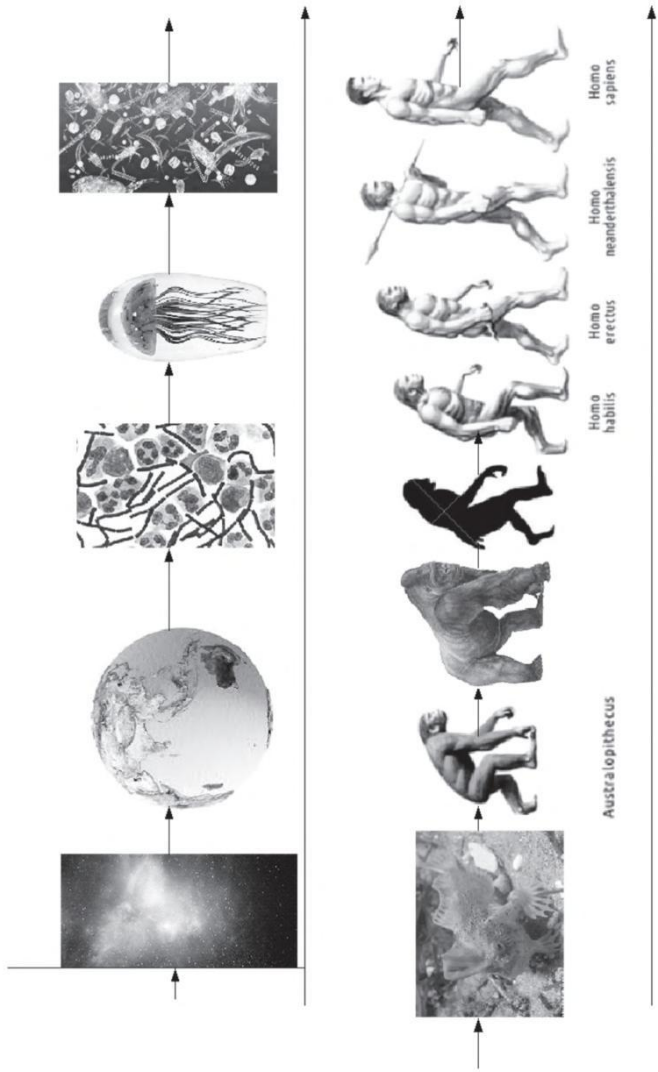

Figure 1.1: Human development through time on Earth (B = one billion, M = one million, K = one thousand years; timeframe is not on a scale).

In Table 1.1, the development of beneficial decisions, or wisdom, made by animals and humans during their very long development on Earth is presented.

Table 1.1: The development of organisms on Earth as a result of brain development (B = one billion, M = one million, K = one thousand years)

Organism	Years Ago	Size of Brain (in grams)	Symptoms of Wisdom	Results of Wisdom	Other
Plankton and animals in the seas	600 M		Self-preservation instinct	Development of fish with fin hands	To this day, this instinct is dominated by the behavior of animals and people
Fish with fin hands on land	370 M		Exit to a calm land	Evolution in hominids	Wandering on land for safety and food
Australopithecus	40 M	420	Replacing claws with nails and increasing the manipulation of hands and legs using tools	The birth of a lighter man, lighter than the big apes	Increased agility
Big apes	17 M	500	Living in a group, communication	Childcare	Parenthood cultivated by people
Hominid	5 M	420	Walking learning, but only on two legs—more efficient than monkeys	They absorbed less heat through their backs	They emerged from the branches of chimpanzees and ceased to be apes

H. habilis	2 M	700	Used stone tools while hunting	They were capable of self-defense and acquiring fresh meat, not carcasses	Smarter than animals and using tools, which resulted in the development of cognition
H. erectus	1.6 M	1120	They hunted large mammoths in groups; they used fire, which protected them from cold and darkness	The larger brain was able to solve more complicated problems	Until today, man fights with cold and darkness
H. Neandertalensis	300 M	1500	Communication in tribal life was limited, based on individual experience	They mixed with H. sapiens, but as a result, they were defeated because they communica-ted badly	
H. sapiens	200 K	1500	Commun-cation based on a developed and symbolic language	Good communication and cooperation in the tribe	Communication based on good cognition in a group or society determines the success of a person

Source: Caldararo, 2017; Asimov, 1991; the author.

The development of living organisms on Earth began with the formation of bacteria around 3.6 billion years ago. However, only after 3 billion years

did the development of marine animals begin, about 600 million years ago. Thanks to survival instincts, life evolved on land after 230 million years. Here, living organisms had to adapt to new challenges, which led to the development of the brain in animals in order to make effective decisions that ensured their safety and food. This increasingly efficient brain has caused, starting about 40 million years ago, the evolution of a humankind, which is still underway. The law of human evolution (LoHD) can be formulated as follows:

> The primary mechanism of human evolution consists in the development of the brain and the ability to communicate using a symbolic language, which leads to the growth of knowledge about the world and the development of wisdom in adapting to the challenges of the natural environment and human communities and technology.

The following section will define the contemporary characteristics of wisdom, which will provide an instrument to analyze how the concept of wisdom developed along with the development of human cognition.

1.2 The Reservoir of Human Cognition in the Contemporary Perspective

1.2.1 A Review of Research Concerning Wisdom

Modern philosophy (fifteenth to twentieth centuries) engrossed itself in the methods of reasoning, the passage from existence to cognition, and from religion to science. However, the issue of wisdom was, in a way, eliminated from philosophical research in the last 500 years. This topic seems to be too banal to philosophers, who chose to close themselves behind the doors of their ivory towers and ceased to take any interest in day-to-day living. The dominant theme in their studies is the definition of the so-called world outlook. Notably, all major philosophers do have their own worldviews; however, by no means whatsoever can they mention another worldview, as if those other views are not significant any longer. This might account for philosophy being so different from sciences such as physics, biology, or chemistry, where discoveries and improvements are made on the past achievements. The contemporary physicist, for example, does not deny the accomplishments of Newton, Bohr, or Skłodowska-Curie, even though the theories of those authors have been upgraded or changed outright. The most recent 500 years of philosophy were marked by the ideas of sages such as Giordano Bruno, Copernicus, Descartes, Galileo, Locke, Hume, Voltaire, Rousseau, Kant, Hegel, Marx, Kierkegaard, Nietzsche, Bergson, Russell,

Whitehead, Carnap, Wittgenstein, Heidegger, Sartre, Popper, Levi-Strauss, Foucault, Kuhn, Derrida, Habermas, and others.

In 1912, research on wisdom was being conducted by the German psychologist William Stern, who investigated the intelligence quotient (IQ) in children and then in adults, especially military recruits. IQ is seen by many as wisdom; however, what the IQ test does is it assesses an individual's capability of doing complex tasks. It could, then, be seen as a wisdom ability index.

At the end of the twentieth century, the American psychologist Vivian Clayton distinguished between three activities determining wisdom: obtaining cognitive knowledge, reflective analysis of knowledge, and filtering knowledge with one's emotions. When she retired, further psychological research was undertaken in Germany.

In 1980 the German Max Planck Institute started a project on wisdom research (which can be understood as "taking wisdom down to the lab") under the guidance of the German-American psychologist Paul Baltes (1939–2006). In this Berlin project, wisdom was recognized as "expert knowledge having a pragmatic influence on the fullness of life" (Baltes & Mayer, 1999). The latter part of the definition regarded wisdom as right judgment, refined advice, analysis of psychological depth, emotional control, and committed understanding. However, to the benefit of the cause, a group of psychologists from that institute was strongly critical of the philosophers' perception of wisdom as utopian. They saw wisdom as unpopular because, having studied 700 people, they did not find anyone wise among them. They concluded that the development of wisdom reaches its climax around age 65, while around age 75 the human mind loses its intellectual capabilities, with several exceptions. The German-American psychologist Monika Ardelt, however, disagrees with the Max Planck psychologists' proposition that wisdom is a unique privilege of experts. She thinks that regular people can be wise, too (Ardelt, 2004, p. 257–285). She continued Clayton's research in a 3D model that integrated "cognition, reflection, and emotions."

To the detriment of the cause, though, the Berlin project did not launch any broader empirical research on wisdom. It was only the American psychologist Robert J. Sternberg from Yale University who researched wisdom, proving that the investigation of human potential cannot conclude with the IQ; it must also reckon with wisdom (Sternberg, 1999). Wisdom is understood as a successful application of intelligence for the sake of attaining the common good using balanced personal, interpersonal, and supra-personal interest, in both the short and long term, considering adaptation to the environment, changing, or even selecting a new

environment. Wisdom, he believes, can thus be equated with prudence. This is a lengthy definition of wisdom—a very complex and complete one as well. It is, however, complicated in application and seemingly only applies to vital life situations.

One of the most recent researchers of wisdom is the American publicist Stephen Hall, who conducted a review of wisdom research for the *New York Times* (Hall, 2007, p. 58–69) in 2007. He concluded that young people are more pessimistic than their elders in expressing their opinions, the reason being that the individuals more advanced in age have encountered more negative situations than the young, and so they have developed more emotional composure and tend to regain a balance in their psyche after a negative experience. Still, the author proposes no definition of wisdom, which he sees as a mystery; the way wisdom is developed remains a mystery to him, as well. It is hardly surprising that the most famous Encyclopedia Britannica does not define wisdom, either.

It is puzzling that neither philosophers nor psychologists should have taken any notice of the fact that, since the end of World War II (1939–1945), economic decision-making theorists have developed research on making optimal decisions, that is, mainly wise ones. Several pioneers such as Koompans (1975), Kantorowicz (1975), Simon (1978), and Kahneman (2002) were even given Nobel Prizes in Economics precisely for elaborating a method of making the best possible decisions. Robert McNamara (1916–2009) devised a method of deploying various categories of loads among ships sailing in *Land Lease* supply convoys to the UK and Russia. Since these were attacked by German U-boats, usually several of them sank. His method focused on ensuring that a mix of goods should reach its destination, and it avoided shipping the same category of items on one vessel. Was this method not a wise solution? This is how the discipline of operational research was initiated in an industry that, for example, served the purpose of devising a section of metal sheets as was necessary to make some parts so that the loss of raw material would be minimal. Was this optimal section of sheets not a reflection of the designer's wisdom? What about their calculations leading to planning the best possible timetable of production in order to minimize machine idleness? It, too, betrays wisdom in decision-making.

As far as calculating optimal decisions in corporate management is concerned, management science has tackled this problem. Methods of linear programming are currently used in the present to determine the best possible planning of a production program to manufacture the necessary number of cars of various models to a maximal company profit or to minimal company expenditure (but never both at the same time). This is the so-called diet

problem: how many specific kinds of food need to be eaten to secure the necessary number of proteins and vitamins at the lowest possible cost. An optimal diet is an expression of wise eating, is it not? Another method of linear programming, the so-called transportation method, computes the best possible route of a truck's journey in shipping goods to shops so that the sum of the paths will be most cost-effective regarding labor and fuel, and shortest in time.

The development of information technology (IT) in computer architecture is about building ever-faster computers that can process information as fast as people do. According to some estimates, such a computer is supposed to become available around 2025. A question can be asked, though, whether a computer like this would think wisely if there is no consensus as to what exactly knowledge is. Another branch of IT deals with automating decisions using artificial intelligence (AI). AI can automate a well-defined concept of the decision, but its wisdom will never be greater than the wisdom of the designer of such a computer system. More importantly, it will not be wisdom independently generated by a computer without it being influenced by a human designer.

At the beginning of the 1990s, informatics offered data mining from large databases, which a company such as Walmart collects every day in their several thousand shops scattered all over the world. This provides a wealth of information, and even knowledge, about the customers of the company. It appears that the goods in the highest demand on Monday are nappies and beer because, after the weekend, when, for example, a wife asks her husband to replenish the stock of disposables that ran out over the weekend, the husband also makes a point of buying beer, which he drank over the same period watching sporting events. Because of the rules regarding the most popular goods on Monday, the store manager is ready to make the best decisions—and wise ones at that—concerning these goods. First, they must secure sufficient stock on Monday; second, the manager could place those goods on the same shelves if desired to facilitate the job for the customers. However, if they wished to maximize the company's turnover, the manager would place those along aisles far away from each other to provoke the customers to buy other goods on impulse on their way from the nappies shelf to the one with beer, or the other way around. Aren't the decisions of that manager wise?

At the beginning of the twenty-first century, an IT discipline began to emerge called *cognitive informatics* (Wang, 2003). Up until that point, technological science had dealt with vocational applications, such as computerizing engineering jobs, process control systems (air traffic or production control), and organizations (administration, business, university,

and so forth.). Cognitive informatics, in turn, investigates the effect of IT on the cognition of the increasing knowledge (i.e., generally speaking on the informed behavior) of humankind. The Semantic Ladder model (1990) defines the data-information-concept-knowledge-wisdom hierarchy, and Targowski has set out to formulate the interdisciplinary theory of wisdom (Targowski, 2011a), which is, most likely, the essential virtue of humankind and which results from the ever-improving cognition of the world and life situations.

1.2.2 The Semantic Ladder of Cognition Units

The development of IT over the last sixty years has taken it from the phase of technical and scientific automation and routine administrative computer data processing to artificial intelligence, which makes it possible to automatize well-defined decision-making. If these are to be "wise" decisions, IT specialists must ask what wisdom is.

An information specialist not only wonders what wisdom is but also dwells on the meaning of information. Information is the main raw material processed by the computer; however, information specialists do not know what they get their computers to process. On the other hand, when you ask a mechanical engineer what steel or plastic is, they know. Likewise, an electrical engineer knows they deal with electricity, and any chemist, physicist, as well as a sociologist or physician knows what they are working with.

This sort of situation in IT results from the fact that the biggest emphasis is placed on the syntax of programming languages, databases, operating systems, and software. The term "syntax" in the IT world deals with the "grammar," as it were, of IT solutions. It answers the questions "How is it to be done? How is it to be programmed? How is information to be found?" rather than what information is.

It is information semantics that seeks to explain what information is. It is utilized in IT applications in assisting vocational work, organization administration, and control systems. Information semantics deals with answering the question of what exactly information is, such as what information is necessary for the monitoring of the implementation of the production plan. The point here is the substance of this monitoring. Semantics in IT does require knowledge of syntagmatics, in the same way as the speaker of a foreign language ought to know the grammar of the foreign language to be well understood.

In the USA there are 600,000 teachers of English, who know the grammar of the language very well (and this is what they live off), but they

may not be as good in putting the language to use in writing. The specialists who are excellent in that respect are writers, columnists, and journalists. They know what to write about, and this is why they are read and can make a living from writing. How many are there? Several thousand? There are up to several hundred writers at a time whose sole means of subsistence is writing, depending on the period and stage of their creative life.

This is also the case with IT. Complex IT system consultants in the corporate world earn several times the money made by programmers just because they know what kind of information to process and what for (and this is dealing with IT pragmatics). They also know how the information needs to be processed.

The issue of what information "is" has long been investigated by information theory. It dates to the early twentieth century. One of its pioneers even provided a formula to define information: $I = -\text{Log}_2\ p(\alpha)$. What this implies is that if it is Tuesday today, the information that tomorrow will be Wednesday $p(\alpha)$ equals 0, for the fact has a probability $p=1$, $\text{Log}_2 1 = 0$, since $2^0 = 1$, which is to say that a 100% certain fact is not information. So, what is information?

Like in the structure of matter, where in its atom there are many elementary particles such as protons and electrons, so too this holds in IT, where information is a notion that generalizes all elementary particles of cognition, processed by the human brain and computers. These include data, information, concepts, knowledge, and wisdom, as illustrated by the Semantic Ladder (a flowchart) model in Figure 1.2.

We will now turn to a definition of the individual units of human cognition, as illustrated by a decision-making situation in a securities investment portfolio of equities traded on the New York Stock Exchange.

- *Data.* The *Dow Jones* index of, say, 10,000 points on a Monday of a given month and year will be the *data*.
- *Information*. The fact that on the following Tuesday, the *Dow Jones* was 8,000 points, that is, 20% less than the day before, will be *information*. This is a rather unpleasant kind of information, which characterizes the *change* of the index by minus 20%. This information demands that the investor conceptualizes a new solution.
- *The concept* may be about the choice of one of three option-concepts. Because the stocks fell in price and are cheap, a new package of shares can be bought (C_1); in other words, having slumped so much, they cannot keep falling; another option (C_2) will be the sale of one's stocks in order to avoid bigger losses. Finally, the third solution (C_3)

will be neither selling nor buying stocks. Now, having three concepts/options of a solution, a judgment needs to be made as to which solution is the best.

