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The Extended Human Psyche Model. Preliminary Modeling of the Psycho-Bio-Technical Systems

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Abstract

The rapid development of technology in our time increasingly shows signs of technological singularity. Awareness of emerging technologies by a person becomes a vital quality. The creation of models that allow understanding of the phenomena associated with modern technologies helps to get closer to solving the problem and eliminate the threat to humanity from technology. This article describes the creation of the extended Assagioli's human psyche model and its application to psycho-bio-technical systems. The article includes discussions regarding the application of the Theory of Human Motivations 2.0 (THM 2.0), Simple Learning Motivation Hierarchy Model (SLMHM), and Societal Patterns Evolution Model (SPEM) to better understand self-awareness, libido, will, intuition, and even consciousness. It is assumed that the models under consideration can be used to model complex phenomena, but require artificial intelligence for implementation. The article includes consideration of the influence of the level of human motivation on the level of technologies with which he interacts.

Keywords: Theory of Human Motivation 2.0; Psychoanalysis; Psychosynthesis; Psycho-bio-technical Systems; Biotechnology; Medicine; Artificial Intelligence

Introduction

Humanity has already passed through the so-called VUCA (Volatility, Unpredictability, Complexity, and Ambiguity) world and must now face the BANI (Brittle, Anxiety, Non-Linearity, and Incomprehensible) World [1]. “The number of new cases and deaths of mental disorders worldwide has increased, and will continue to increase in the near future” [2]. Debates regarding to uncontrolled development of Artificial Intelligence (AI), as an example of turbulent and uncontrolled antroposphere development, become more and more intensive and vital [3,4]. “The symbiosis of human and machine intelligence is forging a new epoch of cultural evolution. This Perspective highlights the transformative role of intelligent machines in reshaping creativity, redefining skill value, and altering human interactions” [5]. “The COVID pandemic has, among other things, intensified the debate about biosecurity and biosafety, driven by concerns not only about naturally emerging diseases but also accidental releases of pathogens and nefarious uses of biotechnology. One of those concerns regards the rapid progress both in protein design and synthesis, and potential nefarious uses of these technologies.” [6]. A generative algorithm can develop the nerve agent VX and tens of thousands of analogs [7].

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"Biotechnology is a multidisciplinary field that involves the use of living organisms, biological systems, or derivatives to develop products and technologies for various sectors, including healthcare, agriculture, and environmental science. It encompasses techniques such as genetic engineering, cloning, and fermentation, and plays a critical role in areas like drug development, vaccine production, and crop improvement. The integration of Artificial Intelligence (AI) and Machine Learning (ML) in biotechnology and biochemistry is driving a paradigm shift, revolutionizing research and applications across these fields." [8]. There are ethical issues and risks identified in the field of biotechnology [9]. "Many doctors have used AI in microbiology for illness diagnosis, functional genomics medication research and development, biomarker recognition, and medical imaging diagnostics. The development of biotechnology and our usage of AI as a potential source are already commonplace in the field of life science." [10]. There are some drawbacks in AI that should be emphasized, including the need for professionals to be trained in AI, requiring more costs and time, and the high energy demands of server units. Ethics is a crucial topic in AI field, mainly due to misinformation that is sometimes associated with new creations [11]. Motivation is chosen as the main factor influencing how and in what direction technologies will develop. It is possible to accept the fact that technologies, especially AI and artificial bioorganisms, can be inherent in the technologies themselves. An example would be the artificial selection of guard dogs motivated to protect livestock. Many algorithms for training AI models are also based on the selection of candidates who are better motivated to solve a certain problem. The theory of human motivations by Abraham Maslow [12,13] and the human psyche model by Roberto Assagioli [14,15] have been playing an invaluable role in the progress of humanity. These theories lie in many practices and methods. At the time of Maslow and Asagioli, their theories were in demand to explain and solve problems related to the human psyche. Currently, a new theory is needed to deal with modern challenges related to increased information flows and the development of the technosphere. Theory of Human Motivations 2.0 (THM 2.0) [16] was developed based on the Simple Learning Motivation Hierarchy Model (SLMHM) and Societal Patterns Evolution Model (SPEM) [17,18] to be a model capable of being used in application to psychology and technosphere. Taking into account the development of Artificial Intelligence (AI), THM 2.0 creates completely new opportunities for modeling the human psyche, as well as issues related to the brain-AI connection.

The Theory of Human Motivation by Abraham Maslow [12,13] is proven and effective in many cases across many disciplines, including business, management, marketing, parenting technology, education, and psychology [19, 20]. Graves built his levels of existence based on Maslow's theory [21]. ERG theory is another example of motivation theory that was developed from Maslow's theory [22]. Dilts proposes a pyramid of neurological levels, as a developed version of Maslow's pyramid [23].

However, there is incompleteness observed in the model and its criticism [19,20,24-26]. King-Hill [27] mentioned the following facts related to the imperfection of Maslow's theory and its understanding:

- the hierarchy of needs is often represented in literature as a pyramid, yet within his writing, Maslow did not use this representation;
- the evidence for the hierarchical order of the needs proposed by Maslow is sparse [28];
- the existence of a rigid order of needs for every individual is questioned [28];
- the hierarchy was steeped in ethnocentricity and based upon a Western ideology [29];
- the model alone does not account for differences in the cultural needs of societies and their unique social and intellectual needs [29];
- the needs of individualistic societies reflect the needs for self-actualization and self-fulfillment, whereas a collectivist society is focused on the community and acceptance and belonging within this structure [29];
- the position of sex within the hierarchy has also come under criticism as it is categorized alongside breathing and food [29];
- bracketing sex in a category forms an individualistic perspective that does not acknowledge the emotional and psychological impacts that this has upon an individual [29];
- the hierarchy is too simplistic and does not account for societal needs at a particular time, such as recession and war [30];
- the ranking of needs varies with age and does not appear to be the same across all age groups [31];
- Maslow used only the top 1% achievers of college populations and referred to well-known academics and high achievers, making it impossible to generalize his findings to the wider population [32].

