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The birth of a science

Abstract. *Physics, biology, chemistry, for example, do not already only study programs in many universities but are at the forefront of the development of science, and that is science itself. The development of the basic foundation becomes the mother of science, such as mathematics, as a suspicion of the birth of new sciences. The interests related to the life and welfare of humans always invites the possibility of the birth of science in concepts, but mathematics confirms it. In certain cases, as an application, or it gives birth to answers in technology form, which is distorted according to the social demands of society. Every science has its methodology, which is based on the logic that helps to reason. A natural model is an approach to generating methods, as well as the principles that develop in artificial intelligence based on mathematics. This principle not only changes the way of perceiving data, but it also establishes new definitions of data, and changes statistics, optimization, and other fields. Each science also has implications for other sciences but also has applications that are also related to other sciences. Every science supports technology to improve social welfare. Historically, century by century, many new scientific fields were born, and it has evidence from the publication of scientific works to books as scientific standards. Then, the teaching curricula supported its initial dissemination and its development through research with evidence of scientific publications either through papers in proceedings of scientific meetings or articles in the journals. A study program about science in the related faculty is mandatory, and it is as the spearhead in further scientific and technological development. So everything starts and ends at one point, namely the birth of new science, as the birth of data science. This paper describes the birth of science by involving historical traces. The reflection of scientific development is starting from the foundation to become a scientific field, namely data science. It also illustrates the roadmap of a scientific indirectly.*

Keywords: *Data science; mathematic; artificial intelligence; science-technology-humanities; engineering-economy/business-social*



Introduction.

Today a new science has been born, known as data science (Cleveland, 2001). The birth of science has reasons of its own but has a background that goes far back (Hancock, 1837). Physically, the earth had spread before humans existed (Calvin & Bond-Lamberty, 2018). Before the presence of humans, many creatures were present, and a part is extinct even though some survived, some did not survive (Usami, Saburo, Inaba, & Kitaoka, 1998). At that time, all of it currently grouped as plants or as animals. Plants, animals, and humans share a place on earth. They are related to and support each other. The land and its surroundings are the living environments between them. In their relationship, they interact and raise several problems (Manuri et. al., 2017; Onrizal, 2019; Onrizal, Amelia, Amri, Sulistiyono, & Mansor, 2019; Kurniawan et. al., 2020). Every creature has unique characters and properties, but they also have the general characteristics that apply to each other. The clashes between their personalities and their properties have triggered the presence of options (Rahmawati & Basyuni, 2019; Nuruddin, Noor, & Abidin, 2020). The option presents different problems, including making the option itself.

The continuous presence of options, following the interaction of humans and their environment with other creatures (Deutsch, Reimes, Fiebig, & Oehler, 2019), gave birth to ideas and discourses. Systematically these ideas and discourses form something that we recognize today with the name of science (Ishihara & Sofronis, 2018). Ideas are collection of thoughts poured into a media called discourse, with it and infrastructure being science (Liu, 2004). However, discussions about science have not yet complete. There is a possibility of the birth of new science. Therefore, this article presents some specific notes about science, where it is to solve problems that arise in that life. Primarily the implications which give rising to data science.

The overall physical reality can be recognized by the human senses (Liengme, 2015). It is data. The existence of reality depends on the concept in the form of logical (Birkhoff, 1936), or logically it is valid, where the argument is determined in its logical form (Kempson, 1988), for example: "Every mammal has a heart." It is information. Arguments under reality are given a value true (T) (Fettweis, 2005), while the opposite is false (F) (Thorpe, 1930; Nasution, 2018a; Burrieza & Yuste-Ginel, 2020; Kürbis, 2019). Symbols F and T summarize the values so that they are easily recognized (Stalnaker, & Thomason, 1968), but also abstract the logic so that it is easy to implement (Broadrick, 1950; Nasution, 2018b; Lennartson, Liang, & Noori-Hosseini, 2020; Li & Wang, 2020). Two values (true and false) are concepts that logically become an integral part of human life. True and false always the determinant of taking the next necessary steps also becomes the future reasoning material (Texley & Norman, 1984; Lee, 1987; Nasution, 2018c, Yuen, Reyes, & Zhang, 2019).