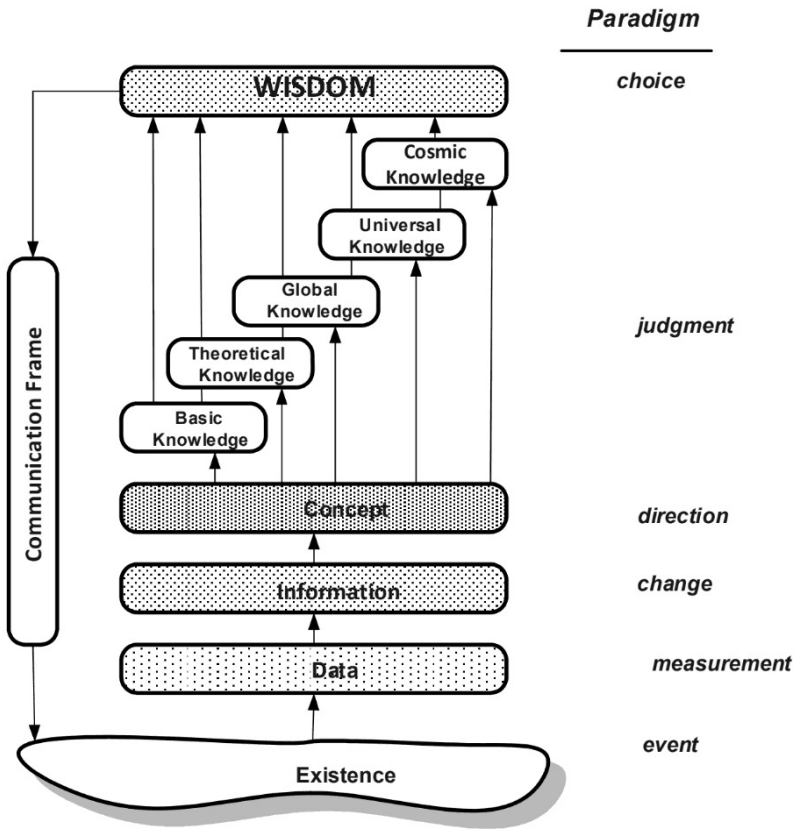

Figure 1.2: The Semantic Ladder of cognition units (Targowski, 1990a, p. 136).

- *Knowledge* is a set of principles, rules, and research data which the investor will make use of in the assessment of each of these options. Basic knowledge indicates that one should buy shares when they are cheap and sell when they are expensive. Theoretical knowledge might indicate that a decline in the prices of stocks may result from the economy entering a recession. Global knowledge suggests that a war with state X is imminent and this fact will increase the needs for the sake of war. What universal knowledge implies is that when the

economy enters a recession, profits from trading stocks dwindle, but money can be made on trading bills of exchange (bonds).

- *Wisdom*. The investor has received an assessment of the situation in the four categories of knowledge and now must choose between three options/solutions. Since selling the stocks would mean a loss, option C_1 is rejected. As war is coming, and stocks might increase in value, the investor does not buy but, rather, decides to keep their shares and waits. So, option C_3 was selected and time will tell whether this was a good, and hence wise, choice.

The semantic model explains that wisdom is not knowledge; neither is it information nor data. It is *judgment* and the *choice* of concepts of thinking and action. Moreover, in order that the concept would be properly formulated, one needs to be well informed; that is, one has to have verifiable data. To make a wise assessment, one needs to have good knowledge: basic, theoretical, global, and universal. Not all have such kinds of knowledge, and, therefore, their judgments are not wise within the range of knowledge that a decision-making subject has. This is not to say that if one has a wide range of knowledge at one's disposal, one has a guarantee of wise judgment. There are other factors, such as emotions, intuition, luck, or the will to implement a wise action, and so forth. All that is an art of living. The word *art* used here refers to an intuitive and innovative approach to the known and right principles of judgment and an ability to create new principles and break rules when they are outdated for the case.

An example of applying the Semantic Ladder to characterize art as cognition is illustrated in Figure 1.3. Art is cognition which cannot be falsified. The history of art is the history of viewing the world and reality in a language of beauty (Targowski, 2009a, p. 239). Until the eighteenth century, art was the exact "photographic" registration of events and figures playing important roles in society. It was the time of Leonardo da Vinci's academicism, emphasizing symmetry and perspective (*data processing*). Art was, in those times, the rhetoric of power. Its mission was to glorify a ruler and his court.

After the great French Revolution, artists abandoned their sponsors; they become more impoverished but free to do what they wanted to do. In the nineteenth century, Romanticism in music and literature as well as impressionism in painting liberated artists. They left their studios and entered the real world of the beauty of nature. Van Gogh, Matisse, and Gauguin went to the countryside and painted the Sun, flowers, and pleasant moods, supported by good company and wine. Ever since, artists have tried to define their concept of reality, and they often saw it as a processed

actuality, with a message for change—saying "we are free and can paint as we wish" (*information processing*).

The academicism in art, based on Leonardo da Vinci's rules of symmetry and perspective, was replaced in the twentieth century by a law permitting anything possible in art. It was the manifesto of post-impressionism, which Paul Gauguin proclaimed in 1901. The artists broke with the strategy of *how* to paint and looked for a new strategy of *what* to paint. Now art and science sought the same clue, which was *the truth*. The twentieth century in art was a century of permanent search by the avant-garde for perception and synthesis of time (*concept processing*).

Pollock's action painting, for example, is art without beginning and end. It is a reflection of reality in life, science, and politics. Art wants to optimize our perception and feelings. First Picasso's cubism, then futurism, Bauhaus' holism, Dadaism, and Dali's surrealism—their art is a manifesto of change and engagement in the social process, which can be illustrated by Picasso's *Guernica* (1937), *Dove of Peace* (1949), and *Massacre in Korea* (1951). He is followed by Pollock and Rothko in New York and by others in Europe (*concept processing*). Andy Warhol's pop art, New York's happenings, Italian transavantgarde, and superrealism—all quests to deliver a message on new rules and patterns. Marshall McLuhan even proclaimed "the medium is the message." In other words, information "converts itself" into energy and matter: the secret of life and its chance of survival (*knowledge processing*).

Whether art will reach a level of wisdom processing is another question. Jean Dubuffet, who is considered equal to Picasso, says: "The wise art? What a crazy question! Art is nothing more than a product of happiness and craziness. A man without bread dies, without art, the man dies from boredom." This is one artist's opinion.

The Polish artist, Stanislaw Witkiewicz, said in 1919: "art is such a discipline where a lie never leads to positive results." Witkiewicz's rule can be tested in the Soviet Union and Nazi Germany. In the former, after the Bolshevik Revolution in 1917, the new order only accepted socialistic realism in art. Artists could only glorify work in the fields and the shop floors. Artists such as the great poet Osip Mandelstam, who did not follow this direction, were sent to the Gulag or convicted, as was "parasite" Joseph Brodsky, a future Nobel laureate who did not obtain a government license to be a poet! Vladimir Mayakovski, a poet of the Revolution, in protest against this official cultural policy committed suicide. Boris Pasternak, who received the Nobel Prize for *Doctor Zhivago*, could not accept the prize since the Soviet Prime Minister Nikita Khrushchev did not like the book. At the beginning of the 1980s (the Brezhnev regime), the avant-garde

exhibition in Moscow was demolished by government bulldozers. In those 73 years, official Soviet art lied. However, it lost control of its artists in 1991, when its sponsor, the Communist Party, was proclaimed illegal.

In the period between the two world wars, Berlin became the capital of decadence, and the movie *Cabaret* illustrates this period in German culture. In 1933 when Hitler came to power, the deconstruction of German culture began on a wide and premeditated scale. Police closed the famous Bauhaus school. About twenty-five directors of museums were fired, leading artists to flee the country. The minister of propaganda, Joseph Goebbels, ordered books to be burned that were not in line with national propaganda. This took place in the same country where a century ago Heinrich Heine said: "where books burn their minds flare up." All avant-garde painters were condemned. The Führer asked, "what artist is that who paints the sky in green and grass in blue?" He called the avant-garde a sick people who should be sent to psychiatric hospitals. A new school of "the beautiful German" could only be practiced. It was nothing more than a repetition of Soviet socialist realism.

Both histories of Communism and Nazism are the history of censored and falsified information. Their goal was to keep people under strong control through fear and tension. Both "new civilizations" captivated the minds of their citizens and did not allow for independent and critical, active thinking. Both civilizations were eliminated by force or the idea of freedom.

Today, a free human being applies art, literature, and music as a thermometer of life's rush and a compass which indicates the world's state of mind. These instruments are metaphors since art's calling is to provide a perception of reality in the language of beauty. Nerveless, art, to be important, must look for truth, like Italian *arte povera*. This quest nowadays can be called *wisdom processing*, as a sign to be more informed and wise about these causes and results.

The theory of the Semantic Ladder is a contemporary approach of the twenty-first century. It clearly distinguishes wisdom from the remaining units of cognition. In approaches from centuries ago, wisdom was a concept of the totality of the wisdom of mankind, which an individual human was incapable of attaining, and, therefore, no one was truly wise. In a contemporary psychological approach, wisdom is an expert attitude, inaccessible to the rank and file. In a cognitive IT approach, wisdom can be possessed by any sane individual.

An interdisciplinary approach of cognitive informatics to wisdom gives the contemporary theory of wisdom a reference to the theory of wisdom from the past, when wisdom was synonymous to all the units of cognition and resembled, as it were, the medical science from the period when the

microscope was unknown; or it could be compared to physics when an atom was a homogeneous mass of matter, rather than made up of elements such as protons, electrons, and so forth.

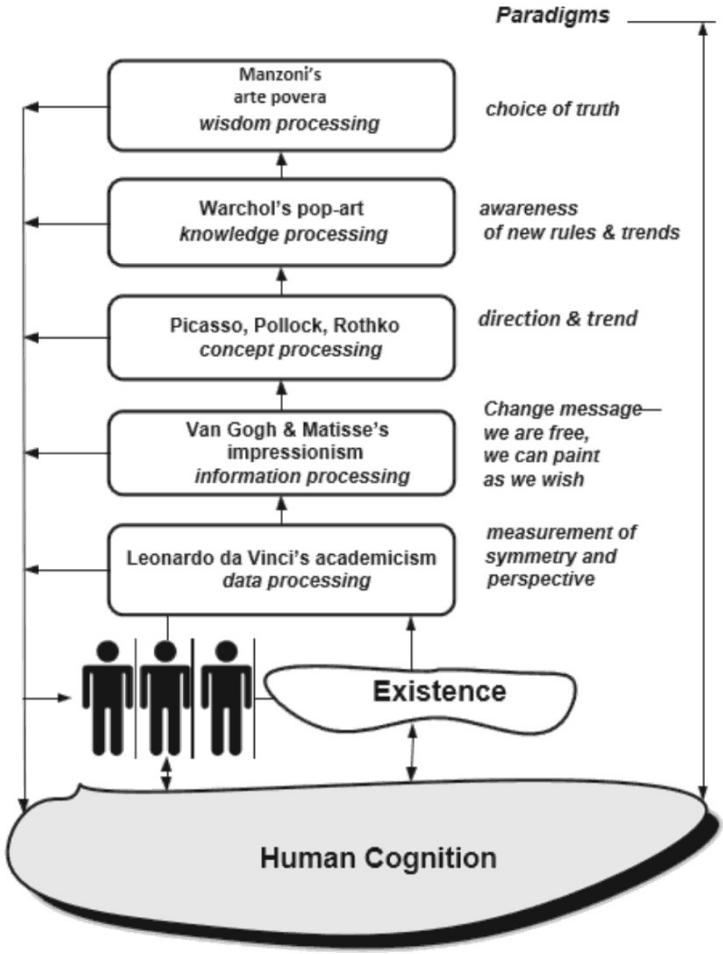

Figure 1.3: Art as seen as units of cognition (Targowski, 2009a, p. 238).

1.2.3 The Art of Living

The art of living is the skill of controlling one's emotions; it is the will of employing morality. It is also intuition and the ability to be guided by the commonwealth rather than one's personal benefit, and it is the ability to focus on important issues: the will to apply selflessness and the will to be either patient and modest or energetic, depending on the situation. The art of living is the skill of functioning in unpredictable situations and reckoning with some less rational factors; it is also the skill of proper conduct when faced with a company of people coming from a generation different than one's own. The art of living may reinforce the wisdom of *judgment and choice*, but it can also weaken, discredit, and neutralize these.

Some essential examples of the art of living will be provided in the following sections.

Be philosophical. Determine your philosophy of life. Are you a believer, an unbeliever, or an agnostic? Are you pragmatic? Can you anticipate situations (*a priori*)? Do you know what wisdom is about? Do you know how to live? Alternatively, perhaps you are an idealist who is also down-to-earth, a realist who understands that elitism reflects natural diversity and determines progress but, as a young person, you are also ethical and tolerant. In other words, what is your life philosophy? What is your worldview? It can be conceptualized in different ways, but what matters is that you should be aware of your life philosophy and conform to its principles, such as being moral.

Be moral and ethical. Morality depends on civilization. There are nine civilizations now, governed by religion and the morality it entails. Western civilization is determined by the morals of Roman Catholic and Protestant Christianity. Eastern civilization is also controlled by Christianity: its Orthodox variety. Buddhism governs the Chinese and Japanese (Shinto-nature) civilizations but also Buddhist and Hindu, albeit in varying shades. The African civilization is shaped by several religions, with Islam controlling the north and Christianity controlling the rest, with some exceptions.

One can give the example of Napoleon's "emotions" during the battle of Waterloo when, due to gastric disorders, he spent much time in a latrine. Emotions never left him, and the battle was lost, with bad fate (his countrymen, in fact) banishing him into exile. Stalin, too, behaved emotionally, as he did not believe the reports saying that Germans were to invade his country in 1941, and after the invasion, he hid for a week for fear of being arrested and killed; thus, he left the office without command for a week. It is only after he understood no one meant to arrest him (all the politicians of those days were afraid of Stalin) that he came back to perform

his duties. Emotionality is about maintaining controlled objectivity so that the emotions of vengeance or viciousness do not surface. Young people manage their emotions worse than seniors. Thus, they make less wise decisions than the older ones. One tends to say about the young that they are "on a short fuse." Therefore, they make worse decisions. Temperament, which is otherwise an asset when one is young, is a weak point in decision-making and is even a dangerous ingredient in the system of thinking. Its lack in old age is perceived to be a disadvantage, but in reasoning, its lack tends to be an advantage.

Be focused on essential matters. The skill of focusing attention on important matters determines effective thinking and action, that is, a wise life. Human life is short, unfortunately. Once they have learned how to live, must they pass away into eternal vigil? Therefore, a wise life is about dealing with issues that are important for a particular human being. Would one like to live a good and exciting life? Alternatively, perhaps, one would like to do something meaningful.

Albert Einstein is an example of concentrating on important things. When he began his first job as a rank-and-file worker of the Patent Office in Bern, Switzerland, he complained about being snowed under with applications for patents. This was the turn of the nineteenth century, characterized by the intensive progress of the Industrial Revolution in the English-speaking world. The boss advised him not to read everything that comes in the post: sort the applications into those already patented (having no chance to be patented) and those that could be; apply yourself to the latter. Einstein used this advice in his research. When he first came up with his formula of energy ($E=mc^2$), he did not get lost in the tangle of research in theoretical physics. He was always able to get down to the most important work. He spent his last 20 years elaborating on the "theory of everything," which neither he nor others have been able to do successfully. Incidentally, Einstein was not as wise in his private life as he was in physics. He lacked wisdom in his relationships with women. On the other hand, it was a wise decision to leave Germany in 1933 and go to the USA; however, did he do a good thing rejecting the offer to become the first president of the State of Israel in 1948? He wanted to devote his research to the theory of everything, but he failed. In 2000, *Time* magazine declared him the man of the twentieth century. A bad example of the skill of focusing on the most critical matters of the office is President Barack Obama in 2009–2012. This was a time of growing unemployment, which he began to deal with selectively only in the third year of his term. What he brought to the foreground was obligatory health insurance, the constitutionality of which had been questioned (in July 2012 the Supreme Court pronounced the healthcare reform constitutional,

saying that some fees for services are a form of tax whereas the President considers those fines for not insuring employees). Because the problem of unemployment was not being solved, the president ranked low in the polls.

The Italian PM, the tycoon Silvio Berlusconi, behaved likewise in terms of his inability to focus on issues of state priority: he thought, contrary to facts, that the Italy of 2011 was faring well, as indicated by the plight of seaside guesthouses and restaurants when Italy had begun to plunge into an ever-growing debt loop to the brink of insolvency. It caused his prompt resignation.

Be reflective **(*forget-remember-connect*)**. Remember what is worthwhile, forget what is unworthy of remembering, and be prepared to associate *facts*, *judgments, and choices*. Develop the skill of reevaluating events from the past, present, and those that can happen in the future. Controlled contemplation of an event should occur: see the event in new circumstances and time. This is particularly true of children who made unwise decisions in the past, contrary to the advice from their parents. Years after, in a controlled state of emotions, they might wish they had obeyed their parents.

Be altruistic. The issue of altruism marks noble individuals, who guide their judgments and choices in keeping with this value. What might seem irrational for some, for others, such as Abraham Lincoln, Franklin D. Roosevelt, Nelson Mandela, Martin Luther King, John Kennedy, John Paul II, Lech Walesa, Warren Buffett, or Bill Gates, seems an obvious and wise solution. It can be expected that everyone should be selfless, but it is leaders that should be marked by this attitude. Regular people can apply this to their closest environment, such as parents, spouses, children, cousins, neighbors, and others in need in their proximity.

Be patient. In the English military, there is a principle that important operations should be decided the next day after having a good night's sleep, to avoid haste and making an unwise decision that could be painful in its consequences. The English appreciate the virtue of patience. Often it is not worth reacting immediately to a critical situation so as not to exacerbate the crisis and find oneself in a situation with no way out. Making important life decisions requires time to make a *judgment and a choice* toward a solution. Rushing to get married in the USA, for example, has led to a situation in which every other couple gets divorced. If you have a conflict with someone, give them time to back off, come to their senses, or, possibly, make another mistake.