Technologies of brain-computer interaction are young and intensively developing. There is a high demand for a modern model, allowing understanding and solving phenomena in the sphere of the human psyche, technologies, and particularly AI. This demand becomes bigger and bigger. Not conformity of existing models, such as Maslow's theory and derivated models with modern requirements, and their age form a deep gap in science and practice.

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This paper explores the application of the Theory of Human Motivations 2.0 (THM 2.0) [16] to expand Assagioli's psyche model. The proposed model seeks to bridge the gap in contemporary approaches, enabling a deeper understanding and representation of the human psyche, technologies, and human-technology interactions. Biotechnology and biomedicine relate to both humans and technologies.

THM 2.0 is based on the Simple Learning Motivation Hierarchy Model (SLMHM) and Societal Patterns Evolution Model (SPEM) [16]. Although SLMHM and SPEM can be effectively used to model many phenomena, THM 2.0 is designed to be used in the psychology field. SLMHM and SPEM [17,18,33] were created as tools for modeling the development of Smart Cities as socio-technical systems [34], Information Society, and Society 4.0 and Society 5.0 [35].

The following Research Questions are set for this research:

RQ1. How can the model of the psyche be expanded, what will be the result and what are its characteristics?

RQ2. What is a psycho-bio-technical system and how can it be modeled?

RQ3. What is the scientific practical value of the created models?

Methodology

The methodology of current research is based on descriptive and comparative designs [36]. The descriptive nature of this research is concluded by presenting updated THM 2.0. The THM 2.0, its levels, patterns, and phenomena are compared with existing phenomena using an analogy that represents the comparative design. According to the abstraction levels [36], this paper presents the theory on the conceptual levels. This paper discusses the application of the new model to the psyche phenomena such as self-awareness, libido, will, and intuition. The extension of understanding of these conceptions and the new look to them is a sign of proof of the new model. Chapter "The Model" describes the new representation of THM 2.0 as an extended Assagioli's "oval" model [14,15].

The paper describes the extended model of the human psyche as the main component of the psycho-bio-technical system because we assume that:

1) The human psyche is the most complex component of the system ("The brain is the most complicated material object in the known universe.", Gerald Edelman);
2) A person cannot cope with what his psyche cannot cope with ("The understanding does not derive its laws (a priori) from nature, but prescribes them to nature.", Immanuel Kant; "The world is my representation.", Arthur Schopenhauer).

Development of bio and technical components is given in conjunction with the levels of human motivation, reflecting the level of development of his psyche. Thus, the article describes two components - an extended model of the psyche and a model of the development of psycho-bio-technical systems, which are of scientific and practical value. Chapter "Discussion of findings" contains several hypotheses that can help better understand psyche phenomena. This section also discusses the levels of development of biotechnology and biomedicine, as well as their compliance with human motivations.

Literature Analyses

Literature about SLMHM, SPEM, and THM 2.0 is the main source for this research. At the same time, this research is based on the findings of Freud, Jung, Maslow, and Assagioli. The discussion includes a review and addition of the results of their research, which on the one hand includes literature dating from the previous century, and on the other hand creates a basis for expanding fundamental knowledge about the human psyche, taking into account modern realities, including, first of all, the development of technology. The study also used literature examining general issues of biotechnology and biomedicine.

Maslow's theory of human motivations [12], levels of existence by Graves [21], map of consciousness by Hawkins [37], 4 realities by McWhinney [38-41] and others were studied at the development of SLMHM and SPEM. Findings from psychology, philosophy, sociology, coaching, economy, technology, and different maturity models lie in the foundation of SLMHM and SPEM [18]. THM 2.0 was proposed to model human motivations as part of societal development in the development of society, economy, and environmental system according to 17 United Nations Sustainable Development Goals [17]. Assagioli along with Maslow, was one of the founders of the emerging field of transpersonal psychology and the transpersonal or Higher Self [42]. THM 2.0 was designed to be free of known disadvantages of Maslow's theory. The advancements of the THM 2.0 were achieved by 16 levels and fractal structure. The THM 2.0 was designed to fit Maslow's theory as closely as possible. The extension of the Asagioli model with THM 2.0 being discussed in this paper is very promising.

The Model

Application of THM 2.0 to Assagioli's model extends it and results in some changes in the initially presented THM 2.0 [16,17]. Taking into account this influence and other research of THM 2.0, the following changes are applied to the THM 2.0 (see Figure 1, where AQ, PQ, IQ, EQ, CQ, and TQ are Adversity, Physical, Intelligence, Emotional, Creativity, and Transpersonal Quotients accordingly):

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- The Transpersonal Self and the Deep Self are introduced. This makes THM 2.0 compatible with Assagioli's model;
- Extrinsic motivations are presented with signs "+" and "-". This allows us to represent such dependencies of a person as affecting someone or being affected by someone (here comes to mind Jung's shadow);
- The transient arrows are removed because transitions (of "I", consciousness, state, etc.) can have a place between any patterns;
- Transpersonal Skills, Transpersonal Intelligence, and Transpersonal Quotient (TQ) are introduced to complete the structure of the model;
- Although God is not introduced in the new structure, in case of need God can be placed at the top of it in opposite to the Non-Existence at the bottom.

Development of the psyche can go through the patterns. At the same time, one can say about the transit of consciousness between the patterns.

