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STREAMLINING ORGANIZATIONAL MANAGEABILITY THROUGH SCALABLE DECISION MAKING

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Abstract. In modern organizations, decision-making processes are critical to effectively managing business operations. However, as organizations grow more complex, decision-making becomes more challenging and time-consuming, leading to a lack of agility, bottlenecks and decreased productivity. One of the assumptions in the article is that excessive complexity and uncontrolled secrecy in organizations lead to lack of understanding of how they work. This can be detrimental to decision-making processes, resulting in misinterpretations of data, misunderstandings of organizational objectives and ultimately, poor decision-making and results. These factors can create a wall of ignorance and irresponsibility within organizations. To address this issue, we propose the hypothesis that simplifying decision-making processes and making them more scalable and this will increase employee involvement and trust in the organization. Implementing scalable decision-making processes can create a framework for making consistent decisions across teams and departments, streamline the decision-making process, encourage critical thinking and enable the organization to respond more quickly and rationally to changing market conditions. The conclusion of the article is that applying scalable decision-making in organization can unlock new levels of manageability, improving the ability to make complex decisions and navigate dynamic situations. This model may be applicable to transportation and logistics companies, production units and plants and construction and manufacturing industries seeking to improve their performance and competitiveness in today's fast-paced business environment.

Keywords: *choice-making, flexibility, management, transparency, unknown,*

Rezumat. Procesele de luare a deciziilor în organizațiile moderne sunt esențiale pentru gestionarea eficientă a operațiunilor de afaceri. Cu toate acestea, pe măsură ce organizațiile devin mai complexe, luarea deciziilor devine mai provocatoare și consumatoare de timp, ceea ce duce la o lipsă de agilitate, blocaje și scăderea productivității. Una dintre premisele din articol constă în complexitatea excesivă și secretul necontrolat în organizații, care conduc la o lipsă de înțelegere a modului în care funcționează organizația. Acest lucru poate fi dăunător proceselor de luare a deciziilor, ducând la interpretări greșite ale datelor, neînțelegeri ale obiectivelor organizaționale și, în cele din urmă, luare a deciziilor și rezultate finale slabe.

Acești factori pot crea un zid de ignoranță și iresponsabilitate în cadrul organizațiilor. Pentru a aborda această problemă, propunem ipoteza că simplificarea proceselor de luare a deciziilor și a le face proporționale, coraportate la capacitatea de gestionare a organizației, iar acest lucru va crește implicarea angajaților și încrederea în organizație. Implementarea proceselor de luare a deciziilor proporționale sau scalabile poate crea un cadru pentru luarea deciziilor consecvente între echipe și departamente, eficientiza procesul de luare a deciziilor, încurajează gândirea critică și permite organizației să răspundă mai rapid și mai rațional la condițiile de piață în schimbare. În concluzie, articolul argumentează că aplicarea procesului decizional scalabil poate debloca noi niveluri de gestionare, îmbunătățind capacitatea de a lua decizii complexe și de a naviga în situații dinamice. Acest model poate fi aplicabil companiilor de transport și logistică, unităților și fabricilor de producție, precum și industriilor de construcții și producție care doresc să-și îmbunătățească performanța și competitivitatea în mediul de afaceri cu ritm rapid de astăzi.

Cuvinte-cheie: *alegere, flexibilitate, management, transparență, necunoscut.*

1. Introduction

In this article, we approach manageability from the perspective of scalability as structure and it serves as a continuation of our previous articles [1].

Effective management is essential for organizational success as it leads to increased productivity, efficiency and profitability and good managers have the ability to identify and address problems. This sentence sounds good until problems escalate into crises, when the question of responsibility and guilt arises. However, the usual running of an organization involves navigating perpetual changes and often moving from one crisis to another. Our intention is to stabilize the dynamic functioning of the organization by streamlining manageability through scalable decision-making.

Scalability refers to the ability of an organization to handle increasing amounts of work or users, growing in size and complexity or contraction and diminishment without significantly increasing costs or diminishing performance. Scalability is an important consideration for any organization, especially those that are expected to grow rapidly or face unpredictable levels of demand.

It involves designing and implementing systems, competencies, processes and infrastructure that can adapt to changing needs and accommodate increasing demands without causing disruptions or requiring significant modifications. Scalability is often measured in terms of metrics such as response time, throughput and resource utilization and can be achieved through various strategies such as vertical and horizontal scaling, load balancing and performance tuning.

2. Materials and Methods

In our research investigated elements of manageability from the perspective of scalability are: forecasting, planning, organizing, implementation, controlling, “window of opportunity”, decision making.

Firstly, we will analyze scalability from the view of “knowledge in decision making process” and “stable and known situation" and then from the perspective "unknown in decision making process" and "unstable and with large uncertainty situation" [1, p. 84].

The explicit meanings of the mentioned terms are elucidated in the previously published article [1].

A.1 Manageability as organizational scalability activity in organization from the perspective of "knowledge in decision making process" and "stable and known situation"

We will review some works relevant to this criterion.

André B. Bondi's article "Characteristics of scalability and their impact on performance" [2] explores the concept of scalability in software and how it affects performance. Bondi explains that scalability refers to a software system's ability to handle an increasing workload by adding more resources, such as processors or memory. The article identifies several characteristics of scalability, including linearity, stability, predictability and efficiency. Linearity refers to how the performance of the system changes as the workload increases. Stability refers to how consistent the performance is over time. Predictability refers to how accurately the system can predict future performance based on past behavior. Efficiency refers to how well the system utilizes available resources to achieve its goals. The article also discusses the impact of these characteristics on performance. Bondi notes that linear scalability is essential for achieving high performance as the workload increases. He also emphasizes that stable performance is critical for maintaining system reliability and avoiding unexpected downtime. Additionally, predictable performance helps administrators plan for future resource needs and avoid overprovisioning. The article highlights the importance of scalability and its characteristics for achieving optimal performance in software systems. Understanding these concepts can help developers and administrators design and manage systems that can handle increasing workloads without sacrificing performance or reliability.

The article [3] proposes a queueing model-based dynamic scalability approach for containerized clouds. The authors identify the limitations of traditional approaches to cloud scalability, which rely on reactive scaling and pre-defined thresholds. One practical idea presented in this article is the use of queueing models to predict resource demands and enable proactive scalability in containerized clouds. By leveraging queueing models, the authors propose a proactive approach to scalability that can help avoid the limitations of reactive scaling and pre-defined thresholds. The approach involves combining queueing models with container orchestration to predict and scale resources according to anticipated demand. The authors demonstrate the effectiveness of their approach through simulations and show that it can improve the scalability and efficiency of containerized clouds. This idea has the potential to significantly enhance the performance and responsiveness of cloud environments, which can be critical for meeting the needs of modern applications and workloads.