Be responsible for your activities. Predict the outcomes of your judgment and choice, and in what way they may impact yourself, your

family, your profession and work, your country, and even your civilization and the world.

Communicate your solution. The wisdom of living is not only about wise reasoning but also about implementing your wise solutions. This is achieved by submitting your ideas to the right people and institutions at a right time.

> The art of living is about: (a) the moral, ethical, and intuitive balancing of emotions, (b) attention directed to important things, and (c) an ability to reflect by way of remembering significant matters and forgetting those irrelevant, associating significant factors and reacting to events characterized by patience and a dose of selflessness as well as other immeasurable factors, especially in difficult situations, so that wise judgment and choice are reinforced.

1.2.4 What is Wisdom?

The previous considerations show that, in common sense, wisdom is the right assessment and choice of a solution concept. A lot of computational (mathematics) methods, as well as intuitive methods, can be used for evaluation and selection; however, the scope and quality of assessments and choices also depend on the number of minds used. A person with only *steering* and *basic* minds (processing basic knowledge = common sense) will be able to judge and choose a solution option in common sense only.

For many situations, such wisdom is "sufficient." However, by increasing the number of different minds used, we can enhance our judgment and wisdom's quality. Other types of minds include the following: reasoning, global, universal, digital, virtual, cosmic, and hybrid.

These assessment and selection methods and the number of minds employed can provide the right JUDGMENT and CHOICE of solution options. However, this is what a computer would do, not a person who uses their art of life in these intellectual processes. In such a way one can strengthen the scope and quality of judgment and selection, as well as reduce their uncertainty.

On the other hand, the processes of the art of living are further elementary processes of wisdom, which, through their life energy, strongly influence JUDGMENT and CHOICE. The elementary processes also include the wisdom of civilization, family, profession, and other types of wisdom that a person has access to through the reflective process of the art of living. Thanks to them, a person remembers-forgets-connects what is important in those kinds of wisdom in which he/she grew up and lives.

Based on the presented main mental processes, wisdom is defined as follows:

> The wisdom of a human being in his/her daily conduct results from right judgment and choice of a solving concept using one or several minds, such as basic, reasoning, global, universal, digital, virtual, cosmic, and hybrid. Also, the quality of wisdom depends on the art of a given person, which results from his/her genetics, character, morality, education, practice, relationships, environment, and the ability to draw on the wisdom of family, profession, civilization, and other wisdoms. In particular, the wisdom of the person or his/her organization must result from his/her responsibility for the positive fate of the surrounding civilization. The effects of wisdom are survival, health, life, fulfillment of goals, cognition, solution, action, suggestion, advice, opinion, decision, and others.

In short, the definition of wisdom is

> Wisdom is right judgment supported by knowledge and right choice in the context of the art of living.

This definition is illustrated in Figure 1.4, the model of the universal wisdom cycle in the infological and psychological information (knowledge and wisdom) approach, where the remaining approaches—philosophical (life goals) and anthropological and political (civilizations)—are recorded in great data, great knowledge, and great wisdom.

Wisdom is a product of thinking. The presented fundamentals of the approach to cognizing indicate that humans use two decision-making systems: emotional-intuitive (the art of wisdom) and rational (good judgment and choice). This approach is supported by the psychologist Daniel Kahneman, the 2002 Nobel Prize laureate in economics for his theory of decision-making in conditions of insecurity (Kahneman, 2011). Kahneman defined two systems: System 1—fast thinking—acts as if automatically with little mental effort. It will instantly detect that one object is further away from the other, determine the source of a sound, supply the result of 2+2=, finish the adage "There is silence ...," etc. System 2—slow thinking—requires a larger amount of mental effort and is sometimes backed up with complicated calculations, such as filling in the annual income tax form, providing information on the workplace phone number that includes an extension, or checking a logical or mathematical proof. System 1 requires no major scan in human memory; system 2 does.

System 1 generates impressions, feelings, inclinations, and—when supported by system 2—it can even generate religious beliefs, attitudes, and intentions. This system can even be programmed by system 2. System 2

operates effortlessly under normal circumstances, but when it detects a difficult situation, it switches, as it were, to higher levels of reasoning, which slows this form of reasoning down to remain wise.

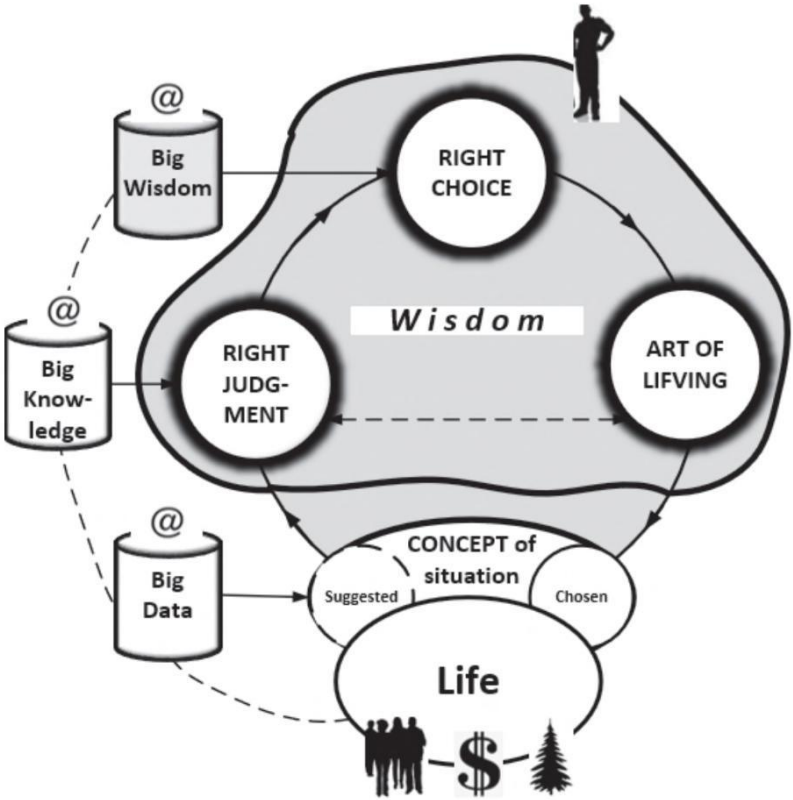

Figure 1.4: The model of the wisdom cycle (without the updating of big data, big knowledge, and big wisdom) (Targowski, 2017, p. 105).

Certainly, a human being employs system 1 or 2 automatically for most of their conscious life. The theory only corroborates the validity and role of human psychology in human life. Psychologists even categorized major behaviors depending on age. The Erikson (1902–1994) model is particularly appreciated, as it allows one to predict with a high likelihood the behaviors of the person one is dealing with, in other words, their wisdom:

- Stage I—infancy (birth to 18 months)—trust, mistrust, willingness, hope;
- Stage II— early childhood (18 months to 3 years)—self-control, courage, and will;
- Stage III— age of play (3 to 5 years)—purpose, initiative, guilt;
- Stage IV—school age (6 to 12 years)—method, competence, resourcefulness, and inferiority complex;
- Stage V – adolescence (12 to 18 years)—misperception of one's role, sacrifice, and loyalty;
- Stage VI—young adulthood (18 to 35 years)—membership, love, privacy, solidarity vs. retreat;
- Stage VII—middle adulthood (35 to 55/65 years)—productivity, care, aging, self-interest, stagnation;
- Stage VIII—late adulthood (55 or 65+ years)—wisdom integration vs. desperation.

This German-American psychologist thinks that only old people can be wise. This goes against the theory discussed here, which holds that people can be wise irrespective of age if they have good judgment and make good choices, and apply a good art of living. However, the eight stages and the major behaviors that can be expected of people in various age bands provide premises on what to pay attention to in relations with others, and this is a great help in elaborating wise judgments and making wise choices.

Humankind is controlled by three systems: biological (genes), spiritual, and reasoning (resulting in wisdom, stupidity, or their mix). Humans do not yet have control of their biological system, even if genetic engineering promises this. Humans choose their spirituality, whether it is religious or a form of lay spirituality. The system of reasoning is supposed to reconcile those two when they clash (a proposition endorsed by the psychologist Marek Celiński).

Before modern humans began to understand what wisdom was, however, a few thousand years had passed, which will be mentioned in the following sections.

1.3 A General Overview of the Evolution of the Role of Cognition in Civilized Humans

The history of human evolution is a history of progress obtained from the development of knowledge of the world by humans, based on common-sense knowledge as well as professional and scientific knowledge. This knowledge is not linear; it is often forgotten or ignored. For example, at the

end of the reign of the Roman Empire, there were conflicts and poverty among subordinate peoples who did not think about developing new knowledge about the world. However, after the collapse of this empire, there was a Renaissance (fifteenth century) of human civilization, which, with new enthusiasm, increased knowledge, especially scientific knowledge about the world and life.

In the Middle Ages—known as Dark Ages (fifth to fifteenth centuries)—the knowledge developed by the Greeks and Romans was forgotten, but in the time of the Renaissance (beginning in the fifteenth century), they began to recall the achievements of the ancient classical civilization. In the seventeenth and eighteenth centuries, there were numerous conflicts and wars, both in the West and in the East, which led to inventions of items such as the pocket watch, flushing toilets, champagne, barometers, telescopes, adding machines, and so forth, which improved the convenience of people's lives. However, the bigger explosion of knowledge and technology took place with the development of the eighteenth century scientific and engineering knowledge, which caused the Industrial Revolution in the nineteenth century and the scientific and technical revolution in the twentieth century.

1.3.1 Knowledge and Wisdom of Ancient People

The knowledge and wisdom of ancient people who started the process of civilization 6,000 years ago consisted of the knowledge of running livestock, farming, sewing clothes, and baking rice cakes. These people were able to build houses and temples, extract iron, and produce weapons as well as other objects of everyday use. Some knew writing; however, the greatest effort was devoted to the development of art and the knowledge of killing and torturing opponents. What was the condition and wisdom to keep many conquered people in check by emperors, kings, and all kinds of absolute rulers? The knowledge and wisdom resulting from knowledge manifested in ancient countries as follows (van Doren, 1991):

- Mesopotamia – this area developed the earliest from all the empires of the letter (about 3100 BCE), which is a good reflection of the Sumerian language. Writing was used to register accounts of lives and property inventories to conduct trade. Writers were quickly employed and enjoyed privileges and recognition in this first civilization in the world. Today, writers have become the "brains" of modern societies (Targowski et al., 2018).

- Egypt - knowledge of human immortality and preparation for it during life prevailed. This was a special privilege of emperors who had built pyramids during their lifetime. Priests possessed advanced knowledge about nature (e.g., about outflows and tides of the sea and lagoons of the Nile or shadows of the Sun), which forced subordinates to stay in line with the status quo. To this day, this type of wisdom is practiced by contemporary autocratic rulers. Modern religions have also benefited from this wisdom, which prepares the faithful for eternal life, provided they fulfill several conditions during life (Targowski et al., 2018).
- China – China's wisdom is based on the teachings of Confucius (551–479 BCE), such as, for example, that eminence should result from substantive contribution and moral perfection, not from birthright. The substantive contribution should result from learning, which over time has been reduced to studying the writings of this sage. Another sage, Sun Tzu, taught that war should be won without a battle. In addition, even the farthest journey begins with the first step. All in all, the wisdom of the Chinese people is at present the strategy of being in the middle of the road. For example, in the twenty-first century, China wins a trade war with the United States without a "battle" and sharp conflicts.
- India – in this region, society was organized in a hierarchical caste system, in which everyone knows their place, their role, and destiny. This system ensures the relative stabilization of the state. Similar systems are contemporary totalitarian states, in which certain people are "more equal" than others. In democratic countries, there is also a division into classes according to the state of ownership, but there is the possibility of moving between these classes.
- Aztecs and Inca – this is where contemporary Mexico and Peru are located. The Aztecs invented a precise calendar, and they were able to build large buildings and develop agriculture based on irrigation and crop alternation. The Incas knew how to build roads and buildings; however, because the Incas did not know the wheel, their roads were built for pedestrians. Governments were absolute and based on sacrificing people on the altars in the name of the common good. Thus, they were based on their subordinates' fear and their ruthless obedience.
- Greece – this area developed art and architecture to the level of beauty and immortality. It also brought into existence the first political system in the world called "democracy," although it lasted for a very short time. The Greeks introduced the science of

philosophy, or love of wisdom, which is still developing and is without signs of saturation. The three great Greek philosophers are still studied and admired to this day: Socrates (470–399) recognized the truth as the most important virtue of man, while Plato (227–347) argued that one must develop ideas that guide the existence of people and society, and Aristotle (384–322) classified most of the world's components and life, and also recognized that only the extraterrestrial soul is wise and that people are stupid. Unfortunately, almost all the eminent philosophers living after him agreed with this claim and did not get involved in research on this most important intellectual resource that people have on Earth.

- Rome – the Romans did not take from the Greeks a sense of beauty and love for wisdom, or philosophy, but instead developed a sense of being a civilian, or a citizen of the state. Emphasis was put on the construction of good roads for the marching of troops, the construction of aqueducts, and the planning and application of the law. Unfortunately, the Romans were not interested in developing science or knowledge, and they applied absolute tyrannical power over their subjects, except for a more liberal power in the very city of Rome, where the elite of this empire lived.
- Judaism – Judaism is based on four premises:
  - Humans are responsible for themselves.
  - People are to apply their commandments and principles.
  - God will never fail the God of believers and will ensure that their stay on Earth will be a success.
  - God requires believers to be witnesses to his being, goodness, and justice.
- For 4,000 years, Jewish wisdom (Telushkin, 1994) has been growing and contains thousands of common-sense recommendations that advise the use of the rabbi, the spiritual leader of the community. These recommendations result from the practice of everyday life, the Talmud, and the writings of important Jewish authors. Examples of so-called Jewish wisdom are the following:
  - When, if ever, are lies allowed?
  - If you have unfairly damaged your reputation, can you restore it?
  - Is the person who sells the weapon responsible for its use?
  - If the human embryo is not life, what is life?
  - What are the nine biblical challenges that a decent person should practice?
- Christianity – the Jewish prophet Jesus Christ proclaimed "love your neighbor as yourself" and broke with the current practice "hate or

even kill your neighbor so that you can live better." People liked this new strategy of a more secure, and more sustainable and just life. While the Jewish God is unhappy, but just, the God of Christians is also just and merciful.

- Islam – this religion proclaims the Holy War (jihad) with unbelievers in order to achieve moral perfection through the unity of civil and religious life. There is a great sense of guilt for one's sins and the way they are forgiven. With this idea, Islam has convinced about a billion people on Earth today.
- Buddhism – this is a secular religion, or a set of ethical principles of life, for it proclaims modesty on the verge of asceticism and the pursuit of the Four Noble Truths through the Eightfold Path. Buddhism is a religion of the poor directed against invaders, that is, occupiers of smaller nations, which is what the Tibetan occupation is currently undergoing with China.

From the distant past comes the following:

1. The most important challenge for wisdom was the absolute rule of the people, and their wisdom was directed at survival in tyranny.
2. Knowledge and knowledge of writing served for mobility up the social strata.
3. The idea of social equality was not formulated, although religions and wise men uttered it, usually providing it in the afterlife. This means that it would come later, and not now, and on condition of listening to those who exercise power.

1.3.2 Knowledge in the Middle Ages (Known as the Dark Ages)

After the fall of Rome in 496 CE, chaos broke out in Europe for about 1,000 years. This was a period of various parties vying to control the Papacy, and the Holy Roman Empire, ruled by German emperors, was founded by Charles the Great of the Franks in 800 CE. During this period, faith struggled with reason and ended with the Pyrrhic victory of faith. St. Augustine sought to expound the wisdom of life by dividing it into "the city of God" and "the city of the emperor," which was developed later by St. Thomas Aquinas. He claimed that God could be analyzed, for which he was considered a heretic. However, this division was heavily criticized by other theologians. Therefore, the wisdom of the people of that time consisted in conforming to the dogmas of religion and not using an intelligent solution. Among others things, this allowed for the creation of beautiful sacral

architecture in Europe, especially in Rome. However, faith and superstition defeated reasoning until the Renaissance in the fifteenth century.

1.3.3 Knowledge in the Beginnings of the Renaissance (Fifteenth Century) and Enlightenment (Eighteenth Century) and Thereafter

Knowledge in this time was based on scientific knowledge and the power of reason. As a tool for recording (memorizing) and distributing knowledge in Europe, the printing press was invented by Johannes Gutenberg (1400–1468) in 1454. The foundations of science were given by Nicolaus Copernicus (1473–1543), who denied the dogma of the Church that the Sun revolves around the Earth. Starting from this observation, Descartes (1596–1650) formulated the principles of the scientific method, the first principle of which says that one should doubt the current state of affairs. The second states that a big problem should be divided into smaller ones, while the third rule advises solving minor problems gradually. In the wake of this, Isaac Newton (1643–1727) formulated the law of gravitational attraction, and Johannes Kepler (1571–1630) defined the laws of planetary motion. However, Giordano Bruno (1548–1600) burned at stake for believing that Our Lady Mary was not a virgin and that the Earth revolves around the Sun, and Galileo Galilei (1564–1642) could not be a scientist, because he claimed that the Earth was revolving around the Sun. It is evident that the dogmas of faith gave way with difficulty to scientific knowledge.