Adversity Pattern

Adversity Pattern (AP) relates to the Initial Formation Pattern (IFP in SPEM) and chaos [16]. AP corresponds to the ability of a person (speaking strongly of Deep Self) to face any unfavorable situation in his/her life, to the science of human resilience, i.e. an ability to handle different adverse situations as and when required [43]. Not existence lies below AP and the degradation in AP leads to disappearance or death. Due to the random nature of problems and the absence of structured problem-solving, reactive avoidance of problems is the main strategy of behavior. Exposure to both known and unknown challenges (diseases) takes place.

Physical Pattern

Two ways exist to transit above AP based on intrinsic and extrinsic motivations accordingly. Both ways introduce the appearance of some kind of structure. Intrinsic motivation leads to the development and transit into the Physical Pattern (PP). Extrinsic motivation leads to transit into Mind Control Pattern (MCP) and under external structuring. One can say that PP is the pattern where archetypical Jungian symbols are located. PP relates to the Physical Quotient (PQ) that originally was described for the body. PQ takes into account motor skills, alertness, physical speed, strength, endurance, calisthenics, game dancing, and neural and physical health [44]. However, PQ qualities can be applied to the mind and psyche: thinking skills, alertness, speed of thinking, power of thought, endurance, stability of thinking, and so on. In AP, the thinking was purely reactive and aimed at solving problems as soon as they arose. In PP, it becomes possible to wish, take the initiative, find abilities, and finally act. This pattern is characterized by reactive approaches to known challenges (diseases) but exposure to unknown problems (diseases) remains.

Intelligence Pattern

The structure of Physical Pattern (PP) allows one to go ahead and get benefits on the base of a developed structure or action. Intrinsic motivations lead to transit from PP to Intelligence Pattern (IP). In the case of extrinsic motivation, there is a transition to the Physical Control Pattern (PCP). Examples of PCP include any kind of enforcement action even if a person forces himself to do something to achieve an aim. Mechanisms of improvement and benefit relating to IP as well as Adaptive Society Pattern (ASP) in SPEM allow one to adapt to emerging internal and external changes. IP relates to the Intelligence Quotient (IQ) and cognitive intelligence. "Intelligence is the ability to think rationally, learn effectively, understand complex ideas, and adapt to the environment" [45]. This pattern is characterized by reactive approaches to unknown challenges (diseases). This strategy of problem-solving allows one to achieve adaptation to changes.

Emotional Pattern

Development at the intelligence level leads to disproportions in skills and the rise of internal contradictions (Matthew effect, logical paradoxes, etc.). In the human psyche, this is expressed by the disproportion between developed and undeveloped skills (or say brain structures). Sufficient internal resources and satisfaction at previous levels lead to development and transit from IP to Emotional Pattern (EP), characterized by better connectivity [16]. Lack of internal resources at IP leads to transit under the Cultural Control Pattern (CCP). This pattern is characterized by proactive approaches to known challenges (diseases).

Creativity and Illusory Control Patterns

Sufficient internal resources and satisfaction at previous levels lead to development and transit to Creativity Pattern (CP). Lack of internal resources leads to transit to Technological Control Pattern (TCP). CP as well as the Creative Society Pattern (CSP in SPEM) corresponds to the level of development and realization of ideas and creative abilities. Sufficient internal resources and satisfaction at previous levels lead to further continuous development to the highest, level – Transpersonal Self. Lack of internal resources leads to transit to Illusory Control Pattern (ICP) [16]. This pattern is characterized by proactive approaches to unknown challenges (diseases).

Application of THM 2.0 to Assagioli's model leads to its modernization as is shown in Figure 2.

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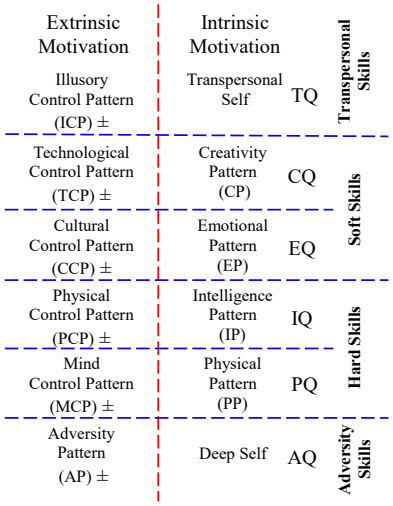

Figure 1: THM 2.0 Patterns.

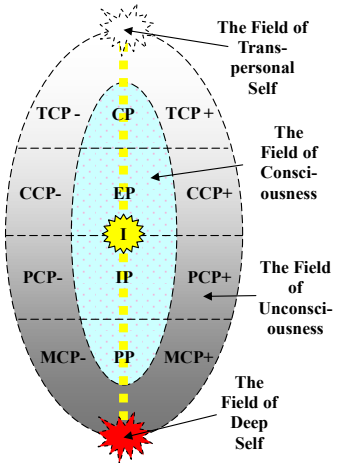

Figure 2: Extended Assagioli's model.

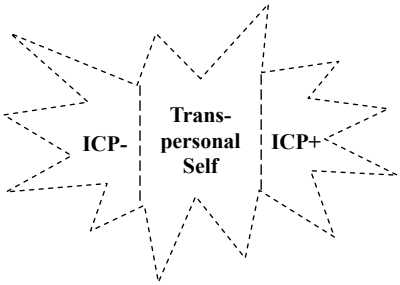

Figure 3: The Field of Transpersonal Self.

Figure 4: The Field of Deep Self.

The Transpersonal Self and the Deep Self are the boundary points of the model. Following the logic of the THM 2.0 model, we assume that each of them consists of three parts, as shown in Figure 3 and Figure 4.

16 THM 2.0 levels are directly applied to the field of consciousness and relate to intrinsic motivations. The levels are presented in Figure 5.