In reason, humans apply logic to composing word by word (Lathan, 1856), to build sentences, to convey concepts, and we can understand that it has value or gives answers (Yeshurun, 1976; Kara, Schwentick, & Zeume, 2010; Nasution, 2018d; Morales-Garzón, Gómez-Romero, & Martin-Bautista, 2020). A sentence that can be

proven true or false (Nota, Orefice, Pacini, Ruggiero, & Tortora, 1993), it is stated as the statement, p (Harrop, 1956; Godlovitch, 1969; Nasution, 2018e). Let p_1 , p_2 , and p_3 are statements (Novoselov, & Fadeev, 1982), where $p_1 =$ “a distance of two cities Medan and Jakarta 1,420 km”, $p_2 =$ “a distance of two cities Medan and Kuala Lumpur is 338 km”, and $p_3 =$ “a distance of two cities Kuala Lumpur and Jakarta is 1,166 km”. Thus there is a statement p where $p = “p_1 < p_2 + p_3”$ (Ohrstrom & Klarlund, 1986; Martin, 2005; Ma, Liu, & Xu, 2013). So far, some flights only connect three cities: Medan, Jakarta, and Kuala Lumpur. The price of flight tickets for closer distances is assumed to be cheaper than flight for longer distance. Let q_1 , q_2 , and q_3 are statements, where $q_1 =$ “a price of flight ticket from Medan to Jakarta”, $q_2 =$ “a price of flight ticket from Medan to Kuala Lumpur”, and $q_3 =$ “a price of flight ticket from Kuala Lumpur to Jakarta”. The facts, however, have revealed that the ticket prices for a flight to Jakarta directly from Medan are higher than through Kuala Lumpur, namely $q = “q_1 > q_2 + q_3”$. Thus, one concept is not always the same as another concept (Nasution, 2018f; Marlasari, Nashiruddin, & Adriansyah, 2019). If p then q means that if $p_1 < p_2 + p_3$ applies then $q_1 < q_2 + q_3$ applies. However, if $p_1 < p_2 + p_3$ applies then $q_1 > q_2 + q_3$ applies based on reality. It means that other behaviours affect the original reality, such as inefficiency in-flight management. Reality is expressed based on data for facts to speak, but both data and metadata never without together with time. In general, disclosing data as fact in a conversation without involving a time when the data was encoded, it causes that fact to be inappropriate, or we call it the “hoax” (a falsehood) (Nasution, Aulia, & Elveny, 2019; Hamsal & Zein, 2019). For example, a sentence “if $p_1 < p_2 + p_3$ applies then $q_1 > q_2 + q_3$ applies” is a statement of true value had been valid during the reign of Jokowi era in Indonesia, where data and information do not support each other (Adang, 2019). It is not science. Thus, the statement is not hoax. Therefore, all of that requires a strong foundation.

Facts that apply on a case-by-case basis or specifically unearthed together will be a sample, which is collected in space and recognized as data samples (Keyfitz & Robinson, 1949; Nasution, 2018g; Chatterjee & Bhuyan, 2020). The fact is universally valid in talks based on data. The data are called population. In the universe of discourse U , association by association well-express accordance with what to be a discussion, each case is a member of the intended association or set (Usó-Doménech, Nescolarde-Selva, & Gash, 2018). For example, elephants are mammalian animals. Elephants are members of the mammalian collection (community) or we note as g in M . In other cases, when we talk about truth the universe of discourse is $U_M = \{T, F\}$. It expresses science through membership, for example, an association of words is to define a science (Richards, 1928; Barnes, 1961; Nasution & Noah, 2012; Laufer, 2019, Menadue, Giselsson, & Guez, 2020), where the word by word have semantically different meanings, and as data, this requires a science, namely data science (Gentle, Härdle, & Mori, 2012; Pop, 2014; McMaster, Rague, Sambasivam, & Wolthuis, 2015).

Research methods.