The Roman Catholic Church at that time was digging into its dogmas after the schism in 1517, when Martin Luther posted on the door of the Castle Church in Wittenberg 95 theses stating the need to reform the teachings of Christianity. The result of this was the division of this religion into Catholics and Protestants, with great consequences for the further development of Western civilization. The theology of Protestantism simplified the theology of Catholicism, and it viewed God as approaching people without the need of the mediating, hierarchical system of the clergy and its bureaucracy. The Bible was also considered the only source of knowledge about the Christian faith.

Humankind's struggles with fate were reflected in the literature of William Shakespeare (1564–1616), who asked the immortal question "to be or not to be?" In contrast, philosophy formulated many ideas about making decisions and human behavior, including, for example, empiricism, pragmatism, idealism, rationalism, materialism, sensualism, positivism, criticism and apriorism, spiritualism, messianism, radicalism, naturalism,

Marxism, individualism, elitism, behaviorism, logicism, intuitionism, praxeology, and many other approaches to a wise life (Targowski, 2013a, p 50–51).

Unfortunately, these philosophers—the authors of the ideas mentioned above—did not deal with wisdom since it was viewed as too trivial a subject, and it was not recommended by Aristotle. The problem was that the authors of these views of the world were closed in the ivory tower, isolating themselves from the everyday life of people. As a result, these great ideas were not accepted by people because they did not know about them. In contrast, the narrow English elite led to the English Revolution in 1688. It created a parliamentary democracy that limited the king's absolute power and led to the growth of wise decisions in English society.

Similarly, the narrow American elite was well informed about the condition of the British colony in North America and had much proper knowledge about how to organize the future United States after winning the American Revolution (1765–1786). The American Constitution (1788) is still an unrivaled example for other constitutions in the world, and it introduced democracy in its best form to the world. Similarly, the French elite had a good knowledge and assessment of the weakness of the French kingdom, which resulted at the beginning of the French Revolution in 1789. After its completion in 1799, France became a republic—admittedly briefly—and the subjects of the King became French citizens in freedom, brotherhood, and equality.

Thanks to the invention of the telegraph and the telephone as well as the introduction of state-owned mail, public communication grew. In contrast, the invention of punch card machines mechanized the processing of mass data found in business and public administration, such as census statistics. As a result, knowledge was developed not only to support commercial and production bureaucracy, but also to assist in governing countries. This has also led to making good and, what we would call today, wise decisions.

1.3.4 Knowledge in the Twentieth Century

When the Industrial Revolution replaced the muscular work of people with the work of machines, people gained more free time, which they could devote to learning a profession and enjoy improvements and promotion. The invention of the electric lamp has especially made it possible to learn in the evenings. As a result of needs, there has been a great development of education and universities in Western civilization, especially in its branch called the Atlantic civilization. There was a scientific and technical revolution based on advanced physics and chemistry as well as others,

which, additionally supported by two world wars (1914–1918 and 1939–1945), introduced cars, planes, radio, television, computers, computer networks, the Internet for general use, effective medications, and the resulting social engineering development. On the other hand, in the twentieth century governments came to power proclaiming Communism (1917–1991), Fascism (1920–1945), and Nazism (1933–1945), which turned out to be criminal, antihumanistic, and antiscientific, based on pseudo-science, which produced negative knowledge. This negative knowledge did not develop the wisdom of the people, their organizations, and states. When the Soviet bloc talked about popular democracy, this actually meant a lack of democracy. This type of language was defined as a new language. In 1945–1991 there was the Cold War, which consisted mainly of a propaganda war, that is, a war in which there was published all kinds of information and knowledge, including negative information and knowledge. It is estimated that, from the beginning of printing books until 2016, there are 134,021,533 unique books to read (Panganiban, 2016). To this should be added tens of thousands of newspapers, magazines, and scientific magazines that systematically inform and print new knowledge.

1.3.5 Knowledge in the Twenty-first Century

During this age, the development of knowledge has intensified. The Internet has made it possible to popularize e-books, e-magazines, and e-bulletins, the counting of which is practically impossible. Google has undertaken the task of scanning all the books of the world and making them available online, for a fee of course, including a minimum fee for authors. Amazon, on the other hand, has struggled with traditional book publishers because it wants to sell e-books for less than $10. Time will show how the reading market will stabilize. One thing is certain, though: e-access to almost all books will effectively inform authors and readers about knowledge. However, whether this will lead to plagiarism or new knowledge, again, time will tell. Also, will this not stop the publication of new books and articles, since remuneration will be minimal? On the other hand, social networks like Facebook sell personal data that profile people for all kinds of needs, which was previously prohibited in democratic countries.

The increase in the ease of e-publishing and e-access to e-knowledge has led to competitiveness between universities and colleges across the world, which has increased funding for research and, consequently, recruitment of an increasing number of scientific and professional staff capable of winning the university race for better and wealthier students. It

can be estimated that there are around 26,368 universities in the world (CSIC, 2017), and there are a similar number of industrial and state as well as non-governmental organization (NGO) research and development centers. In total, it can be approximated that there are around 50,000 significant centers in the world, employing on average about 100 publishing scientists at universities and 20 publishing scientists in the other centers, or about 5.5 million major knowledge producers in total. If one important report contributing to knowledge is prepared by each of them per year, we reach 5.5 million knowledge-contributing reports each year. This is an enormous number of reports to read and conceptualize.

For example, 730 scientific magazines with anonymous ratings are published just in IT; despite the e-access, the question is whether one scientist can use these scripts positively for their specific scientific research. However, IT specialists working outside universities do not read these scientific magazines but read reports from consulting companies unavailable in an open, online mode for readers who do not pay high prices for such reports. Similarly, researchers at the university cannot afford to read reports from consulting companies. Hence the next question is, what is the value of these scientific publications? A similar situation takes place in medicine and other economic and social sectors.

This unexpected progress of modernization in civilization caused the development of the idea of postmodernism, that is, a return to non-technical and normal life, where humans and not computers are the axis of life.

1.3.6 Knowledge Results from Education

Education is, in a broad sense, an act greatly affecting mental development; that is, the quality of thinking and deciding as well as the nature of human behavior in both the intellectual and physical realms. In the organizational sense, education is a process in which society deliberately informs its members about accumulated knowledge, wisdom, qualifications, and values from generation to generation through schools, universities, institutes, organizations, and so forth. In a specialized sense, education is a discipline dealing with methods of training as well as learning in schools and universities, which is unlike other forms of learning at home or in educational projects that are treated as a business.

In the historical perspective, the following observations can be made:

- Education in antiquity was not considered an important process that the state must organize for its subordinates. Only a small group of enthusiasts dealt with knowledge, except for China, where the

administration was based on substantively qualified Mandarin officers, who had to pass knowledge and qualifications examinations (Targowski and Han, 2014, p. 193).

- Education since the Renaissance in the Middle Ages has been recognized as a very important value for the modernization of society.
- The first training and education programs were oriented toward the training of the clergy; later they began to transform into liberal education in Western and Eastern civilizations.
- Since the Industrial Revolution (nineteenth century), education has begun specializing in training and educating specific professionals. However, elements of liberal education have entered these programs as common or general knowledge.
- Specialization in education in the twentieth century has led to the so-called knowledge silos, i.e., education that is more and more specialized and without time for education in liberal arts and general knowledge. In this way people were trained and educated but were narrow-minded. This includes, for example, politicians whose general interests are limited to the years of their term in a given position in the state apparatus.

Education in the twenty-first century must take into account the following trends and needs for promoting real knowledge and wisdom (Targowski, 2016, p 240–241):

- The rapid development of civilization has led to over-productivity and superconsumerism, which directs residents to an unbalanced development of life on Earth, and, as is well known, people do not have a planet B to move to when the strategic resources on Earth are exhausted. This must be strongly addressed in educational programs.
- The fast, technically assisted development of globalism leads to the liquidation of the middle class in Western civilization, thus undermining the foundation of its democratic system and capitalism with a human face. In place of unjustified enthusiasm in schools and universities for globalism, educational programs must address this problem and combat the so-called artificial media (fake news), which, in the name of anarchist doctrines, serve false information about the state of affairs in the world.
- The rapid spread of the Internet leads to the development of a culture of hatred and youth addiction to e-communication and isolation in real environments; however, it simultaneously leads to the development of about 100 million elite young people communicating in the world,

who have an impact on life in real environments. Educational programs should address this problem, not by more online learning but rather by limiting this form of development of knowledge and qualifications, which takes place at the expense of knowledge and qualifications in real life.

- The development of global civilization lowers morale and business ethics, and minimizes the activity of local life, as evidenced by the dying out of the local press, which was a binder for the local community. Educational programs must address this problem.

1.3.7 Conclusions

1. Knowledge and wisdom in antiquity and the Middle Ages was unavailable. Hence human "wisdom" consisted in self-preservation and survival until the so-called tomorrow because human behavior was controlled by an absolute and usually cruel ruler. The average lifespan at that time was less than 30 years.
2. The exception here were Jews, who studied written Jewish wisdom as healthy and sensible solutions. The Chinese also learned Confucianism, which prescribes healthy and reasonable behaviors in everyday life.
3. On the other hand, the followers of Catholicism, Islam, and Hinduism subordinate their everyday wisdom to the quality of the afterlife. That said, Protestantism teaches wisdom for the needs of everyday life; hence, countries such as Great Britain, the United States, the Netherlands, Australia, and New Zealand have achieved prosperity in life due to respect for work on Earth, without waiting for a better life after death.
4. Knowledge and wisdom at the level of the elite in antiquity and the Middle Ages was available, but only for those few who could read and write, and especially for priests. Hence, their wisdom consisted of calculated solutions.
5. Knowledge and wisdom at the level of organization in antiquity and the Middle Ages was available at the level of governing the state, thanks to a staff of people from the informed elite. The wisdom of ruling consisted of the use of fear and cruelty to control subordinates, and conquered tribes and nations.
6. Knowledge and wisdom in modernity for older citizens grew due to the development of education and training as well as the complexity of civilizational challenges, such as searching for a job. Thanks to education, people started to gain theoretical knowledge apart from

knowledge and common-sense wisdom, which deepens their understanding of situations and leads to wise choices of solutions.

7. Knowledge and wisdom in modernity at the level of organizations such as business companies have been supported by economic and business sciences, and thus it has become more in-depth and optimal.
8. Knowledge and wisdom in modernity at the level of the apparatus of power has increased thanks to the promotion of well-educated people to the highest positions in this apparatus. However, their wisdom is often influenced by the interests of companies represented by lobbyists who, by the "laws" of these politicians, cause corruption. Does this cause a decrease in the quality of wisdom? What can be characterized by such observations is that, in poverty, people are wise, and in prosperity, foolish?
9. Education in the twenty-first century is mainly offered in a narrow perspective and in a situation where strategic resources such as oil, gas, coal, uranium, and nonferrous metals are unlimited. Such a situation took place in the nineteenth and the first half of the twentieth century, but not in the second half of the twentieth century and the twenty-first century. Education in the narrow perspective is optimistic and promotes the understanding that only "sky is the limit of development," but in the long term, it should be more pessimistic and truthful, since the sustainability of civilization is in question nowadays.
10. In these considerations, the term "wisdom" was used from the standpoint of cognition in the twenty-first century. In ancient times, the modern concept of wisdom was not widely used, as in its ancient meaning; it was associated with cleverness, intelligence, or success.

1.4 Evolution of the Human Mind and its Potential for Knowledge and Wisdom

The brain is the most complex biological-chemical-nervous-information-communication system on Earth. This system determines the success of animals and humans in confrontations with the ecosystem. Thousands of scientists have been studying the brain's functioning and development. The Greek philosopher Aristotle (384–322) in the fourth century already understood that wisdom does not only result from experience but also from the functioning of the brain and the "soul." He placed the soul in the human heart. From that moment on, the concept of duality, the distinction between brain and mind (the soul of Aristotle), was created. Plato, on the other hand, moved the soul (or mind) from the heart to the brain. Admittedly, our emotions are still associated with the heart, such as love, and not with the

brain, which even explains madness in love: it does not result from a rational brain, but an emotional heart.

Descartes (1596–1630) in the seventeenth century—that is, about 2,000 years after the time of Aristotle—clarified this dualism, claiming "cogito ergo sum," or "I think therefore I am." In other words, the abstract, information process of thinking was separated from the physical existence of matter, confirming the brain-mind duality. Moreover, he put the mind in the brain in one of the glands. Further research into brain functioning is involved in distinguishing the brain's functions and their localizations in the brain and in explaining the input-process-output relations of these functions at the biological-nervous-chemical-energy level. Particularly important contributions in this respect were made by such scholars as Joseph Gall (1758–1828), Sigmund Freud (1856–1939), Burrhus F. Skinner (1904–1990), Jean Piaget (1896–1980), Konrad Lorenz (1903–1989), Richard Restak (1942), and others.

As a result of these tests, one can define the human mind as follows:

> The mind generates meaning and purpose in our life and our view of the world in the past, present, and future through conscious and unconscious information and communication processes creating permanent and impermanent maps of things, supported by biological-nervous-chemical-energetic processes of the brain.

The modern philosophy of mind generalized the brain-mind system into the mind-body system, causing a discussion about whether this system can be reduced to elements and whether each of the elements can be analyzed and improved in relative isolation. Alternatively, this arrangement cannot be reduced and should be treated as a whole. The reduction approach treats the mind according to the computer model, where the brain is hardware, and the mind is software that algorithmically and procedurally processes external signals into results enriched with information previously stored. The reduction approach to the mind is used in sociobiology, computer science, and especially in artificial intelligence, evolutionary psychology, and various neurosciences.

The pioneer of studying the mind according to the computer model was Marvin Minsky (1927–2016), who, in his book *The Society of Mind* (1986), formulated that agents, agencies, and their elements as well as relations occur in conflicts and compromises, in themselves, in individuality, introspection, problems and goals, in memory, in synthesis, in the division of space, in teaching meaning, in perception and belief, in reformulation, in consciousness and memory, in emotions, in development, in reasoning, in words and ideas, in context and ambiguity, in teaching and teaching, in

comparing, in censoring and joking, in the mind and the world, in the reality of thinking, and in mental models. Minsk's approach provided the basis for the development of artificial intelligence. Minsky, in cooperation with Irving Good (Izydor Gudak 1916–2009), demonstrated in MIT in the 1980s how neural networks (infocommunications) of the mind can self-develop, based on self-learning and following the pattern of their development in the brain. This approach to artificial intelligence is now intensively developed.

Minsky understood "the society of mind" as a collection of many elements and mental processes that this system, or the over-arrangement of the brain, considered on the syntactic level. In the present approach, however, this "society" will be analyzed as a dynamic collection of many types of minds from their worldview on different levels and semantic ranges. One of the first who studied the content (or the semantics) of information-communications was Alfred Korzybski (1879–1950), who developed the discipline of general semantics. His idea boiled down to saying that human thought is abstract and parallel to things, which he illustrated with the well-known saying that "the map is not the territory."

This approach cannot be confused with studying someone's intelligence in the so-called intelligence quotient (IQ) because intelligence is not knowledge or wisdom but the ability to solve problems. People can be very intelligent, but not wise at all. For example, Albert Einstein was very intelligent in physics and music, but not so in private life. High intelligence can sometimes be a curse, because as in sports, for example, you cannot win merely because you have the potential, but because of smart tactics. For example, in tennis, one must wisely choose the stroke appropriate for a given situation on the court. This is similar to the curse of wealth, when in wealthy countries, the rich and intelligent youth is not attached to science.

In the presented approach, we do not deal with the physiology of the mind, only with its variations due different worldviews. In this way, one can assess the level of knowledge and wisdom of a given person, and thus understand "what they mean" in dealing with other people. This type of assessment and expected solutions can also be applied to specific organizations and governments, examining their knowledge and wisdom and what can be expected from them.

This approach can be compared to the difference between the mission of a world travel agency and its marketing for tourists and the efficiency of the bus, ship, or aircraft engine, without which travel around the world could not take place. Similarly, the brain (engine) is treated as a "black box," and the mind as a tool (map) for thinking, deciding, and remembering.

1.4.1 The Complete Mind in the Twenty-first Century

Steering Mind. This mind coordinates the functioning of the brain, which in turn controls the functioning of the human biological body in a way that differs from the animal. The scope of this coordination includes analog-digital integration, supporting macro- and microprocesses of the brain and mind, such as:

- central processes: the biological clock, instincts, DNA chains, consciousness, subconsciousness, and the management of biological organs such as sensors, receptors, memory, synapses, transmitters, molecules, neurons, limbs, head, neck, abdomen, body, and so forth;
- mental processes: motor processes, behavior, will, emotions, interest, desire, information processing (informing content), thinking, reasoning (making decisions, solving problems, and so forth), learning, falling into dreams, counting, remembering, forgetting, recognizing patterns, assessment, (channel) communication, and so forth;
- episodic-semantic processes: data, information, concepts, knowledge, wisdom, diagrams, links, frames, routines, episodes, and so forth.