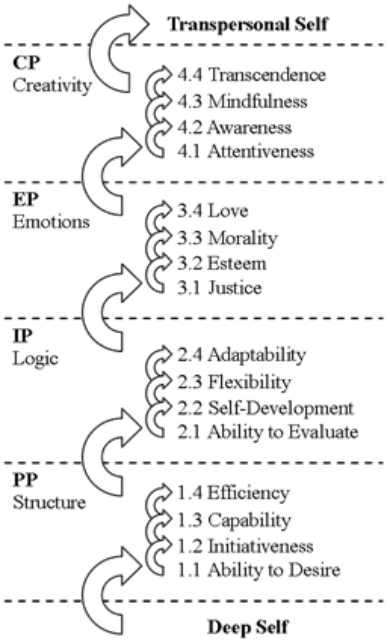

Figure 5: THM 2.0 Levels.

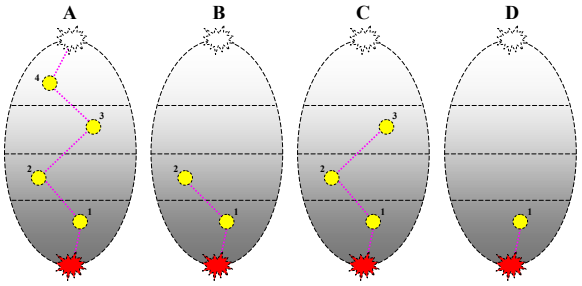

Figure 6: Models of Intuition.

Discussion of Findings

Although some changes have been introduced into the THM 2.0 model, there are no fundamental changes compared to its initial presentation [16]. Initially, THM 2.0 implied transcendence, mission, or God as the highest aim. The introduction of the Transpersonal Self in THM 2.0 allows us to create it fully compatible with the existing experience gained on the base of Assagioli's model. At the same time, the Deep Self is introduced as opposed to the Transpersonal Self, which is also new in Assagioli's model. God can be presented at the top of the model as the highest infinite and unknowable idea in opposition to nonexistence at the bottom.

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This is useful for studying religious phenomena, but not as an introduction to the scheme of a concept that goes beyond the description. God in THM 2.0 presented the openness of the model [16]. Asaggioli's model supposes openness by bounds transparent to the collective unconsciousness. THM 2.0 can extend the conception of self-awareness. The first THM 2.0 level corresponds to desire. Here we can remember Descartes's "I think, therefore I am". Moving up by THM 2.0 levels we can extend this statement to "I intend, therefore I am", "I can, therefore I am", "I act, therefore I am", …, "I am all, therefore I am" (one can say that this last statement is similar to Samadhi state). Technical phenomena that are close in structure to the structure of the human psyche are most understandable to humans. Of particular interest are problems of aligning AI values with humans [46]. SLMHM, SPEM, and THM 2.0 have similar structures and can be used to model synthetic systems, such as socio-technical systems, brain-computer interfaces, and so on. A combination of SLMHM and THM 2.0 is presented in [17]. Technologies of a higher level than the psyche of a particular individual can contribute to the development of that individual [33]. There is so-called Miller's "Magical Number Seven", supposing that the average human can operate by 7±2 (seven plus minus two) objects in this short-term memory [47]. The human psyche is enormously complex and modeling it by existing models, operated by 7±2 or fewer components led to significant bias. THM 2.0 has more components and is fractal by nature. This makes the model too complex but promises higher accuracy relating to existing models.

Berne [48] proposed to consider three ego states of the human psyche: Child, Adult, and Parent. These states can be easily mapped to three THM 2.0 patterns, where: Child => Adversity Pattern; Parent => Physical Pattern; Adult => Intelligence Pattern.

THM 2.0 allows to addition of two new ego states:

1) Persona ("Persona in the analytic psychology of Carl Jung, the public face an individual presents to the outside world, in contrast to more deeply rooted and authentic personality characteristics. This sense has now passed into popular usage" [49]) => Emotional Pattern. Successful behavior in this pattern includes success in communications with other people and depends on Emotional Intelligence. It is very important here to be able to determine what ego state the interlocutor is conveying, choose your ego state to respond and manage communication;

2) Sage => Creativity Pattern and is characterized by the highest states of the psyche. This is expressed by a high level of intuition, attentiveness, and the ability to fully manage communication, avoiding traps and dead ends and fully achieving goals.

Kenny [50] claimed that the value of psychoanalysis is obfuscated by its practice to reverse the detrimental descent into theoretical and therapeutic disarray. Küçükalp [51] highlighted Freud's psychoanalysis as one of the fundamental concepts of modern capitalism. At the same time, she described the emergence of the concept of neo-humanism. These facts show the possible problems in understanding modern capitalism and neo-humanism. The fractal nature of THM 2.0 allows us to model not only the ego states but other psyche fragments and their interactions. These psyche fragments can relate to subpersonalities, units of consciousness [52], microvitas [53], and so on. Research promising fruitful results is the development of a new Brain Model on the base of the experience of the Triune Brain model and discussions associated with it [54-56]. Although this model has not been physiologically confirmed, such a division at the functional level may be useful in some psychotherapeutic cases. THM 2.0 allows us to use a model with 5 (or even 16 and more) functional levels.

Deep Self and Transpersonal Self

The field of Transpersonal Self, located in the high unconsciousness, contains three components. The presence of illusory patterns in this field indicates that illusions influence the Self and that the Self influences illusions. The study of this element is a large and interesting task. However, here we can recall the analogy with the Holy Trinity: the Father; the Son; and the Holy Spirit or the Vedic Trimurti - the trinity of supreme divinity in Hinduism, in which the cosmic functions of creation, preservation, and destruction are personified as a triad of deities. The field of Deep Self also contains three components. It is located in the low unconsciousness and is interested in studying related conceptions. It is obvious that "libido" is the force that pushes the personality towards qualitative development, towards infinity, towards light, and towards God. At low THM 2.0 patterns, it corresponds to the desire for pleasure and sex, which at this level corresponds to the desire for life. "Mortido" is the complete opposite of "libido". Here we should also mention "destrudo", which was introduced as the force of manifestation of "mortido". Here, however, we should introduce a symmetrical concept - "creatido", which represents the force of manifestation of "libido". In general, this does not contradict Freud's psychoanalysis and even complements it.

