BLOCKCHAIN, SMART CONTRACT, AND GLOBAL DIGITAL TRANSFORMATION

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ABSTRACT

Global digital transformation (GDT) is a challenging goal with two paths. The first is about future profit and benefits, and the second is about the know-how gained via working on a task with vast integrity. The second direction creates the content of understanding of present digitalization in organizations and projects. Opens space for initiatives, e.g., for a new project paradigm that explains the definition of the United Economy for the GDT development operations. The author uses his work on the SPC Concept development, its operational units (SPC Utility), and rules of limits of the scope of the projects (SPC Drivers) to test the ideas of the target group and final beneficiaries. The author of this article mentions new initiatives and is interested in the expert's formation (a new guild) for Blockchain and Smart contact technologies, which is meeting at its second international conference.

KEYWORDS

Philosophy, Business, Scaling, Blockchain and Smart Contract, and New Project Paradigm

Text poslední odstavec

1. INTRODUCTION

The article touches on the ideas of how to deal with the problems of the current world (wars, pandemics, climate change), people (money, capital, health, education), nature (existence and diversity of life), landscape (food, drinking water, energy, security) and seas (in other words, the human-generated waste terminals). It tells if we already have 21st-century technology and experience from previous millennia on the table, it is appropriate to see these problems as one package and start solving them.
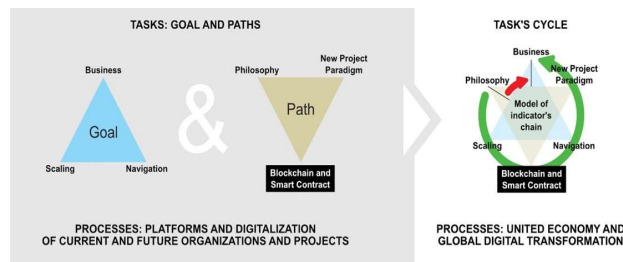

Figure 1. Content and purpose of this article

How to proceed is indicated in Figure 1. Philosophy (in the sense of influencing politics) and trade development (primarily a free market without sanctions) need new impulses. The straight path (red arrow) is the path of corruption and destruction of nature's values. A green path is offered. It's about mastering the scaling of the processes we deal with. The article is about the support of Blockchain and Smart Contract technologies and navigation to obtain a new project paradigm.
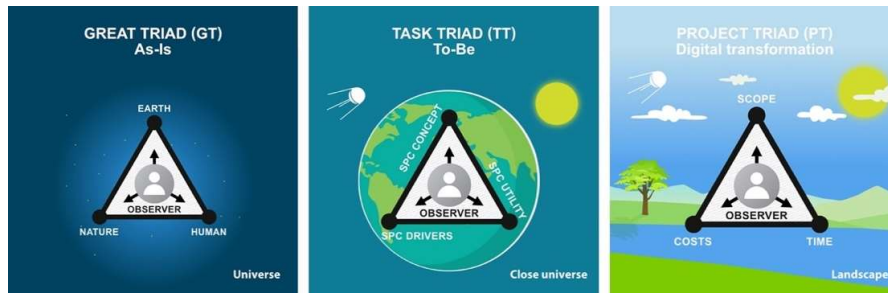

Figure 2. Hierarchy of the environment of the Global Digital Transformation (GDT)

Therefore, the article is addressed to the Second International Conference on Cryptography and Blockchain, October 2022, Sydney, Australia. at the end of the article, the author turns to the newly established professional community on how Blockchain and Smart Contract development is worth today and whether it is compatible with the idea of starting to work on a new complex task called "Global Digital Transformation, GDT ". The author of the article has prepared it as a set of information (dominantly in a graphic way) for the reader so that his intention is understandable.

2. FRAMEWORK OF PROJECTS AND ORGANIZATIONS IN BUSINESS

The article respects that everything a person has done leaves a mark on himself, Nature, and Earth. He/she does it through organizations, and everything new they prepare for organizations, they do through projects. The article discusses organizations such as Micro, Small, and Medium Enterprises (MSME) concerning production, services, bankruptcy, or lockdown situations. The projects are presented as one package for three development circles. These are Social and Economic Development (SED), Disaster Risk Reduction (DRR), and Humanitarian Aids (HA) projects. The everyday glue of projects in one package is the basic principles of project management and the core of the project's algorithms. Figure 3 distinguishes the structure of organizations and places their dominant parameters (business success, the ability to face risks, and their competitiveness) in the role of sensors.
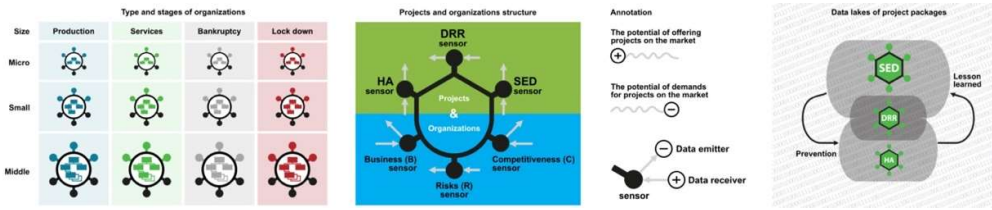
Figure 3. Current projects and organizations in the MSME business environment

Figure 3 presents a standard view of organizations and projects. Organizations are represented by the MSME type and SED, DRR, and HA by current projects. The UN initiatives, Sustainable Development Goals (SDG), enter this established structure. This initiative is still looking for its grounding. The SDG business concept is missing. The present stage does not motivate donors to invest on a worldwide scale. That is why it is necessary to involve them.
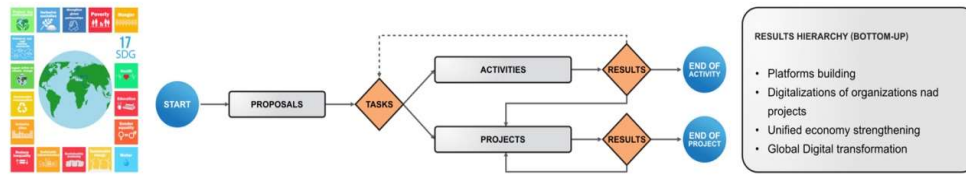

Figure 4. Potential of the UN Sustainable Development Goals (SDG) for the GDT

Sustainable Development Goals (SDG) are born randomly, and more activities than projects arise. Figure 4 reacts to the contradiction of this situation. UN SDG presents the path to the GDT as an output in a hierarchy of goals from the bottom up. From initiatives, through wildly growing digitalization, the need to strengthen the Unified Economy to obtaining added value from the effects of GDT in a specific location.