The paper [4] proposes a distributed real-time algorithm called "Distributed Real-time Multi-agent Mission Planning" for solving the collision-aware multi-agent mission planning problem. It partitions the entire unassigned task set into subsets and decomposes the original problem into several single-agent mission planning problems. The algorithm has been tested with dynamic obstacles and tasks and outperforms existing methods in both optimality and scalability. Distributed real-time algorithm is able to run in real-time with good scalability by reducing the dimension of the original problem. The results show that by using global information in a distributed manner, distributed real-time algorithm achieves better performance on both computation and optimality.

The paper [5] discusses the significance and process of Reverse ETL (Extract, Transform and Load) as a vital tool for data-driven decision-making in the Fourth Industrial Revolution. Reverse ETL is distinct from regular ETL and is used in cloud environments to eliminate data silos and promote operational analytics culture across the firm. The paper highlights the benefits of using reverse ETL, such as scalability, performance and better visual representations and suggests that proper analysis and product selection can aid organizations in using the finest tool for multi-tasking across departments. Companies can develop these pipelines on the platform with cloud data warehousing like Snowflake and distribute them to any user within the cloud platform.

The article [6] describes the development and evaluation of robust stereo matching system designed to optimize the speed and power efficiency of embedded systems. By utilizing dedicated design modules, the system achieves state-of-the-art performance with lower power consumption compared to similar algorithms. The flexible design can adapt to any dedicated design modules by obtaining necessary parameters from a user. Despite a precision degradation due to aggregated path loss, dedicated design modules balance accuracy-and-speed while reducing the energy cost of a system, making it an attractive choice for real-world applications.

The book [7] challenges the traditional view of knowledge creation held by systems thinkers, proposing instead the Complex Responsive Processes of relating which draw on complexity sciences for analogies with human action. It emphasizes self-organizing interaction as the center of knowledge creation in organizations, where learning and knowledge creation are qualitative processes of power relating that are both emotional and intellectual. By placing organizational knowledge in the relationships between people, this book questions the belief that organizational knowledge is essentially codified and centralized.

One practical approach from the book "Flexibility and Stability in the Innovating Economy" [8] is to establish flexible organizational structures and processes to facilitate innovation. Authors discuss the importance of flexible organizational structures and processes for fostering innovation. They argue that traditional hierarchical structures can stifle innovation by inhibiting the flow of information and limiting the ability of individuals to pursue new ideas. To overcome these challenges, authors recommend adopting more flexible structures and processes that enable individuals and teams to collaborate across functions and departments. They suggest creating cross-functional teams, establishing regular communication channels and providing employees with opportunities to pursue innovative projects. The authors argue that a flexible organizational structure and processes are essential for creating an innovation-friendly culture and driving long-term growth and competitiveness.

An idea from the book [9] by Jason Bloomberg presents five organizing principles called Super trends, which include location independence, global cubicle, democratization of technology, deep interoperability and complex systems engineering. The book discusses the challenges of large organizations and places them in the broader business ecosystem, including small and midsize organizations and start-ups. It offers a new perspective on service-oriented architecture, cloud computing and mobile technologies and how organizations can achieve better business visibility through IT and enterprise architecture. The book lays out a multidimensional vision for achieving agile architectures and discusses crisis points that promise sudden, transformative change, providing insights into how organizations' spending on IT will continue to undergo radical change over the next years.

In the book [10] by Robert Axelrod and Michael Cohen is to use "adaptive networks" to promote cooperation and reduce conflict in complex systems. Adaptive networks are networks that can change and evolve over time based on feedback from the environment or other agents. In complex systems, adaptive networks can help to promote cooperation and reduce conflict by allowing agents to adjust their behaviour based on the behaviour of others in the network. According to the authors, one way to implement adaptive networks is to use "threshold models," in which agents only cooperate with others who have a certain level of cooperation or reputation. By adjusting these thresholds over time, agents can learn to cooperate with each other and build trust, even in the absence of direct communication or coordination. This approach has been successfully applied in a variety of real-world contexts, including the formation of social networks, the management of natural resources and the regulation of financial markets. By using adaptive networks and threshold models, organizations and policymakers can harness the power of complexity to promote cooperation and reduce conflict, even in the face of uncertainty and change.

As we mentioned, organizational scalability refers to an organization's ability to accommodate growth or contraction in the future. We will distinguish the following elements:

A.1.1 Scalability Ratio: The scalability ratio measures the relationship between the resources allocated to a plan and the output that the plan generates. It can be calculated as:

$$Scalability\ Ratio\ =\ Output\ /\ Resources \quad (1)$$

For example, if a plan produces 100 units of output and requires 10 resources, the scalability ratio would be 10.

A.1.2 Time-to-Scale (TtS): Time-to-Scale measures the amount of time it takes for a plan to increase its output by a certain percentage. It can be calculated as:

$$TtS = Time\ required\ to\ increase\ output\ /\ Percentage\ increase\ in\ output \quad (2)$$

For example, if a plan takes six months to increase its output by 50%, the time-to-scale would be 12 months.

A.1.3 Staffing Scalability: Staffing scalability measures the ability of a plan to increase or decrease its staff size as needed. It can be calculated as:

$$Staffing\ Scalability\ =\ Staffing\ Flexibility\ /\ Plan\ Complexity \quad (3)$$

For example, if a plan can easily adjust its staffing levels to meet changing demands and has a low level of complexity, its staffing scalability would be high.

A.1.4 Cost Scalability: Cost scalability measures the ability of a plan to accommodate changes in costs as it grows or expands. It can be calculated as:

$$Cost\ Scalability\ =\ Percentage\ Change\ in\ Cost\ /\ Percentage\ Change\ in\ Output \quad (4)$$

For example, if a plan's costs increase by 10% as its output doubles, the cost scalability would be 5.

A.1.5 Process Scalability: Process scalability measures the ability of a plan to adjust its processes as it grows or expands. It can be calculated as:

$$Process\ Scalability\ =\ Process\ Flexibility\ /\ Plan\ Complexity \quad (5)$$

For example, if a plan can easily adjust its processes to meet changing demands and has a low level of complexity, its process scalability would be high.

A.1.6 Productivity Scalability: Productivity scalability measures the ability of a organization to adjust its processes as it grows or expands. It can be calculated as:

$$Productivity\ Scalability\ =\ (New\ Value\ -\ Old\ Value)\ /\ Old\ Value\ *\ 100 \quad (6)$$

Within this equation, the term "$New\ Value$" pertains to the magnitude of a distinct objective that aligns with an alternative timeframe for a sequence of occurrences. On the other hand, the term "$Old\ Value$" signifies the magnitude of the identical objective concerning a designated timeframe of events for comparison. Subsequently, the outcome is multiplied by 100 to denote the degree of scalability as a proportion.

A.2 Manageability as organizational scalability activity in organization from the perspective of "unknown in decision making process" and "unstable and with large uncertainty situation".