The result of the steering mind is the emergence of a semantic (cognitive or mental) reaction that makes the mind capable of, among other things, the following acts:

- understanding the change in the state of a situation, for example a person fell ill and feels terrible or won a lottery ticket and is happy and even very happy;
- coordinating the sequence of human activities as a result of the change of other circumstances, including organizing and adapting to social life and so forth;
- coordinating the relationship between episodes of action, for example suppose an application for admission to studies resulted in admission: this requires appropriate mental and logistical preparations to undertake these studies at a given time and under specific conditions;
- formulating the goal and strategy of action, caused by the above-mentioned semantic reaction, for example a person suffering from incurable cancer must end their short life if this is the desired goal and implement it in the form of a chosen strategy, which can be done through a will that has its goals and donor strategy;

- formulating the Principia (including rules, laws, and so forth) in connection with the situation, for example a subsidy for children is granted starting with the second child;
- controlling physical or information systems, for example if a bank account is robbed, this requires changing the password of the account to an almost undetectable one, which may require changing the IT system of the whole bank, and so forth.

As from this review of the steering mind, it appears that the brain is a biological-energy apparatus for the functioning of mental processes that occur in the mind, or "software" of the brain, which is the "hardware" of the head.

The evolution of the human steering mind shows that its most important process is communication, which in about 40 million years (since the emergence of *Australopithecus*) has evolved from communication based on instinct to communication supported by computer networks at present. At the same time, communication developed the tribal life of humans, and it now functions in the form of societies and even in the form of a global society, which in the twenty-first century has begun to be organized (Targowski, 2014a).

The moment a person began to know how to use fire, they also began to reason and develop mental processes within the brain, which began to form the mind as a tool to explore the world and complicate it. This happened with the help of better and more complicated *information*. Over time, reasoning developed this mind to the level of cunning and then ordered information and communication using a symbolic language that strengthened the organizational functions of human communes. The invention of printing and recording information on paper has led to the development of education and the emergence of other types of minds, characterized by the scope and quality of the information processed and improving human life in advanced civilizations.

These new minds will be discussed further, with the contemporary role of the steering mind taking on an additional task, namely, to coordinate the interdependence of the ever-emerging minds in the internal and external processes of human life.

The basic mind developed in humans about 200,000 years ago, when *Homo sapiens* possessed an intuitive way of communicating based on "body language," or facial expressions. This led to the development of learning and the memorization and mimicry of language, which, as a result, led to the enlargement of the brain, i.e., memory and associative circuits. Over time, this mimicry was replaced with spoken language and symbols; it was

possible to memorize stories and myths and self-reflect in the past, present, and future. As a result, it was possible to organize people into families, tribes, and society, which led to the expansion of the brain and especially its memory. Practicing this form of information-communication caused the development of external forms of communication, that is, what language, drawings, papyri, and books were and are today. In this way, organized societies grew and developed moral virtues and values (within religion) to control the desirable behaviors of their members. The concepts of guilt and punishment were strongly implemented and are applied both in early societies and today. The basic mind is still functioning and is most often used in the practice of everyday life.

The basic mind generates a common-sense type of knowledge and wisdom, perhaps occurring most at the level of junior high school. Knowledge and wisdom are used by most people on the globe. Examples of this type of knowledge include principles such as "you can lead a horse to a waterhole, but you cannot force it to drink water;" "no one is as deaf as those who do not listen;" "wisdom increases wisdom among wise people;" and "there is silence before the storm." In addition, Murphy's Laws are known in America. Law I says that if something can go wrong, it will go wrong. Law II states that a new system generates new problems.

The reasoning (theoretical) mind began to develop more intensely around 500 years ago when the invention of the book caused the dissemination of theoretical knowledge. Although universities have been operating in Europe since 1200—in Paris (1200), Naples (1229), Cambridge (1243), Sorbonne (1257), Lisbon (1290), Kraków (1364), Vienna (1365), and Heidelberg (1386)—it was only the invention of printing (1454) that caused the rapid dissemination of knowledge at that time. This first resulted in the dissemination of navigational knowledge, which enabled great geographical discoveries (e.g., America in 1492), and later in knowledge of the algebraic type (1494), Venetian commercial accounting, knowledge of modern anatomy (1514), zoological knowledge (1516), ballistic knowledge (1537), and knowledge about the solar system and, within it, the role of the Earth (1543). Later still this resulted in knowledge of mineralogy (1556) and modern astronomy (1571), and after that, the French Academy was established (1635), analytic geometry was formulated (1637), probability theory was defined (1654), Newtonian physics was born (1663), and then theoretical physics, chemistry, biology, and all the other sciences and techniques developed rapidly.

Thanks to theoretical knowledge, a new human mind emerged, which we will call "the reasoning mind." In the Middle Ages—sometimes called the Dark Ages, which prevailed after the fall of Rome (476 CE) and lasted

until the beginning of the Italian Renaissance (1453–1600)—people drew wisdom from religion, which prepared them for happiness and even for eternal life after death. To some extent, people were manipulated by the clergy, but they used to dream about happiness. On the other hand, theoretical knowledge and the reasoning mind that arose with it freed humans from the darkness of ignorance. Humans began to evolve from mere existence to knowledge and from religion to science. They began to reason, both on their own and—most importantly—logically, causally, and effectively.

The emergence of the reasoning mind came to people in a very difficult way since the Church possessed a monopoly on knowledge and wisdom, which, with its dogmas of faith, controlled people's lives quite strongly and effectively. Inconvenient views were called heresy by the Church, which it judged from 1231 (the first inquisitorial decrees of Rome) until 1834 (the decree closing the Inquisition), that is, for over 600 years.

When people felt the power of reason, they began to develop ever new "views of the world," which has since become the domain of philosophy. The Renaissance (1453–1600) revived humans from the Dark Ages and restored their joy in creating beauty and being in their surroundings. Michelangelo (1475–1564) and Leonardo da Vinci (1452–1519), and numerous Italian architects were there to achieve this goal. Other notable figures include English philosophers such as John Locke (1632–1704), who introduced the concept of the importance of experience in life (*empiricism*), David Hume (1711–1776), who developed the theory of uncertainty in action and *skepticism*, and Isaac Newton (1642–1727) as well as French philosophers, such as the encyclopedists: Denis Diderot (1713–1784), Montesquieu (1689–1755), Voltaire (1694–1778)—a well-known opponent of organized religion, intolerance, fanaticism, and superstitions—and Jean-Jacques Rousseau (1712–1778), whose essays of social protest became leaven for the French Revolution. These figures laid the foundations for the Enlightenment (seventeenth to eighteenth centuries), also known as the Age of Reason, which in fact still continues and has new tasks.

As human enlightenment began to develop in the eighteenth century, the German philosopher Immanuel Kant (1724–1804) realized the significance of the role of reason in life. He believed that human reason could assess a situation independently, regardless of "facts." It can assess the situation in advance by pre-empting facts. Reason, he believed, can execute future situations (a priori) and predict their consequences before they are empirically learned, as argued by the skeptic David Hume. Kant's philosophy influenced German idealism, represented by Hegel and Schelling.

In the philosophy of Georg Hegel (1770–1831), the author broke with the static study of life, history, and civilization in favor of a dynamic study, guided by dialectics; that is, by deriving a solution from the thesis and antithesis, from action and antibehavior.

Based on the dialectic, Karl Marx (1818–1883) defined *communism*, and the development of *democracy* in the twentieth and twenty-first centuries is based on the control and balance (*dialectics*) of the three pillars of state power: judicial, legislative, and executive. In the science of apriorism, Kant introduced, as a principle, that apart from the inductive (*empirical*) method one should use the deductive method, that is, predict new paradigms and their effects. Although the deductive method was known to medieval logics it was not popular, especially in mathematics, which began to develop strongly with the Industrial Revolution.

The methods of evaluating human reason were a great progress in releasing humankind from superstitions. They drew humans closer to learning the truth about nature and life and to understanding more and more about why and how to live—if not happily, at least well.

As a result of the constantly evolving enlightenment of humankind, the reasoning mind of humans invented the engine, the telegraph, telephone, microscope, car, plane, antibiotics, computer, and the Internet—and all within 200 years. Thanks to these inventions, the muscular civilization (called "the agricultural wave," 4000 BCE–1850 CE) was supplemented in the nineteenth century by self-perpetuating civilization (motorized, called "the industrial wave"), and it was later strengthened at the end of the twentieth century by information civilization (also known as "the information wave"). All of this led to the expansion of knowledge and wisdom and their dissemination, and it has led to telecommunication access to handheld computers for almost every user's demand.

The number of people who possessed the reasoning mind in the nineteenth century was very small, because education at the university level was available only to a narrow elite, mainly men (sons of rich parents and future priests, who mainly studied theology). For example, the number of children attending school per 10,000 inhabitants in 1850 in the USA was 1,800, in Germany 1,600, England 1,045, France 930, Italy 463, and Russia 98. In 1900, these numbers (Easterling, 1981) increased by an average of 30%. In school, the students equipped themselves with only the basic mind, because the reasoning mind requires theoretical knowledge, available only at the university or polytechnic. The number of people with a university education, including engineering education, was very small in the nineteenth century. It can be estimated that in the largest European countries, it was only several thousand. In Russia in 1850, the percentage

of adults able to read and write was 5–10%, in Prussia 80%, in Austria 60% (excluding Hungary), while in the USA it was 90%. In Poland, this percentage was comparable to the level of Russia and amounted to 5–10% (Cameron, 1993, p. 220).

In the nineteenth century, Poland was under three partitions, and the Polish elite, after three unsuccessful uprisings (1830, 1848, and 1863), mostly emigrated from the country. About 400 Polish engineers who built roads, bridges, and railways and who were educated at the very good Transport Institute in St. Petersburg emigrated from Poland and built roads, bridges, and railways in Canada, North America, Latin America and Europe as well as in Russia, France, Greece, and other countries, even those such as China. The contemporary development of the railway can be compared to the contemporary development of the Internet, because the railway determined the pace of development of the Industrial Revolution, just as the Internet currently determines the pace of globalization. A few Polish scientists also left the country, such as Maria Skłodowska. Unfortunately, the bourgeois revolution (based on the ideas of the French Revolution) reached Poland only in 1918, and the Industrial Revolution, slightly leaving its mark in the interwar period (with the creation of the Central Industrial District and the construction of a modern port in Gdynia), took off in Poland after 1945, that is, after World War II.

These two revolutions (French and Industrial)—so crucial to the development of the understanding mind—could not have taken place in Poland for political reasons: there were very few people with a reasoning mind. Polish elites were very patriotic but too emotional. They did not reason. They were only two-minded. They did not have the patience to develop Poland as an example for Russia, as Czar Nicholas wanted, preferring to fight him instead. Despite the opposition of the Polish general in 1830, Polish patriots did the opposite of the decision of the Czechoslovak elites, who used their membership in the Austrian-Hungarian Empire very wisely.

Margrave Aleksander Wielopolski, Polish administrator of the Russian partition, said "it is possible for Poland to die, but it is impossible to cooperate with Poles." This lack of the understanding mind was particularly marked by the parliamentary chaos in 1919–26 and was visible in the genesis of the attack of Germany and the USSR on Poland in 1939 as well as in the decision to establish control in Warsaw in August 1944.

The Polish elites of that time did not understand the complexity of the situation: they made bad judgments and poor choices for solutions, that is, they acted unwisely, causing a cataclysm for the people, nation, and state.

By analyzing the development of the reasoning mind, one can realize why certain countries have developed faster than others. Take the example of the USA in the twenty-first century, where in 2011 the percentage of citizens with higher education was 30%: in Poland this was only 18% (Statystyczny: Statistical Yearbook, 2011, p. 189), meaning Poles with this mind are 1.7 times less frequent than Americans in the USA, a country recognized as one of the best developed.

The reasoning mind assesses the situation based on common sense (basic mind) and based on theoretical knowledge. For example, a nurse with two years of specialist education knows a dozen or so medical rules, while a doctor with five years of education and three years of experience knows several hundred of them. Hence, their judgments and choices of treatment options will be very different. Let's take the example of a technician with two years of specialized education who knows a dozen or so technical rules and an engineer with six years of polytechnical education who knows several hundred of them: The latter knows that a two-support bridge cannot have two rigid supports, because it will collapse; moreover, they can convert the strength of the designed structure in a rather complicated mathematical algorithm.

The difference between the knowledge and wisdom of basic reason and theoretical reason is best seen in the example of a nutrition strategy. Two-minded (steering and basic minds) people like fast food because it is tasty (salty, spicy, fatty, or sweet, depending on the type), whereas people with three minds know that such food is unhealthy. The first are overweight, suffer from diabetes, and are dissatisfied with their appearance and die early. The latter are healthier and are not ashamed of their appearance, because they have better judgment and make better dietary choices. They are more wiser.

The global mind has emerged very strongly in the twenty-first century, as the Internet is currently developing economic-based globalization. Developed countries are entering a structural crisis because of this. Specialists learn foreign languages at an accelerated pace, and universities launch studies on globalization.

The global mind is guided by the principle: "think globally, act locally." In practice, the power of global corporations destroys local effort, which is too weak to meet the challenges of big capital. To some extent, this rule works well only in France, where the "small bourgeoisie" (*petit bourgeoisie*) defends its property (restaurants, hotels, shops, and so forth) against the invasion of big business, such as Walmart. The global mind functions in cyberspace and reaches all places that function on the Internet. The paradox of this mind lies in the fact that one's relationship with one's

neighbor has lessened in favor of acquaintance with people thousands of miles away. The global mind is constantly developing, causing its development to have no saturation point; it still "broadens and deepens," making it very extensive in regard to information, knowledge, and wisdom. There are still, however, people without a global mind—many, in fact—maybe even the majority in the world. People with two minds (steering and basic) or a triage (steering, basic, and reasoning) cannot compete in terms of information, knowledge, and wisdom with people with a quadruple mind (steering, basic, reasoning, and global), although a group of people with steering, basic, and global minds can be imagined (but with limited understanding). Many sailors, soldiers, and officials on foreign missions and couriers, and even merchants (self-taught) belong to such a category.

The universal mind develops via an additive process as the evolution of humanism, guided by morality, and in particular by virtue and values (Figure 1.5). The evolution of humanism has been taking place since the foundations of Judaism 4,000 years ago, which held that life was to serve people in the name of God. The leading idea was justice, understood as giving everyone what they deserve. The Ten Commandments occupied a central place, given to Moses by God.

Greek culture, from the mid-eighth century BCE onwards, gave us the need to develop art, literature, philosophy, and science, combining their values in a beautiful triad of truth, goodness, and beauty. A great example of a universal mind was the Greek philosopher and scholar Aristotle (fourth century BCE) who, with his classifications and definitions of the world, gave grounds for contemporary reasoning. The Greek ideal of truth contained elements of knowledge and wisdom. The Polish researcher of civilization Feliks Koneczny added the values of well-being and health to the traditionally understood Greek triad. After many centuries of Greek domination in the islands and shores of the Mediterranean and self-destructive wars between their cities, the time had come for the dominance of Roman culture.

Based on well-developed armed forces, the Romans organized the cohabitation of citizens under the "rule of law." Let us add only that this was the law applicable to its citizens. From that time on, civilization began to be discussed, and Roman law is being studied even today as an example of universal thinking. However, after the excesses of the Romans in waging wars, Christianity introduced the values of faith, hope, and love of one's neighbor in the first century CE. The value of loving one's neighbor was especially a complete surprise for Roman society and the warring nations that were guided by ruthlessness in life and death combat. People marveled at this value, and after almost 300 years of its suppression by the highest

authorities in Rome, Emperor Constantine the Great (272–337) had to recognize them as the universal values of the Roman state (313 CE).

Figure 1.5: An additive historical process of human value development according to the Kawczak–Targowski model (Celiński and Kawczak, 2000, p. 385).

The fall of Rome (476) plunged Europe (although this was not then the name used to refer to that region) into darkness for nearly 324 years until the Franks began to organize their empire (800), which was strongly and positively influenced by Christianity. This process took Europe over 650 years and was crowned with the Renaissance (1453–1600), which proclaimed full human development through the sponsored (by the family of the Medici) beauty of art (that is, in sculptures and paintings by, for example, Michelangelo, Leonardo da Vinci, Dürer, and Titian) and in the form of magnificent architecture, the most splendid example of which is the Basilica of St. Peter in the Vatican. Excesses related to its financing led to

the reformation or division of the Roman Catholic Church into Protestantism and Catholicism (and the exclusion of Luther in 1521).

Soon, a series of religious wars and the Inquisition plunged Europe into hatred and persecution through the sixteenth and seventeenth centuries. At the end of the seventeenth century, however, the Age of Enlightenment emerged (and it lasted through the eighteenth century), and in response to religious wars and the Inquisition, it introduced the value of tolerance. The Age of Enlightenment not only emphasized the importance of the values of rational thinking, replacing superstitions and dogmas, but it also demanded respect for the freedom of thinking, words, and assemblies, which in modern times is still a challenge for countries with undemocratic power systems (e.g., in China or the Middle East, Cuba, and Venezuela, not to mention North Korea). The United States Declaration of Independence of 1776 recognized as values equality, freedom, and law, albeit only for whites. It was only after almost 190 years that black citizens were fully equated with white rights. This declaration promised the individual citizen the "right" to happiness. The United States was such a huge and resource-rich country that happiness seemed then at hand for all who emigrated from overpopulated Europe, which was constantly plunged into wars and conflicts. This declaration is still the best definition of modern liberalism and individualism today. The Tea Party in the twenty-first century is continually returning to these values.