It is worth mentioning that Jung viewed libido much more broadly than Freud. Jung [57] distinguished four basic psychological functions: thinking, feeling, sensation, and intuition. The following accordance with the THM 2.0 patterns is observed:

Sensation -> Physical Pattern;

Thinking -> Intelligence Pattern;

Feeling -> Emotional Pattern;

Intuition -> Creativity Pattern.

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The oval representation of THM 2.0 shows that all patterns are vertical projections of one onto the other. THM 2.0 extrinsic motivation patterns have two signs "+" and "-" (Figure 1). Application of Gödel's incompleteness theorems [58] to the bounded human psyche as a system shows that the bounded psyche is incomplete. It means it contains contradictions. The pursuit of completeness is the healthy driver of development [18]. For the THM 2.0 one can say that this is nothing other than "libido" as an energy, and "creatido" is a method of expansion based on creation. Another method of getting rid of contradictions in the psyche is to simplify the system by destroying part of it. This method corresponds to "mortido" as energy and "destrudo" as the manifestation of this energy. One can draw an analogy with physics, where the potential difference (like contradictions in the psyche) determines electrical energy (psyche energy). One should also think about the question - is libido capable of manifesting itself as destrudo, and mortido as creatido? Such facts as the asceticism of yogis and monks, which aim to develop the spirit, that is, "libido", in fact, manifest themselves as "destrudo", aimed at the shortcomings of the body. Here we are talking about libido in a broad sense, but not in a narrow sense, as Freud introduced it. Another example is the manifestation of "mortido" through "creatido" - the development of weapons. The detailed discussion on these issues is beyond the scope of this study and makes a great interest for future research.

Will and Intuition

Striving for self-awareness to raise its state can lie in the foundation of will. If we look at Assagioli's phases of the will [15] through the THM 2.0, we can conclude:

1) The THM 2.0 can expand Assagioli's phases up to 16 levels;
2) Speaking about the will we can consider intrinsic motivations only;
3) The first Assagioli's phase can correspond to the setting of the highest aim [17], THM 2.0 level 5, Evaluation, and THM 2.0 level 2, Intention;
4) Deliberation can be matched to THM 2.0 level 1, Desire, because it is the level of thoughts;
5) Choice and Decision are matched to THM 2.0 level 7, Alternatives;
6) Affirmation can be matched THM 2.0 level 13, Attentiveness;
7) Planning is matched to THM 2.0 level 2, Initiativeness;
8) Execution is matched to THM 2.0 level 4, Efficiency.

The aspects of the fully developed human will be projected to the patterns of THM 2.0 (Figure 5):

1) The Strong Will = Physical Pattern;
2) The Skillful Will = Intelligence Pattern;
3) The Good Will = Emotional Pattern;
4) The Transpersonal Will = Creativity Pattern.

The fully developed human will can be also presented as THM 2.0 16 motivation levels. This approach can get not only 16 steps to develop human will but also 16 types of will.

Body-feeling-mind meditation is a fundamental psychosynthesis technique for working with all aspects of the will [42]. It means that psyche fragments of all four patterns are involved: body (Physical Pattern), feelings (Emotional Pattern), mind (Intelligence Pattern), and the process of meditation as the Creativity Pattern. Although the aspects of the fully developed human will fully correspond to the THM 2.0, the phases of the will correspond to the model partially. Obviously, it is because Miller's law [47] shows that 16 THM 2.0 does not fit into human short memory. Speaking strongly THM 2.0 is not step by step development model. The higher patterns can be developed more than the lower ones. This case can explain the phenomena of poor artists who painted the miracle pictures being in the Creativity Pattern without developing the Intelligence Pattern (IP is responsible for material wealth and body health). For example, Vincent van Gogh suffered from mental illness, which can be correlated with problems in the "lower" patterns of the model (Physical Pattern and Intelligence Pattern). So, development in all THM 2.0 patterns corresponds to the fully developed human will, discussed above.

The model allows us to put forward very interesting hypotheses regarding such a phenomenon as intuition. If in all 4 patterns of the psyche, there arise fragments connected to each other "vertically", including the connection with the higher and lower Self, then intuition manifests itself in its fullness. In this case, a state, feeling, formalization, and the possibility of realization of insight arise (see Figure 6, case A). Another type of intuition, which can be called "expertness" takes place where two fragments from Physical Pattern and Intelligence Pattern connect. In this case, knowledge and experience (Physical Pattern) connect with the logic and formulation (Intelligence Pattern) (see Figure 6, case B). One more intuition type arises when three fragments from the Physical Pattern, Intelligence Pattern, and Emotional Pattern connect. This type can be named "emotional intuition" (see Figure 6, case C). Reflexes can also be considered a type of intuition where only a fragment from the Physical Pattern is involved (see Figure 6, case D). Discussion of all types of intuition that can be which can be obtained by analysis using whole THM 2.0 is out of the scope of this paper and could be a subject of future research. Also, only phenomena that include the interaction of fragments of the psyche located in

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all patterns/levels can be called intuition. Phenomena that include only a part of them can be called quasi-intuition.