3. ORGANIZATIONS AND PROJECT'S INTERACTIONS

The article assumes that the reader has experience with MSME and has an idea of what SED, DRR, and HA projects are and how to link the SDG goals to them. Organizations, projects, and development activities are people's tools for dealing with external and internal threats. At the same time, organizations and projects define the virtual environment for identifying influences and ways to solve problems that bother people (individuals, teams, collectives). Figure 5 shows the complexity of this environment and, at the same time, is a prelude to further detailed analysis of how to start dealing with the interactions of organizations and projects on a general (global) level.
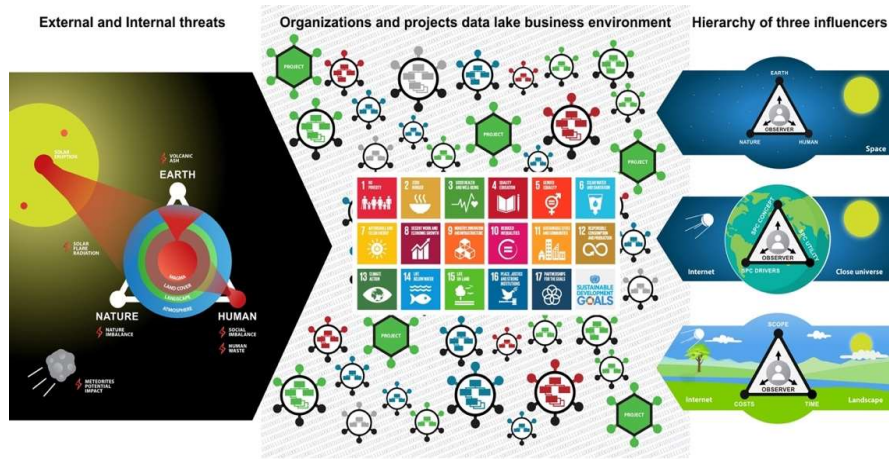
Figure 5. Climate change and other influencers of the organizations and projects relationships

The fact that a solution exists proves the preservation of basic principles. For business, it is the principle of supply and demand. For organizations and projects, it is the principle of project management. Both principles have been tested in sufficient depth over many years of practice and already benefit from the possibilities of Artificial Intelligence (AI) and Machine Learning. The communication service (Internet, data services, mobile phone, etc.) has growth potential, and we can assume that it can support the paths to global Digital transformation (certainly technically). Four cases are indicated for the interactions in Figure 5. The first is the synergy of supply and demand, the other two represent errors on either the supply or demand side, and the last are situations where demand and supply are out of the necessary synergy for various reasons.
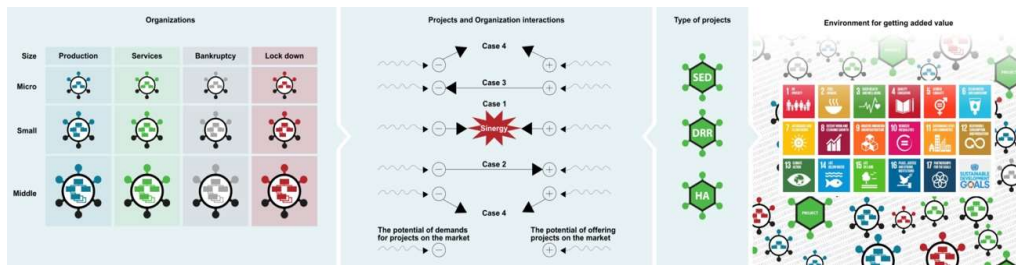

Figure 6. Interactions among organizations and projects

Figures 5 and 6 indicate that the road to digital transformation is challenging and risky. The assumption that we can predict the technical difficulty is what this conference should confirm, question, or refute. It is worse with risks, especially with those that the Human is bringing to the Great Triad themselves. An example is a nearby universe and the landscape where you live. GDT development needs peaceful cooperation in near space (for sustainable communication) and urban, peri-urban, and rural areas identified for development in peace.

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4. SUPPLY CHAIN AND PROCUREMENT

Figure 7 deals with the synergy of demand and supply in the free market in an environment cultivated by project management. Supply chain and Procurement are the most critical issues of any project. These primarily include the legal framework's adaptability to the growing digitization environment. Similarly, projects need their project management. The need for a new project paradigm (derived from the theory of the Kuhn Cycle) is on the table. The cooperation of organizations and projects covers the entire hierarchy of beginnings and ends of mutual demands and offers (of products, services, and works). Figure 7 offers a view of Procurement and its three components: sourcing, purchasing, and payments. It underlines the role of UN goals (SDG) projects. It draws attention to projects for low-income areas (with a predominance of informal business relationships and still relatively low legal smog).
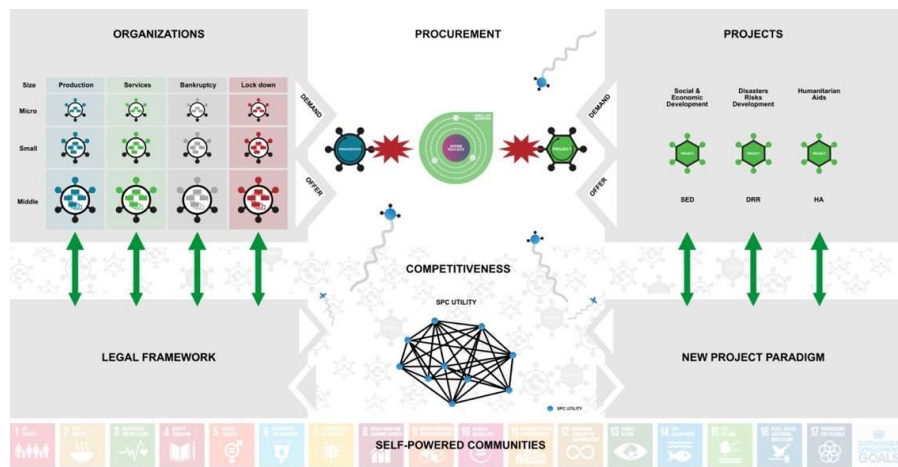