In general, what is called the universe, global, or the public, they cannot be authorized to the parts, local or specificity (Evans, 2002). The universality of generality can only be abstracted to make it easier to understand. Like using optimization for realizing effectiveness and efficiency (Martorell, Sánchez, Carlos, & Serradell, 2002), which in certain cases refutes economic principles (Nuykina, 2020), it cannot be proven uneconomical (Nasution, 2012). Physically the earth is flat or round, depending on the viewer and the evidence submitted. Humans step by step walking on the land, each step measured the land in discrete with flat surface properties, $i = 1, 2, \dots, n$ (Gorenflo, Mainardi, Moretti, & Paradisi, 2002), but vehicles move from one place to another crawling the earth’s surface continuously through wheels $2\pi r$, $r =$ radius of a circle (Gao, Chen, & Yang, 1990). Mapping the surface of the earth, both discrete and continually results in the development of set theory into a part of mathematics called topology (Grayson, 1981; Nasution, 1990), which is science (Kuratowski, 1972). The topology tells us that the round and flat earth are the same, even though the physical reality of the earth is round. It reveals that every birth of science requires a methodology.

In terms of topology, in abstract geometry, the earth loses absolute distance and is independent of size (Bredon, 1993), but we need it. Whereas in terms of algebra, it is in invariant of geometry, on earth, there is the distance that can be measured (Dress & Havel, 1993), but we lose it. In terms of statistics, in the implication of geometry, the earth studded with numbers (Shamos, 1976), but we un-get the predictions. All of these are problem that are naturally present when science has a confrontation with the interests and needs of life. Historically mathematics is not part of philosophy, even though mathematics is considered as a science (Nasution, 2020a). It proves that philosophy and geometry are twins and born together (Bird, 1996), whereas geometry is part of mathematics. Indirectly, mathematics becomes a method for most of the sciences, while philosophy becomes a method of meaning from it.

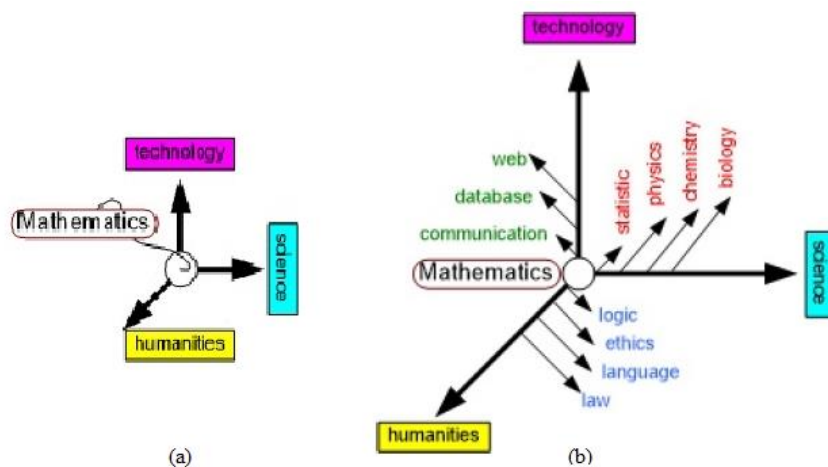


Figure 1. a – Science from origin; b – Lines with the studies for science, technology, and humanities

In general, the systematic relationship between things, the character of sense experience (Suratno, 2012), thought (Vygotsky, 1964), and imagination (Warnock, 1976) bridge the birth of science, which is compelled by the need to state (through cases, examples, and outcomes). The need perhaps necessary for a change in origin exits (Grant, 2016), the determination of the authenticity of the change itself becomes a problem in that change, and this requires and becomes science (King, 2004). The earth is composed of numeric, but we are unable to compute. However, it is good to state science and then distinguishes it from technology and humanities, as their relationship in Figure 1(a). In history, science generally expresses as a way to study various aspects of nature in an organized, systematic, and through different standardized scientific methods (Bryman, 1989; Wilson, 1999; Oliinyk, 2020). The term technology refers to the overall means for providing goods needed for the survival and comfort of human life (Geroski, 2000). Whereas, humanities state that it is a study to elevate humans. Then, become more civilized with science through methods (Peterson & Seligman, 2004). It fills the history of science.

We physically can explore the earth and the world in various directions, and this drives many different fields of study, and then presents science (Faure, Trap, Lin, Monié, & Bruguier, 2007). Thus the study of the universe (Chopra & Kafatos, 2017), the discussion extends as far as the assumptions can be thought of (Lewis, 1998), and reveals many axioms, and as supplement of definitions (Kroeber & Kluckhohn, 1952), facts are elaborated and proven through lemma (Kuhn, 1960), propositions (Stoker, 1998), and theorems (Sion, 1958), or to the conjecture (Moretti, 2000). An approach for a study is by establishing themselves into the science.

