A Look to Model of Society and Teams Development based on Initial Formation, Primary, Adaptable, Information, and Creative Society Patterns

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Abstract: There are different Maturity, Motivation, and Development models. The models can be applied to the development of organizations, businesses, information technology infrastructure, human resources, and so on. This paper discusses society patterns that can be used in modeling society and team development. The model discussed has many advantages over existing ones. It assumes the Age of Creativity and the Creative Society Pattern as the upmost level of development. The patterns are juxtaposed with the 16 levels Simple Learning Motivation Hierarchy Model that allow modeling of dynamic processes with Expansion and Totality as the upmost levels. This approach eliminates the limitations of existing models and allows detailed modeling and planning. Explanation of the future development of humanity (up to the Age of Creativity) is one of the advantages of the model.

The paper contains the description of the main peculiarities of society patterns and creates a basis for practical implementation of the model for society and team development. Organizations and teams can benefit from this model through its implementation in consulting and coaching processes. The model can be used in regional/organizational development and investment planning.

Keywords: team development; society development; maturity models

1. Introduction

Issues of society development become more and more important in our informational age and tendency to globalize economy. These issues relate to different sides of human life, including technology and the so-called Smart City conception. Different development and maturity models were created to support the planning and realizing the development of organizations, businesses, and cities. This paper considers the following model types:

- Coaching (Whitmore's Performance Curve (Whitmore, 2017));
- Psychological (McWinney's 4 realities (McWhinney et al., 1997; McWhinney, 2007; Young, 2004; Ковалёв, 2018));
- Philosophical (Sarkar's quadri-dimension economy (Sarkar, 2020));
- Technological (Agrarian, Industrial, Information, Post-Information/Creativity ages);
- Economical (Experience economy (Pine II & Gilmore, 2020));
- Different Maturity Models (CMMI Product Team, 2010; Hillson, 1997; Lee et al., 2007; Luftman, 2001; Newman & Logan, 2008; Paulk, 2001);
- Simple Learning Motivation Hierarchy Model (Gakh, 2022a).

Five society patterns, i.e. Initial Formation Pattern (IFP), Primary Society Pattern (PSP), Adaptable Society Pattern (ASP), Information Society Pattern (ISP), and Creative Society Pattern (CSP) were identified to consider in modeling society development. CSP can be also called Post-Information Society Pattern (PISP). CSP is a better name for this pattern because reflects a key peculiarity of this pattern – creativity.

Juxtaposing the patterns considered with the considered development and maturity models, including the 16 SLMHM levels (Gakh, 2022a) (see Fig 1), allowed us to clarify and prove the patterns' peculiarities. Findings and conclusions are presented in the corresponding chapters.

This research showed that the different development and maturity models have similarities. Some of them are quite old and can be updated according to modern needs. The similarities are determined by the patterns considered. This paper includes also a discussion of issues relating to sustainable development and harmonization of interaction between society and the environment.

The patterns considered can be used in modeling development not only in society but in organizations, cultures, teams, and other groups. The scope of the model covers the development of Sustainable Information Society and Smart Cities (meaning of Smart City is not settled yet (Mosannenzadeh & Vettorato, 2014), investments, regional, social, economic development, environmental protection, and so on.

2. Literature, Theoretical Background and Research Questions

Whitmore advocated examining what an individual's process of psychological development can tell us about the direction in which companies, communities, and cultures are evolving, and the stages through which they will pass on the journey. He presented the performance curve based on four cultures: Impulsive, Dependent, Independent, and Interdependent (Whitmore, 2017).

McWhinney has created a psychological model of thinking according to 4 realities and their main peculiarities: Unitary (Policy), Sensory (Action), Social (Values), and Mythic (Vision) (McWhinney et al., 1997; McWhinney, 2007). The model was proven in practice (Young (Young, 2004) and Kovalyov (Ковалёв, 2018)). On the base of his realities, McWhinney has described several paths of change. Renaissance (Sensory -> Social -> Mythic -> Unitary) and revitalization (Unitary -> Mythic -> Social -> Sensory) are the archetypal main paths covering all four realities (McWhinney et al., 1997). Kovalyov supplemented three McClelland's motivating drivers and described four basic needs: Needs for Power, Needs for Achievement, Needs for Affiliation, Needs for Creativity (Ковалёв, 2018).

Sarkar describes the quadri-dimension economy as a part of Progressive Utilization Theory (PROUT). Four parts of the economy: General, Commercial, People's, and Psycho should be integrated and adjusted to ensure the maximum utilization and rational distribution of all resources, and to harmonize human progress with all creation (Sarkar, 2020).

Rabie describes human society development ages as the following: hunting and gathering age, agricultural age, industrial age, knowledge age (post-industrial age, the information age, the globalization age) (Rabie, 2013).

The three dimensions of sustainability include Economic (Profit), Social (People), and Environmental (Planet) components. Economic and Environmental components determine Eco-efficiency. Economic and Social components determine Equity. Social and Environmental components determine Liveability. All three components determine Sustainability (Sonnemann et al., 2015).

The sustainability value creation framework presented in (Harbi et al., 2015) contains the following components: Toolbox, Business implementation, Business benefits, Value drivers, and Business value.

The PDCA (Plan, Do, Check, and Act) cycle is one of the quality management tools that can be used by companies to implement life cycle management initiatives to improve their sustainability performance (Gemechu et al., 2015). The juxtaposition of SLMHM levels with the PDCA phases is discussed in (Gakh, 2022b). (Gakh, 2022a) contains the most detailed description of SLMHM in application to education development. Four components of the business value of sustainability, i.e. Risk, Cost, Sales, and Brand are discussed in (Baitz, 2015).

Experience economy considers four economic offerings: Commodities, Goods, Services, and Experiences. Many noteworthy indicators are given in (Pine II & Gilmore, 2020). The indicators selected for this discussion are presented in Table 1 juxtaposed with patterns considered.

Khalifa states that the post-information society is the 5th generation of the societies that humanity has known so far, that come after the previous four generations which are: the hunter-gatherer society, the agricultural society, the industrial society, and the information society. The post-information society is a society where information becomes a task in itself, a task carried out as soon as one thinks about it—the information and the machine on the one hand, and the human mind on the other hand become one thing (Khalifa, 2021).

Key characteristics of the post-information society according to Khalifa (Khalifa, 2021) are:

1. Greater chances for rapidly developing countries, no matter how small or poor these countries are;
2. Individuals will have more influence;
3. New types of competition to control individuals' personal information;
4. Better understanding of societal trends and individual priorities and preferences;
5. Difficulty controlling the smart machine environment that will result from technological development;
6. Cyborgs: half-human, half-machine creatures.

The application of SLMHM to education development is discussed in (Gakh, 2022a). Education development strategy is described as 16 levels of interaction between Students, Parents, Schools, Society, and the Environment. Complete elimination of problems in the interaction between these components can be taken as the goal of the model.