Figure 7. The business model on the global level: views on the MSME packages

The sourcing, purchasing, and payments are sensors to confirm the conformity between two business partners in a pre-set algorithm of a project stage for a specific environment of supplier-customer relations (e.g., represented by the scope of SPC Drivers). The Procurement model is to be built to react to each pre-defined market environment via a hierarchy of three sensors. It consists of the Sperm Nucleus (SN) and a Shall of Sensor (SS). Then SN is a core of aggregated algorithms of predictable tasks, and sensors are doors for the market operations. It is an idea and a stimulus to find the solution.
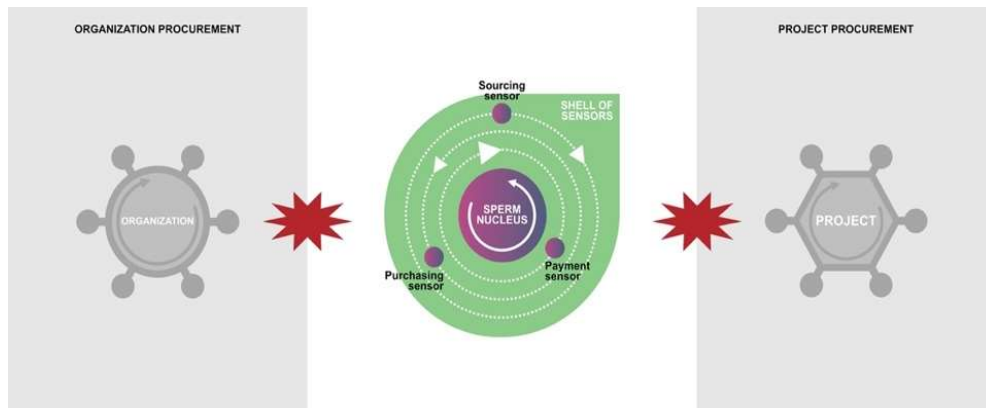
Figure 8. Procurement model – sperm of the business scheme

Figure 8 offers an idea of the arrangement of algorithms for expected standard operations at the level of contracts (e.g., the path from preparing a futures contract for the supply of goods to its delivery and acceptance). Machines do all this under defined conditions and without human participation. The principle of this approach is matching supply and demand in the procurement hierarchy. The technical solution further includes the connection of the machine unit with the project preparation and implementation processes, according to Figures 14 and 15. The construction of the Smart Contract structure (for each specific project) is a breakdown of the functions of the Procurement model.
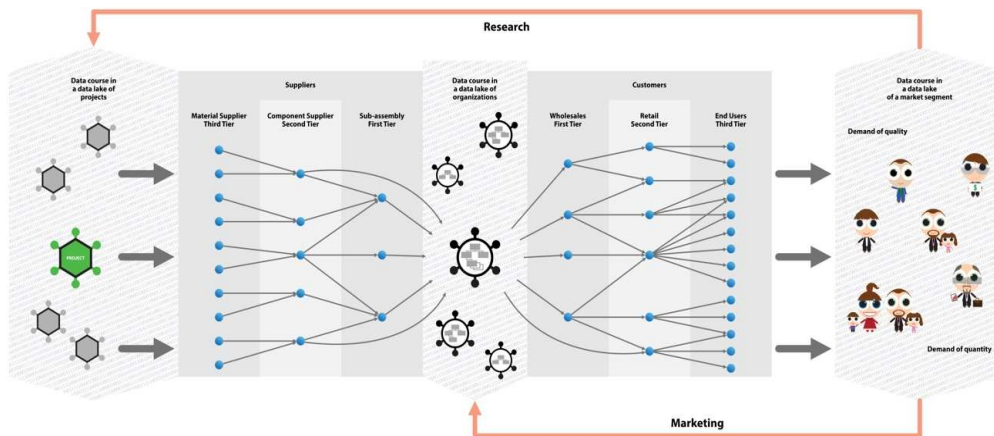

Figure 9. Organization's status and SED, DRR, and HA projects opportunities

The model presented in Figures 7 and 8 is at the heart of the new demand for Project management (PM) and ICT support. The goal is to find a new tool for awarding orders in the environment of the emerging new paradigm of projects and their links to organizations. The assignment of the task is defined, for example, in Figures 3 and 10.