Based on ontology (Bergmann, 1950; Taylor, 1959; Hanneborg, 1966; Nasution, 2017a), some things are reviewed and studied that establish themselves. There is among them become the basis of almost all science. For example, physics F being the implications of the mathematical universality M (McCarthy, 1972). In this case, M is relevant to F if it means physics as a science. In other words, if F can be proven based on mathematics M , or in short $F \Rightarrow M$, and physics becomes science (Nasution, 2018g). However, among those that were examined and studied, some continued to change or not could un-proven for establishing themselves (Comroe Jr., 1977). In this case, the universe of discourse state that as $U(F) = 1$ if F can be proven based on mathematics M , or $U(F) = 0$ otherwise. Thus $U(F)$ is temporary or provides opportunities, and looks for proof both logically, naturally, or experimentally. Opportunities for it, is experimentally justifying a portion of the whole. Generally, we recognize it as a statistic, but it remains subject to mathematics (Cobb & Moore, 1997) (Fig. 1(b)). Opportunities it, is experimentally justifying a portion of the whole.

Science has its completeness. Completeness such as methodology is not outside of any science. Thus, when someone gets a methodology (Rawlins, 1949; Novikov & Novikov, 2013; Nasution, 2013; Martineau, Traphagen, & Sparkes, 2013; Nasution, 2020b; Simmel, 2020), science is being born. All of that involves mathematics. In this case, the methodology for expressing the birth of science is offer: As the order in which

the terms appear (if there are in various means such as dictionaries); Study programs (academic facilities for organizing it); Scientific meetings or journals (as a means of accumulation and dissemination) or also the number of documents (as an evidence of growth) (Ben-David & Loewy, 2000; Gupta, 1997; Green, Johnson, & Neal, 2003; Lin & Liao, 2008; Zanotto, Vanz, & Stumpf, 2017; Nasution, 2019).

Results and discussion.

What makes a study mature into science is the methodology (Kaplan, 1998; Dionisio & Casola, 2003; Kyrö & Kansikas, 2005). As a tool that complements the essential equipment, in other words. In other words, science is change, but science is also origin. Far humans are so concerned with the work of the brain. Historically, birth of a science is dependent on the meaning of words. Historically, the birth of a science is dependent on the meaning of words. Historically, the description, explanation, approaches, methods, innovation, reasoning, and implementation of the birth of a science is dependent on the meaning of words. Initially, for example, the “work” word (verbs) as origin, where the job (work, is a person’s role in society) as an object. The “work” done the passive verb, employ (to make use of word “work”) as order, do (make the work) as the commands, the performance (work outcomes) as signs of achievement, be at (more, most) work as adjectives (Erickson & Mattson, 1981). Either science or data, it is not only related to the procedure, the logic. It is not only limited to the composition and sequence, but that is also systematic. It is not comfortable with the forms and the relationships, i.e., structure. However, it also has a model and simulation where they as a complete guide and they also are a particular science (Nasution, 2017b). The presence of the neural network in artificial intelligence is a result of technological advancements such as computers, the internet, and their relations. The neural network, for example, is a science not only a method to solve any problems but also a model and a simulation of the workings of the brain or brain structure (Azmi, Nasution, Zarlis, Mawengkang, & Efendi, 2019).