The described model of intuition can be used to explain Assagioli's techniques of spiritual psychosynthesis [14,42]. These techniques are based on thinking (Creativity Pattern) about specific symbols (Physical Pattern), heroes (Physical Pattern), their interactions (Intelligence Pattern), and feelings (Emotional Pattern). This process promotes the development of connected psyche fragments from all four patterns, as presented in Figure 6, case A. Jung's method of active imagination can be modeled similarly. Katsikopoulos and others [59] referring to Klein [60] claimed that experts using intuition avoid analysis. THM 2.0 shows (Figure 2 and Figure 6) that there are cases where analysis is avoided and cases where analysis is performed in unconsciousness. Baylor [61] claimed that immediacy, sensing relationships, and reason are 3 components of intuition. Sensing relationships relate to the Emotional Pattern because it is a pattern of emotions and connectivity. Reasons relate to the Intelligence Pattern because it is a pattern of logical thinking. Metaphors and insights relate to the Creativity Pattern because it is a pattern of creativity and state. THM 2.0 shows that Baylor's model can be extended by introducing PP, including symbols, structures, and knowledge.

Three Eras of Medicine

Dossey [62] described three eras of medicine: Mechanical Medicine; Mind-Body Medicine; and Nonlocal Medicine. Taking into account these facts one can assume the following in terms of the THM 2.0 patterns (Figure 1, Figure 2):

- Adversity Pattern supposes chaos. There is no medicine at this level, rather there is every possibility for the disease of any etiology;
- Physical Pattern supposes structure. This is the level of Mechanical Medicine aimed at improving the structure of the body (as well as the blood, hormones, brain, and mind). It is the level of somatogenic etiology illnesses;
- Intelligence Pattern supposes logic and benefits. This is the level of Mind-Body Medicine aimed to improve the health of both body and mind. It is the level of psychogenic etiology illnesses relating to internal causes;
- Emotional Pattern supposes feelings and emotions. This is also the level of Mind-Body Medicine. But at this level, Mind-Body Medicine relates to social interactions (speaking strongly to interaction with the external environment). It is the level of psychogenic etiology illnesses relating to inter-personal contradictions and contradictions with the external environment;
- Creativity Pattern supposes ideas and creativity. This is the level of Nonlocal Medicine aimed to improve mind problems relating to the highest states of the human psyche. It is the level of supernatural etiology illnesses.

"Psychosomatic medicine is a branch of medicine that emphasizes the role of psychological factors in causing and treating disease" [49]. "Psychosomatic Medicine deals with the interactions between physical, emotional, and social processes in the occurrence, course, and the patient's coping with disease and states of suffering. Physical, emotional, and social factors in different proportions play a role in every illness. The doctor's task is to recognize not only the organic components but also the psychosocial processes involved in the disease and to take these into account. Whether psychosocial stress is present can be clarified by the doctor only in the framework of a psychosocial anamnesis" [63]. One can say that illness of psychogenic etiology relates to psychosomatic medicine that is currently more and more popular.

Biotechnology

SLMHM, SPEM, and THM 2.0 can be used to model practically all phenomena. In application to a biotechnological product, it can be modeled according to the levels, presented in Table 1. The models can be applied not only to biotechnological products but also to processes and services. The models can also be applied to issues related to biomedicine and other issues. The levels of development indicated in Table 1 for a biotechnological product can also be applied to a service (as a product). The levels of management and production can be determined in accordance with the levels of the product. The table can help to assess and model psycho-bio-technical systems because contains a juxtaposition of levels of THN2.0 (psycho), biotechnological product (bio), SLMHM (technical), and technology.

A clear description of the psycho-bio-technical system model, briefly shown in Table 1, is not an easy task. Below is a description which, due to the requirement of simplicity, is given somewhat unsystematically. Thus, the development of the system is sometimes presented from the point of view of human motivation (psycho), sometimes from the point of view of biotechnological product development (bio), and sometimes from the point of view of technologies. A detailed systemic description is beyond the scope of this article.

Structure pattern (Levels 1.1-1.4, Figure 5, Table 1)

This is the pattern in which a biotechnological product is created or emerges. A biotechnological product cannot desire in the full sense of the word, therefore, at the very first level, we can talk about quasi-desire. Here we can talk about the purpose of a biotechnological product. That is, its purpose must be present inside it. Here the product is not evaluated however a working process exists. The process of production of a biotechnological product can be initiated by the demand.

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Table 1: Levels of qualities of THM 2.0 and biotechnological product.

Level	THM 2.0 (Figure 5)	SLMHM [17]	Biotechnological product	Technology [16]
4.4	Transcendence	Totality	Interbeing	Convergence, Coalescence
4.3	Mindfulness	Expansion	Unfoldment	Globalisation, Totalisation
4.2	Awareness	Streamlining	Sentience	Streaming AI
4.1	Attentiveness	Information	Attunement	Generative AI
3.4	Love	Extraordinary	Symbiosis	Proactive technologies
3.3	Morale	Synergy	Ethoharmony	Connectivity, Communications
3.2	Esteem	Optimization	Reciprocity	Strategic management
3.1	Justice	Reward	Parity	Open technologies, Openess
2.4	Adaptability	Innovations	Adaptability	Agile methodologies, Adaptation
2.3	Flexibility	Alternatives	Versatility	Version control, Knowledge management
2.2	Self-Development	Improvement	Improvability	Optimization, quality management
2.1	Ability to Evaluate	Evaluation	Assessability	Analyses, Calculations
1.4	Efficiency	Action	Efficiency	Production
1.3	Capability	Feasibility	Capability	Creating tools and collecting components
1.2	Initiativeness	Intention	Initiating	Motivating, planning, design
1.1	Desire	Desire	Quasi-desire	Marketing, advertising, propaganda, demand

The human motivations are basic: desire, initiativeness, capability, and efficiency.