5. DATA LAKE, DATA POOLS, AND PROJECT DATA FLOWS

Data Lake (DL) is a system or repository of data stored in its natural/raw format, usually object blobs or files. DL can operate as a single data store within the data centers (using cloud services from vendors such as Amazon, Microsoft, or Google). DL is presented in Figure 10. A funnel of project data has a monitored project scope, giving Figure 2. It includes the possibility of leakages or the entry of projects into the funnel (offset's outputs and inputs). The funnel is preceded by a filter that sets the volume and quality of projects in the funnel. The filter allows DL to create a distributed data system responsible for managing and storing each funnel's data pool (DP).
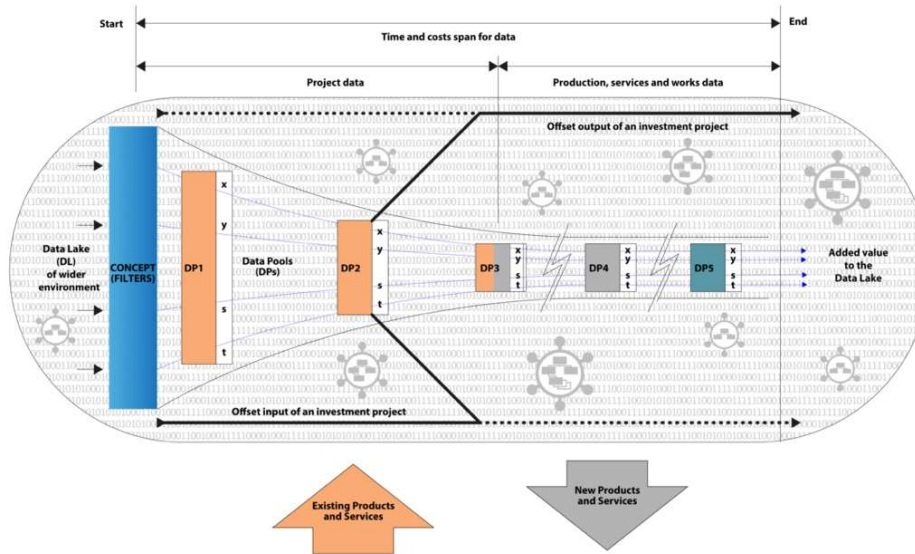

Figure 10. Data flow in a Data Lake via Data Pools in a project funnel

A data pool (DP) in Figures 10 and 11 represents a centralized repository of data where trading partners (project stakeholders in positions as retailers, distributors, or suppliers) can obtain, maintain, and exchange product information in a standard format. The data is arranged in a funnel structure for a specific purpose and using the data pool spectrum (see more in Figure 14). Five Data Pools (DP) are distinguished.

DP1: project data in chains (in the steps) of individual project preparation or sets of project portfolios.

DP2: data blocks compiled according to individual project implementation or portfolio steps.

DP3: interface at the end of the project life cycle. It closes the path from ideas, plans, preparation, and implementation, to the project's transformation into work.

DP 4: a database of the operational phase of the project (data values obtained by completing the project). At this stage, the project has changed into a physical asset.

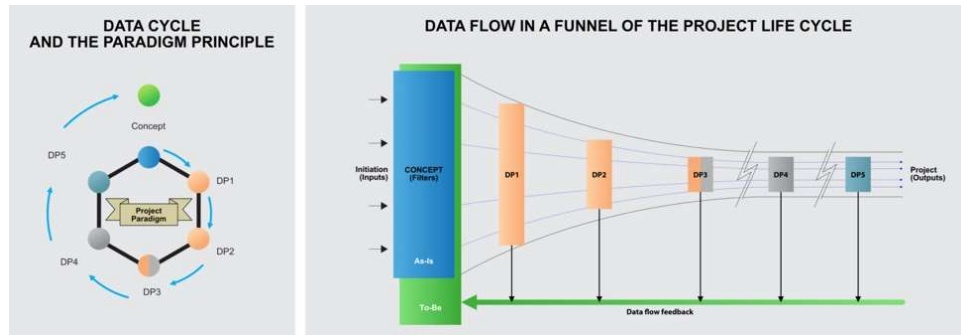DP 5: end of the project life cycle, of its physical or moral value.

Figure 11. Data Pools cycle of a project data flow in a funnel of a life cycle project

Figure 11 presents a data flow in a project cycle during all five data pools and via the dynamic dialectic diagram. It illustrates a structure of the growing added value as an algorithm of tasks in each DP. It is about the data building, and maintenance for the Big Data needs and is entirely relevant to the scope of the assignment related to the Global digital transformation, GDT.

6. PROJECT CHAIN STRUCTURE AND MACHINE PROCESSES

Figure 12 explains the phases:

I. The existence of multiple platforms supporting the goals of digitization.

II. Monitoring of the ongoing digitization of processes in organizations and projects.

III. Legal environment and the logical paths to the unified economy.

IV. GDT is the most attractive tool of the current generation.

Figures 10 and 11 explain how to understand these four phases. It is essential to respect the composition of the work at each stage. GDT is an algorithmic task. Figure 13 suggests a methodology to proceed.

Figure 12. Blockchain and Smart Contract task's structure diagram

It is a journey through hoops to the goal. It is not an obstacle course (according to sports terminology). This path is unknown, and the desired success cannot be trained beforehand. It is about how to know or develop the package of algorithms for such a track (see Figure 8). Figure 13 offers an algorithmic process for professionals to set paths and bring the goal closer to others. It is the path to democracy, development, and security of the Human in the role of a partner in the Great Triad.
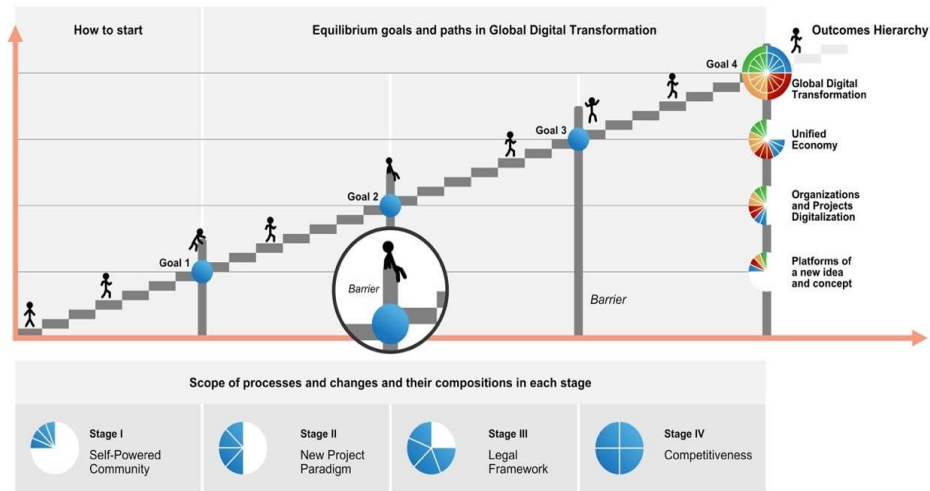
Figure 13. Model of algorithms and equilibrium of goals and paths in an object hierarchy