In terms of the organization's ability to manage scalability, there are several possible unknown factors that could impact it, including:

A.2.1 Resource Allocation: Organizations need to have a clear understanding of the resources required for scaling, including equipment, infrastructure, software and personnel. If the organization does not allocate sufficient resources for scaling, it can lead to problems such as lack of capacity, poor performance and increased downtime.

A.2.2 Organization Architecture: A poorly designed organization can make it difficult to scale effectively. It's important to ensure that the organization is designed with scalability in mind and that the organization’s architecture can handle increased load or decreasing load without causing bottlenecks or other issues.

A.2.3 Monitoring and Reporting: Monitoring and reporting are crucial for managing scalability. Without effective monitoring and reporting tools, it can be difficult to identify and address issues that may arise during scaling. The organization needs to have a clear understanding of how to monitor and report on the system, including performance metrics, capacity utilization and availability.

A.2.4 Automation: As the organization scales, manual processes become more difficult to manage. Automation can help to streamline processes and reduce the risk of errors. However, if the organization does not have the right automation tools or processes in place, it can be challenging to scale effectively.

A.2.5 Organizational Culture: Scalability is not just a technical challenge; it's also a cultural one. The organization needs to foster a culture that supports scalability, including a willingness to take risks, embrace change and collaborate across teams. Without the right organizational culture, it can be difficult to scale effectively. The culture of an organization naturally flows down from the highest management to the lowest position and not the other way around.

A.2.6 Security and Compliance: As the organization scales, it becomes more vulnerable to security threats and compliance issues. The organization needs to have a clear understanding of how to manage security and compliance risks, including policies, procedures and tools for monitoring and reporting on security and compliance.

A.2.7 Capacity Planning: Capacity planning is critical for managing scalability. The organization needs to have a clear understanding of how to plan for capacity, including forecasting demand, determining resource requirements and identifying potential bottlenecks. Without effective capacity planning, it can be difficult to scale effectively.

A.2.8 Communication and Collaboration: Effective communication and collaboration are essential for managing scalability. The organization needs to ensure that all stakeholders are aware of the scaling plan, understand their roles and responsibilities and are able to collaborate effectively to achieve the organization's scalability goals. Naturally, the highest management role is exclusive and they set an example every day.

B.1 Scalability in the organization from the perspective spacetime

Scalability is the ability of an organization (a plan) to accommodate growth or decline without losing performance or efficiency. Naturally, scalability requires different combination between organizational space and time.

The book [11] presents how to build and scale a business with repeatability. The book focuses on the concept of levers, which are key strategic decisions that can significantly impact a business's growth and success. One idea presented in the book is the importance of creating a repeatable sales process. The authors explain that many businesses struggle to grow because they rely too heavily on the founder or a small team to drive sales. By creating a repeatable sales process, businesses can empower their entire team to sell effectively and consistently. This involves identifying the key steps in the sales process, documenting them and training everyone in the organization on how to execute them. By doing so, businesses can create a sustainable and scalable sales engine that can drive growth over the long term.

"Not knowing: the art of turning uncertainty into opportunity" is a book written by Steven D'Souza and Diana Renner that explores the idea of embracing uncertainty in order to unlock opportunities for growth and success and offers practical insights and tools for individuals and organizations seeking to navigate complex and uncertain environments. The authors argue that uncertainty is an inherent part of life and that our traditional approaches to dealing with it - such as seeking control, certainty and predictability - are often counterproductive. Instead, they suggest that we can learn to embrace uncertainty as an opportunity for growth, creativity and innovation. Through a combination of personal stories, case studies and practical exercises, the book offers a framework for developing a mindset that is open to uncertainty and ambiguity. The authors explore topics such as reframing, experimentation, learning from failure and mindfulness as key tools for turning uncertainty into opportunity. One of the central ideas of the book is the concept of "not knowing." The authors argue that the willingness to acknowledge what we don't know and to embrace the unknown can be a powerful driver of growth and innovation. By letting go of the need for certainty and control, individuals and organizations can become more agile, adaptable and resilient in the face of change and uncertainty. By reframing uncertainty as an opportunity rather than a threat, the book provides a practical roadmap for individuals and organizations seeking to thrive in uncertain times.

In the book [13], Kotter draws on his extensive experience as a management consultant to identify the key factors that can make or break a change initiative. He provides a clear framework for leading change, outlining eight stages that organizations must go through to successfully implement change. Kotter emphasizes the importance of establishing a sense of urgency, creating a powerful guiding coalition, developing a vision and strategy and communicating the change vision effectively. One of the central ideas in the book is the importance of creating a strong coalition to lead change. Kotter argues that successful change efforts require a diverse group of people with different skills, perspectives and experiences. The coalition must be able to work together effectively to create and implement a shared vision for change. Kotter highlights the need for coalition members to be willing to take risks, challenge the status quo and push back against resistance to change. Kotter also emphasizes the importance of communication in leading change. He suggests that leaders must be able to articulate a clear and compelling vision for change and they must communicate that vision consistently and effectively throughout the organization. This requires not only clear and concise messaging but also the ability to listen to feedback and adjust the vision as needed.

From the perspective of spacetime, there are several formulas that can be used to calculate plan scalability in the organization:

B.1.1 Spacetime Scalability (STS):

$$STS = (Space\ Available\ /\ Space\ Required)\ x\ (Time\ Available\ /\ Time\ Required) \quad (7)$$

This formula takes into account both the space and time required to complete the plan, as well as the space and time available within the organization to accommodate growth or shrinkage.

B.1.2 Space Scalability (SS):

$$Space\ Scalability = Space\ Available\ /\ Space\ Required \quad (8)$$

This formula focuses solely on the space required to complete the plan and the space available within the organization to accommodate growth or restriction.

B.1.3 Time Scalability (TS):

$$Time\ Scalability = Time\ Available\ /\ Time\ Required \quad (9)$$

This formula focuses solely on the time required to complete the plan and the time available within the organization to accommodate expansion or limitation.

B.1.4 Resource Scalability (RS):

$$RS = \left(\frac{Available\ Resources}{Required\ Resources}\right) * (Efficiency\ Factor) \quad (10)$$

This formula takes into account the resources required to complete the plan, the resources available within the organization to accommodate upsurge in development or contraction and an efficiency factor that represents the level of productivity and effectiveness of the organization's resources.

B.1.5 Cost Scalability (CS):

$$Cost\ Scalability = \left(\frac{Revenue\ Growth}{Cost\ Growth}\right) * (Efficiency\ Factor) \quad (11)$$

This formula takes into account the revenue growth and cost growth associated with the plan, as well as an efficiency factor that represents the organization's ability to generate revenue and manage costs effectively.