Ecological, economic, socio-cultural, and political components were proposed to be considered as ones of the Sustainable Information Society (Ziemba, 2017). Technological, economic, occupational, spatial, and cultural elements of the Information Society were selected (Webster, 2014).

Cities worldwide play a prime role in social and economic aspects and have a huge impact on the environment (Albino et al., 2015). Although the meaning of Smart City is not settled yet, there is an agreement on the significant role of ICTs in smart urban development (Mosannenzadeh & Vettorato, 2014). ICTs are an important tool for the transformation of industrial society into information and knowledge society. It is a networked society, emerging a new social morphology, and gaining economic, social, political, and cultural primacy. People live in a culture and a society that is constantly changing, either because the economic, social, political, and cultural contexts are increasingly massified, internationalized, and globalized, or because the relations of life, study, work, and capital are changing rapidly and constantly (Rascão & Poças, 2021).

There are also several mature models allowing to assess how "smart" the city is. The low level of maturity of the SC, the lack of sufficient and real-time data, and the lack of standardization in previous years hampered the development of such models. Citizens are considered "prosumers" of geo-tagged data and content affecting cities' everyday norms and interactions (Moustaka et al., 2020). The study shows that SC can be considered a socio-technical system. This statement is studied in detail in (Kopackova & Libalova, 2017).

SC Development Maturity Model, defined in (Waarts, 2016) consists of five levels: initial, repeated, defined, managed, and optimized, and is built based on six factors for which the maturity is determined on these five levels: strategic alignment, culture, people, governance, method, and information technology and information systems (IT/IS).

Software Capability Maturity Model (SW CMM) was developed by the Software Engineering Institute (SEI) at Carnegie Mellon University in 80th-90th in response to a request to provide the government with a method for assessing the capability of their

software contractors (Paulk, 2001). As ICTs have significantly grown since SW CMM introduction, ICTs are currently rapidly developing, the question "can SW CMM be considered as fully met to current needs or not?" is still open. It should be mentioned, that SW CMM was developed for organizations, but not for country-level projects (Pham, 2010; Pham et al., 2013). Since the introduction of the Capability Maturity Model, many maturity models were developed including Knowledge Management Maturity Model (KMMM) (Qodarsih et al., 2019).

There are ISO 37xxx standards relating to the establishment of SC operating models for sustainable communities (ISO, 2015). There are ranking SC models and experience in ranking cities (Aihemaiti & ZAİM, 2018; Giffinger et al., 2007). The SC Maturity and Benchmark Model have been designed to capture the key aspects of a city's transformation journey to become a smarter city. The model allows a city to quickly assess its strengths and weaknesses in five key dimension areas related to city smartness and to set clear goals as to how it wishes to transform over the next two to five years (TM Forum, 2022). Three maturity models which approached a city in a holistic way were discussed in (Shoukry, 2021; Torrinha & Machado, 2017). Main maturity model design patterns were identified. Typically, three application-specific purposes of the model used are distinguished: descriptive, prescriptive, and comparative (Poeppelbuss & Roeglinger, 2011). Different Maturity Models for Information Systems were studied. The number of levels in the considered models varies from 4 to 6 (Proençaa & Borbinha, 2016).

Information governance maturity levels presented in (Dong & Keshavjee, 2016) include Substandard, In development, Essential, Proactive, and Transformational. The six Capability Levels based on ISO 15504 (APMG International, 2012): Incomplete, Performed, Managed, Established, Predictable, Optimized. COBIT 4.1 Process Maturity Levels (APMG International, 2012): Non-existent, Initial/ad hoc, Repeatable but intuitive, Defined, Managed and measurable, and Optimized. The Institute of Asset Management Asset Management Maturity Scale (GFMAM, 2022): Innocent, Aware, Developing, Competent, Optimizing, Excellent. The 'Capability Maturity Model' (CMM – a software development maturity model) (GFMAM, 2022): Initial, Repeatable, Defined, Managed, Optimizing. The 'Portfolio, Programme and Project Management Maturity Model (P3M3) (GFMAM, 2022): Awareness, Repeatable, Defined, Managed, Optimized. The 'People Capability Maturity Model' (GFMAM, 2022): Initial, Managed, Defined, Predictable, Optimizing. The 'Testing Maturity Model' (GFMAM, 2022): Initial, Definition, Integration, Management, Optimisation.

Three categories of maturity dimensions in Enterprise Content Management are Human, Information, and Systems. Maturity Levels Defined by Key Characteristics of Enterprise Content Management are (Pelz-Sharpe et al., 2010): Unmanaged, Incipient, Formative, Operational, Pro-Active. Capability maturity levels for research data management (Qin et al., 2014): Initial, Managed, Defined, Quantitatively Managed, Optimizing. EIM Maturity Model: Unaware, Aware, Reactive, Proactive, Managed, Effective (Newman & Logan, 2008). Records Management Maturity Model: Absent, Aware, Defined, Embedded (JISC InfoNet, 2013). Records Management Maturity Model Grid consists of the following levels: Ad hoc, Managed, Standardized, Predictable, Optimized (JISC InfoNet, 2013).

Crosby's Quality Management Maturity Grid (Paulk, 2001): Uncertainty, Awakening, Enlightenment, Wisdom, Certainty. SW CMM levels are (Paulk, 2001): Initial, Repeatable, Defined, Managed, Optimizing. The model of Business-IT Alignment Maturity involves the following five levels of strategic alignment maturity (Luftman, 2001): Initial/Ad Hoc, Committed, Established Focused, Improved/Managed, and Optimized. The four capability levels, each a layer in the foundation for ongoing process improvement, are designated (CMMI Product Team, 2010): Incomplete, Performed, Managed, Defined. The five maturity levels, each a layer in the foundation for ongoing process improvement, are designated (CMMI Product Team, 2010): Initial, Managed, Defined, Quantitatively Managed, Optimizing. Business Process Maturity Model levels (Lee et al., 2007): Initial, Managed, Defined, Quantitatively Managed, Optimizing. The risk Maturity Model, presented in (Hillson, 1997) contains the following levels: Naïve, Novice, Normalized, and Natural.

Among the various approaches that support business process management (BPM), maturity models receive increasing attention. This is in line with the general popularity of maturity models across a wide range of application domain, the expected increase in adoption by industry, and the growing academic interest in such models. Based on the assumption of predictable patterns of organizational evolution and change, maturity models typically represent theories about how an organization's capabilities evolve in a stage-by-stage manner along an anticipated, desired, or logical path. Accordingly, they are also termed stages-of-growth models, stage models, or stage theories. Early examples of maturity models refer to a hierarchy of human needs, economic growth, and the progression of IT in organizations. Nolan's stage hypothesis, for instance, stimulated much research that resulted in conflicting findings as regards its empirical validity. The corresponding stage model, however, has been widely adopted and led to hundreds of models based on a staged sequence of levels. Only few maturity models follow other structural designs (Röglinger et al., 2012).