Figure 14 shows that it is not an unknown path. It contains a table that speaks to two directions of GDT development. Defines the base of the project's structure for preparing the first (pilot) steps of implementation and the direction of the deployment of machines in this process. Concerning project management, below presented a structure of packages and milestones:

Packages of works on a project:

Initiative - the first opportunity or reason that exists; Analysis - work done to develop a reliable estimate of the project's timing and cost; Consensus - stability of inputs coming from stakeholders; Contracting – an agreement between two or more parties to accomplish a project's scope by a schedule and approved financial sources; Procurement - a process of finding and agreeing to terms and acquiring goods, services, or works from an external source, often via a tendering or competitive bidding process; Implementation – transforming the project preparation data package into the implementation stage's steps; Monitoring - execution of a project (goods, services, and works) on the building site; Closing – project completion and its financial closing; Evaluation - in three positions: ex-ante (in stages of project preparation), interim (during implementation stages), and ex-post (when is a project or its core segment completed).

Milestones of works on a project:

Proposal – a document (a roadmap) that plans out the project's steps, so everyone involved understands what it is about; Statement – a formal document that defines the scope of the work involved for a vendor and clarifies deliverables, costs, and timeline; Prospectus - a formal document that balances the opinion on the project scope and the accessibility of financial sources for project preparation and implementation phases; Contract – is a critical document that includes terms and conditions (project scope, time, and costs) to be followed by the involved parties; Sub-contracts – is a set of documents reflecting the project procurement results in a specific supply chain environment; Procedures – is a detailed set

of steps to be taken throughout the project, monitored, and regularly noted; Protocols – it reflects on the project life cycle (preparation and implementation stages) and represents rules for all procedures on an operational level; Declaration - is an announcement to project stakeholders that the project achieved the goal; final acceptance is issued, and the project is closed; Catalogue - It is about project data storage and data operations with a link to the results of ex-ante, interim, and ex-post evaluations.

Project Chain Structure			Project Machine Process				
Protocols	Packages	Milestones	PPM	PIM	IFCM	IAIM	PPTDM
1A	1. Initiatives	A. Proposal	As-Is		As-Is	As-Is	As-Is
2B	2. Analysis	B. Statement	α		(IFCM)		
3C	3. Consensus	C. Prospectus	To-Be		To-Be		
4D	4. Contracting	D. Contract		As-Is β	As-Is	Internal Audit Integrity Machines	Public Project's Truth Detection Machines
5E	5. Procurement	E. Sub-contracts		To-Be	Internal Financial Control Machines	(IAIM)	
6F	6. Implementation	F. Orchestration		As-Is γ			(PPTDM)
7G	7. Monitoring	G. Reporting		To-Be	(IFCM)		
8H	8. Closing	Declaration		As-Is δ			
9I	9. Evaluation	I. Catalogue		To-Be	To-Be	To-Be	
Project Data Storage							
Monitoring of projects in operation for a big data structure building and maintenance							To-Be

Figure 14. Project data structure and project machine processes in a project package

The right side of the table in Figure 14 and Figure 15 is about the deployment of machines in the process of project preparation and implementation. Figure 15 shows a proposal for four machines.

PPM – Project Preparation Machine: a tool for managers of project preparation stages that works with Blockchain and Smart Contract support. This tool unlocks access to packs and milestones. It is designed for the workflow phase of project preparation.

PIM - Project Implementation Machine: a tool for managers of project implementation stages with a link to PPM. It supports the entire project cycle according to the set packages and milestones. It performs Smart Contract functions primarily through data on financial flows.

IFCM - Internal Financial Control Machine: a tool for managers involved in internal financial control operations (e.g., the credibility, correctness, and completeness of financial flows in the project). Step by step, according to the project preparation and the construction plan, the machine monitors (checks) the consumption of planned funds and the growth of the value of the work on the construction site.

IAIM - Internal Audit Integrity Machine: a specific tool for project managers for the project cycle run monitoring. The goal is to work with indicators of the project's effectiveness, efficiency, and economy and to create and collect data for the catalog.

PPTDM - Public Project's Truth Detector (Machines):a new (designed) tool for project managers and their communication with the public (with all stakeholders, media, and any other interested party).

PPM, PIM, IFCM, and IAIM tools should only be open to professionals; (the team of project managers, invited colleagues, certified experts, auditors, police, judges, and international court experts). With this relief, the PPTDM tool should provide managers and other persons fully involved in the project operations. The public has the right to be informed but not about detail. Any fault or fraud is not the subject of public discussions but only for police and judge's bodies. Only after gaining results (partial or complex) is a broad space for media open for any policy speculations.