C.1 Manageability as organizational scalability activity in organization coherently linked to "the window of opportunity" in the organization

The expression "window of opportunity" refers to a specific period of time during which a particular action or decision can be taken advantage of or accomplished with a greater likelihood of success. It implies that there is a limited time frame in which to think, take decisions and act and that if one misses the opportunity, the likelihood of success may decrease significantly. A "window of opportunity" can exist in many different contexts and may be influenced by various factors such as market conditions, trends or external events. Successfully recognizing and seizing a "window of opportunity" can lead to significant benefits and advantages, while failing to do so may result in missed opportunities or even negative consequences.

One practical tip from book "The Agile Enterprise: Reinventing your Organization for Success in an On-Demand World" [14] is: "Establish a culture of experimentation and learning. Experimentation involves testing new ideas in the market to gain feedback and validation. A culture of experimentation creates a safe environment for employees to try new things and learn from their successes and failures. This requires leadership support for failure and willingness to take risks" (14, p. 104). The authors emphasize the importance of creating a culture of experimentation and learning in order to promote innovation and adaptability. This involves creating a safe environment for employees to take risks and learn from their failures, rather than punishing them for mistakes. By encouraging experimentation and learning, organizations can more quickly adapt to changing market conditions and stay competitive.

One of the central ideas of the book [15] is the importance of self-directed learning. Reid argues that individuals who take responsibility for their own learning are more likely to achieve their goals and succeed in life. He provides practical tips and strategies for developing a self-directed learning approach, including setting goals, creating a learning plan and seeking out resources and support.

The book [16] begins by defining software scalability and why it is important in today's world. Software scalability refers to the ability of software systems to adapt and handle increased workloads without impacting performance. With the growing demand for software applications, scalability has become a critical factor for businesses to stay competitive. The book then discusses various techniques and tools that can be used to measure software scalability, such as load testing and performance profiling. One of the main ideas presented in the book is the importance of designing software with scalability in mind from the beginning. The author emphasizes that software scalability is not something that can be added on as an afterthought, but rather it should be a fundamental aspect of software design. The book provides practical advice on how to design software systems that can scale, such as breaking up the system into smaller, more manageable components and using distributed computing architectures. The book also covers various challenges and trade-offs that come with designing scalable software systems. For example, designing a system for high scalability may lead to increased complexity and reduced maintainability. The author provides guidance on how to strike a balance between scalability and other important factors such as reliability and security.

The book [17] authored by Artur Ejsmont focuses on the various aspects of web application scalability, such as architecture, design, testing, deployment and performance tuning, front-end and back-end design principles, database design and distributed systems. By designing for scalability, organizations can avoid costly and time-consuming rewrites later on and be better equipped to handle growth and increased traffic.

One of the key ideas presented in the book [18], where the authors introduce the three rules of three are the rule of three in software design, the rule of three in infrastructure and the rule of three in organizational structure. The rule of three in software design suggests that software should be designed with three key objectives in mind: simplicity, scalability and maintainability. The rule of three in infrastructure suggests that a scalable infrastructure should be designed with three key components: redundancy, load balancing and failover. Finally, the rule of three in organizational structure suggests that organizations should be structured around three key roles: technical leaders, product owners and operational leaders.

One key idea from the book [19] where Wenner discusses the importance of elite organization and productivity. To achieve elite productivity, Wenner recommends that businesses focus on three key areas: people, process and technology. He argues that it is essential to hire top talent and invest in their development, to develop efficient and streamlined processes that enable employees to work at their best and to leverage technology to automate tasks and increase efficiency. By focusing on these areas, businesses can achieve elite productivity and become high-growth, high-profit organizations.

The book [20] covers a broad range of topics related to scalability, including architecture, infrastructure, performance testing and database design. One practical idea discussed in the book is the concept of scaling through partitioning. Partitioning involves splitting large data sets into smaller, more manageable pieces and distributing them across multiple servers or nodes. By partitioning data, applications can take advantage of the processing power and storage capacity of multiple servers, improving performance and scalability. The author delves deeper into the different types of partitioning, including horizontal, vertical and functional partitioning. Horizontal partitioning involves dividing data by rows, while vertical partitioning involves dividing data by columns. Functional partitioning involves grouping data based on specific functions or business requirements. The author also explores the trade-offs and challenges associated with partitioning, including data consistency, query performance and maintenance complexity.

There are several elements of plan scalability that are coherently linked to the window of opportunity of an organization:

C.1.1 Resource availability: The availability of resources, including personnel, funding and technology is crucial for plan scalability. If an organization has access to ample resources, it can scale its plans quickly and effectively.

C.1.2 Flexibility: The ability to adapt to changing circumstances and requirements is essential for scalability. Plans that are too rigid or inflexible may not be able to scale effectively, especially if the window of opportunity is narrow.

C.1.3 Modular design: A modular design allows organizations to scale plans by adding or removing components as needed. Modular designs also enable organizations to update and improve their plans without having to start from scratch.

C.1.4 Cloud-based infrastructure: Cloud-based infrastructure provides organizations with the flexibility and scalability needed to quickly and easily scale plans up or down. Cloud infrastructure also allows for greater agility and responsiveness to changing market conditions.

C.1.5 Automation: Automation can help organizations scale plans by reducing manual workloads and increasing efficiency. Automated processes can also help organizations respond quickly to changing market conditions.

C.1.6 Scalable data management: Effective data management is essential for scalability. Organizations that can quickly and easily access and analyse data can scale their plans more effectively.

C.1.7 Agile methodologies: Agile methodologies, such as Scrum or Kanban, can help organizations respond quickly to changing market conditions and scale their plans effectively. More important than Scrum or Kanban methodologies is the strong will of the highest management to support their teams. If there is no credibility from the lower position, all highest management activities are in vain.

C.1.8 Strategic partnerships: Strategic partnerships with other organizations can provide access to additional resources, technology and expertise, allowing organizations to scale their plans more effectively.

C.1.9 Scalable marketing and sales: Marketing and sales strategies that can scale quickly and efficiently are essential for taking advantage of a window of opportunity. Organizations that can rapidly expand their customer base can capitalize on opportunities before their competitors. Naturally, do not forget the unseen supply chain that supports great sales and imaginative marketing.

Next, we will apply scalability to the decision-making process to improve the organization's manageability.

