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# New model for digital sustainable growth: Insights from human biology and surgical approach - a retrospective analysis of 15 years of constant socio-economic innovations at the Human Information Technology Lab, Finland

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## Abstract

**Introduction** Over 15 years, the Human Information Technology Laboratory in Finland has undertaken an exploration of sustainable growth at the nexus of technology, economics, and society. Diverging from traditional academic approaches, this study is dedicated to offering pragmatic solutions.

**Study challenge** Set against the backdrop of technological convergence, this enduring innovation project grapples with the intricacies of economic, societal, and individual challenges. The overarching aim is to transcend theoretical constructs and foster sustainable technological growth, guided by insights from human biology and surgical methodologies.

**Methodology** Unfolding across three distinct phases from 2008 to 2023, the study encompasses transformative projects such as Dream City, Geniementor, Genieteams, Big Data Social Matching, The Navigator, Maestro, and BankRabbna. These initiatives explore different realms like data monetization, personalized education, collective innovation, and the digitalization of national and international labor markets.

**Results and discussion** At the heart of the study is the introduction of the Digital Sustainable Growth Model (DSGM), heralding an innovative governance approach. The DSGM aspires to cultivate adaptable and intelligent technology to propel socio-economic development in the digital era, drawing parallels with the flexibility and intelligence inherent in the human body.

**Outcome and recommendations** Through adeptly addressing various barriers, the study identified a feasible technological solution exemplified by the development of the Growth Model showcased in technologies like Maestro, Fourqan, and BankRabbna. The recommendations underscore the critical importance of fostering international cooperation as an integral aspect of navigating the challenges associated with sustainable growth.

**Keywords** Digital Sustainable Growth Model, Growth Media, Maestro, Fourqan, BankRabbna

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## 1 Background

### 1.1 Evolution of the Growth Theory and the Global Sustainability Paradox

In the intricate mosaic of our societal narrative, economic theories have served as guiding stars, illuminating the pathways of growth. The Solow model meticulously outlined the dynamics of capital, labor, and technology, providing profound insights into economic development (Solow 1956). The intellectual journey continued with Paul Romer's endogenous growth theory, introducing the transformative role of innovation in shaping our economic trajectory (Romer 1990). This ongoing exploration, marked by meticulous investigation and collaborative endeavors, has been fundamental to our progress.

Within this intellectual tapestry, an opportunity for growth emerges – the continuous pursuit of socio-economic sustainability. Aligned with the grand aspirations embedded in the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs), our journey toward their realization unfolds as an intricate odyssey. The undeniable reality of sustained socio-economic sustainability challenges does cast a shadow over our accomplishments, emphasizing the ongoing imperative for inclusive economic sustainability (United Nations 2022; van Niekerk 2020).

### 1.2 Evolution of state models and the Nordic paradox

Navigating the landscape of economic growth theories, it is crucial to concurrently delve into the evolution of modern state models. Despite concerted efforts at all levels – from individual endeavors to global initiatives – the battle for socio-economic sustainability endures. Key performance indicators in various socio-economic realms attest to the resilience of sustainability challenges. For example, despite advancements in employment opportunities, a persistent global struggle with job insecurity and underemployment remains. Income inequality remains a pervasive challenge, highlighting socio-economic disparities that persist despite policy efforts (Hristov and Chirico 2019).

The Nordic model, often lauded for its comprehensive welfare system, for its comprehensive welfare system, stands as a paradox. While it has achieved remarkable social equality, the sustainability of its welfare state faces scrutiny. The burgeoning costs and demographic shifts challenge the traditional welfare paradigm, questioning its long-term viability.

Examining the role of sustainability key performance indicators (KPIs), Hristov and Chirico (2019) underscore their significance in implementing sustainable strategies. These indicators serve as essential tools in gauging and enhancing sustainability efforts across various domains.

Additionally, van Niekerk (2020) contributes to the discourse with insights on inclusive economic sustainability, focusing on the Sustainable Development Goals (SDGs) and addressing global inequality challenges. His work provides valuable perspectives on the intersection of economic sustainability and global socio-economic disparities.