7. MACHINE EXAMPLES AND NEW PROJECT PARADIGM

Machines like PPM, PIM, IFCM, and IAIM should be open only for professionals, except for the projects managers' team, and for any invited peers, attested experts, auditors, police, judges, and international judicial expertise). The Diagram in Figure 15 assigns individual machines to project preparation and implementation algorithms.
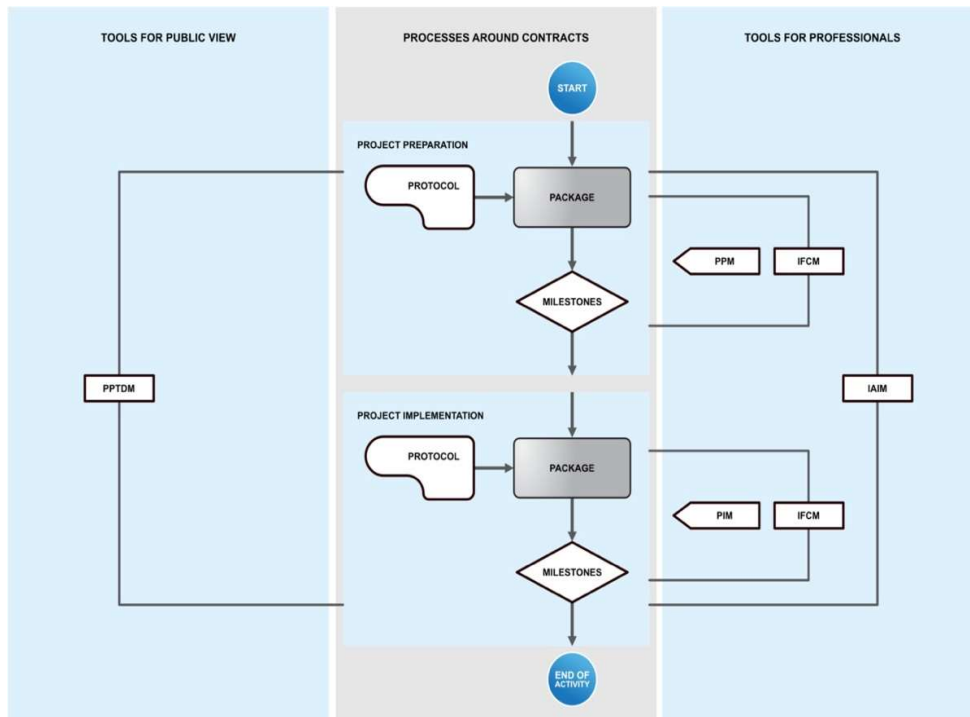

Figure 15. Project preparation and implementation chain principle – a workflow diagram

Figure 16 offers an approach to breaking an object, "The New Project Paradigm," in its developing stages and allows scaling of steps to design models on strategic and tactical levels (for virtual, specific, open, and live cases). Of course, with the link to details in Figures 14 and 15.
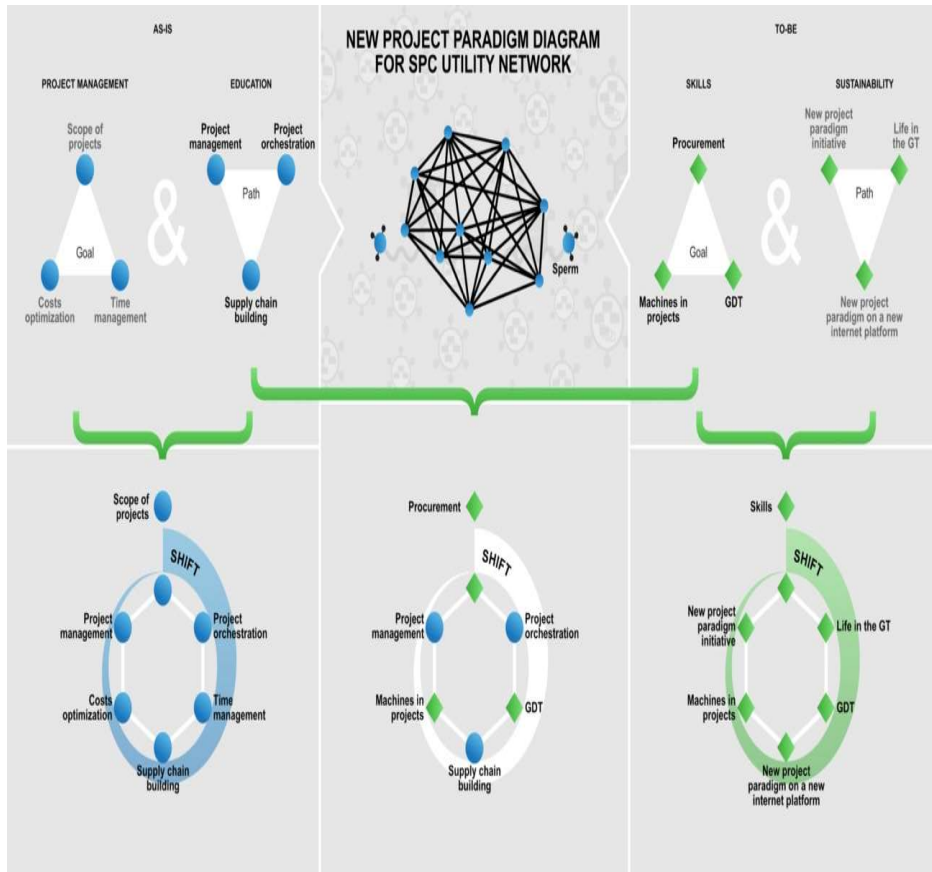