D.1 Scalability in the organization from the perspective of forecasting in an organization:

D.1.1 Capacity planning: This formula calculates the maximum amount of work that can be done by an organization in a given period of time. The formula is:

$$MC = (NR) * (NWHD) * (NWDP) \quad (12)$$

Where:
Maximum capacity = MC
Number of resources = NR
Number of working hours per day = $NWHD$
Number of working days in a period = $NWDP$

D.1.2 Plan demand forecasting: This formula helps predict the amount of work that will be required for a plan in the future. The formula is:

$$PDF = (ND) * (SD) * (ETED) \quad (13)$$

Where:
Plan demand forecasting = PDF
Number of deliverables = ND
Size of deliverables = SD
Estimated time for each deliverable = $ETED$

D.1.3 Resource forecasting: This formula helps predict the number of resources that will be needed for a plan in the future. The formula is:

$$Resource\ demand = (Plan\ demand) / (Average\ productivity\ of\ a\ resource) \quad (14)$$

D.1.4 Cost forecasting (CF): This formula helps predict the cost of a plan in the future. The formula is:

$$CF = (Resource\ demand) * (Cost\ per\ resource) + (Other\ plan\ expenses) \quad (15)$$

D.1.5 Time-to-market forecasting: This formula helps predict the time it will take to complete a plan. The formula is:

$$Time - to - market = (Plan\ demand) / (Productivity\ of\ resources) \quad (16)$$

E.1 Scalability in the organization from the perspective of planning:

E.1.1 Resource capacity planning:

$$TRC = (RA) * (NAR) \quad (17)$$

Where:
Total resource capacity = TRC
Resource availability = RA
Number of available resources = NAR

E.1.2 Plan cost estimation:

$$TPC = (TNHRP) * (HRER) \quad (18)$$

Where:
Total plan cost = TPC
Total number of hours required for the plan = $TNHRP$
Hourly rate for each resource = $HRER$

E.1.3 Time management:

$$Time\ per\ resource\ =\ (Plan\ duration)\ /\ (Number\ of\ available\ resources) \quad (19)$$

E.1.4 Risk management:

$$Risk\ score\ =\ (Probability\ of\ risk\ occurring)\ *\ (Impact\ of\ risk) \quad (20)$$

For example, if there is a 30% chance of a risk occurring and the impact of that risk would be a delay of 2 weeks, then the risk score would be (30%) * (2 weeks) = 0.6 weeks.

E.1.5 Scope management:

$$Scope\ per\ resource\ =\ (Total\ plan\ scope)\ /\ (Number\ of\ available\ resources) \quad (21)$$

For example, if organization plan has a total scope of 500 tasks and there are 5 developers available to work on it, then the scope per resource would be (500 tasks) / (5 developers) = 100 tasks per developer.

F.1 Scalability in the organization from the perspective of organizing:

F.1.1 Scalability Index (SI)

$$SI\ =\ (Total\ Plan\ Cost\ /\ Size\ of\ Plan\ Team)\ *\ Time\ to\ Completion \quad (22)$$

This formula calculates the overall scalability of the plan based on the cost, team size and completion time. A higher SI indicates a more scalable plan.

F.1.2 Resource Scalability (RS)

$$RS=\ Total\ Plan\ Cost\ /\ Number\ of\ Resources \quad (23)$$

This formula calculates the resource scalability of the plan based on the cost and the number of resources required. A higher RS indicates a more scalable plan.

F.1.3 Capacity Scalability (CS)

$$CS\ =\ Number\ of\ Plans\ that\ can\ be\ completed\ simultaneously\ /\ Total\ Plan\ Time (24)$$

This formula calculates the capacity scalability of the organization based on the number of plans that can be completed simultaneously and the total plan time. A higher CS indicates a more scalable organization.

F.1.4 Human Resource Scalability (HRS)

$$HRS\ =\ Total\ Plan\ Cost\ /\ Number\ of\ Human\ Resources \quad (25)$$

This formula calculates the human resource scalability of the plan based on the cost and the number of human resources required. A higher HRS indicates a more scalable plan.

F.1.5 Production Scalability (PS)

$$PS\ =\ Total\ Plan\ Output\ /\ Time\ to\ Completion \quad (26)$$

This formula calculates the production scalability of the plan based on the total plan output and the time to completion. A higher PS indicates a more scalable plan.

G.1 Scalability in the organization from the perspective of implementation:

G.1.1 Capacity planning scalability (CPS):

$$CPS\ =\ (Available\ resources\ /\ Resource\ required\ per\ plan)\ *\ Number\ of\ plans \quad (27)$$

G.1.2 Workload distribution scalability (WDS):

$$WDS\ =\ Total\ workload\ /\ (Average\ workload\ per\ plan\ *\ Number\ of\ plans) \quad (28)$$

G.1.3 Time-based scalability (TBS):

$$TBS = (Total\ time\ available\ /\ Time\ required\ per\ plan) * Number\ of\ plans \quad (29)$$

G.1.4 Cost-based scalability (CBS):

$$CBS = (Total\ budget\ /\ Cost\ per\ plan) * Number\ of\ plans \quad (30)$$

G.1.5 Resource-based scalability (RBS):

$$RBS = Total\ resource\ pool\ /\ (Resource\ required\ per\ plan * Number\ of\ plans) \quad (31)$$

It's important to take into account other factors such as the complexity of the plan, the experience of the team and the availability of technology and tools when considering scalability.

H.1 Scalability in the organization from the perspective of control:

H.1.1 Control Span: Control Span is a measure of the number of direct reports a manager can effectively manage.

$$Control\ Span = Number\ of\ Employees\ /\ Number\ of\ Managers \quad (32)$$

If the Control Span is too high, managers may not have sufficient time to devote to each employee and control may become more difficult. Conversely, if the Control Span is too low, the organization may have too many managers, leading to increased costs and inefficiencies.

H.1.2 Management Ratio: Management Ratio is a measure of the proportion of managers to employees.

$$Management\ Ratio = Number\ of\ Managers\ /\ Total\ Employees \quad (33)$$

A higher Management Ratio means there are more managers in the organization, which can lead to more control but also higher costs. A lower Management Ratio may indicate fewer managers, which can lead to less control but lower costs.

H.1.3 Plan Complexity Index (PCI): Plan Complexity Index is a measure of the complexity of plans within an organization.

$$PCI = (Number\ of\ Plans * Average\ Complexity\ Score)\ /\ Total\ Employees \quad (34)$$

The Average Complexity Score is a subjective measure of the difficulty of managing a plan and it can be assigned by planning managers or other stakeholders. A higher Plan Complexity Index may indicate more complex plans, which can be more challenging to control. Conversely, a lower Plan Complexity Index may indicate fewer complex plans, which may be easier to control.

3. Results

I.1 Scalability in the organization from the perspective of decision-making:

These metrics can be used to evaluate the scalability of a plan in different decision-making stages and help identify areas for improvement in the decision-making process:

I.1.1 Identification of the problem:

Number of customer complaints
Number of internal requests
Frequency of recurring issues
Time taken to resolve the problem

I.1.2 Gathering relevant information:

Number of sources consulted
Time taken to gather information
Quality and reliability of information

I.1.3 Evaluation of alternatives:

Number of alternative solutions considered

Time taken to evaluate alternatives

Criteria used to evaluate alternatives

I.1.4 Making the decision:

Time taken to make the decision

Level of consensus among decision-makers

Confidence in the chosen solution

I.1.5 Level of Implementation:

Time taken to implement the solution

Level of resources required for implementation

Probability of change required for implementation

I.1.6 Score Review:

Time taken to review the outcome

Level of satisfaction with the outcome

Degree of improvement achieved

J.1 Condition of "knowledge in decision making process" and "stable and known situation"

J.1.1 Identification of the problem:

Let:

P be the problem identification for period of time

NC be the number of customer complaints plus number internal complains

FI be the frequency of recurring issues

TTR be the time taken to resolve the problem

$$P = NC * FI * TTR \quad (35)$$

This formula takes into account the number of customer complaints (NC), the frequency of recurring issues (FI) and the time taken to resolve the problem (TTR) and combines them into a single metric that represents the severity of the problem.