Moreover, Jackson (2009) poses a critical question in "Prosperity Without Growth? The Transition to a Sustainable Economy". This inquiry prompts a reevaluation of traditional notions of prosperity and economic growth, urging a shift toward a sustainable and inclusive economic trajectory.

### 1.3 Unraveling the paradox with concrete socio-economic evidence

The paradox intensifies as our interventions, designed to alleviate socio-economic sustainability challenges, frequently end up exacerbating the very issues we aim to address (Wilson and Vasile 2023). It becomes evident that our comprehension of the root causes is insufficient, resulting in interventions that, unintentionally, worsen the situation. This observation is consistent with the facets of the sustainability paradox identified by Argento et al. (2022). Moreover, the only sustainable achievement thus far seems to be the persistence of the sustainability gap (Vargas-Merino et al. 2023).

The more we strive to untangle the socio-economic sustainability knot, the tighter it seems to become. This paradoxical observation prompts a crucial realization – a paradigm shift is not only desirable but imperative (Ashby et al. 2019).

Concrete socio-economic evidence further underscores the need for a recalibrated approach. For instance, social equality measures, while addressing certain disparities, may inadvertently create new divides. This unintended consequence aligns with the findings of Argento et al. (2022). Economic policies aimed at stimulating growth sometimes fail to address the deeper issues of wealth distribution and access to opportunities (Ashby et al. 2019). The intricate web of unintended socio-economic consequences signals a systemic issue in our approach to sustainability.

### 1.4 Decoding the unsustainability cascade: an orchestrated sociological diagnosis

The pathophysiology of the "sustainability gap" unveils a dual challenge: the stark imbalances between social structures and economic dynamics and the resulting "cascade of stress" from individuals to global communities (Deci and Ryan 2000). Each level is not merely a victim but a contributor, underscoring the imperative for a unified approach.

This widening critical gap, fueled by the relentless pace of change, serves as a crucible for myriad challenges. Picture it as a central nervous system glitch, disrupting the flow of vital information in the sustainability cascade (Scientific and Technical Advisory Council 2020). Miscommunication and a lack of synchronized response mechanisms escalate the socio-economic stress cycle, exacerbating the global sustainability paradox.

The heartbeat of this challenge reverberates in the speed and coordination gap. The world's evolution, especially in the digital era, outpaces the responsiveness of traditional systems. It's not merely a lag but a chasm between demand and supply, innovation and implementation—a gap that jeopardizes the core of sustainability efforts (Vorobyenko 2022).

## 1.5 The unsustainability cascade: simplifying dynamics and explaining the gap

### 1.5.1 Sustainability simplified

Sustainability propels humanity's journey, operating as an engine that relies on a delicate equilibrium between two wheels: the master wheel, represented by humans, and the slave wheel, encompassing all facets of society, including the economy. Human motivation and cognition fuel this engine (Lee and Kwon 2023). Key Performance Factors gauge the balance, encompassing indicators like direction, speed, engine component performance, and the fuel level (Hristov and Chirico 2019).

Maintaining this equilibrium requires a robust feedback loop system for sustainability, characterized by speed and precision in controlling actions and responses within the engine, indicating our level of control.

### 1.5.2 Explaining the sustainability gap

The industrial era portrayed the labor market as a two-wheeled engine, where demand dictated terms to supply. Globalization disrupted synchronization, leading to the economic wheel steering society—a genesis of the "Sustainability Paradox" (OECD 2019). This permeated society, causing various "sustainability gaps" at different levels, resulting in disparities in talent, environment, social aspects, and equality.

### 1.5.3 The digitalization effect on the sustainability engine

In our rapidly evolving socio-economic landscape, the digital economy introduces a paradox demanding immediate attention. Promising unparalleled connectivity and efficiency, it also brings inherent sustainability challenges (Guandalini 2022; Ramakrishna and Jose 2022). As the sustainability gap unfolds, exhaustion grips the human wheel, exacerbated by the transition

from mechanical to digital in the economic realm (Allen and Malekpour 2023). This shift signals a slow-down in growth, jeopardizing our ability to sustain life (Bloom and Zucker 2023).