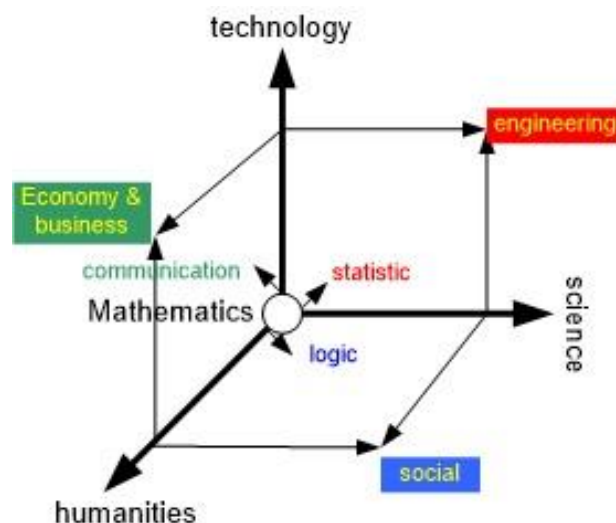


Figure 2. Slices between fields of knowledge

Every science has a basic foundation in what is we call it mathematics (Graham, Knuth, Patashnik, & Liu, 1989), a principle about the truth methodology (Fig. 2). The logical structure of mathematics that expresses a structure that is equipped with a valid form. Structure become subject to the method of logic. It requires accuracy and conclusions to be concluded without regard to the actual state and the power in behind. Therefore, mathematics is determined as a logical collection system (Kac & Ulam, 1968). Naturally, mathematics does logic and logic becomes the core of mathematics, and all the knowledge from it in its writing also needs to be in a consistent style. It is what makes science in it entirely. Each science that exists requires packaging. The theory of physics, for example, is not enough if it is not packaged in proofs, for example, by experiment. All collections of logical arrangement both in formulas and a series of definitions are the logic that is arranged systematically and integrated as a result of thinking. While the real proof (materially), that is the experiment, can only give it based on the laboratory report or hook-connected with the nature or characteristic of their material (Clauser, Horne, Shimony, & Holt, 1969). Thus, in experiments, the variables are presented in which observations reveal facts in the data, and the relationships among those variables are thus arranged (Bronzan, Kane, & Sukhatme, 1974). The event that arises through observation provides complementary evidence of the existence of science.

Science may not have anything to do with values, although it contains certainty the importance of truth, but how it has a relationship with the environment where values are useful. Imagine, physics, in this case, is not materials only, but is an expression of realizing to nature: large celestial bodies, such as the sun, too small objects like atoms, and not enough until that. It is expression in big data, through computation, and need a science, namely data science. The stationary properties of objects become part of physics based on their interactions with nature. Therefore, the environment is not only materials, but also about living things, where Internet of Things has a role. Thus, every science is born through the originator and socially distribute to other scientists who confirm and disseminate. For example, the view about a right triangle states that $c^2 = a^2 + b^2$, is a theorem by Phytagoras, where its interpretation as follows. A form of a square wide unit is the result of the sum of two square wide units with one side of the squares forms a right triangle (Quadrat, Lasserre, & Hiriart-Urruty, 2001). This formula is algebraically justified, and in the field of trigonometry it becomes a major proposition. Algebra too based on a designation derived from the Arabic, prevailing in a particular society and society, “al-jabr” (in Arabic language) for “gathering broken parts (Gandz, 1936).

In what is stipulated, the principles are explicitly stated and systematically accumulated. The preparation of science is on-going. Changes to principles are including changes to change or form a permanent nature to change. Such as chemistry, is now born as a science, used to be different assertions and of course systematically in different ways than other studies. It causes the affirmation to always be stated again (Lyell, 1847). At that time, physics in a methodology like a human child continued to

grow under his mother. Likewise, biology before becoming a science, it is the changes occur to changes with an emphasis on life as the opposite of the major of inanimate objects (Munir, Hattori, & Shimada, 2002). The principles of life change, but also the origin. Likewise, the foetus continues to change in the womb in a measured a systematic way, but it also establishes itself as something original like the DNA in that embryo (Hayati et al., 2019).

The softening of firmness in theory either by involving variables, adding parameters, or accommodating human characteristics and behaviour, has caused mathematics as a mother of knowledge to contain new science. As an analogy, when a baby is born, the environment accepts it as something new, and then the baby grows in the environment and society. Like it, the social knowledge is born as a science, for example, but the umbilical cord is still attached to the line of science and however mathematics keeps provide intake (Fig. 2). Social science has been born, but it still bounded by statistical methodology (Solis, 2020), for example, and social science is not able to be present at the main lines of science (Goldthorpe, 2001). This expression is a logical implication that social science is the context in the statistics S is relevant to the possible mathematical M proof, or $U(S)_o \cap S = 1$ if $S_o \cap S$ can be proven based on mathematics M , $U(S)_o \cap S = 0$ otherwise. The symbol \cap is the umbilical cord attached to the science line.