Extended Nolan Model (Boza et al., 2017) describes four eras: Data Processing Era, Information Technology Era, Network Era, and Smart Era as well as nine stages of development.

Maslow's Theory of Human Motivation (Maslow,1943; McLeod, 2020) is proven and effective in many cases across many disciplines, including business, management, marketing, parenting technology, education, and psychology(Denning, 2012; Rutledge, 2011). However, there is incompleteness observed in the model and its criticism (Denning, 2012; Enright, 2018; Geller, 1982; Rutledge, 2011). SLMHM was developed to avoid the disadvantages of Maslow's Theory (Gakh, 2022a) and was corrected to be compliant with the Plan-Do-Check-Act cycle that makes it applicable in management (Gakh, 2022b).

2.1. Research Questions

The core of this research is to study and describe the team and societal development model based on IFP, PSP, ASP, ISP, and CSP. The patterns are juxtaposed with the 16 SLMHM levels (Gakh, 2022a) that gives their better understanding.

Research questions are:

- **RQ 1.** What are the peculiarities of the patterns considered?
- **RQ 2.** What is the role of each pattern in the development model?
- **RQ 3.** How the patterns can be used to understand the dynamics of development?
- **RQ 4.** Can the patterns be used to model Smart City and Sustainable Information Society development?

2.2. Research Methodology

This research is based on descriptive and comparative designs (Walliman, 2011). The descriptive nature of the research is concluded in observations of existing models and patterns from psychology, business, economy, and Information and Communication Technologies (ICT). Different 3-5 component models and patterns were selected. The 16-level SLMHM model was also selected. All selected models and patterns were compared using analogy that represents the comparative design of this research.

According to the abstraction levels (Walliman, 2011), the research describes a theory. This paper presents the theory on the conceptual levels. It also attempts to describe indicators, confirming the conceptions. Some variables and values are presented to evaluate the percentage of patterns in society/team.

The patterns are juxtaposed with the elements of the models studied (see Table 1). Peculiarities of IFP, PSP, ASP, ISP, and CSP (see Table 2) are determined based on existing models presented in the literature.

The patterns considered are juxtaposed with the 16 SLMHM levels (Gakh, 2022a) (see Fig 1). Juxtaposing the patterns with elements of different models, including SLMHM

allowed us to clarify and prove their peculiarities. Findings and conclusions are presented in the corresponding chapters.

3. Findings

Table 1 contains elements of 3-5 component structures and models extracted from the literature examined. The elements are juxtaposed with the society patterns studied. IFP is not presented in Table 1 because it does not contribute to society or team development.

Table 1. Similarities between the society patterns and relevant conceptions.

Reference	PSP	ASP	ISP	CSP
The Performance Curve (Whitmore, 2017)	Impulsive	Dependent	Independent	Interdependent
William Schutz's Firo B theory (as interpreted by Whitmore) (Whitmore, 2017)	Inclusion	Assertion	Cooperation	Co-creation
SLMHM levels	1.1, 1.2, 1.3, 1.4	2.1, 2.2, 2.3, 2.4	3.1, 3.2, 3.3, 3.4	4.1, 4.2, 4.3, 4.4
Age	Agrarian	Industrial	Information	Age of Creativity* (Post-Information)
Age by Rabbie (Rabie, 2013)	Agricultural	Industrial	Knowledge	Globalization
PROUT quadry-economy (Sarkar, 2020)	General	Commercial	People's	Psycho
McWinney (McWhinney et al., 1997; McWhinney, 2007; Young, 2004)	Unitary	Sensory	Social	Mythic
Motivating drivers (Ковалёв, 2018)	Power	Achievement	Affiliation	Creativity
3 dimensions of sustainability (Sonnemann et al., 2015)	Organizational (Structure)*	Economic (Profit)	Social (People)	Environmental (Planet)
PDCA cycle (Gemechu et al., 2015)	Plan	Do	Check	Act
Areas of concern (Gemechu et al., 2015)	Stakeholders	Market/Commerce	Social Impact	Environmental Impact
Business values of sustainability (Baitz, 2015)	Risk	Cost	Sales	Brand
Experience economy (Pine II & Gilmore, 2020)	Commodity	Good	Service	Experience
4 Realms of experience (Pine II & Gilmore, 2020)	Education	Escapist	Esthetic	Entertainment
Economy (Pine II & Gilmore, 2020)	Agrarian	Industrial	Service	Experience
Economic function (Pine II & Gilmore, 2020)	Extract	Make	Deliver	Stage
Nature of offering (Pine II & Gilmore, 2020)	Fungible	Tangible	Intangible	Memorable
Key attribute (Pine II & Gilmore, 2020)	Natural	Standardized	Customized	Personal
Method of supply (Pine II & Gilmore, 2020)	Stored in bulk	Inventoried after production	Delivered on demand	Revealed over a duration
Seller (Pine II & Gilmore, 2020)	Trader	Manufacturer	Provider	Stager
Buyer (Pine II & Gilmore, 2020)	Market	User	Client	Guest
Factors of demand (Pine II & Gilmore, 2020)	Characteristics	Features	Benefits	Sensations
Economic Pyramid (Pine II & Gilmore, 2020)	Discover and extract commodities	Develop and make goods	Devise and deliver services	Depict and stage experiences / Determine and guide transformations
Progressions of economic value and Valuable Intelligence (Pine II & Gilmore, 2020)	Data	Information	Knowledge	Wisdom

New competitive landscape (Pine II & Gilmore, 2020)	Organization	Execution	Correction	Application
Information governance maturity levels (Dong & Keshavjee, 2016)	In development	Essential	Proactive	Transformational
Risk Maturity Model (Hillson, 1997)	Novice	Normalized	Natural	Total*
Extended Nolan Model (Boza et al., 2017)	Data Processing Era	Information Technology Era	Network Era	Smart Era

Notes:

* Added by the Author

Table 2 shows the peculiarities of the Society Patterns. The peculiarities were determined as the quintessence of peculiarities of corresponding relevant conceptions from Table 1.

Table 2. Peculiarities of the Society Patterns.