An evident challenge is the impact on human well-being, reflected in technostress (Rosário and Dias 2023). The younger generation grapples with constant connectivity and information overload, negatively affecting mental health. Complexity is added by the emergence of artificial intelligence (AI), posing existential threats and raising ethical questions (Marín-González et al. 2022).

Urgency to address these sustainability challenges is highlighted by the "now or never" reality (Guandalini 2022; Ramakrishna and Jose 2022). The sustainability gap deepens with digitalization's disruptive force, impacting human cognition and motivation, leading to "Young Aging" (Science Advice Initiative of Finland 2021). Young individuals struggle with integration into the labor market and lack motivation, contributing to a dual aging crisis in society (Ramakrishna and Jose 2022; Science Advice Initiative of Finland 2021; Allen and Malekpour 2023).

Confronted by unparalleled challenges, a transformative imperative emerges, demanding a fundamental reassessment of strategies (Torelli 2021). Our sustainability approach requires a comprehensive diagnosis, understanding the socio-economic stress cycle, the gap between demand and supply, and rapid coordination challenges in our digitalized world (Wang and Chen 2022).

The call for a fresh approach is a rallying cry for a paradigm shift, urging us to discard outdated models (Bloom and Zucker 2023; Bonilla et al. 2018). This is a pragmatic imperative, not a theoretical exercise. The digital age demands departure from conventional thinking and exploration of uncharted territories (Iacovidou et al. 2021; TWI2050 2018).

## 1.6 New perspective for digital economy and sustainable development

Drawing inspiration from the intricacies of the human body, with its 37.3 trillion cells orchestrating over 200 billion reactions per second, offers a profound blueprint for steering socio-economic development in the digital age (Roy and Conroy 2018). This biological marvel serves as a metaphor for our socio-economic fabric, where myriad interactions and changes necessitate harmonious collaboration to address dynamic challenges.

The efficiency inherent in the human body's capacity to exchange rapid and accurate information, responding with precision, stands as an invaluable model for our societal structure (Hekler et al. 2020). It prompts us to envision a global community functioning as a cohesive

and innovative entity, akin to the synchronized efforts of cells and organs within the human body.

The alternative to such strategic collaboration is a perilous journey, akin to being swept away by the storm of digital challenges (Haferkamp and Smelser 1992). Therefore, the true opportunity lies in leveraging digitalization as a potent tool to unify humanity in a synchronized and interconnected effort. This strategic approach mirrors the coordinated dance of cells, exchanging information and responding precisely, offering a viable means to confront the sustainability gap and its dynamic complexities (Hassani et al. 2021).

In the interconnected web of sustainability, the key lies in creating a two-way communication pathway—a highly efficient loop facilitating the exchange of information about changes and updates at each level (Deci and Ryan 2000). From individuals to the global community, everyone must be part of this innovative team, with precisely defined roles and a coordinated response mechanism tailored to unique capabilities.

Imagine a world where every entity, from an individual to a nation, functions as an innovative team. The key lies in orchestrating a synchronized response mechanism, ensuring that every change and update is communicated swiftly and met with a precise response at each level (Scientific and Technical Advisory Council 2020). This orchestration is not a luxury but a necessity for our collective survival in the digital era.

In the digital era, where information travels at the speed of light, survival hinges on our ability to transform the entire world into an innovative, well-coordinated team. The choice is stark: either synchronize our efforts and orchestrate a global solution or face the consequences of a disjointed, unsustainable future. It's a call for humanity to unite as one, innovate as one, and thrive as one on the path to a sustainable global existence (Vorobiyenko 2022; Deci and Ryan 2000).

Our collective destiny at this crossroads depends on the path we choose. It's not merely a decision between adaptation and resistance; rather, it's a profound call to orchestrate our global society as a cohesive and innovative entity. Embracing digitalization as a unifying force becomes imperative, resonating with the resilience and adaptability observed in the intricate workings of the human body. This deliberate choice offers the promise of navigating the digital age with equilibrium and foresight, steering our socio-economic trajectory toward a sustainable future.