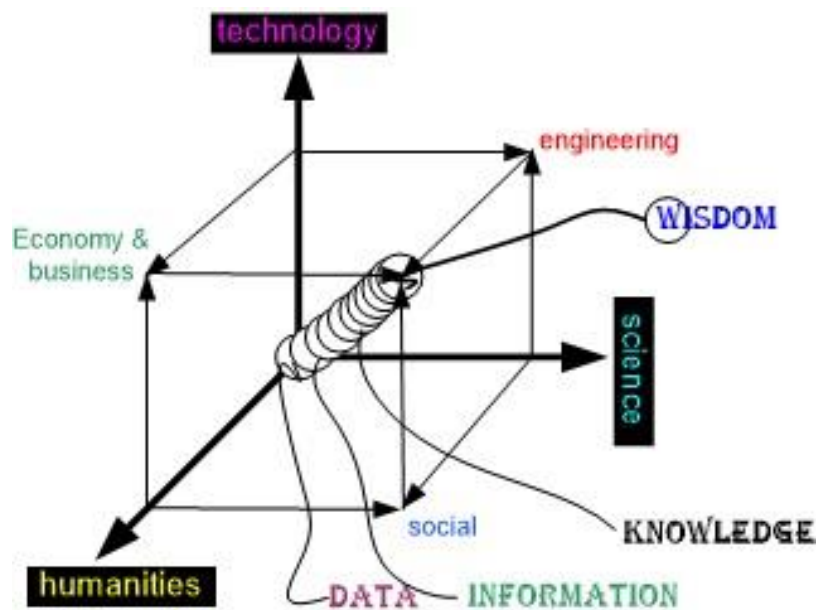


Figure 3. From data to wisdom

Conversely, assertiveness accompanied by application by involving various approaches to natural behaviour and human desires has caused mathematics as a mother of knowledge to contain the twins of new science, namely as a result of calibration of well-being. It's birth, accepted as something new, the social environment becomes a place of growth on earth, but like its twin, the umbilical cord continues to be bound to the lines of science and depends on how to the parent treat it. Just imagine,

however computer science can be separated from mathematics when doing computing. How computer science disproves mathematics when the program flow requires logic (Graham, Knuth, Patashnik, & Liu, 1989), especially when optimization must play a role or the intelligence is implanted to overcome human behaviour (Delle Monache, 2016; Gillen, Freeman, & Tootell, 2017; Nasution, 2018g; Pagan & Dörfler, 2019; Hosni, Li, & Ahmad, 2020). Not only is the study of program complexity at the core of computer science (McCabe, 1976), but the efficient use of energy is the accompaniment of program implementation (Mayer & Dänekas, 2013; Karanikolas & Liaramantzas, 2017). The heart line science-technology-humanities and engineering-economy/business-social is a line that is related to data-information-knowledge and wisdom. This core line comes from the origin where mathematics is positioned and meets the three-lines meeting between engineering, economy & business, social. Thus, by using the interpretation of Figure 3, it can reveal that some new science was born and the umbilical cord remained attached to mathematics.

Table 1. The means of dissemination

No.	Publication	Publisher	First time
1.	Knowledge-Based Systems	Elsevier	1(1) December 1987
2.	Journal of Innovation & Knowledge	Elsevier	1(1) January 2016
3.	Data & Knowledge Engineering	Elsevier	1(1) 1985
4.	Knowledge and Information Systems	Springer	1 February 1999
5.	Technology, Knowledge and Learning	Springer	1 January 1997
6.	Knowledge, Technology & Police	Springer	1 March 1988
7.	Knowledge Management Research & Practice	Springer	1 July 2003
8.	Data Mining and Knowledge Discovery	Springer	1 March 1997
9.	Knowledge and Space Clashes of Knowledge	Springer	Book Series Vol. 1 2008
10.	Journal of the Knowledge Economy	Springer	1 March 2010
11.	Knowledge Management and Organizational Learning: Advances in Knowledge Management	Springer	Book Series Vol. 1 2015
12.	IEEE Transactions on Knowledge and Data Engineering	IEEE	1(1) March 1989
13.	ACM Transaction on Knowledge Discovery from Data	ACM	1(1) March 2007

The term data (plural of datum) has been recognized for a long time (Anonim, 1824; Nasution, Aulia, & Elveny, 2019, Lederer, Capone, Umlauf, & Hirche, 2020). While the presentation of the term data science has so far only in several context of discussion in the last thirty years. Data science is not yet born; the content is still young so that it can be present in the form of a study program (Karbasiyan & Johri, 2020;