Peculiarity	IFP	PSP	ASP	ISP	CSP
Backbone	Chaos	Structure	Action	Evaluation	Integrity
Individuals	In the chaos	In the team	To the aim	To express	To create
Values	No common values. Individual values differ	Traditions, rules, law	Facts, logic, benefits	Feelings	Ideas, creativity
Function	Survival	Union	Adaptation	Connection	Integration
Goal	Survival	Structural stability	Sustainability	Sustainable development	Prosperity
Organiza-tion	Chaotic	Hierarchy / nodes in priority	Hierarchy / connections in priority	Network / connections in priority	Network / nodes in priority
Control	Ad hoc	Command	Reactive	Proactive	Self
Technology	Manual tools	Harvesting/mining machines	Production machines	Smart tools	Artificial Intelligence
ICT	Entertainment	Structure	Logic	Connectivity	Artificial Intelligence
City	Separated households	Conventional	Industrial, Commercial	Smart	Creative
Economy	Informal	Agriculture, gathering, mining	Industry, manufacturing	Service	Hi-Tech
Science	Observation	Experiment	Analysis	Synthesis	Hypothesis
Knowledge	acquired from personal experience.	Few have knowledge. Knowledge is hidden from the majority.	Knowledge is available to those who prove that they can master it.	Knowledge is in the public domain.	Knowledge is in the global generation/circulation.
Thinking	Survival	Will	Intelligence	Emotions	Wisdom
Motivation	Survival	Authority	Carrot and stick	Inspiration	Curiosity
Motivating drivers	Survival	Power	Achievement	Affiliation	Creativity
Environ-ment	Considered as threatening	Considered as a infinite source of materials and energy	Considered as a finite source of materials and energy	Considered as an important one, but separated from society/teams	Harmonized and integrated with society/teams
Risk Mana-gement	Ad hoc approach to deal with uncertainty	Performed through a small number of nominated individuals	Routine business process	Proactive to known risks	Proactive to unknown risks

3.1. Society Patterns and SLMHM Levels

Society Patterns can be juxtaposed with the SLMHM levels (Gakh, 2022a; 2022b) as Fig 1 shows. IFP does not relate to a SLMHM level because it presents an initial, chaotic pattern. The main findings can be expressed as stated below.

3.1.1. Initial Formation Pattern

IFP presents preliminary style of living where people do not union. People live by themselves or separately by small groups. This is the pattern of chaos and survival. This is the pattern does not correspond to any of the SLMHM levels. The main obstacle at IFP is characterized by a high possibility of philosophical/religious control (Read Write Think, 2010). This possibility takes place due to absence of constructive reasons to unite and co-operate. Next pattern solves this problem. It should be mentioned that IFP is not considered in some cases (Table 1, for example, does not include IFP).

3.1.2. Primary Society Pattern

PSP presents a style of living where people union to solve problems together. PSP presents the first four SLMHM levels:

- **Level 1.1. Desire**. People want to interact and be united. Grouping people and forming a society is dictated by the need for joint problem-solving. Communication is required to unite and interact with people in a group. So, if one speaks about ICT, there is a demand for ICT appears. Technologies: marketing, advertising, propaganda.

- **Level 1.2. Intention**. People start realizing their desire to form a society. If Level 1.1 corresponds to a thought or an idea, Level 1.2 can be expressed in planning actions and having a vision for fulfilling the desire. Active search for ways to fulfill the demand in ICTs takes place. Technologies: motivating, planning, design.

- **Level 1.3. Feasibility**. People look for abilities to form a society that takes communication abilities. Examples of communication and information related to traditions, rituals, laws, formal processes, and so on. Technologies: data collection, data structures, text/image/media collection, hardware, network infrastructure (data transfer).

- **Level 1.4. Action**. Primitive society is initiated. Communication is mainly represented by command flows. Information is represented by short messages. Technologies: data processing, data manipulations.

The main aim of PSP is the formation of social structure by unifying individuals with command flow linkages. Trade, flows of commodities, goods, and so on also take place. The main obstacle to development at PSP is characterized by a high level of bureaucracy (Read Write Think, 2010). A high level of bureaucracy assumes the absence of proper evaluation and does not allow to move to the next level. The next pattern solves this problem.

3.1.3. Adaptable Society Pattern

ASP presents a style of living where people try to solve problems in a way to adapt to internal and external threats. ASP presents the second four SLMHM levels:

- **Level 2.1. Evaluation**. Society wants to assess the benefit and cost of its processes. ICT solutions include methods of evaluation and are integrated with mathematics and other sciences. Technologies: data analyses, mathematical statistics.

- **Level 2.2. Improvement**. Society processes are continuously improved. ICT includes a collection of knowledge because it is required for improvement. The conception of time, iterations, change management, and quality assurance appears. Technologies: quality management, quality assurance, optimization.

- **Level 2.3. Alternatives**. Improvement requires new versions of tools and processes to be compared to the old ones. The more alternatives occur, the better the improvement is. Society may be characterized by democracy and competitive economics.

Technologies: version control, organizational arrangements, knowledge management.

- **Level 2.4. Innovations**. There are improvements representing processes or outcomes that make society adaptable. Speaking briefly the improvements allow quick reaction to the known problems. Changing and unknown nature of the surrounding world is compensated by the novelty of innovations. Technologies: agile methodologies, automatic systems.

The main aim of ASP is continuing improvement of the economy and other sectors of society and adaptation to changes based on facts, benefits, logic, and analytics. Efficiency improvement and quality management appear here. The main obstacle to development at ASP is characterized by a high degree of corporate control (Read Write Think, 2010). Evaluation and improvement can be sharpened to assess and optimize certain parameters while other parameters may be sacrificed. An example is an increase in labor productivity at the expense of health. The next pattern solves this problem.

3.1.4. Information Society Pattern

ISP presents a style of living where people are connected to share their feelings forming some kind of collective intelligence. ISP presents the third four SLMHM levels:

- **Level 3.1. Reward**. Innovations are implemented in practice and their benefit and harm are measured. For harm, it is worth taking such an action in which any resource is depleted (Gakh, 2022a). Governmental control is required to implement objective measurement of benefit and harm (benefits tempt businesses to implement innovations without carefully examining possible harms). ICT solutions include means of implementation and operation assessment. Technologies: open data/software/hardware/..., SWOT, E-Government, M-Government.
- **Level 3.2. Optimization**. There are processes making greater rewards and lower harm from innovation. Governmental incentives require optimizing the innovations. ICT solutions include means of optimization and customization. Technologies: strategic management, optimization algorithms/technologies.
- **Level 3.3. Synergy**. All contradictions and harm between all components are eliminated. The level also requires synergy between all parties: the government, private sector, business, and so on. Integration in ICT solutions with outward things is completed. Technologies: networks, connectivity, social media (connectivity functionality), distributed ICT architectures, simulation.
- **Level 3.4. Extraordinary**. Synergy leads to the appearance of innovations (named here as extraordinary) allowing eliminating any problem with a proactive approach. At this level, strong sustainable development of the society is achieved. Technologies: prediction, forecasting, proactive technologies, Proactive Information Delivery (PID).

The main aim of ISP is connectivity, distributed applications, and remote services (Service Oriented Architecture for example). Satisfaction of members of society, their feelings, and values are key characteristics of ISP. Due to individual personality traits, the question is wider and differs by quality than increasing efficiency and benefits which is characteristic of ASP. The main development obstacle at ISP is characterized by a high degree of technological control (Read Write Think, 2010). Optimization and synergy are provided to a high extent by technologies. This leads to dependence on technologies. The next pattern solves this problem.