### 1.7 Study focus and purpose: navigating 15 years of investigating sustainable societal structures

For 15 years, the Human Information Technology Laboratory has explored applying human body homeostasis

and surgical approaches to societal frameworks, particularly in digital sustainability. Initiated in 2008, this interdisciplinary initiative delves into the feasibility, challenges, and requisite models and technologies.

This article serves as a comprehensive chronicle, transcending theoretical discourse to document a 15-year journey of innovation. It underscores our commitment to an open model study, revealing layers of societal dynamics mirroring biological resilience. Addressing challenges and scrutinizing feasibility, it envisions a future where equilibrium and resilience sculpt our socio-economic landscape.

## 2 Methodology

### 2.1 Introduction to the Human Information Technology

#### Lab

#### 2.1.1 Overview

Established in Finland, the Human Information Technology Lab stands as a unified entity dedicated to research and development on one front and practical applications, innovations, and market deployment on the other. This model is intentionally designed to bridge the gap between academic exploration and real-world impact, embodying a commitment to self-sufficiency by actively seeking revenue streams and private investments. By strategically locating itself at the intersection of theoretical knowledge and tangible applications, the lab effectively addresses the common disparity between academic endeavors and practical outcomes.

Operational dynamics within the lab are governed by a diverse board, bringing together expertise from various realms, including academia and commercialization. The lab's approach involves seeking external advice from other research centers or experts to enrich decision-making processes. The organizational structure is characterized by collaborative, project-centric teams, each operating with defined goals, timeframes, and resources. This framework encourages a culture of autonomous resource management and optimized actions. General management oversees inter-team collaboration, ensuring cohesiveness, tracking the overall strategy, and providing comprehensive reports to the board.

#### 2.1.2 Evolutionary phases

The lab's journey unfolds through distinct evolutionary phases, marked by strategic scaling in size and resources. Expansion aligns with the lab's increasing integration into a broader ecosystem for research, innovation, and pilot deployment. This adaptive growth ensured that the lab remained dynamic and responsive to emerging challenges, contributing to its effectiveness in navigating the complexities of the ever-evolving technological landscape.

### 2.1.3 *Open methodology*

In initiating this open-model study, the deliberate choice to forgo a predefined methodology at the project's commencement was intentional, in harmony with the study's adaptable and dynamic essence. However, the board members, after several refinements, established a comprehensive set of clear guidelines. This included a list of crucial 'decisions' conveyed to the execution team as 'actions' during implementation. Throughout this phase, the execution team provided regular updates to the board, receiving valuable feedback that steered them in maintaining equilibrium between the social and economic domains. This iterative process ensured a resilient and systematic approach to effectively navigate the complexities of the sustainability cascade.

## 2.2 *Guidelines for the open methodology*

### 2.2.1 *Starting at the roots*

- Decision: Engage with the sustainability cascade from a deeply rooted individual level.
- Action: Initiate personal professional career switches, entering the labor market with entirely new roles, progressing through different levels with diverse switches.

### 2.2.2 *Establishing the Human Information Technology Laboratory*

- Decision: The laboratory would be an integral part of the experiment, functioning as a private entity independent of public funding, aiming to withstand socio-economic demands.
- Action: Formulate and establish the laboratory, ensuring it survives and thrives within the evolving socio-economic landscape.

### 2.2.3 *Balancing social and economic domains*

- Decision: Maintain balance at all stages between the social and economic domains.
- Action: Prioritize equilibrium, ensuring that neither domain overshadows the other, fostering a harmonious integration.

### 2.2.4 *Mastering problem-solving skills*

- Decision: Consider problem-solving skills as the primary survival tool.

- Action: Focus on developing and honing in-depth problem-solving capabilities, recognizing their significance in navigating the sustainability cascade.

### 2.2.5 *Scientifically rooted approaches*

- Decision: All approaches and innovations should originate from well-verified scientific concepts, translating into fully applied solutions practically used in the labor market.
- Action: Ground every initiative in scientifically validated principles, ensuring practicality and relevance to real-world challenges.