Krystina, 2020; Leidig & Cassel, 2020; Mike, 2020). However, data science we expressed as a multi-disciplinary study that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from structured and unstructured data (Dhar, 2013). Disclosure of this description took place in 2013, where there is an article explain it in *Communications of the ACM*, and furthermore continue to accumulate to a systematic form, namely scientific organization. On the other, the term data science has become the name of a journal, namely *Data Science: Journal of Computing and Applied Informatics* (JoCAI) published by Talenta Publisher (Nasution, et al., 2018): <https://talenta.usu.ac.id/JoCAI>, where the first article is about data collection (Gunawan, Amalia, & Najwan, 2017). This journal was published for the first time in 2017. The standard dissemination facilities, Elsevier has published a book with the title “*Data Science*” for the 2nd edition in 2018 as a form of support to the development of this science (<https://www.elsevier.com/books/data-science/kotu/978-0-12-814761-0>). Based on the point of dissemination, the data science continuous establish itself as science with the launch of the *Springer Series in the Data Science* (<https://www.springer.com/series/13852>). Whereas in IOP Publisher (<https://iopscience.iop.org/>), searches have resulted in the top 500 results of open access articles in the journal. Thus data science is not data and it is science (Leek, 2013). So, data science has become a combination of several scientific disciplines that closely link with mathematics. Today, there is a plan to establish the position of data science as knowledge (Lausen, Böhmer, & Krolak-Schwerdt, 2015; Priestley & McGrath, 2019; Oyamada, 2019; Vedula & Hager, 2020). That is by establishing a Study Program of Data Science at Universitas Sumatera Utara (Nasution, Sitompul, & Nababan, 2020).

At the core line, there is also information, but unlike data, the term information science already long use, and for the first time in the dictionary, it was raised in 1955. Expression of information science is a field relating to analysis, collection, classification, manipulation, storage, retrieval, movement, dissemination, and protection of information (Stock & Stock, 2013). The journal as a means of research dissemination was published under the name of information sciences in 1968 the first time by ScienceDirect (<https://www.sciencedirect.com/journal/information-sciences/vol/1/issue/1>) as well as several book series that publish in Springer Series in Information Science (<https://link.springer.com/bookseries/710>). Currently, the number of documents related to information science has reached 6680000 results based on searches on Google Scholar. In particular, the birth of information science with information system or not, has grown in such a way as to form the curriculum in this field in 2002 (IS2002) for the Bachelor program (Gorgone et. al., 2003) and was perfected in 2010 (IS2010) (Topi et. al., 2010), while for Postgraduate students compiled in 2006 (MSIS2006) (Gorgone, Gray, Stohr, Valacich, & Wigand, 2006), and upgraded in 2016 (MSIS2016) (Topi et al., 2017). Thus, information science has been born and grew in such away. Knowledge is much older than information. Perhaps experience is as old as conscious existence about what they must know in the form of

data itself. “Knowledge is human intimacy, awareness, or understanding related to facts, information, descriptions, or skills obtained through experience or education by agreement, discovering, or learning” (<https://en.wikipedia.org/wiki/Knowledge>). However, many fields of study depend on exposed knowledge, for example, knowledge-based management, knowledge-based economics, and so on. When information science has grown to become a science, the baby of data science has not yet been born. Knowledge is still looking for seeds to be planted in the womb of mathematic, where the mathematic is a scientific basis. The study continues, therefore, although several means of dissemination in publishing have been present, Table 1, which is present to date, only relates to the theory of knowledge. Further study of experience requires lengthy research, perhaps including research on education itself. Probably, the experience is more challenging to systematize so that it is not organized into a scientific form than the organizing, forming, and presenting the knowledge technology. When both sides of the study of information are so challenging to becomes a science. It may be too challenging for mathematics to accept wisdom as a process output from the arrangement of data-information-knowledge as a process of becoming or birth as a science. Wisdom, organizationally, is outside the organized scientific methodology based on the lines of the science-technology-humanities as well as the lines of the engineering-economy/business-social, Figure 3. However, wisdom is the outcome of the whole. So, wisdom is the outcome of science, and new science will be born because of that. It is a history that follows data-information-knowledge-wisdom for data science.

Conclusions.