3.1.5. Creative Society Pattern

CSP presents a style of living where people can share their ideas and realize their creativity. CSP presents the fourth four SLMHM levels:

- **Level 4.1. Information**. The synergy between all components of the system and the strong sustainable development of the society is achieved. Any new component or

interaction can be added to the system by means where information is a priority. Hypotheses appear, develop into theories, and then, if proven, are introduced into practice. New information, information types, and structures continuously appear. Technologies: data mining, artificial intelligence, machine intuition, social media (generation of information), prosuming.

- **Level 4.2. Streamlining**. In order to be useful information must be processed and checked for applicability to the system. High volumes of information require streamlining optimization including data structures and processing algorithms. Technologies: hardware-implemented algorithms, data stream optimization algorithms.

- **Level 4.3. Expansion**. Streamlined information flows leads to expansion beyond existing knowledge. Integration of all system components, i.e. (society components, hardware, software, etc. is maximally integrated. Technologies: machine creativity (examples of AI-generated art are presented in (AIArtists, 2022; MIT, 2022) and can be considered as machine creativity).

- **Level 4.4. Totality**. Expansion leads to maximal extension and total coverage of all possible components and their interactions. This is an abstract level that cannot be clearly described because continuous expansion goes beyond knowledge. This level is most unlikely to be achieved. It is also possible to develop derivative theory where this level will be achievable. Such a situation is possible for closed limited systems only.

The main aim of CSP is individual creativity and ideas. Previous patterns create ground abilities to support CSP and the appearance and implementation of the ideas.
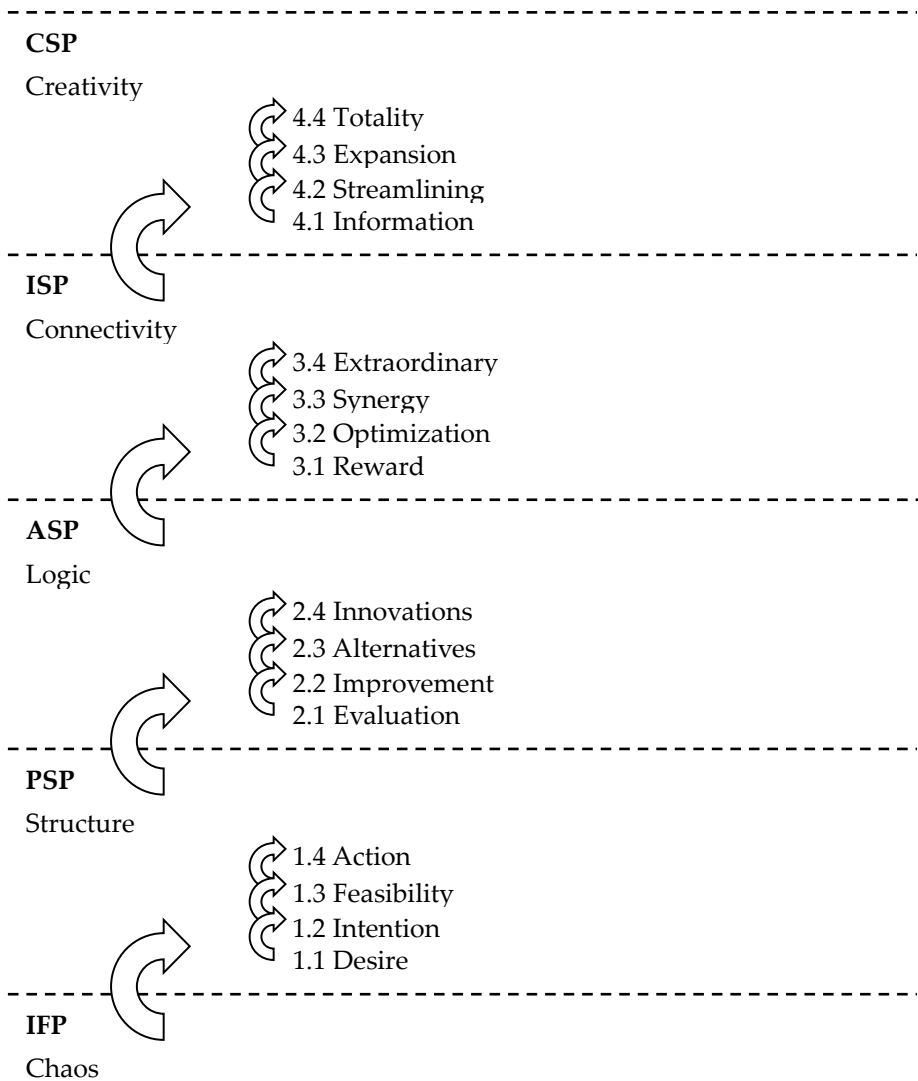
Figure 1. Society Patterns and SLMHM Levels.

4. Discussion of Findings

Whitmore shows that an individual's process of psychological development can tell about the direction in which companies, communities, and cultures are evolving, and the stages through which they will pass on the journey (Whitmore, 2017). These statements and similarities presented in Table 1 prove the following assumptions:

- Companies, communities, and cultures reflect the psychological development of their members;
- Personal psychological state, as well as group psychological state, can be described, for example, in terms of 4 McWhinney's realities;
- Four Whitmore's cultures are analogous to four McWhinney's realities.

One can say that Whitmore's Impulsive culture relates to both IFP and PSP patterns. Impulsive nature inherent in open-loop systems, that is, systems where there is no feedback and improvement. According to the SLMHM feedback and improvement relate to levels 2.1 and 2.2, i.e. to the ASP. Taking into account that IFP is characterized by pure individualism, it is better to say that the culture of IFP is Chaotic. The hierarchy and benefit-oriented nature of ASP allows us to equate it to Whitmore's Dependent culture. Individual goals of ISP allow to equate it to Whitmore's Independent culture. CSP is

characterized by developed connectivity. Thus it can be equated to Whitmore's Independent culture.

Whitmore adopted Schutz's Firo B stages of team development: Inclusion, Assertion, Cooperation, and Co-creation (added by Whitmore). The first stage is called inclusion, since it is here that people determine if they are, and if they feel they are, a team member (Whitmore, 2017). It relates to PSP. Schutz described the Assertion stage as the need for control (Whitmore, 2017). Control means a pursuit of an aim or benefit. So, it can be juxtaposed with the ASP. Cooperation contains a communication component and supposes a share of members' feelings (Whitmore, 2017). It can be juxtaposed with the ISP. Co-creation stage supposes the team to take responsibility for the development process and to self-adjust (Whitmore, 2017). It is the stage of ideas and creativity and it relates to CSP.

McWhinney's Unitary reality corresponds to PSP, Sensory to ASP, Social to ISP, and Mythic to CSP. This concordance is very close. One can say that IFP does not correspond to any McWhinney's reality because of its chaotic nature.

Sarkar's four parts of the economy (Sarkar, 2020) can be directly juxtaposed to the patterns considered: General=PSP, Commercial=ASP, People's=ISP, and Psycho=CSP. Sarkar considers these economics to exist at the same time and adjusted. One can say that all patterns considered exist in society at the same time but in different proportions. IFP does not relate to Sarkar's parts of the economy because it corresponds to the informal economy.