The French Revolution (1789) proclaimed the slogans of freedom, equality, and fraternity, and transformed the subject of the Frenchman into a free citizen. These slogans would guide social development in Europe, America, Australia, and New Zealand, that is, in Western civilization for the next 200 years, culminating in the bloodless Polish Revolution in 1989. The period of Romanticism (1790–1840) preached music (Chopin, Liszt), painting (van Gogh, impressionism, leaving the atelier), literature and poetry (Goethe, Mickiewicz, and Hugo), and philosophy (Schelling) as a reaction to the English (1688), American (1776), and French Revolution (1789), where the fate of humans was subordinated to the general good and life was not highly valued in this process, since a better tomorrow was more important than the bad today. Each victim was, therefore, justified. Romanticism introduced the values of the national cult (several countries were established in Europe at that time, such as Serbia, Bulgaria, and Romania) and human feelings. Romanticism particularly captured the minds of the Polish elite in the nineteenth century, when Poland was divided into three partitions.

The Industrial Revolution in the nineteenth century (in England and Germany, France, the Netherlands, Scandinavia, Switzerland, and northern Italy) gave entrepreneurs a high chance of success in business. On the other

hand, the nascent working class began to look for a fair distribution of income. Hence, two new values entered the treasury of Western civilization: the value of creativity, especially engineering, and the value of socialism.

The significant development of the English, German, and American economies in the twentieth century set the reign of liberal capitalism. It brought equality between men and women, civil and human rights, the self-determination of nations, open society, and an intensified value on private property and the free market, although not all these values are observed in the practice of Western civilization in the twenty-first century.

When technology, especially computer technology (as a result of the creation of the information and computer wave), began to bombard the systems responsible for the functioning of society (automation, robotization, digitization, virtualization, export of labor, unemployment, and so forth), there was a rebound of society to these information processes, which supposedly should support peoples' lives.

Just as Romanticism emerged in the nineteenth century as a reaction to revolutions, at the end of the twentieth century a period of postmodernism emerged, or criticism of the technical modernization of society. This period brought values such as love, the relativity of truth, knowledge, wisdom, autonomy, responsibility, self-fulfillment, and the importance of individual views and experience.

People often rejected common views and theories and preached their own, as if against scientific logic or facts (as Hegel said over 200 years ago). Humans again reached for their reason, not to be fooled by the media, politicians, businessmen, and technicians who see mainly their own, not general, interest.

Unfortunately, postmodernism lost to economic globalization in the twenty-first century, which transformed Western civilization into a global one, and its religion became business. The value of global business is to maximize profit in a short period, which comes at the expense of society and nature. What is "best" is best for business, and criticism of business in the media and parliaments is impossible because the media and politicians are losing financial support. Universities are beginning to talk about the need for sustainable development, including the vitality of business, responsibility for the environment, and social responsibility. In economic theory, it has started to oppose the "shallow economy" (i.e., considering only business costs) in favor of the "deep economy," which considers the costs of environmental destruction and social costs resulting from business-led unemployment (e.g., moving jobs to Asia).

The paradox of the liberal economy is that, as a result of its proclaimed principle, when it reaches "success," it ceases to be liberal and democratic,

because it is de facto directed by lobbyists daily. Voters choose parliamentarians only once every four years, who then submit to lobbyists, that is, to the will, money, and goals of great company bosses (CEOs) and financiers. The liberal economy resembles a snake that eats its tail. Alternatively, it is like "Lenin's rope," for bankers will lend money and earn, despite knowing that they will be hanged by the rope.

The universal mind is characterized by constitutional judges and lawyers, doctors, priests, intellectuals, and humanists of various specialties. This mind has been developing wonderfully in the last 4,000 years. At this time, the evolution of humanism has developed many different values that make us noble beings, if we apply them in life. Unfortunately, this is not so: humans cope well with these values when they are in poverty; however, in prosperity, they are stupid. Moreover, although it seemed that the Internet has led to the development of knowledge and information, in practice it is leading to economic globalization, which destroys the values of Western civilization, based on Christianity.

The new emerging global civilization stopped the evolution of humanism in the most developed countries and put it back to its state in the sixteenth and seventeenth centuries, when religious wars, lack of tolerance, and ruthlessness prevailed.

In the twenty-first century, the universal mind found itself in a great crisis, for the humanism of enlightened people was overpowered by the attitude of global business, which dominated the minds of politicians and media specialists with its narrow interests. Ordinary citizens were confused and dominated by the business religion. It was the defeat of people who, instead of being wise, had become blinded by the idea of a monstrous enrichment of 1% of people at the expense of the rest of society.

We discussed the five types of human minds that should be used so that humans can be called knowledgeable and wise in the twenty-first century. Figure 1.6 provides a model of the five types of human minds (strictly interdependent) typical for the twenty-first century.

A wise human in the twentieth century is a five-minded person with a complete mind. Less wise are four-minded people, who have a *steering* mind, a *global* mind, and a *reasoning* mind (and, therefore, they are independently thinking). Of course, they also have a *basic* mind (dependent). However, their problem is that, in the absence of a *universal* mind, their decisions are not filtered by the system of values, and therefore, although they can be pragmatic, they cannot be humanistic. This mind-and-decision system characterizes contemporary leaders of global businesses and finances.

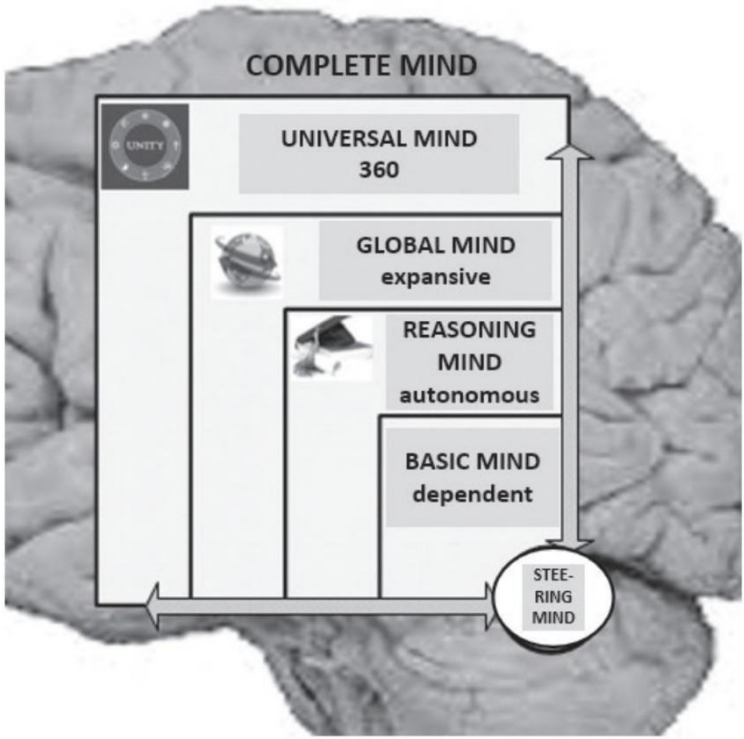

Figure 1.6: A complete (five-element) human mind in the twenty-first century (Targowski, 2013a, p. 74).

Three-minded people usually have the following minds: *steering*, *basic,* and *reasoning*. They belong to the educated class but are "narrow-minded." They can be good professionals, good spouses and parents, and children, but their path of social and professional development is not long. On the other hand, two-minded people, that is, those with the steering and basic mind, constitute most of the world's population. They have so-called common sense, which can lead them well through life. However, their knowledge and wisdom cannot be compared with multivision people. In understanding the more complex situations of life, they depend on the opinions and decisions of people who reason independently. Polish Highlanders consider themselves wise. They are very good hosts, who, in difficult mountain conditions, have successfully developed various types of businesses and their families do well; however, their decisions can still only

be considered common sense unless they have worked in America, where they could have developed their global mind. If so, from now on they will see more "vastly."

Moreover, here we come to a situation where combinations of different minds do not necessarily have to be hierarchical, as the model in Figure 1.6 indicates. For example, one can imagine people with the following minds: *steering*, *basic,* and *universal*. Certainly, they belong to nuns and religious persons, as well as to many supporting people working in the health and justice system. One can imagine people with *steering*, *basic,* and *global* minds, which have already been mentioned. They include sailors, soldiers, and officials in foreign missions, and so forth.

When it comes to examples of famous people, especially in politics, US President Franklin D. Roosevelt was a five-minded politician. He won the election four times and presided during the complicated times of World War II, fought against the powers of Germany and Japan in a situation that the United States was not prepared for. He also led the country out of the Great Depression in the 1930s. He graduated from two universities of the so-called Ivy League: Harvard and Columbia, which provided him with an independent mind. He demonstrated the use of his *universal* mind at a meeting with British Prime Minister Winston Churchill on the USS August off the coast of Newfoundland (Canada) on August 14–17, 1941. Prime Minister Churchill insisted that the United States join the Second World War. President Roosevelt agreed on the condition that the United Kingdom agree to the right of nations to self-determination, leading to decolonization (i.e., getting rid of the colonies), to the freedom of navigation on the seas, and to the improvement of living conditions of working people. These conditions were included in the Atlantic Charter, signed by both leaders. As for his *global* mind, it must be remembered that there was no Internet at the time. Nevertheless, Roosevelt was overseeing (as the war was commanded by the Head of the Joint Chiefs of Staff General G. Marshall) the course of the victorious war in Europe, the Atlantic, and the Pacific.

The opponent of President Roosevelt was Adolf Hitler, who ignominiously lost the war. Why? He had only two minds: *steering* and *basic*. He lacked a *reasoning* and *universal* mind, even a *global* one. It turned out that the two-minded German leader had no chance to defeat the five-minded Western leader. In summary, it can be concluded that FDR was 2.5 times more wiser than Adolf Hitler and, therefore, won the war.

Let's turn to the facts. If Hitler had had a *reasoning* mind, he would have first attack the USSR, not France and Great Britain. Because the Polish government refused Hitler to jointly attack the USSR in April 1939, Hitler could not freely reach Russia through Poland. General Erwin Rommel

proposed that Hitler attack Russia from the south, after moving from Africa through Egypt. He needed five divisions for this. Hitler refused and repeated the strategy of the "first in the trenches" with the use of millions of soldiers, which was known to him during his time as a corporal. In June 1941, he attacked the USSR in three directions at the same time: Moscow, Leningrad, and the Caucasus. He dispelled his strength and lost. The protesting generals who were dismissed included his best general, Heinz Guderian.

When he attacked the Ukraine, the Germans were greeted with bread and wine. The Ukrainians regarded the Germans as their liberators, especially because they remembered the genocide Stalin had done on their nation when he took away their food, including the grain. Hitler, instead of thanking them for a nice welcome, began to murder them. He lacked a *universal* mind because his system of values was at the level of the Roman emperor Nero, known for his cruelty. How could he have known about the values brought about by the French Revolution and the Enlightenment?

In June 1944, when the Germans were expecting the Allied invasion of England at the French coast near the English Channel, a dispute arose between Generals Rommel and Guderian (restored to favor, after he was moved aside following Germany's defeat in Russia and criticized by the aforementioned general) regarding how to deploy a panzer division. Rommel wanted to locate the division at the well-developed port of Calais (closest to England), while Guderian was not sure where the Allies would land, so he chose a distance of 100–200 km from the English Channel (more or less in the middle of Normandy) so that, when he came to know the landing place, he could quickly reach it. Hitler, notified of the dispute, chose a Solomonic solution. He divided the division into three branches and placed it in the east, west, and south of the French coast. Of course, Guderian was right, but Hitler, with his wisdom at the level of the *basic* mind, could not solve the problem wisely.

About 160,000 soldiers of Jewish origin served in the German Army (Rigg, 2009). They were good soldiers and considered themselves patriotic Germans who had lived for centuries in Germany. However, in the cities where they came from, their families were persecuted. When they visited them on leave from the front, their families complained about bad treatment so they would put on their official uniforms, pin numerous decorations, and visit the local SS offices to complain. Usually, in the offices, there were non-commissioned officers who had to report to these officers from the front and explain themselves for the persecution of the families. These situations were simply grotesque. To somehow meet his subordinates, Admiral Karl Dönitz (commandant of the Navy) and Marshal Hermann Göring (commandant of the Air Force) turned to Hitler for a positive

solution to the case. Hitler did not take charge of families, and he ordered all these soldiers to be released from the army. No leader with higher education, leading such a devastating war, would have disposed of so many thousands of good soldiers.

Hitler, without a *reasoning* mind, gave only six months to German physicists to produce an atomic bomb, because he believed that physics was a Jewish science and he had an aversion to it. A lack of higher education and, hence, a lack of respect for scientific knowledge caused the failure of the V1, V2, and V3 rocket development program. After the bombing of factories near Szczecin, production was moved to dungeons in the Harz Mountains, and, in order to gain labor, the Mittelbau-Dora concentration camp was organized near Nordhausen.

Any logically thinking commander would have created excellent conditions to produce rockets. They were to be an incredibly powerful weapon that would decide the fate of the war. The commandant of this camp should have been their constructor, Werner von Braun. The Germans, however, were led by the degenerate Gestapo, who led the murder of 50,000 prisoners with, of course, enormous damage to the production program and the success of the Germans in the war.

In the summer of 1944, the Germans retreated from the Eastern front, beaten by the Red Army. The Home Army (AK) command began to think about the uprising in Warsaw. There were many opponents, including Adam F. Ronikier (1881–1952), President of the Economic Care Council (until 1943). He was part of the official administration of the occupied state, which organized the life of society in agreement with the occupant. President Ronikier lived in Kraków and suggested to the local head of the Gestapo, Miller, that the Germans would allow the Polish brigade to bring the Polish Army from London to Warsaw. The idea was that the government in London, supported by a regular army, would officially accept the Red Army in the capital. In a sense, this would delay its march to the West or facilitate the Germans' organized withdrawal from the Eastern front. The Germans would have benefited from this since it would provide them with an easier withdrawal from the East. Governor Frank agreed to the plan, but he wanted Hitler's permission. To this end, a German colonel went to Berlin to personally explain the concept. Hitler did not agree to this plan, although Ronikier was logical and sympathetic to the German cause and, of course, the Polish case. Hitler with his minds, *steering* and *basic*, was unable to understand the positives of this plan in the basic and critical situation in Germany (Figure 1.6).

It can be seen from the quoted examples that Hitler lacked above all an intelligent mind, one of whose features is objectivity based on the

evaluation of theoretical criteria, which leads to the valuation of advantages and disadvantages of a solution (possibly using measurable factors). Hitler, on the other hand, in his judgments and choices, was guided by far-reaching subjectivism, in which racial prejudice prevailed for the allegedly lower Jewish and Slavic races. Hitler simply did not fully understand the situation and—as is said colloquially—"had a stain in his eyes."

In foreign policy, Hitler had a *global* mind in good shape, but only at the beginning of his diplomacy. His successes include winning the conference in Munich in 1938, in which the United Kingdom, Italy, and France agreed that Germany would take over western Czechoslovakia and accept the annexation of Austria to Germany. His success also includes the signing of the Molotov–Ribbentrop Treaty in 1939, which facilitated the defeat of Poland but delayed the Soviet attack by two years. Moreover, this was his strategic goal, laid out in the famous slogan of "pressure on the East" (*Drang Nach Osten*).

According to the famous British geographer Halford MacKinder, Russia is the "Heartland and who rules it, rules the world" (1904), and Hitler wanted to rule the world. The General Eastern Plan (*Generalplan Ost, GPO*) resulted from the earlier National Socialist idea of gaining "living space" (*Lebensraum*), which was allegedly needed for the German "higher race of humans" and was based upon the Nazi interpretation of *Drang Nach Osten*.

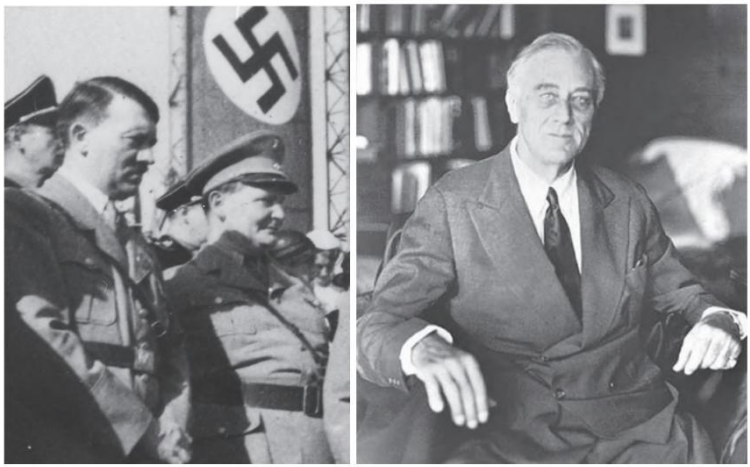

Figure 1.7: Could the two-minded Adolf Hitler win World War II against the five-minded President F. D. Roosevelt? He could not, and lost. (Photo: Wikipedia).

Viewed as a long-term policy of Germany, the pact with the USSR in 1939 was a short-term success. As a result, Hitler failed to achieve the most important idea of expanding the living space for "growing German culture." Germany waited two years unnecessarily, during which time the USSR solidified its military and not only defended itself against the German attack (June 22, 1941) but defeated Germany and destroyed Berlin in 1945.

The signing of the pact with Japan and Italy on August 27, 1940, was a wise move by Hitler, but declaring war on the United States on December 11, 1941, four days after the destruction of the American fleet in Pearl Harbor by Japan, was a death sentence on Germany.