### 2.2.6 *Systemic, scalable, and transferable approaches*

- Decision: Ensure that every approach is systemic, scalable, well-documented, and transferable.
- Action: Develop methodologies that are not only effective on a small scale but can be expanded, documented comprehensively, and transferred to diverse contexts.

### 2.2.7 *Global perspective*

- Decision: All projects must have a global orientation.
- Action: Implement initiatives that transcend geographical boundaries, contributing to global knowledge and progress.

### 2.2.8 *Equal opportunity and objectivity*

- Decision: Teams in different projects should offer equal opportunities to individuals from diverse global backgrounds, avoiding exclusion, and maintaining objectivity.
- Action: Foster inclusive teams that embrace diversity, ensuring everyone has an equal chance to contribute without bias.

## 2.3 *Evolutionary phases of methodology: a retrospective analysis*

As the study concludes and the Human Information Technology Laboratory fulfills its mission, the focus shifts towards analysis and documentation. In

retrospective contemplation, we discern distinct phases in the evolution of our methodology. These stages have not only shaped the trajectory of our study but have also contributed to the broader understanding of sustainable socio-economic development:

### 2.3.1 *Foundation and consultancy phase (2008–2010)*

The laboratory's initial phase unfolded within a dynamic economic landscape, commencing amidst the tumultuous backdrop of the 2008 financial crisis. The primary objective during this phase was to gain a comprehensive understanding of the intricate dynamics governing micro-macro-economic functions. This understanding was cultivated through immersion in real-world events, spontaneous learning, and extensive research and development efforts. Operating as a consultancy service, the laboratory aimed to bridge the chasm between academic theories and practical realities.

### 2.3.2 *Product development phase (2011–2023)*

*Dream City* project: Within the framework of this project, the emulation of Nokia's trajectory served as a focal point for assessing innovation capabilities. A collaborative effort from a diverse, multinational team aimed to project human resilience and innovative potential, particularly in challenging circumstances. The ultimate result of this endeavor was the formulation of the Human Information Technology Lab R&D strategy, outlining a visionary roadmap extending until the year 2050.

*Novogenie (2011–2012)* Novogenie served as the catalyst for BankRabbna's development, laying the foundational groundwork for exploring the transformative potential of data monetization.

*Geniementor (2013–2014)* Geniementor marked a pivotal moment in personalized education and innovation engagement, building upon Novogenie's foundation.

*Genieteams (2015–2016)* Genieteams demonstrated the power of collaborative innovation, emphasizing the role of collective creativity in organizational and national progress.

*Big Data Social Matching (2017–2018)* Collaborating with Tampere University of Technology, the laboratory developed a cloud service prototype designed to match city members, enhancing local economies.

*The Navigator (2018–2019)* A significant project aimed at digitizing the labor market, The Navigator aligned closely with Nobel laureate Paul Romer's growth theory. It delved into the ways technology and innovation drive sustained economic growth in the labor market.

*Maestro (2020–2022)* The Maestro project epitomized core capabilities of the navigator, with a focus on data monetization, personalized assistance, and secure digital interaction. Designed for operation within a specific country, it promoted national development within a secure digital framework.

*BankRabbna (2023–)* BankRabbna: Decentralizing Welfare with Ethical FinTech Concepts. BankRabbna stands as a distinctive fusion of socio-economic services, providing international accessibility to individuals across the globe—a democratization of welfare. Inclusive of principles and digital economic FinTech concepts, this project empowers individuals to leverage advanced digital tools while upholding ethical financial principles.

*Fourqan (2023–)* The AI Guardian, our latest endeavor, serves as a personal assistant with a primary mission to ensure user safety amidst the cognitive and digitalization hazards posed by artificial intelligence.

### 2.3.3 *Documentation and productization phase (2022–23)*

This approach, documented as the know-how of the Human Information Technology Lab, has transformed it into an innovative and unique research and innovation center. This lab may well be one of a kind globally, specializing in the digital economy and sustainability, with a specific focus on the digitalization of the economy.