Logical Pattern (Levels 2.1-2.4, Figure 5, Table 1)

This pattern corresponds to evaluation according to certain criteria. Evaluation allows for improvement. The presence of an improvement mechanism leads to the need for alternatives and versions (without an improvement mechanism, the presence of alternatives does not make sense). Ultimately, this leads to adaptability. Qualities of a biotechnological product here are: assessability, improvability, versatility, adaptability. The human motivations are: ability to evaluate, self-development, flexibility, adaptability.

Emotions Pattern (Levels 3.1-3.4, Figure 5, Table 1)

This is a pattern of connectivity (connectedness and closeness lead to the emergence of feelings and the need to express emotions). The first level is a sense of justice, based on the equal distribution of benefits and equal treatment between all participants in the interaction. Esteem comes second because fairness requires better treatment of those who contribute more to the system. The practice of striving for honor by the participants in the interaction leads to the emergence of a desire to contribute more benefit to the interaction. Morality appears (based on such principles as the 10 biblical commandments or the principles of yama/niyama). As a result, morality develops into unconditional love. At the same time, unconditional love is not only a feeling but also a state.

Qualities of a biotechnological product and the human motivations are:

1) Parity is related to the feeling of justice;

2) Reciprocity is related to the feeling of esteem;

3) Ethoharmony is related to the morale;

4) Symbiosis is related to love.

It should be emphasized that morality has a direct relation to ethical issues. However, modern ethics is based on humanism, in which a person is considered the main element of the system. The morality considered in the model is based on neo-humanism, in which a person is considered part of the system [17].

Creativity Pattern (Levels 4.1-4.4, Figure 5, Table 1)

One of the qualities of unconditional love is openness and acceptance of everything that happens. This leads to increased attentiveness. Attentiveness requires the next level - awareness of what is happening. Awareness of what is happening to a greater and greater degree is nothing other than mindfulness. The limit of this expansion is transcendence.

Qualities of a biotechnological product and the human motivations are:

1) Attunement is related to the attentiveness;

2) Sentience is related to the Awareness;

3) Unfoldment is related to the mindfulness;

4) Interbeing is related to the transcendence.

Psycho-Bio-Technical Systems

The above discussion shows the levels of maturity of a biotechnical product and its connections to human motivation and technology levels. Human is the creator of technologies and consideration of psycho-bio-technical systems from

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the point of view of humans makes sense. The fact that ethical issues in science are of primary importance speaks about the requirements for researchers and producers of biotechnological products. It becomes obvious that the creation and use of a biotechnological product of a certain level (Table 1) requires performers of no less low levels of development and motivation.

The presence of control patterns in the THM 2.0, as well as the presence of polar patterns in the extended model of the psyche (Figure 1, Figure 2), can explain many problems that exist in the field of biotechnology and biomedicine. A simple example is a drug injection: an antibiotic is used to destroy microorganisms, and a vitamin is used to create conditions for improving metabolism. That is, substances can act with a plus or minus sign. Such substances most likely belong to level 2.1, Assessability. Antibiotics lead to the development of resistance in bacteria. This does not allow us to say that such substances belong to level 2.2, Improvability. The Fecal Microbiota Transplant procedure (FMT) is aimed at achieving balance in case of intestinal microflora deficiency. This procedure most likely belongs to level 3.1, Parity. Symbiotic microorganisms belong to level 3.4, Symbiosis. Level 4.4, Interbeing, most likely refers to the coexistence in one body of various cells, such as neurons, myocytes, fibroblasts, etc.

The most common medical procedures, such as taking pills at high temperatures, can be classified as level 2.1. In this case, such technology as analysis is used, which consists of measuring the temperature and such a quality of a person as the ability to evaluate. Such a quality may be absent in a person due to some disease, for example, dementia. Designing and synthesizing new proteins using generative AI requires a person to have at least developed attentiveness, which is related to level 3.1. Such a developed level of attentiveness also includes developed lower levels from 1.1 to 2.4.

The creation of an organism that represents a developed Psycho-Bio-Technical System requires a person to have the skill of being in a state of transcendence, that is, level 4.4. This statement also applies to systems where a person is part of the system. From this, we can also conclude that the integration of the human mind with artificial intelligence requires the skill of being in a state of level 4.2, Awareness. It should be taken into account that in almost all cases the system is psycho-bio-technical since a person is involved in it. At the same time, the level of human motivation directly affects the entire system. However, the system itself also affects the person. Both effects are of interest to medicine. The first case is for understanding how much the level of human motivation affects the resistance to diseases (There are observations that ascetic monks who have the skills to be in high states of the psyche have high resistance to diseases. However, this article does not provide scientific evidence of this observation.). The second is on how biological and technical solutions can affect the treatment of a person.

«More than 35% of US Corporations offer meditation or mindfulness training to their employees: Google, Apple, IBM, Intel, McKinsey & Company, General Electric, General Mills, Nike, Sony, Ford, Target, IKEA, eBay, LinkedIn, and the U.S. Marines, to name a few» [64]. This shows that leading AI developers, and others, understand that having workers in the 4.3 state of Mindfulness is important for developing high-level technological solutions.

Issues of consciousness , self-awareness, libido, will, and intuition are considered inherent to humans. These issues have not been fully studied by science and some of them are terra incognita. The model under consideration can help in approaching the solution of such phenomena.

Consciousness

The study of consciousness by taking psychedelics and taking EEG and MEG readings has the following drawback according to the model under consideration: EEG and MEG readings are related to level 2.1, Evaluation/Assessability. However, consciousness itself may be related to the highest level 4.4, Transcendence (however, this has not been proven either). It is possible to study consciousness using AI, but at the moment, AI is at level 4.2. There is another problem here - humanity has been developing for a long time in the Industrial Era, which corresponds to levels 2.1-2.4. At the same time, science is also at this level. Thus, there is reason to believe that the study of consciousness is an attempt to project higher layers of motivation (if they are higher - this has not yet been proven) onto levels 2.1-2.4. There is currently no toolkit in science that would work with levels 3.1 and higher, which makes a great contribution to its reductionism.