Rabie's hunting and gathering age can be juxtaposed to the IFP, agricultural age to PSP, industrial age to ASP, and knowledge age to ISP. But his globalization age most likely relates to CSP. Indeed, hunting and gathering can be performed individually or by small groups (IFP), successful agriculture require more union and met specific rules (PSP), and industry has made it possible to cover many physiological needs through the production of useful goods (ASP), knowledge becomes more accessible due to development of connectivity (ISP), globalization is a peculiarity of CSP.

The three dimensions of sustainability (Sonnemann et al., 2015) directly relate to three patterns in consideration (Economic=ASP, Social=ISP, and Environmental=CSP). In addition to these three dimensions, one more should be added. Organizational (Structure) relating to PSP creates this model complete (it could be named "The four dimensions of sustainability"). At the same time, one can say that PSP or organizational component is already built-in all three components. SLMHM proves this vision because sustainability can be achieved only at level 2.4, Innovations. SLMHM level 2.4 relates to ASP, or to the Economic component. So, sustainability requires an Economic component as a minimum and cannot be achieved at PSP. Thus the 4th component can be not mentioned. IFP represents a pattern that is out of all other patterns because it does not contribute to sustainability and even hinders it.

Components of the sustainability value creation framework presented in (Harbi et al., 2015) can be mapped to the patterns considered as follows: Toolbox = PSP, Business implementation and Business benefits = ASP, Value drivers, and Business value = ISP. The result of the framework, i.e. "Sustainable value creation" can be mapped to the CSP. IFP here does not also consider a sustainable contributing pattern.

Phases of the PDCA cycle presented in (Gemechu et al., 2015) can be directly mapped to the patterns considered as follows: Plan=PSP, Do=ASP, Check=ISP, Act=CSP. In this context, the aim of the PDCA cycle is the achievement of sustainability. It is because phase Do relates to ASP. The juxtaposition of SLMHM levels with the PDCA phases that are discussed in (Gakh, 2022b) together with the juxtaposition of SLMHM levels with the patterns considered proves the possibility of mapping of the patterns considered to the PDCA cycle.

Areas of concern, presented in (Gemechu et al., 2015) can also be mapped to the patterns considered as follows: Stakeholders=PSP, Market/Commercy=ASP, Social Impact=ISP, Environmental Impact=CSP.

Four components of the business value of sustainability that are discussed in (Baitz, 2015) can be mapped to the patterns considered as follows: Risk=PSP, Cost=ASP,

Sales=ISP, and Brand=CSP. Regulatory management that is a subcomponent of Risk correlates with the PSP rules. Efficiency and productivity of the Cost component correlate with the ASP benefits. Sales can be intuitively mapped to the ISP. Brand can be intuitively mapped to the CSP.

Indicators of experience economy taken from (Pine II & Gilmore, 2020) and presented Table 1 can relate to the patterns considered (see Table 2) in the way described below (relationships are represented in full or in part):

- **Experience economy: Commodity, Good, Service, Experience**. Commodity relates to agriculture, gathering, and mining. Good relates to industry, manufacturing. Hi-Tech is used to deal with deep and wide experience of society/teams. Hi-Tech is also a result of an experience in technical progress;

- **4 Realms of experience: Education, Escapist, Esthetic, Entertainment**. Because there is no knowledge in IFP, one can say that Education appears in PSP. Escapist can be understood as a type trying to escape from PSP and looking for benefits. Esthetic relates to feelings. Entertainment relates to ideas and creativity. These relations are not obvious and should be studied deeper that is out of the scope of this paper;

- **Economy: Agrarian, Industrial, Service, Experience**. It directly matches the Economy peculiarity of patterns considered (see Table 2). Hi-Tech is used to deal with deep and wide experience of society/teams. Hi-Tech is also a result of an experience in technical progress;

- **Economic function: Extract, Make, Deliver, Stage**. It directly matches the Economy peculiarity of patterns considered (see Table 2). A statement that "Work Is Theatre & Every Business a Stage" (Pine II & Gilmore, 2020) shows that creativity is an element of Stage function;

- **Nature of offering: Fungible, Tangible, Intangible, Memorable**. Because organization and structure are elements of PSP and benefit is not, one can say that Fungible relates to PSP. This relation requires more research. Tangible relates to industry and production, thus it relates to ASP also. Intangible relates to feelings, thus it relates to ISP. Memorable relates to creativity (art), thus it relates to CSP;

- **Key attributes: Natural, Standardized, Customized, Personal**. The attributes intuitively correlate to the patterns considered. Natural relates to Economy peculiarity, thus it relates to PSP. Standardized relates to optimization, thus it relates to ASP (one can say that Standardized relates to traditions, rules, and law, thus it relates to PSP, so, it is a reason to deeper study). Customized directly relates to people's feelings, so it relates to ISP. Personal relates to the ability to realize personal ideas and creativity, so it relates to CSP;

- **Method of supply: Stored in bulk, Inventoried after production, Delivered on demand, Revealed over a duration**. It directly matches the Economy peculiarity of patterns considered (see Table 2). Raw materials relate to storage in bulk. Industry and manufacturing require inventorying. Service is delivered on demand. Revealed over a duration can relate to Hi-Tech;

- **Seller: Trader, Manufacturer, Provider, Stager**. It directly matches the Economy peculiarity of patterns considered (see Table 2 and the Economic function in above). Raw materials require a trade. Manufacture relates to ASP. Provider provides service. A statement that "Work Is Theatre & Every Business a Stage" (Pine II & Gilmore, 2020) shows that creativity is an element of Stage function;

- **Buyer: Market, User, Client, Guest**. The Economy component shows that the market is a buyer of raw materials and agricultural production. Users buy industrial/manufacturing production for use. The client is a buyer of a service. High Tech supposes the minimal dependence of the buyer on the seller, thus the buyer can be considered as a guest;

- **Factors of demand: Characteristics, Features, Benefits, Sensations**. Characteristics are inherent in raw materials and agricultural production. Functions are laid during the production of goods. Benefits are valuable and relate to feelings in ISP. Sensations relate to CSP because it is the result of ideas and creativity;

- Economic Pyramid: Discover and extract commodities, Develop and make goods, Devise and deliver services, Depict and stage experiences / Determine and guide transformations. It is similar to the Economic function (see above);

- **Progressions of economic value and Valuable Intelligence: Data, Information, Knowledge, Wisdom**. These four conceptions are shifted relating to Commodity, Good, Service, and Experience components. In this context one can say that Data is a result of PSP, Information is a result of ASP, Knowledge is a result of ISP, and Wisdom is a result of CSP. And Noise that is not included in Table 1 is a result of IFP;

- **New competitive landscape: Organization, Execution, Correction, Application**. It relates to the PDCA cycle (see Table 1). Organization=Plan, Execution=Do, Correction=Check, Application=Act. It relates to the Backbone (see Table 2). Organization=Structure, Execution=Action, Correction=Evaluation, Application=Integrity.