At that time, the Germans waged a great war against the USSR and should have focused their forces and attention on it. Their actions, however, accelerated the US's entry into the war in Europe in November 1942. In 1943, the US attempted to take control of Africa, then Sicily (10 July 1943), and then France (D-Day in Normandy on June 6, 1944), which ended with the defeat of Germany in May 1945.

From the quoted analysis of foreign policy, it appears that Hitler did not have a competent *global* mind. Attempting to use it became the main reason for failure. Hitler, with only two minds, had no chance of success in his war. He would have, though, if he had first attacked the USSR. The West, if it did not help him, would have remained neutral. It would have meant defeating communism. Hitler had a chance to defeat Russia and reach India, which he had planned to do. Thus, he would have implemented his plan of "enlarging the living space."

Similar conclusions can be drawn after analyzing the minds of many world political leaders. Napoleon came to power thanks to the French Revolution, which he repudiated, delaying the implementation of its ideals for 100 years. Thus, he did not have a good *universal* mind. Regarding the *global* mind, he had a good sense of space, but the war with Russia in 1812 was unnecessary and not only ended with his political defeat, but also finished France as a power and bled 2 million French men. Napoleon was, therefore, three-minded, and the missing two minds decided his defeat.

Contemporary political leaders of Western civilization are usually five-minded (Obama, Holland, Macron, Merkel, Trump, and others), which also does not guarantee success, because the so-called art of living or the art of governing (which will be discussed in another chapter) may be critical in obtaining success in contemporary liquid times. It is not enough to have good ideas and strategies, but one must be able to implement them into the practice of society. On the margins of these considerations one can mention the example of the former Italian Prime Minister Silvio Berlusconi (1936–)

who did not have a *universal* mind (he is a famous scandalist); his governance, therefore, turned out to be a personal defeat.

We leave the readers to wonder what mental tools, or more specifically, how many minds the politicians, bosses, priests, teachers, and professors known to them have as well as what results from their knowledge, and what wisdom can be expected from them.

Human development mainly occurred due to its informative tools used by the brain and mind, which are still subject to improvement, but whose number may be further increased due to circumstances related to the functioning of civilization. For example, we are currently dealing with the formation of a *digital* mind and a *virtual* mind in the twenty-first century.

1.4.2 The Extended Mind of the World Information Elite

The development of humans is frequently driven by their informational and technical tools. Their applications have been decisive in influencing the development of the previously presented five minds. However, there is no end to the info-bio-technological-based development of humankind. In the twenty-first century the rapid and broad expansion of humans has occurred due to all sorts of tools, which mainly impact the mental processes of the brain-mind apparatus, leading to the development of the digital mind and virtual common mind. These minds work outside of a head and can be characterized as follows:

- The digital mind uses the large scope of scientific, popular, and formal literature accessible online from the endless number of digital libraries and Internet-based websites spread out around the world.
- The virtual common mind contributes to cognition and learns from many worldwide operating social networks, like Facebook, Twitter, and Quora.

The information elite can easily apply these two external minds, which for the first time in human history are operational. The architecture of the extended mind with seven internal and external minds is shown in Figure 1.8.

Digital Mind – This mind is of special character because it is only involved with access to digital cognition. So far about 129 million published books have been taken into consideration by the Google Books project (Jackson, 2010). As of June 2010, the company had scanned 12 million books, and these books have been written in about 480 languages. The company plans to complete the scanning of existing books in the public

domain in 2020. The resulting digital collection will consist of four billion pages and two trillion words (Jackson, 2010). About 20 percent of the world's books are in the public domain, and about 10 to 15 percent of these books are in print. The remaining books—most of all titles—are still under copyright but out of print. Google is in the process of borrowing copies of these books from about 40 large libraries worldwide in order to digitize them (Jackson, 2010). Hence, one can estimate that another eight trillion words will be digitalized, making 10 trillion words organized into data, information, concept, knowledge, and wisdom available for the information elite. On top of these mountains of e-pages, one must add another 10 trillion words from other kinds of publications different than books. All together this makes about 20 trillion words (cognition) available online for the information elite and their pupils. It is a tremendous amount of cognitive resources available within seconds, minutes, or hours, and its access will not require leaving home, the office, another other physical location. Of course, accessing this digital cognition will not be cheap. Google will charge users accordingly, for example, either by searches or by time or by other "products" that are sold. This will have a meaningful impact on digital cognition as well as on civilizational development, including humans. Due to the volume of available cognition, this effect should be more significant than printed books. The sad part is that this will be the end of printed books, after their 570 years of blossoming.

Virtual Common Mind – In the twenty-first century, the result of telecom networking in the world (thanks to the Internet) was another mind, which we will call the *virtual common* mind, which contains a set of *virtual* records of cognition in the form of data, information, concepts, knowledge, and wisdom, as illustrated in the model in Figure 1.8.

This mind includes the idea of freedom of expression in common digital space (*cyberspace*), which aims to achieve the common good of people, both in this new space and in the traditional space of life (for many people claim, at present, life in real space is not going in the right direction). As far as the scope of the community of this mind is concerned, it may have a wide range, including family, local, national, or international specific environments as well as different professional and political environments, and so forth. This author claims that the *virtual common* mind gave rise to virtual civilization (Targowski, 2015a), which he characterizes in the following way.

- There is unlimited virtual space in tele-information networks.
- Long periods—if the computers and their networks are used in the world.

- Religion—civil, unlimited cognitive (information) freedom. This is a product of the *virtual common* mind, which developed a virtual common intelligence and wisdom.
- Society—virtual communes have very different coverages and compositions.
- Culture—new values resulting from virtualities, such as connected, expected response, communication rhythm, cognitive productivity, targeted speed, impatience, ethics of virtuality, information, communication, optimization, big picture and a small image (and vice versa), global awareness, and self-awareness. This includes e-behavior, techno-concentration, communication anywhere and anytime, the "death" of distance, no intermediaries, curiosity, the digital and virtual divide, a wealth of information, limited attention, and so forth.
- Infrastructure—made up of computers and their unlimited memory and networks.

The *virtual common* mind is created outside the human body; it is like an external organ or technical prosthesis of the real mind. However, its influence in the direction of solving problems and creating new ones (such as the spreading of hate) is unlimited and, therefore, very dangerous for the well-being of human beings. An example of such a mind is the social network Quora, which is used by about 100 million users each month and which interactively, through questions and comments, develops virtual common knowledge.

Philosophers such as Andrzej Gregorczyk (1922–2014) said that humans need a tool for the human way of immersing one's self in being, that is, for the operational development of cognition and wisdom, while Martin Heidegger (1889–1975) called this tool a human's handiness. Well, this tool is a generational-long chain of DNA and the bestowed human cognitive (information) ability that develops cognition from data to wisdom. The devices that process this cognition are the human minds, which are supported by computers nowadays, as well as their limitless memories and networks. Their influence on our cognition and being could be known for many years and perhaps for centuries, unless the human mind does not prove wise enough and cannot save civilization from the exhaustion of strategic resources and overpopulation. This could cause a cascade of wars over resources once again, including the use of inhumane "operational tools" like the A and H bombs.

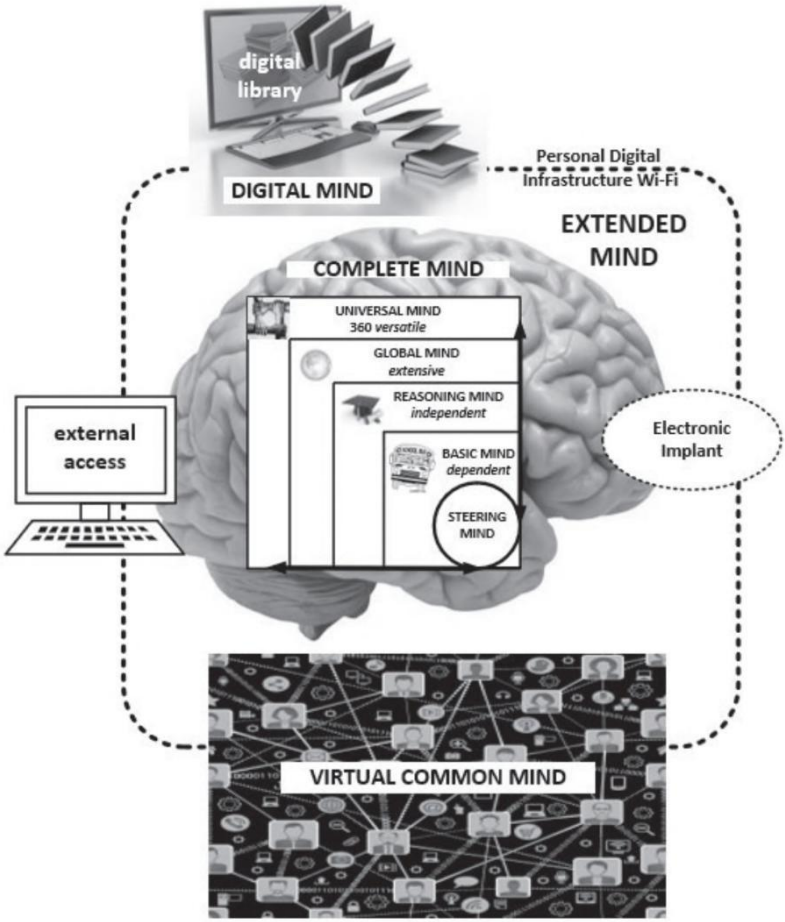

Figure 1.8: The extended mind: The seven-minded human in the twenty-first century, who belongs to the information elite with an electronic implant in the brain, making them a *Homo cyborg* (Targowski, in press).

Furthermore, Michael Strangelove (2005) argues that the virtuality leads to digital piracy and to the anticapitalistic movement since, while television produces a passive consumer audience, the Internet audiences are more active, creative, and dissident. Writers, activists, and artists on the Internet undermine commercial media and its consumer behavior. The online communities are uninterested in the ethics of private property. The entire philosophical framework on which capitalism is based is threatened by

these alternative means of new cultural production and dissemination. Some politicians, like American President Donald Trump, even apply social networks such as Twitter to disseminate their views, bypassing what President Trump calls the "fake media." In effect, the commercial press, radio, and TV convey his daily message to their audiences, either commenting on it positively or negatively. Regardless, his regular message is the number one news story each day.

The application of these seven minds may be applied to evaluate the intelligence and wisdom not only of people but of organizations as well. For example, when Andrew Targowski taught a course on wisdom at the Honors College at Western Michigan University (Targowski, 2012), his students researched the following cases:

- People: Is Warren Buffet a wise man and if yes, why?
- Organizations: Is Obamacare (healthcare insurance system) wise?
- Programs: Is the obesity of young people related to wisdom? In addition, is music education in the US wise?
- Society: Is it wise to support suicide?

The seven minds-oriented analysis can be practiced in a wide range of encounters.

1.4.3 The Super Mind

Cosmic Mind – Since first animal was sent to the cosmos in 1957, we have been active in discovering the universe beyond Earth. So far, we landed on the Moon in 1969 and are preparing a one-way trip to Mars in the coming years. This kind of adventure requires different ways and scopes of thinking that we typically practice on Earth. Hence, those who landed on other planets and those professionals and scientists who sent them there must have had the cosmic mind. So far, only a few thousand such people (from the US, Russia, China, and other countries) have had the cosmic mind.

Hybrid Mind – We are living in times when about 6.5 million informaticians and computer scientists work in the world. About 3.5 million work in the US and 2 million work in China; the remaining specialists work in the rest of the world. The prospect for the growth of employment in information technology (IT) in the US is about 22% in the next ten years (Thibodeau, 2012). This means that many of these IT professionals and scientists will work on the development of AI, robotics, brain, body implants, and high-speed computers. As was already noticed, the machine-driven AI may exceed human intelligence, which means that humans may

use a machine-driven mind together with their human mind, composing the hybrid mind. This mind will be more advanced than brain implants.

Super Mind – The complex of the extended mind and the hybrid and cosmic minds creates the super mind. Figure 1.9 depicts the architecture of the super mind.

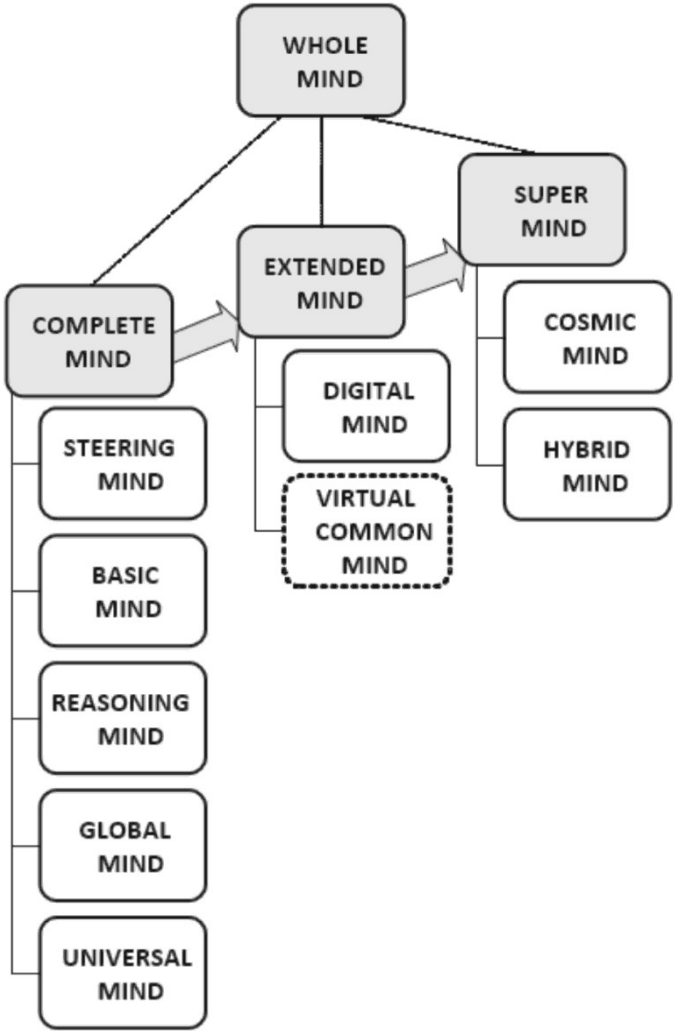

Figure 1.9: The structure of the whole mind, created in the twenty-first century (Targowski, in press). The extended mind also contains the complete mind, and the super mind includes the extended mind (hierarchy shown via the horizontal arrows).

1.4.4 The Wisdom Potential of the Mind's Outlook

In conclusion of this investigation, one can offer the psychological approach in addition to all previous approaches to predict the wisdom of one's outlook for a given issue/problem/question. To do so, besides the kind of minds applied, one can include the mentality of thinking types, such as systematic, creating, synthesizing, analytical, and unsystematic (creating and synthesizing minds were defined by Gardner [2008]). The personality types defined by Riso and Hudson (1999) will also be included, such as the reformer, helper, achiever, individualist, investigator, loyalist, enthusiast, challenger, and peacemaker. Figure 1.10 depicts a model of the wisdom potential of the outlook of a person with a certain number of minds, mentality of thinking, and personality. This model also illustrates the wisdom potential of the outlook presented by a person having a challenger personality with seven minds and a synthesizing mentality of thinking. Such a person is broadly informed, able to see the big picture, and generate competitive solutions. Such a person should be a good worker in the area of research and development, and can be an excellent top executive.

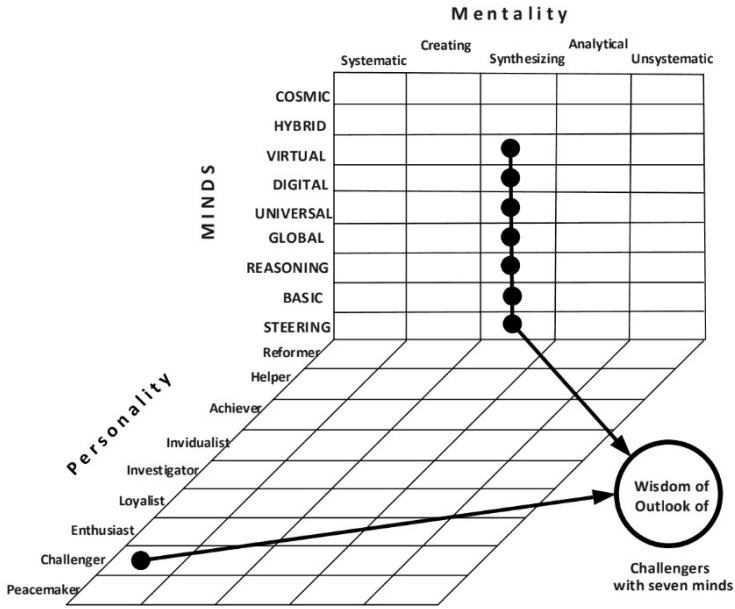

Figure 1.10: The model of the wisdom potential of the outlook of a person with a certain number of minds, mentality of thinking, and personality.

1.4.5 Mind-Driven Handiness in the Future

Nowadays many people in the world are still disconnected and have a problem in combining the small picture with the big picture, as it is depicted in Figure 1.11. However, this situation is changing rapidly and, to be successful, people should shift the paradigm of their existence. This new paradigm promotes the connected and layered existence in many cultures, as it is shown in Figure 1.12.