Self-awareness

This phenomenon is closely related to consciousness. This indicates serious obstacles in its research. However, the study of self-awareness uses the loopback of consciousness on itself and the study of the results. The well-known mirror test is nothing more than the loopback of consciousness on itself through visual (and possibly tactile) perception. Here we should again mention Descartes with his "I think, therefore I am" - the loopback of consciousness on itself through thought. Maslow's self-actualization [13] can be considered nothing else but the loopback at the highest THM 2.0 level – transcendence. Whereas it was mentioned above, the loopback of consciousness on itself can be carried out through techniques corresponding to different levels of the model under consideration. Here we can also mention various meditation techniques, which can also be attributed to the search for consciousness. The model under consideration can help in the development of new experiments on the study of self-awareness and, as a result, advance in understanding what consciousness is. Of particular interest is the study of consciousness and self-awareness in AI. However, the fact

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that humans have access to states up to level 4.4, and AI up to 4.2, suggests that AI is still limited in comparison with humans, although it can show advantages over humans at lower levels. Based on the above reasoning, the study of AI consciousness can also be based on loopback.

Libido, Mortido, Creatido, and Destrudo

The study of these concepts at different levels can yield very interesting results. The extended model of the psyche contains "neutral", "positive", and "negative" components. With the setting up of experiments on psycho-bio-technical systems with the participation of humans, biotechnological products and technologies can yield interesting results.

Will

The study of will in the context of the psycho-bio-technical system, as well as the study of Libido, Mortido, Creatido, and Destrudo, can yield interesting results.

Intuition

Taking into account the models of intuition presented in the Figure 6, it is possible to plan the corresponding experiments. Here, too, the psycho-bio-technical system can give interesting results.

Conclusion

All research questions were answered. The extended model of the human psyche was presented and discussed (**RQ1**). A deep analysis of such psyche phenomena as self-awareness, libido, will, and intuition is evidence of the model possibilities in psychoanalysis. The usage of Assagioli's model and techniques of spiritual psychosynthesis is evidence of the model possibilities in psychosynthesis. Levels of development of psycho-bio-technical systems are presented in Table 1 and some cases were discussed (**RQ2**). The created model has promising scientific-practical value (**RQ3**):

- Modeling of new techniques of medical treatment;
- Creating new biotechnological products;
- Research of psycho-bio-technical systems, including scenarios of possible consequences;
- Research of psyche phenomena, such as consciousness, self-awareness, will, intuition, etc.;
- Research of AI, including questions of consciousness, self-awareness, will, intuition, etc.;
- Analyze failures and problems in psycho-bio-technical systems research;
- Analyze human motivations in dealing with technology;
- Development methods for studying consciousness based on feedback at various levels can yield significant results for both human and AI consciousness research;
- Modeling on different levels: from subpersonalities up to collective psychical phenomena.

The following facts were identified that may explain the limitations of existing experimental methods and models:

- In recent times, humanity has been developing in the industrial era and capitalist relations that correspond to the intellectual pattern. This is confirmed by the fact that modern science and practice are based on logic and facts. At the same time, connectivity is developing, which corresponds to the information era. At the same time, the rapprochement of people requires them to have developed emotional intelligence. Therefore, the information era can be considered inherent in the emotional pattern;

- There is a limitation associated with the magic number 7±2. There is every reason to believe that existing models are limited by this number. The models presented in this article are not subject to this limitation. In addition to the number of levels and components presented in the diagrams, it should be mentioned that these models have fractality. Fractality practically does not limit the complexity of the models. This allows for modeling much more complex phenomena with better accuracy. At the same time, for implementation, these models require the use of information technology and AI in particular;

- Using the Assagioli's human psyche model as a basis may be seen as a limitation. However, it allows for the use of existing experience and knowledge accumulated based on the original Assagioli's model.

A prototype of AI tool for evaluation of scholarly papers using SLMHM was presented on Kaggle [65].

Disadvantages and Future Research

A problem with the terminology and meaning of the terms was discovered during the research. Specific problems may arise when translating the model into other languages. To solve this problem, it is necessary to carefully develop and describe the appropriate terminology. For example, the definition of the term " Mindfulness": "Mindfulness is the process of actively noticing new things", corresponding to the characteristics of the THM 2.0 was found by the author only in the Harvard Business Review [66]. Other definitions of this term are not proposed as consistent with the properties of THM 2.0. The new model has high complexity. This complexity requires modern information technologies such as Artificial Intelligence. At the same time, it is expected that the new model is capable of modeling much more complex phenomena, which is its advantage. Currently, the new model is a theory, requiring proof in practice. The scope of this paper does not allow us to discuss the considered subject in necessary detail. At the same time, several hypotheses were formulated that create a base for fruitful future research.

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Ethics

Following ethical principles is an essential requirement of modern research. THM 2.0 and this research does not relate to any dangerous, destructive or non-ethical practices. According to THM 2.0 current ethical principles are based on humanism inherent in THM 2.0 Intellectual Pattern and Industrial Era, but humanity is stepping into the Information Era and THM 2.0 Emotional Pattern where ethical principles should be based on neo-humanism.

Credit Authorship Contribution Statement

This research was carried out without third-party author's participation. Dmitriy Gakh solely contributed to all aspects of this research paper, including conceptualization, data collection, analysis, methodology, writing, and final approval of the manuscript. This statement underscores that the single author is responsible for the entirety of the research process, from conceptualization to the final draft.

Conflict of Interest Statement

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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