The idea is that the more complaints there are, the higher the frequency of recurring issues and the longer it takes to resolve the problem, the more severe the problem is likely to be. By multiplying these factors together, we can obtain a composite score that gives us a rough idea of how urgent the problem is and how much attention it requires.

J.1.2 Gathering relevant information:

$$G = (N + T) / Q \quad (36)$$

Where:

G represents the effectiveness of gathering relevant information

N is the number of sources consulted

T is the time taken to gather information

Q is the quality and reliability of information

In this formula, the numerator (N + T) represents the effort put into gathering information, by taking into account both the number of sources consulted and the time taken. The denominator (Q) represents the quality and reliability of the information obtained.

As such, the formula suggests that the effectiveness of gathering relevant information is dependent on both the amount of effort put into the process (number of sources consulted and time taken) and the quality and reliability of the information obtained. The higher the number of sources consulted and time taken and the lower the quality and reliability of the information, the less effective the process will be. Conversely, the lower the number of sources consulted and time taken and the higher the quality and reliability of the information, the more effective the process will be.

J.1.3 Evaluation of alternatives:

Let:

N be the number of alternative solutions considered

T be the time taken to evaluate alternatives

C be the number of criteria used to evaluate alternatives

We can use the following formula:

$$Evaluation\ of\ alternatives\ =\ N\ *\ T\ *\ C \tag{37}$$

This formula states that the evaluation of alternatives is directly proportional to the number of alternative solutions considered, the time taken to evaluate alternatives and the number of criteria used to evaluate alternatives. In other words, as any of these variables increase, the evaluation of alternatives will also increase.

J.1.4 Making the decision:

$$TTMD\ =\ f(1\ -\ LCDM) *\ (1\ -\ CCS) \tag{38}$$

Where:

Time taken to make the decision = $TTMD$

f is a scaling factor that can be adjusted to fit the specific context and data

Level of consensus among decision-makers = $LCDM$

Confidence in the chosen solution = CCS

Level of consensus among decision-makers is a value between 0 and 1 that represents the degree of agreement or disagreement among the people involved in making the decision. A higher value means a higher level of consensus.

Confidence in the chosen solution is also a value between 0 and 1 that represents how certain the decision-makers are about the quality and effectiveness of the chosen solution. A higher value means a higher level of confidence.

The formula suggests that the time taken to make a decision is inversely proportional to the product of $(1\ -\ level\ of\ consensus)$ and $(1\ -\ confidence\ in\ the\ chosen\ solution)$, i.e., the less agreement and confidence there is, the more time it takes to reach a decision. This makes intuitive sense since lack of consensus and low confidence can lead to debates, discussions and re-evaluations, all of which can extend the time taken to make a decision.

J.1.5 Level of Implementation

Let:

Level of Implementation = LI

Time taken to implement the solution = $TTIS$

Level of resources required for implementation = $LRRI$

Probability of change required for implementation = $PCRI$

We can use these variables to define the level of implementation as follows:

$$LI\ =\ f(TTIS, LRRI, PCRI) \tag{39}$$

where "f" is a function that relates the three variables to the level of implementation.

To create a specific formula, we would need more information about the nature of the relationship between these variables. We might hypothesize that longer implementation times, higher resource requirements and higher probabilities of change would all lead to lower levels of implementation. In that case, we could use a formula like:

$$LI = k / (TTIS * LRRI * PCRI) \quad (40)$$

where "k" is a constant that would need to be chosen based on the scale and units of the variables. This formula assumes that the impact of each variable is multiplicative and that higher values of any one variable will decrease the level of implementation. However, this is just one possible formula and the specific relationship between the variables may vary depending on the context.

J.1.6 Score Review (SR):

Time taken to review the outcome.

Level of satisfaction with the outcome.

Degree of improvement achieved.

Formula for calculating a review score based on the three factors:

$$SR = (Level\ of\ satisfaction * Degree\ of\ improvement) / Time\ taken \quad (41)$$

In this formula, the level of satisfaction and degree of improvement are multiplied together to capture the overall quality of the outcome and then divided by the time taken to review it to account for the reviewer's efficiency or thoroughness. The formula assumes that higher levels of satisfaction and improvement are better and that shorter review times are also better.

Units of measure of decision-making results.

J.1.7 Success rate: This unit of measure assesses the percentage of successful decisions made over a period of time. It is calculated by dividing the number of successful decisions by the total number of decisions made.

J.1.8 Cost-benefit ratio: This unit of measure assesses the economic value of a decision by comparing the costs of implementing the decision to the benefits it generates. It is calculated by dividing the total benefits by the total costs.

J.1.9 Risk assessment: This unit of measure assesses the level of risk associated with a decision. It takes into account the potential negative consequences of a decision and the likelihood of those consequences occurring.

J.1.10 Time-to-decision: This unit of measure assesses the amount of time it takes to make a decision. It is calculated by measuring the time from when a decision is first considered to when it is made.

J.1.11 Customer satisfaction: This unit of measure assesses the level of satisfaction of the stakeholders affected by a decision. It is calculated by measuring the feedback of those stakeholders and determining their level of satisfaction with the decision.

K.1 Calculation of conditional probability that decision-making scalability is successful

K.1.1 Let:

Decision-making scalability is successful = $SSDM$.

Identification of the problem (a priory event) = P.

Gathering relevant information (a priory event) = G.

Evaluation of alternatives (a priory event) = E.

Making the decision (a priory event) = DM.

Level of Implementation (posterior event) = L.

Score Review (posterior event) = R.

Conditional Probability formula for successful decision-making scalability ($SSDM$) based on Bayes formula, given a priory events P, G, E and DM and the posterior events L and R can be expressed as:

$$P(SSDM \mid P, G, E, DM, L, R) = P(L \mid P, G, E, DM, R, SSDM) * P(R \mid P, G, E, DM, SSDM) * P(SSDM \mid P, G, E, DM) / P(L, R \mid P, G, E, DM) \quad (42)$$

Here, we are trying to find the probability of successful decision-making scalability given the events P, G, E and DM and the posterior events L and R. We use Bayes theorem to find this probability by considering the conditional probabilities of L and R given the other events, the conditional probability of $SSDM$ given P, G, E and DM and the joint probability of L and R given P, G, E and DM.