Figure 16. New Project Paradigm diagram for SPC Utility network example

8. NEW PROJECTS PARADIGM

Figure 17 reminds the need for education and skills in algorithms apps (e.g., algorithms models) and math apps (e.g., data structure models). It is an excellent opportunity for worldwide university cooperation and a specific task for the dramatic growth of any local (provincial) university. The themes are clear: to support SHIFTS in the project's scope and skills and prove it in the local organizations and projects (e.g., in the supply chains, the procurement operations).
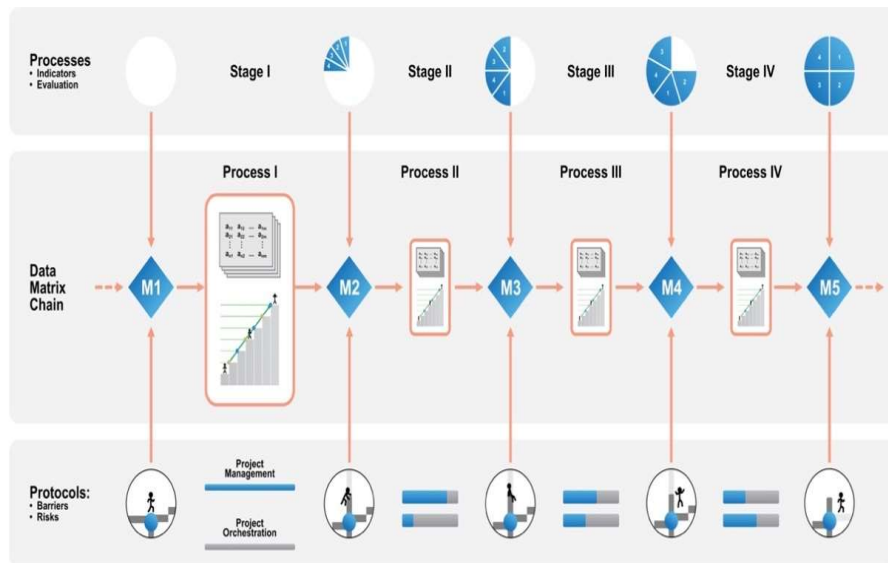
Figure 17. Object's stages proposal and four stages process scaling methodology
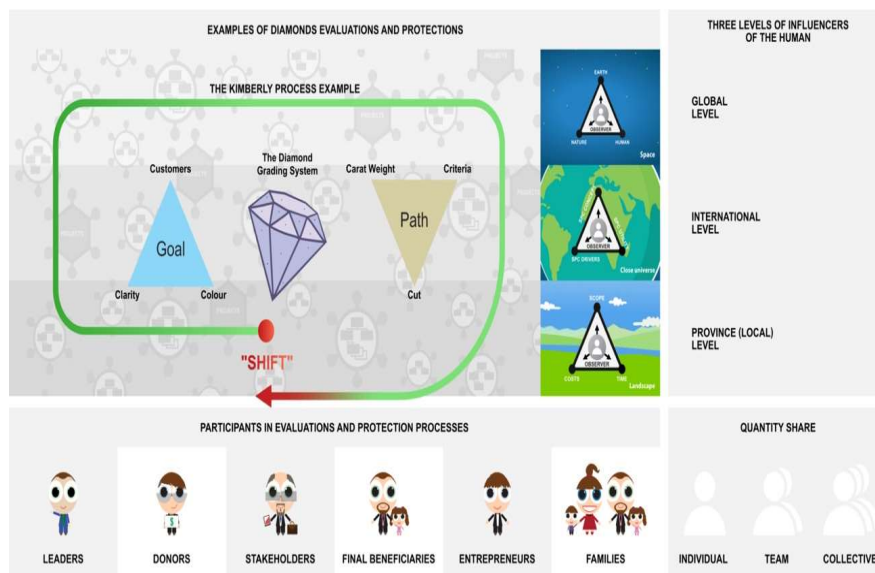

Figure 18. A complex view on the strengthening of evaluation of things around us

Figure 18 is about the grading comparison between indicators of a diamond's value and the SPC Concept. The goal is to explain the role of the algorithm in such comparison via two Dialectical Diagram (DD) triads. It allows us to tell one evaluation story (assessment) in two ways; one for diamonds and one for project management. A comparison example offers Figure 19.
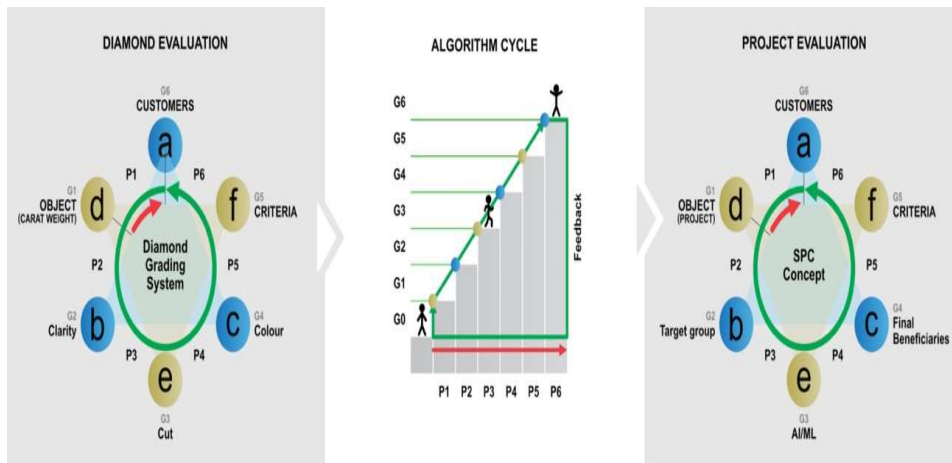
Figure 19. Know-how dissemination and communication

Diamond grading elements (milestones):

The customer (a) is the essential element of the structure of the classification system of the diamond market. The market value of a diamond is identified as carat weight (CW). It is a measurable unit defined as the physical weight (d). The following elements (b, e, c) represent the technological operations' results on the rough diamond. They track and report the growth in value of diamonds (via clarity, cut, and color monitoring) and reflect the trade demand in the broader economic environment.

This approach enables trusted certification. Element (f) represents a completed assessment system and set of certificates with measurable indicators. Thus, the object (diamond) can finally reach customers and act credibly on the open market worldwide.

Inspiration for SPC project classification methodology:

The customer (a) is a fundamental element of the evaluation system structure of any SPC project. The market value of such projects (or portfolio value) is identified based on the stage of preparation and implementation of a specific project or portfolio, in the aggregate as work or object (d).

The following elements (b, e, c) represent (d) the end-user capacity (a business capacity of the Target Group), (e) technological tools and audits of the Human potential participation, and milestones (c) about the intellectual ability of Final Beneficiaries to consume the profit of GDT projects or project portfolio in a wider economic environment.

Milestone, element (f) represents a completed assessment system and set of certificates with measurable indicators. Finally, an object (e.g., a segment of the GDT-like projects of the SPC Concept) can reach customers and act credibly in the global open market segment. The global market system can absorb such projects.

Figure 19 demonstrates an algorithmic cycle of paths (from P1 to P6) to goals (from G1 to G6) in a link to Figure 13. Both concepts (diamond and SDG) are challenging parts. Diamond is the work of the forces of the Universe; SDG is the work of the Human. Both concepts work at the level of clients (and) on the free market. Diamond is an object, and SDG is an object. The market value of the things recognizes milestone (d).

