Wisdom in the Context of Globalization and Civilization

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By

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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.

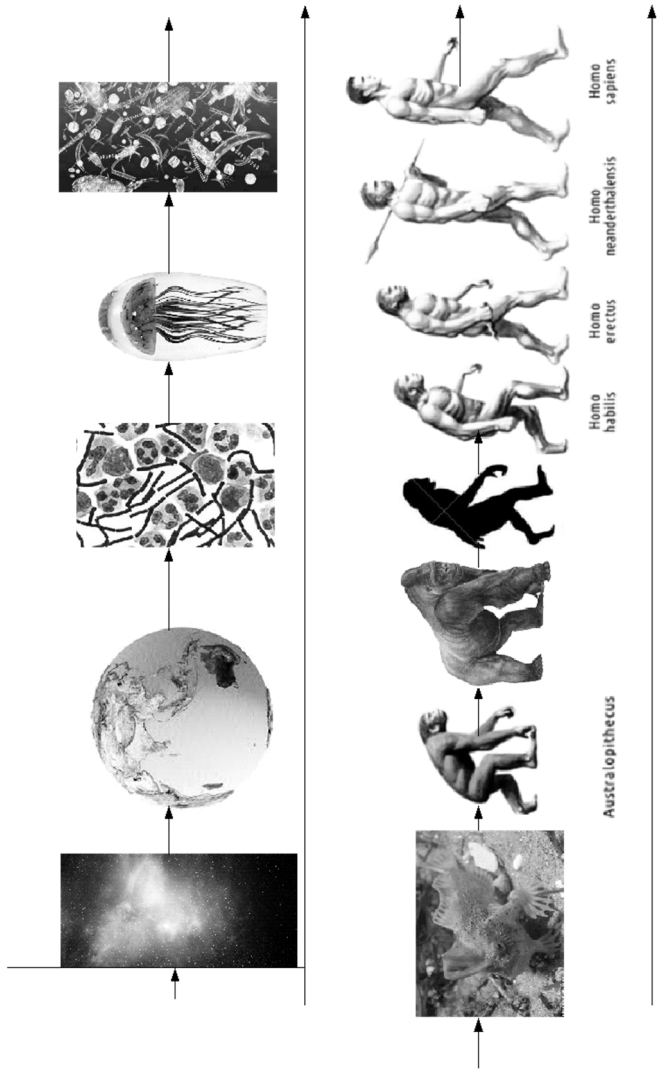

Figure 1.1: Human development through time on Earth (B = one billion, M = one million, K = one thousand years; timeframe is not on a scale).

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	Develop-ment 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
Australo-pithecus	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, communicati on	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 chimpanzee s 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.

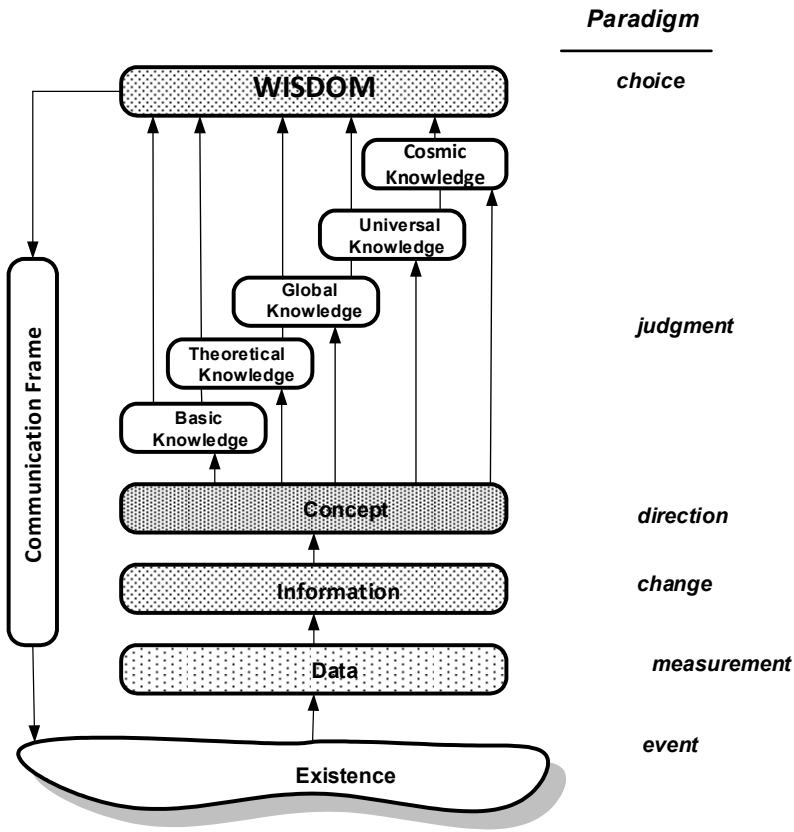

Figure 1.2: The Semantic Ladder of cognition units (Targowski, 1990a, p. 136).

- *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