Positionally information governance maturity levels presented in (Dong & Keshavjee, 2016) can relate to the social patterns as the following: Substandard=IFP, In development=PSP, Essential=ASP, Proactive=ISP, and Transformational=CSP. Research of all 8 principles (Accountability, Transparency, Integrity, Protection, Compliance, Availability, Retention, Disposition) according to these levels is interesting, but outs of the scope of this research.

In Crosby's Quality Management Maturity Grid (Paulk, 2001) Uncertainty is most related to IFP, Awakening to PSP, Enlightenment to ASP, Wisdom to ISP (but it could relate to CSP, - deeper research need), and Certainty to CSP.

SW CMM levels and their conformity to the patterns considered can be as follows (Paulk, 2001): Initial = IFP (the software process is characterized as ad hoc, and occasionally even chaotic), Repeatable = PSP (basic project management processes are established to track cost, schedule, and functionality), Defined = ASP (the software process for both management and engineering activities is documented, standardized, and integrated into a set of standard software processes for the organization), Managed = ISP (detailed measures of the software process and product quality are collected. Both the software process and products are quantitatively understood and controlled), Optimizing = CSP (continuous process improvement is enabled by feedback from the process and from piloting innovative ideas and technologies). This correspondence is rather conditional and requires a more detailed study. Transitions from one level to another should also match SLMHM levels.

EIM Maturity Model: Unaware, Aware, Reactive, Proactive, Managed, Effective (Newman & Logan, 2008). Unaware most likely relates to IFP, Aware, and Reactive to PSP. Proactive, Managed, and Effective most likely relates to ASP.

The levels of strategic alignment maturity in model of Business-IT Alignment Maturity (Luftman, 2001) and patterns considered look like: Initial/Ad Hoc = IFP, Committed = PSP, Established Focused = ASP, Improved/Managed = ISP, Optimized = CSP.

The four capability levels, each a layer in the foundation for ongoing process improvement (CMMI Product Team, 2010), look like Incomplete=PSP, Performed=ASP, Managed=ISP, and Defined=CSP.

The five maturity levels, each a layer in the foundation for ongoing process improvement (CMMI Product Team, 2010), look like Initial=ISP, Managed=PSP, Defined=ASP, Quantitatively Managed=ISP (Quantitative objectives are based on the needs of the customer, end users, organization, and process implementers), Optimizing=CSP (Maturity level 5 focuses on continually improving process performance through an incremental and innovative process and technological improvements).

Business Process Maturity Model levels (Lee et al., 2007) look like Initial=ISP, Managed=PSP, Defined=ASP, Quantitatively Managed=ISP (Quantitative objectives are based

on the needs of the customer, end users, organization, and process implementers), Optimizing.

In general, the names of levels in Maturity Models considered can be described as follows:

- **Initial, Ad hoc** relates to IFP. But sometimes it should relate to PSP;
- **Repeatable** relates to PSP. But according to SLMHM Repeatable includes the satisfaction of level 2.2, i.e. relates to ASP;
- **Defined** relates to ASP. But according to the description, it should relate to PSP;
- **Optimizing** relates to CSP. But according to SLMHM Optimizing includes the satisfaction of level 3.2, i.e. relates to ISP. It is the maximal level, because does not satisfy SLMHM level 3.3, Synergy.

The study of Maturity Models in Business Process Management presented in (Röglinger et al., 2012) shows the Lowest and Upmost Maturity Levels for different models. The Upmost Levels are the most interested because determine the Upmost limitation for the models. CSP, relating to 4.x SLMHM levels (Information, Streamlining, Expansion, and Totality) does not introduce the Upmost limitation.

One can say that the most of Maturity Models relate to IFP, PSP, and ASP, and can partially relate to ISP. So, they do not relate to CSP. Names of levels or phases of different models and systems do not always say their relationship to one of the patterns considered. For example, the Wisdom components of Crosby's Quality Management Maturity Grid (Paulk, 2001) relate to ISP, but not to CSP according to the Table 2. The Deming chain reaction (Paulk, 2001) is oriented to profit and staying in business. It means that the Deming chain reaction relates to ASP.

As a result, one can say that Maturity Models have poor compliance with the patterns considered and the SLMHM levels. Such poor compliance can be explained by the fact that the maturity models were designed in the industrial age (ASP) when the informational age (ISP) had just begun.

The risk Maturity Model, presented in (Hillson, 1997) contains the following levels: Naïve, Novice, Normalized, and Natural. Intuitively the levels relate to the social patterns in the following way: Naïve=IFP, Novice=PSP, Normalized=ASP, Natural=ISP. For the CSP new risk management maturity level should be introduced. This level should reflect total risk management and be named Total. The risk Management peculiarity presented in Table 2 allows us to better understand the accordance of Risk Management to social patterns.

Four eras of the Extended Nolan Model (Boza et al., 2017) are in good correspondence with the components of other models (Table 1). But nine corresponding stages of development do not show a good coherence with the SLMHM levels. Detailed research of this inconsistency is out of the scope of this research.

17 UN sustainable development goals (United Nations, 2022) can be achieved by the harmonization of society and the environment (harmonization of interactions between students, parents, school, society, and the environment was discussed in (Gakh, 2022a)). ICTs provide valuable tools for such harmonization allowing intensive information processing and control.

A society that does not move to a qualitatively new level in its development can fall into a dystopia. Although the types of dystopias given in (Read Write Think, 2010) refer to literature and cinema, they fit perfectly with the patterns under consideration. People who fit the IFP pattern can fall under philosophical/religious control. People who fit the PSP pattern can fall under bureaucracy control. People who fit the ASP pattern can fall under corporate control. And finally, people who fit the ISP pattern can fall under technological control.

Part of the IFP in society can be assessed through a percentage of the informal economy and unemployment rate. So, the contribution of the informal sector, excluding agriculture, to GDP in developing countries is about 16.3% (Venezuela, 2006) up to 61.8%

(Benin, 2000; United Nations, 2016). The study presented in (Brown & McGranahan, 2016) shows higher figures for informal non-agricultural employment – from 46.2% (Hanoi) up to 83.1% (Lomé). One can say that exclusion of the agricultural sector from considering informal employment reflects the fact that the agricultural sector relates to the agricultural age according to Rabie (Rabie, 2013), i.e. to the primary society. Although society cannot get rid of IFP members, teams and organizations do it. Indeed, a team or organization does not include members who do not benefit.

Part of the PSP in society can be assessed through a percentage of officials. In teams and organizations, it can be assessed through a percentage of supporting staff and hours spent on organization issues. Part of the ISP in society, teams, and organizations can be assessed through connectivity, public events, social support, and so on. Part of the CSP in society, teams, and organizations can be assessed through the ability of their members to realize their ideas and creativity.