Then follow the steps of a technical, physical, and organizational nature, projected into parameters (b, e, c). In the case of a diamond, there are three parameters: clarity, cut, and color linked to technology that can recognize these values. GDT parameters (b, e, c) are linked to Target Groups, Final Beneficiaries, and Audits related to the behavior and thinking of the Human in the GDT processes. Milestone (f) is about the whole (complete) grading system. Such a comparison is not a piece of cake. Conversely, it is a good case for process scaling and algorithmic thinking.

9. CONCLUSION

In conclusion, it is appropriate to limit the article to two extremes. The first is a re-emphasis of the philosophical point of view (why we need philosophy), and the second is an application (what is the impact on the quality and safety of people). Figure 20 recalls the role of the Great triad, including its location in the near universe. In contrast, Figure 21 presents detail as a model of the specific construction of buildings for low-income provinces. The model captures user and security measures against floods, earthquakes, and other influences with a loose connection to Figure 5.
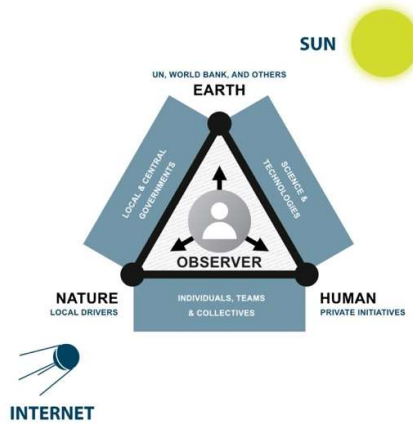
Figure 20. The importance of the Great triad for the success of the GDT

Figure 20 recalls the role of the Great Triad (GT), including its location in the near universe. The Figure presents several views, e.g., of an observer from some orbit out of our planet.

One insight of such a view is that the most critical bodies on Earth are the UN, liquid finance sources, and the capital of the present population (who and where is the manager of this value?).

Another insight is about how Nature suffers from Human behavior and thinking (so the Human has sources, but a manager is missing?).

The last view of the observer of the GT is about the Human. What is missing from them? Is it a miss of private personal, team, and collective initiatives?

Many questions are generated. For example, how the Human reacts to the Sun (on its energy capacity) and how is protected the ICT value for its use in the Nearest Universe (is the internet technology a sustainable solution for the coming generations?). The observer meditates: what are the assumptions for the Global Digital Transformation building? Who answers the questions of this observer?
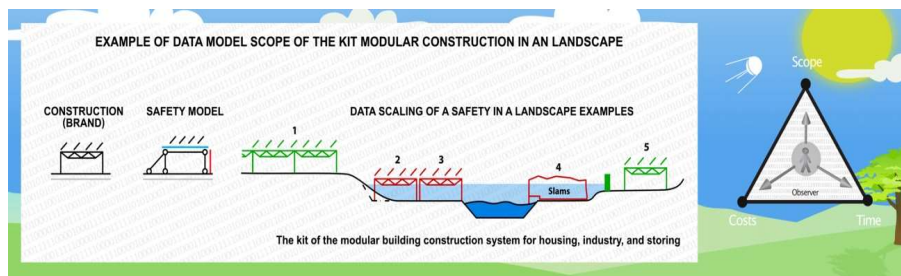

Figure 21. Model proposal of a specific modular construction concept for low-income provinces

In contrast, Figure 21 presents detail as a model of the specific construction of buildings for low-income provinces. The model captures user and security measures against floods, earthquakes, and other influences. The target of this Figure is not to open another issue but to underline the broad spectrum of presented tasks. It can be demonstrated by a comparison, e.g., of Figures 3, 5, 8, 10, 18, and 21.

The author is persuaded that this article's construction helped formulate the questions below and will be helpful for any reaction to them.
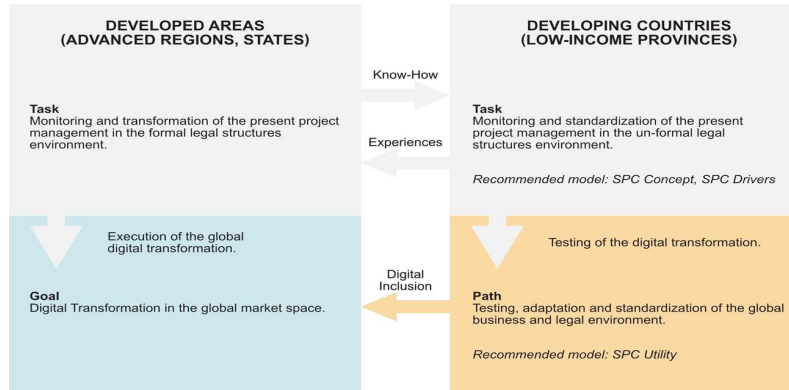

Figure 22. Advanced regions and low-incomes provinces

The summary of the article is described in Figure 22. The Figures and accompanying texts are presented by the author as a basis for thinking about these three questions:

I. Are Blockchain and Smart Contract technologies ready to respond to the needs of the package of organizations and projects according to the text of the article?

II. Is the community of professionals in the Blockchain and Smart Contract field ready to professionally support the entry of these technologies into the complex process, e.g., in the scale of preparing the Global Digital Transformation according to the article?

III. Is there an agreement in the experts' community that it is first necessary to demonstrate the applicability of these technologies (on examples) before the preparation of the GDT begins? If this strength for integrity is not found, is there a danger of breaking the current rapid digitization into fragments? What about digital inclusion on a global scale?

The questions are formulated freely without specifying the addressee to indicate the path taken by the author and to support the hierarchy of understanding of the objectives summarized mainly in Figures 5 and 13.

ACKNOWLEDGEMENT

contemporary problems. But it is also a new knowledge of processing and evaluating this still-growing package of information and data in trust and collaboration.

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