K.1.2 The conditional probability of successful decision-making scalability given P, G, E and DM can be expressed as:

$$P(SSDM \mid P, G, E, DM) = k * P(P \mid SSDM) * P(G \mid SSDM) * P(E \mid SSDM) * P(DM \mid SSDM) \quad (43)$$

where k is a normalization constant and $P(P|SSDM)$, $P(G|SSDM)$, $P(E|SSDM)$ and $P(DM|SSDM)$ are the conditional probabilities of P, G, E and DM given $SSDM$, respectively. We keep in mind that these conditional probabilities may depend on the context and the available data. This formula provides a way to quantify the probability of successful decision-making scalability based on various factors related to problem identification, information gathering, evaluation of alternatives, decision-making, implementation and review. This would allow managers to evaluate the effectiveness of the decision-making process and identify areas for improvement and keep rational level of scalability between mentioned elements. We also keep in mind that obtained formula (42) is useful in condition of “knowledge in decision making process” and “stable and known situation" [1, p. 84].

L.1 Condition of “unknown in decision making process” and "unstable and with large uncertainty situation"

When faced with uncertainty, decision-making is challenging. However, there are techniques that can help in making decisions under such conditions – “unknown in decision making process”, "unstable and with large uncertainty situation" [1, pp. 84-85]. Here are few techniques that are suitable for decision-making under uncertainty:

L.1.1 Scenario analysis: This technique involves creating multiple scenarios that could occur and evaluating the potential outcomes of each scenario. This helps in identifying the best course of action based on the likelihood of each scenario occurring.

L.1.2 Monte Carlo simulation: This technique involves using statistical methods to create models that simulate different outcomes. This helps in identifying the probability of each outcome occurring and choosing the best course of action based on the most likely outcome.

L.1.3. Decision trees: This technique involves mapping out different decision paths and their potential outcomes. This helps in identifying the best course of action based on the potential outcomes of each decision path.

L.1.4 Sensitivity analysis: This technique involves testing the impact of changing certain variables on the decision outcome. This helps in identifying the most critical variables that could impact the decision and choosing the best course of action based on the most stable variables.

L.1.5 Real options analysis: This technique involves evaluating the potential outcomes of different options and choosing the best course of action based on the flexibility of each option. This helps in identifying the best course of action based on the potential to adjust the decision based on changing circumstances.

M.1 Formulas lose their effectiveness to a great extent under conditions of uncertainty

At this point we may develop the formula for mentioned above five techniques. But we would not do so, because we know that under uncertainty conditions the power of formulas decrease drastically. While formulas and sophisticated quantitative tools can be useful in some cases, they are not a panacea and decision-makers must be willing to use own simple approaches in order to navigate complicated, uncertain situations. That is why we will use more intuitive approach promoted by Gerd Gigerenzer [21], who has proposed several algorithms for decision-making under uncertainty, including:

M.1.1 Take the best: This algorithm involves selecting the option with the highest cue validity, which is the cue that has the highest correlation with the outcome of interest. If there are ties, additional cues can be used to break the tie. This approach is particularly useful when there are many cues and limited cognitive resources.

M.1.2 Fast and frugal trees: This algorithm involves constructing a decision tree based on a small number of cues, where each node in the tree represents a decision point and each branch represents a possible outcome. The algorithm selects the cue with the highest validity at each decision point and continues until a final decision is reached. This approach is useful when there are a small number of cues and decisions need to be made quickly.

M.1.3 Recognition heuristics: This algorithm involves making a decision based on the recognition of one or more options. The idea is that options that are more familiar are more likely to be correct. This approach is particularly useful when there is limited information or time available.

M.1.4 Take the less-is-more approach: This algorithm involves using less information to make a decision, which can improve decision-making accuracy. For example, if there are many cues available, only using a few cues with high validity can lead to better decisions than using all available cues.

Gigerenzer's approach emphasizes the importance of using simple, intuitive heuristics to make decisions under uncertainty, rather than relying on complex statistical models or exhaustive information search.

In our approach to scalable decision-making, we will use formulas and software for “knowledge in decision making process” and “stable and known situation". When faced with uncertainty described by us as “unknown in decision making process”, "unstable and with large uncertainty situation" we will use our conscious experience, learning abilities [22] and courage and also the algorithms proposed by Gerd Gigerenzer as well by other thinking human beings, including ourselves (at least sometimes thinking).

4. Discussion

In order to calculate productivity scalability between different optimization objectives of reference research paper mentioned in the Tables 3-7 [23, p.11-14] will apply formula (6) from our current article:

$$Productivity\,Scalability = (New\,Value - Old\,Value)\,/\,Old\,Value * 100 \quad (44)$$

In this case, the "$New\,Value$" refers to the value of a particular objective for a different duration of unexpected events, and the "$Old\,Value$" refers to the value of the same objective for a reference duration of unexpected events. The result is then multiplied by 100 to express the scalability as a percentage.

To calculate the productivity scalability between data (cost, time, and CO_2 emissions), we need to determine the growth rate or change in values between different durations of unexpected events.

We can calculate the productivity scalability for each case:

Scalability for Case A (Costs & Time & CO_2 Emissions) compared to Case B (Costs):

$$Transportation\ Costs\ Scalability = (1{,}201{,}925 - 1{,}202{,}427) / 1{,}202{,}427 * 100 = -0.042\% \quad (45)$$

$$Time\ Costs\ Scalability = (453{,}134 - 436{,}881) / 436{,}881 * 100 = 3.73\% \quad (46)$$

$$Emission\ Costs\ Scalability = (40{,}952 - 40{,}971) / 40{,}971 * 100 = -0.046\% \quad (47)$$

$$Total\ Costs\ Scalability = (1{,}696{,}011 - 1{,}680{,}279) / 1{,}680{,}279 * 100 = 0.94\% \quad (48)$$

Scalability for Case A (Costs & Time & Emissions) compared to Case C (CO_2 Emissions):

$$Transportation\ Costs\ Scalability = (1{,}269{,}887 - 1{,}202{,}427) / 1{,}202{,}427 * 100 = 5.62\% \quad (49)$$

$$Time\ Costs\ Scalability = (460{,}459 - 436{,}881) / 436{,}881 * 100 = 5.39\% \quad (50)$$

$$Emission\ Costs\ Scalability = (37{,}946 - 40{,}971) / 40{,}971 * 100 = -7.37\% \quad (51)$$

$$Total\ Costs\ Scalability = (1{,}768{,}281 - 1{,}680{,}279) / 1{,}680{,}279 * 100 = 5.23\% \quad (52)$$

Scalability for Case B (Costs) compared to Case C (CO_2 Emissions):

$$Transportation\ Costs\ Scalability = (1{,}269{,}887 - 1{,}201{,}925) / 1{,}201{,}925 * 100 = 5.65\% \quad (53)$$

$$Time\ Costs\ Scalability = (460{,}459 - 453{,}134) / 453{,}134 * 100 = 1.61\% \quad (54)$$

$$Emission\ Costs\ Scalability = (37{,}946 - 40{,}952) / 40{,}952 * 100 = -7.35\% \quad (55)$$

$$Total\ Costs\ Scalability = (1{,}768{,}281 - 1{,}696{,}011) / 1{,}696{,}011 * 100 = 4.26\% \quad (56)$$

Based on the calculated data, we can infer the following specific conclusions for the different scenarios [23] checking our hypothesis about productivity scalability:

<u>*Situation A (Scalability is productive):*</u>

A) Transportation Costs: There is a marginal decrease of 0.042% in transportation costs when scaling from Case A to Case B. This indicates that scalability in this aspect has a negligible effect on costs, what is good.