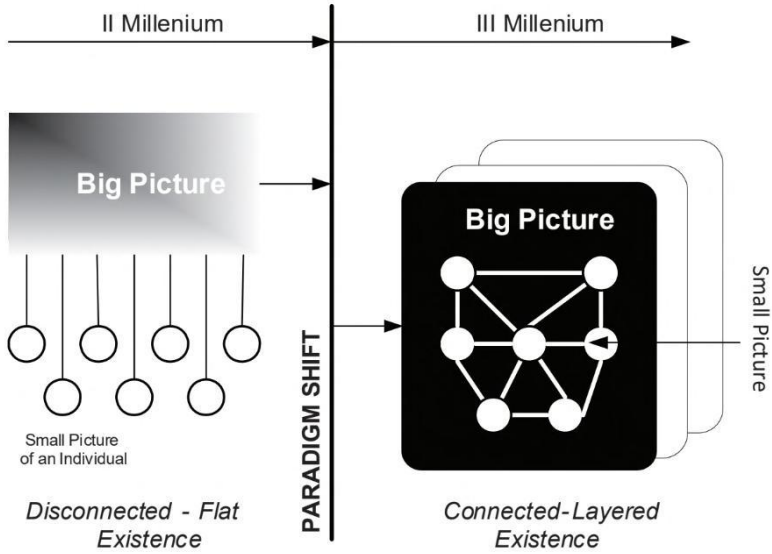

Figure 1.11: The shift of paradigms in human existence in the twenty-first century

It is a dramatic challenge for the current generations since a new world citizen in the twenty-first century may have to live in six to seven cultures concurrently. For example, a person of American culture may be married with a spouse of Hindu culture, living in Chinese culture, and employed by a global corporation that obeys the international law which forbids the employment of children. The work *modus operendi* is digital with strong marketing in social networks, including selling advanced brain implants. Such a person lives in six cultures at the same time and is connected locally, nationally, and globally, all the while thinking how to synchronize the small picture with the big picture. Such people already live and work in situations like the one in the example.

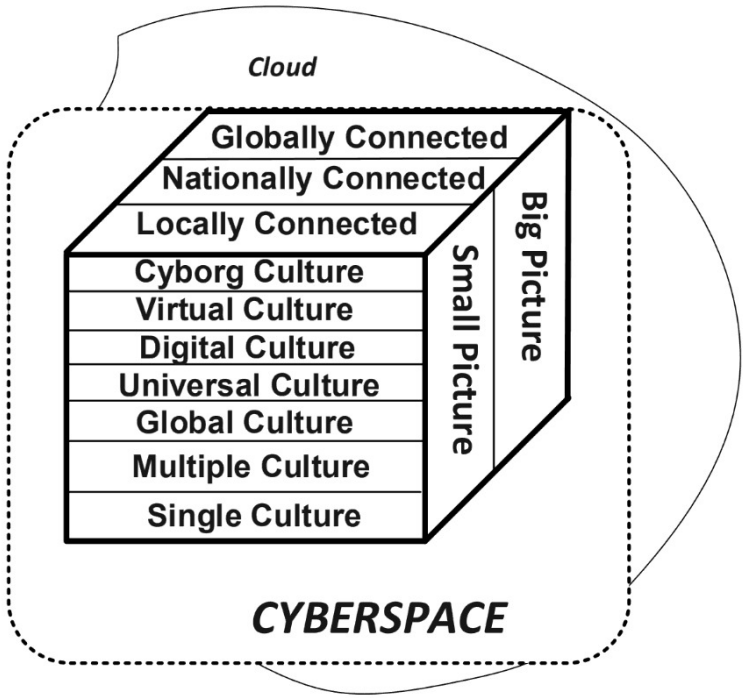

Figure 1.12: The layered culture of human existence in the twenty-first century

1.4.6 Conclusion

1. Nowadays, most of the world population lives with two minds and applies common-sense judgment, which is limited. In Western civilization, about 30% of the population may use the complete mind (five minds) and global and universal judgment, which can solve complex problems but at the same time generate complex problems as well.
2. So far, scientists and engineers in the second millennium have applied only three to four minds; it was just at the end of twentieth century that they used five minds (the fifth is the global mind). In effect, their solutions have some limits regarding the potential contributions of the more advanced extended and super minds, which are in practice in the twenty-first century. What about sages in first millennium BCE, such as Socrates, Plato, and Aristotle? Formally speaking they had three minds: steering, basic, and universal. However, they were active in reasoning

but limited in full scholarship due to this being an early stage in human development. Nevertheless, Aristotle defined the foundation of future learning. Therefore, one can assume that these Greek sages had the reasoning mind as well. They remind one of a genius of our modern times, Thomas Edison, who formally had only two minds. Henry Ford, the father of American industry, had the same number of minds as well as Bill Gates, the father of world personal-based computing. Due to scientific and technological progress in the twenty-first century, this author assumes that he and his readers have at least the extended mind (composed of seven minds).

3. The world information elite, composed of about 100 million people (most of the young generation), use the extended mind (seven minds), including the ability for virtual common intelligence in thinking and decision-making. Their solutions can be dominant or disastrous depending on the circumstances. For example, the replacement of representative democracy by direct democracy may lead to chaos in reality. Among meaningful solutions can be the election of a president, when traditional, real political candidates lose to candidates supported by the virtual society, who are driven less by the political swamp than by merit.
4. To make human minds wiser and safer for the health of the brain, it is rational to spend less time thinking about how to increase the speed of computers to help in the development of the hybrid mind and spend more time thinking about how to provide the right content and procedures-routines for the seven to nine kinds of minds. Unfortunately, the current young generation likes to mostly develop their digital mind and virtual common mind rather than improving their complete mind.
5. Scientists and engineers belonging to the world information elite are fascinated by the potential of advanced information technology, mainly in the area of artificial intelligence and, being impelled by this new tool, are ready to apply the super mind (nine minds), in which the hybrid mind will be the step forward to create *Homo cyborg*. They are also so excited that they are ready to develop the singularity stage of human development. In this stage, will faster-thinking *Homo cyborgs* eventually replace *Homo sapiens*? (Figure 1.13).
6. Perhaps developing the hybrid mind should be treated as a kind of cloning which is forbidden (with some exceptions when this mind is planned for health reasons).

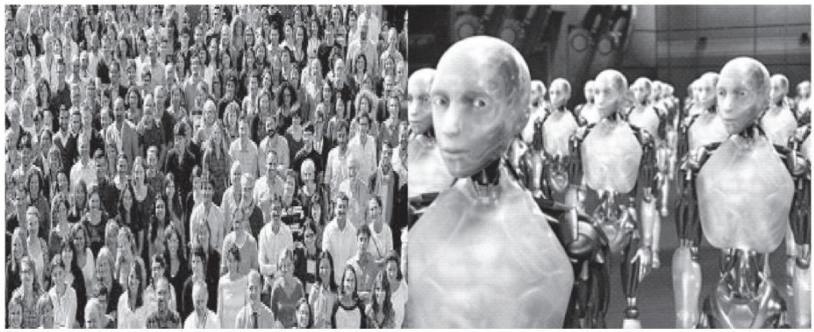

Figure 1.13: Will the transformation of our extended minds into the hybrid minds and machine intelligence eliminate us as *Cro-Magnon* as the *Neanderthals* were eradicated millennia ago? Why are we so foolish as to help science fiction materialize into reality? Why do we want to be killed by machine intelligence?

The question is whether the current information elite and its scientific and political communities can prevent the fall of *Homo sapiens* and the development of *Homo cyborg*. At last, can we be wise and not kill ourselves by applying the right regulations and setting safety limits regarding "playing" with AI?

1.5 Harnessing Cognitive Power Through Information Technology

The increase in the amount of data and their growing role in the life of humankind and organization is due to the development of the press and media, which has intensified since the Industrial Revolution in the nineteenth century in England and later in Western Europe and North America. The development of industry, trade, services, education, and the tax system run by the industrialized states has caused the need to register transactions, which have been stored in growing data resources. The data is subjected to statistical calculations in order to manage enterprises, organizations, or governments more effectively.

Progress in data processing followed the invention of punch card machines by Herman Hollerith and James Powers and their application to the censuses, which initiated the census of the United States in 1890. Based on this technique, in 1924, the IBM company was established, which mechanized mass data processing on punched cards in business and public administration. From 1951, the function of these machines was taken over

by computers, which contributed to the development of the technique and scope of data processing for each significant area of human activity.

Figure 1.14: The Gutenberg press, reconstructed in The International Print Museum in Carson, California, which launched the Gutenberg Galactic in the fifteenth century (Photo: Wikipedia)

Human cognition increases along with the development of infocommunications technology: at first, printing, later polygraphs, and recently telecommuting. The latter is known under the name of information systems (IS) or computer information systems. However, every level of cognition requires a different kind of IS. Figure 1.15 depicts the computer application systems-oriented Semantic Ladder of cognition units.

At the lowest cognition level, *data processing* takes place under a form of transaction processing systems. At the level of *information processing*, supporting systems are of the information system kind, which compares *planned* with *actual* performance characteristics. The higher levels of cognition require expert systems based on artificial intelligence, except for *knowledge processing*, where data mining systems are of great value as well. Every kind of computerized system requires a different architecture, skills to build, timeline, and budget. This is like construction management, in which building residential houses requires different know-how than constructing public buildings, and so forth.

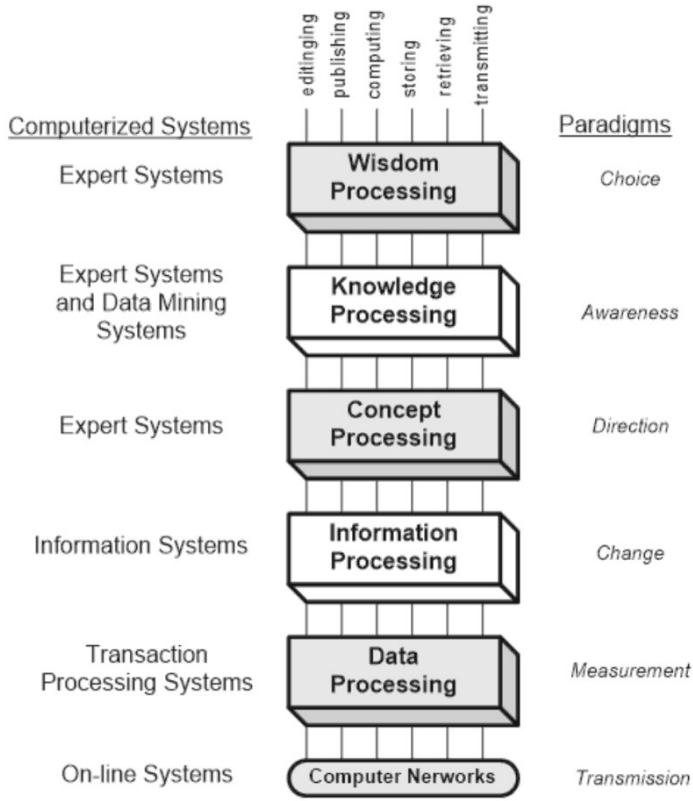

Figure 1.15: The computer application systems-oriented Semantic Ladder of cognition units. (Targowski, 1990a:138).

1.5.1 From Gutenberg Galactic to Baran Galactic

A large qualitative leap in the development of access to data took place when the Gutenberg Galactic passed into the Baran Galactic at the turn of the twentieth and twenty-first centuries. The first Galactic used a printed book (Johannes Gutenberg's invention from 1454), which gradually strengthened the Italian Renaissance. This led to a revolution in science, which, in part, was caused by the publication of the small book *On the Revolutions of the Celestial Objects* by Nicolaus Copernicus, who dared to deny the Church's axiom that the Earth is the center of the world. Over the

next 350 years, printed books, press, and periodicals began to develop the world of data. At that time, about 129 million books and hundreds of millions of copies of newspapers and periodicals full of data about society and the world were printed, worth analyzing both individually (manual) and mass (computerized).

Figure 1.16: Paul Baran (1926–2011) receives the Medal of Technology and Innovation from President George W. Bush in 2007 for the invention of the Internet, which launched the Baran Galactic. (Photo: Public domain)

Launching the Internet for population needs in 1983[2] also launched the Baran Galactic (virtual world)[3]. The massive use of the Internet began in 1989, when the Mosaic, Netscape, Explorer, Firefox, Safari, Chrome, and other browsers were used, which were very easy to navigate for inexperienced users.

Thanks to the Internet, half of the world's population was put into communication with one another and was involved in the generation, processing, and retrieval of data at the beginning of the twenty-first century. A new type of unstructured data has been created. Those that are not subject to any limits with respect to length, syntax, and so forth., are simply generated and saved in a natural way, i.e., in the form in which they appear in books, in the press, or speech.

The Internet has provided a wide distribution of data (in a wider sense, information), and authors and publishers have begun publishing their works in electronic format and selling them online, (for example, on Amazon.com). Others make their work available for free, as is the case in academia.

The Internet caused the so-called *new economy*, as President Bill Clinton called it at the end of the twentieth century. Vice-President Al Gore said that it was developing on information highways. He took this name from the Polish project INFOSTRADA, which he admitted to me indirectly in an interview published in the WIRE journal in December 1995. These INFOSTRADA began to communicate huge ranges of information, sometimes false and threatening so-called data mania.

In this process of global infocommunications in the world, search engines began to play a decisive role accessing information stored on websites. At the beginning there were several search engines, but they were outcompeted by Yahoo and Google, which were continuously accessed every day by users seeking the right information immediately. Google has facilitated the development of consumer data collection, leading to the development of e-marketing, which has become the promoter of the development of social networks such as Facebook and Twitter. In practice, these are marketing networks, where businesses (illegally) buy data about consumers and their behavior in the network (and especially about their preferences).

In order to use the big data available on the network, IBM has developed the Watson expert system (based on artificial intelligence with automatic reasoning called QA, from "question-answering"), which, since 2013, has responded reasonably well to questions asked by the user in natural languages. In principle, it is an intelligent search and association system that has a collection of over 200 million pages with structured and unstructured data and a full set of Wikipedia slogans. Also, it has an e-storage of data containing electronic encyclopedias, dictionaries, lexicons, thesauri, articles, and literature, which it places in databases, taxonomies, and ontologies of the most popular areas of life. The difference between QA technology and Google's data search is that Watson first tries to understand the question, and then finds the best answer. Google, on the other hand, looks for a response based on the ranking of possible answers and chooses the one in the highest place. Also, Google remembers how to ask specific user questions and rankings to apply them in subsequent searches, which is already associated with the use of artificial intelligence, based on programmed possible answers. The Watson system replaced the Deep Blue computer, which defeated the world chess champion, Garry Kasparov. From February 2010, Watson regularly defeated the best players in Jeopardy. IBM lends Watson for periods of time to companies in order to make decisions in a large data context. Nurses who use Watson's services accept 95% of his answers. Philosopher John Searle, however, thinks that

Watson does not think: he believes Watson merely manipulates the symbols very quickly. In other words, Watson does not use wisdom.

1.5.2 The Trend of Big Data and Data Science

In the twenty-first century, there is a rapid development of various types of information and communication equipment, which causes huge data production. It uses all kinds of marketing, which profiles potential customers and sells information on the subject to business and special services, especially from other countries.

The occurrence of data is nothing new in society, as was recalled at the beginning of this chapter. However, their multiplicity and mass character are new phenomena, and additionally, there is the possibility of applying computerized analysis and learning about previously unknown issues and trends. Analyzing data by business and public administration is nothing new. However, the novelty is the massiveness of data, access to which is facilitated by information technologies. Figure 1.17 illustrates the architecture of the big data ecosystem at the beginning of the twenty-first century.

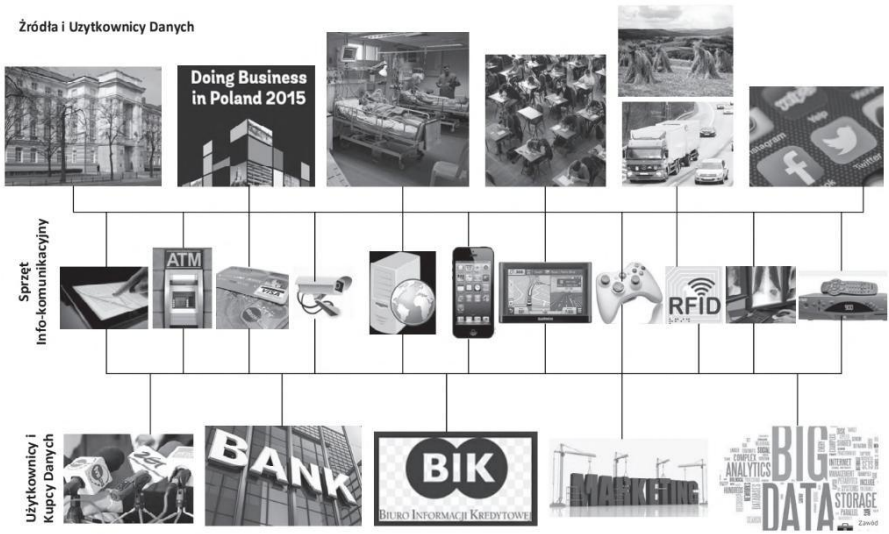

Figure 1.17: The architecture of the big data ecosystem, which is generated at the beginning of the twenty-first century for users and data buyers.