The birth of new science depends on the basic foundation of being the mother of science itself. Mathematics is the basis of science. Furthermore, for supporting science, some efforts build the methodology in such away. Its existence test is based on the introduction of related terms, formulating concepts and principles, proving theories, and carrying out scientific dissemination through scientific meetings, journals, and books. This is all at the core of the community activities: education, research, and community services, where a study program is a scientific community itself.

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Народження науки

Анотація. Фізика, біологія, хімія, наприклад, вже не тільки вивчаються за програмами в багатьох університетах, але і знаходяться в авангарді розвитку науки, і це і є сама наука. Розвиток основного фундаменту стає матір'ю науки, такої як математика, як передумови для зародження нових наук. Інтереси, пов'язані з життям і добробутом людей, завжди припускають можливість народження науки в концепціях, і математика це підтверджує. У деяких випадках як додаток, або ж вона дає відповіді в технологічній формі, яка спотворюється відповідно до соціальних вимог суспільства. У кожній науці є своя методологія, заснована на логіці, що допомагає міркувати. Природна модель – це підхід до створення методів, а також принципів, які розвиваються в штучному інтелекті на основі математики. Цей принцип не тільки змінює спосіб сприйняття даних, але також встановлює нові визначення даних і змінює статистику, оптимізацію і інші області. Кожна наука також має причетність до інших наук, але в той же час має і застосування, пов'язані з іншими науками. Кожна наука підтримує технології для поліпшення суспільного добробуту. Історично, століття за століттям народжувалися багато нових областей

науки, і це підтверджується публікаціями наукових робіт і книг в якості наукових стандартів. Потім навчальні програми підтримували її початкове поширення і розвиток за допомогою досліджень з підтвердженням наукових публікацій або в матеріалах наукових зібрань, або в журнальних статтях. Навчальна програма з природознавства на відповідному факультеті є обов'язковою і є відправною точкою для подальшого наукового і технологічного розвитку. Тому, все починається і закінчується в одній точці, а саме в народженні нової науки, як зародження науки про дані. Ця стаття описує народження науки з залученням відбитків історії. Відображення наукового розвитку починається з формування основ для становлення наукової області, а саме науки про дані. Стаття також опосередковано ілюструє наукову дорожню карту.

Ключові слова: наука про дані; математичний; штучний інтелект; наука-техніка-гуманітарні науки; інженерно-економічний/бізнес-соціальний

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Рождение науки

Аннотація. Фізика, біологія, хімія, наприклад, уже не тільки вивчаються по програмам во многих університетах, но и находятся в авангарде развития науки, и это и есть сама наука. Развитие основного фундамента становится матерью науки, такой как математика, как предпосылки для зарождения новых наук. Интересы, связанные с жизнью и благополучием людей, всегда предполагают возможность рождения науки в концепциях, и математика это подтверждает. В некоторых случаях как приложение, или же она дает ответы в технологической форме, которая искажается в соответствии с социальными требованиями общества. У каждой науки есть своя методология, основанная на логике, помогающей рассуждать. Естественная модель – это подход к созданию методов, а также принципов, которые развиваются в искусственном интеллекте на основе математики. Этот принцип не только меняет способ восприятия данных, но также устанавливает новые определения данных и изменяет статистику, оптимизацию и другие области. Каждая наука также имеет причастность к другим наукам, но в то же время имеет и применения, связанные с другими науками. Каждая наука поддерживает технологии для улучшения общественного благосостояния. Исторически, столетие за столетием рождались многие новые области науки, и это подтверждается публикациями научных работ и книг в качестве научных стандартов. Затем учебные программы поддерживали её первоначальное распространение и развитие посредством исследований с подтверждением научных публикаций либо в материалах научных собраний, либо в журнальных статьях. Учебная

програма по естествознанию на соответствующем факультете является обязательной и является отправной точкой для дальнейшего научного и технологического развития. Поэтому, всё начинается и заканчивается в одной точке, а именно в рождении новой науки, как зарождение науки о данных. Эта статья описывает рождение науки с привлечением отпечатков истории. Отражение научного развития начинается с формирования основ для становления научной области, а именно науки о данных. Статья также косвенно иллюстрирует научную дорожную карту.

Ключевые слова: наука о данных; математический; искусственный интеллект; наука-техника-гуманитарные науки; инженерно-экономический/бизнес-социальный

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