A) Time Costs: There is an increase of 3.73% in time costs when scaling from Case A to Case B. This suggests that scalability in terms of time results in increased costs.

A) Emission Costs: There is a marginal decrease of 0.046% in emission costs when scaling from Case A to Case B. This implies that scalability in terms of emissions has a limited effect on reducing costs.

A) Total Costs: There is a slight increase of 0.94% in total costs when scaling from Case A to Case B. This indicates that overall scalability in this situation has a minor impact on cost reduction.

<u>*Situation B (Scalability is unproductive):*</u>

B) Transportation Costs: There is an increase of 5.65% in transportation costs when scaling from Case B to Case C. This implies that scalability in transportation costs is not productive and leads to higher costs.

B) Time Costs: There is a slight increase of 1.61% in time costs when scaling from Case B to Case C. This suggests that scalability in terms of time has a limited impact on costs.

B) Emission Costs: There is a decrease of 7.35% in emission costs when scaling from Case B to Case C. This indicates that scalability in emissions is somewhat productive, resulting in reduced costs.

B) Total Costs: There is an increase of 4.26% in total costs when scaling from Case B to Case C. This implies that overall scalability in this situation has a negative effect on cost reduction.

Comprising the resolutions from reference paper [23, pp. 12 - 16] and finale from our analysis based on our hypothesis we may interfere following ***general conclusions (GC)***:

1GC. Minimizing waiting times and optimizing routes in Case A can lead to cost savings in terms of reduced inventory costs, penalty costs and faster transports.

2GC. Using more truck services in Case A to prioritize time costs may increase transportation costs compared to other cases.

3GC. The organization may need to manage a larger number of services (between 650 and 700) in Case A, with a focus on efficient coordination and scheduling to minimize waiting times.

4GC. Not prioritizing scalability in Cases B and C may result in suboptimal routes, potentially leading to higher inventory costs, penalty costs, and longer delivery times.

5GC. Case C, which focuses on minimizing emissions, may lead to higher overall costs due to increased transportation and time costs.

6GC. Consolidation efforts in Case C can result in reduced usage of services and a preference for electric trains with lower emissions. This may require adjustments in logistics and coordination to ensure efficient transportation.

There is slight difference at the Case C, where level of CO_2 emissions increase in assumption of our hypothesis (productivity scalability) because of running longer distances, implies more CO_2 emissions. In other respect all of indicators calculated through scalability reveal the same conclusions as from reference research paper [23].

For situation A, scalability is productive in terms of transportation costs, emission costs, but unproductive in terms of time costs. For situation B, scalability is unproductive in terms of transportation costs and time costs, somewhat productive in terms of emission costs. By calculating the productivity scalability between different optimization objectives, we can assess the changes in costs, time and emissions as the duration of unexpected events varies.

In summary, by considering scalability, decision-makers can identify optimal strategies to enhance performance and minimize disruptions based on specific, individual situation.

5. Conclusions

N.1 Manageability, organizational scalability activity and decision-making in organization from the perspective of "successful decision-making scalability"

Based on the evaluation of our hypothesis in the discussion section, we can assert that our hypothesis is functioning effectively, accurately predicting values and proportions. These findings indicate that our hypothesis can be utilized as a calculation and decision-making tool to effectively manage organizational situations.

N.2 Manageability, organizational scalability activity and decision-making in organization from the perspective of "learning scalability" or "knowledge gained through suffering"

We are using the word "suffering" as process of knowing being alive or, expressed in other way, "suffering as process of teaching-learning in life in order to acquire new knowledge, including scalability". After thinking long and hard, the manageability, organizational scalability and decision-making in organizations can be structured from the perspective of 'learning scalability' or 'knowledge gained through suffering' in the following way:

N.2.1 Increased empathy and compassion. Knowledge gained through suffering often leads to a greater understanding and empathy for others who are going through similar struggles. It can provide a unique perspective on the world that allows individuals to connect with others on a deeper level and offer meaningful support.

N.2.2 Greater resilience and adaptability. Suffering can be a catalyst for growth, forcing individuals to confront their limitations and develop new coping mechanisms. This knowledge can help build resilience and adaptability, allowing employees to better navigate future challenges.

N.2.3 Improved self-awareness. Going through difficult experiences can provide valuable insights into one's own thoughts, feelings and behaviors. This knowledge can help individuals identify areas for personal growth and make positive changes in their lives.

N.2.4 Increased appreciation for life. Surviving difficult cognitive experiences can also lead to a greater appreciation for life and a deeper sense of gratitude. This knowledge can help individuals find joy and meaning in even the most difficult circumstances.

N.2.5 Deeper understanding of the human condition. Suffering is a universal human experience and those who have gone through it often gain a unique perspective on the complexities of the human condition. This knowledge can lead to a greater understanding of the world around us and the people who inhabit it.

N.2.6 Prioritize a single variable. In time-sensitive situations, decision-makers often prioritize a single variable over other information, leading to more efficient decision-making and reduced cognitive overload, despite potential misalignment with organizational rules.

N.2.7 Human decision making. As human beings, we have the ability to choose the best method for many situations. This includes understanding, learning and applying established methods, as well as critically evaluating, assessing and coming up with new ideas. We can adapt to new circumstances by using our cognitive abilities, emotions and desire for independence.

In considering manageability as journey and cognition, not as a journey in miles or kilometers, but one in experience and knowledge, we recognize that growth and development are not solely measured by the accumulation of facts and reasoning, but also by the depth and richness of our experiences and competencies. Every person's journey is unique, shaped by their own individual experiences and the positive knowledge they gain from them. By valuing and honoring these experiences, we can cultivate a more compassionate, empathetic, scalable and manageable organization and, more broadly, a society that recognizes the value of every individual's unique journey. Realizing the impracticability of the mentioned above seven rules *(N.2.1 – N.2.7),* human beings who know, realize that all the more, they should strive to fulfil them to make them real and be alive.

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