4.1. Dynamics and Roles of the Society Patterns

The history of the development of mankind contains numerous evidence of the flourishing of the culture of creativity. Antiquity and the Renaissance are examples. This suggests that the CSP at that time was a significant part of society. No one can say that the CSP depends on modern technologies and can only apply to our time. In other words, patterns in society are in a dynamic state and their share is constantly changing. It makes sense to talk about the development of technology in the context of the development of society according to the patterns under consideration. So it makes sense to consider with the help of patterns the development of ICT.

Development of society/team includes sequential development of components corresponding to patterns considered. The development of components corresponding to a specific pattern gives the ability to develop the next components corresponding to the next pattern. Now ISP develops and gives the ability to develop CSP. We can observe the growth of the ability of individuals and teams to express and realize their ideas and creativity. At the same time, ISP grows through pre-developed PSP and ASP. Additionally, members of IFP are taken under sufficient control in order not to interfere with the development.

Each pattern considered contributes to society (see Goal in Table 2): PSP = Structural stability; ASP = Sustainability; ISP = Sustainable development; CSP = Prosperity. The contribution is presented in a quantitative way (gross domestic product, salary, days free, and so on) and in a qualitative way (positive feelings, emotions, and so on). Whitmore shows a continuous increase in performance during development from the Impulsive phase (PSP) to the Interdependent one (CSP) (see Table 1) (Whitmore, 2017). Extended Nolan Model shows a continuous increase in Organization Learning during development from Data Processing Era (PSP) to Smart Era (CSP)(see Table 1)(Boza et al., 2017). Summary growth of benefit during development from PSP to CSP can be presented as Fig 2 shows. Because the benefit is complex, it should be studied for each specific case.
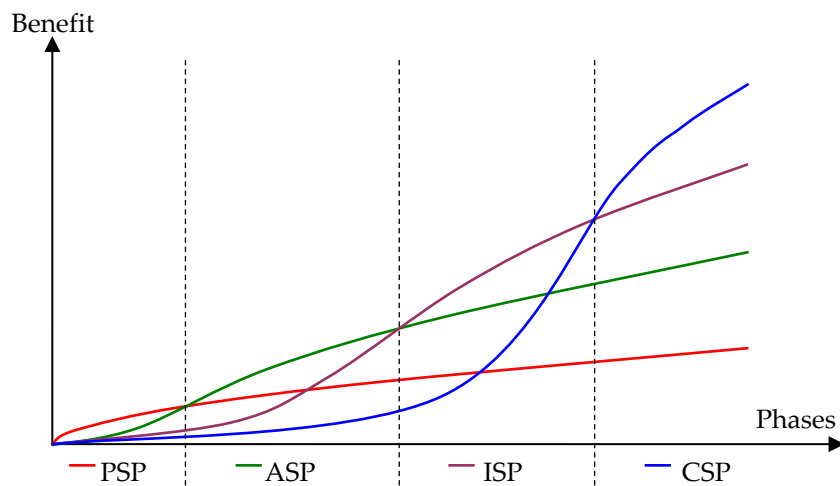
Figure 2. Cumulative benefit during society/team development.

5. Conclusion

All Research Questions are answered. Peculiarities of the patterns considered are discussed in this paper and presented in Table 2. Roles of the patterns considered are also presented in this paper. Peculiarities of the Society Patterns presented in Table 2 and description of them in this paper give an idea of roles of the patterns and the dynamics of development. Table 2 shows peculiarities giving picture about role of the patterns discussed in development of cities (City and others) and society (Goals and others).

Adaptation to the changes is characteristic of ASP. Adaptation leads to sustainability and the appearance of a Sustainable Society. ICT and connectivity, which are characteristics of ISP, lead to the emergence of the so-called Sustainable Information Society. At the same time developed IST allows speaking about sustainable development.

Correspondence of the development of Society Patterns and Cities shows that Smart City relates to developed ISP. The fact that the meaning of Smart City is not settled yet is evidence that society in our days is in developing ISP. At the same time Separated households (IFP), Conventional cities/areas (PSP), and Industrial/Commercial cities/areas (ASP) continue to exist. And, CSP is also developing on the base of developing ISP, which means that the most developed city is Creative City.

IFP does not contribute to sustainability in society and teams. This pattern even introduces chaotic behavior and can harm sustainability. Society tries to include IFP members in other patterns and reduce its fraction. Teams try to exclude IFP members to achieve better sustainability.

CSP, relating to 4.x SLMHM levels (Information, Streamlining, Expansion, and Totality) does not introduce the Upmost limitation. One can say that problems with existing Maturity Models relate to their relations to IFP, PSP, and ASP only, excluding CSP.

One of the major modern problems, Climate Change, can be considered through the interactions between society and the environment. From pattern to pattern these interactions become closer and closer. CSP assumes complete integration and harmonization of the interactions between society and the environment. ICT plays a significant role in the integration and harmonization allowing intensive information processing and control.

Pattern fractions in society can be determined as the following:

- IFP through a percentage of the informal economy and unemployment rate;
- PSP through political and structural stability of society;
- ASP through the satisfaction of basic physiological needs. In economy it can be assessed through Gross Domestic Product (GDP);

- ISP through the ability of society members to feel good, express their filings, and get feedback;
- CSP through the ability of society members to realize their creativity.

Pattern fractions in the teams can be determined as the following:
- IFP through a percentage of members with zero KPI;
- PSP through the stability of the team structure and subordination;
- ASP through the satisfaction of the team members by salary and other compensations;
- ISP through the ability of team members to feel good, express their filings, and get feedback;
- CSP through the ability of team members to realize their creativity.

5.1. Disadvantages

The major disadvantage of this research is concluded in fact that the patterns considered form a theory and did not proven practically. Weak correlation with the elements of some existing models requires more detailed research. At the same time scope of this research does not allow to do it.

The complexity of the SLMHM (Gakh, 2022a) could be also considered a disadvantage. But this complexity allows us to model complex cases. Additionally ICT can be used in the model implementation that makes the complexity problem solved.

5.2. Future Research

The main direction of future research is study of small teams and organizations and their development according to the patterns considered and the 16 SLMHM levels. Such studies can be performed within consulting services and business coaching sessions. Whitmore's work is close to this direction and can help at the first steps (Whitmore, 2017).

Another important research related to understanding the future where humanity is going to. Optimistic scenario shows that society is going to the Age of Creativity (CSP). But two pessimistic scenarios exist. The first is going to the dystopia with the technological control. The second is degradation to ASP, or earlier with their risks.

Investment projects are ones of specific interest. Determination of actual proportions of the patterns considered give a valuable information about results of implementation of specific technologies. The study of the reasons hindering the development of a particular pattern is of great practical importance. It should be borne in mind that the development of a certain pattern requires the development of previous patterns. IFP stands apart because it does not refer to a society or a group. At the same time, members of IFP must be motivated to transit into the PSP.

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