### 2.3.4 *Scientific publication and dissemination phase (2023–)*

Upon the complete maturation of our extensive experience and a firm commitment to practical application, this pivotal phase is dedicated to fostering interaction with brilliant scientists and experts worldwide. It entails active engagement with academic and technical stakeholders, fostering discussions, and collaborating for continuous improvements.

Simultaneously, our focus extends to cultivating comprehensive public awareness about the hope for sustainability. The goal is to inspire collaboration for global peace, with a specific emphasis on reaching grassroots communities. Notably, our efforts are directed towards the younger demographic, encouraging their active involvement in preserving and enhancing their cognitive abilities for a sustainable future.

## 3 Results

In the context of addressing the sustainability gap, we employ the term "sustainability levels" to delineate the progression of this gap through various interconnected stages: individual, family, national, regional, and international.



The overall results of our 15-year innovation endeavor can be classified into three distinct categories:

1. **“Know-How To” Book Series:** Comprising six volumes, this book series serves the purpose of comprehensive documentation, offering an in-depth account of the entire 15-year experience. It functions as a guide for deploying the new model across different levels—individual, family, national, regional, and international.
2. **Digital Sustainable Growth Model (DSGM):** A singular socio-economic model developed as a fundamental framework for fostering sustainable growth in the digital era.
3. **Technology Applications:** Three distinct technology applications, each representing varying levels of prototyping maturity:
  - **AI-Forqan Framework:** A sophisticated AI training framework with built-in safety measures.
  - **Maestro Platform:** A multimodal decision-making platform designed for the full implementation of the DSGM at the national level.
  - **BankRabbna Platform:** Another multimodal decision-making platform tailored for the full implementation of the DSGM at the international level.

#### Explanation of each category of the results:

### 3.1 Highlights of each book within the “Know-How To” series

#### 3.1.1 Individual level

##### “WHY”

- *Objective:* Explores the intricate connection between mental well-being, individual motivation, and socio-economic sustainability.
- *Empowerment Focus:* Aims to empower individuals to take the lead in shaping the economy, emphasizing a reversal of the traditional relationship.
- *Key Themes:* Mental health, personal motivation, and the pivotal role of individuals in fostering socio-economic sustainability.

##### “Learn Innovation Your Style”

- *Objective:* Introduces innovative approaches tailored to individual personality traits, fostering creativity and problem-solving.

- *Individualized Strategies:* Recognizes the diversity of individual thinking styles and provides strategies to enhance innovation based on these differences.
- *Implementation:* Practical insights on applying digital technology to streamline and enhance individual innovation activities.

##### “Sustain Your Ability”

- *Objective:* Synthesizes the insights from the preceding books into a panorama, guiding readers on how to actively participate in the sustainability of their lives.
- *Holistic Sustainability:* Encourages a holistic approach to sustainability that encompasses personal, mental, and socio-economic well-being.
- *Actionable Guidance:* Provides concise and actionable guidance for individuals to contribute to overall sustainability.

#### 3.1.2 Family level

##### “Sweet Marriage Twist”

- 1.1 *Objective:* Introduces the concept of collaborative problem-solving within the family, promoting constant innovation.
- 1.2 *Insights for Couples:* Offers insights and strategies to navigate the complexities of marriage in the Western world.
- 1.3 *Cascade Breakthrough:* Aims to minimize socio-economic stress within families and disrupt the progression of the sustainability cascade.

#### 3.1.3 National level

##### “Finland Diagnosed” and “Breath The Truth”

- *Objective:* Uncovers concealed obstacles to citizen growth globally, with a focus on developed countries like Finland, Canada, and New Zealand.
- *Sustainability Cascade Exploration:* Explores the sustainability cascade and identifies paradoxical methods of interventions in a society, using Finland as a focal point.
- *Global Insights:* Provides global insights into addressing sustainability challenges at the national level.

### 3.1.4 Regional and international level

#### “3.0 PAUL ROMER’S Case Use”

- **Objective:** Explores the implementation of the EU Single Market as an international approach for socio-economic sustainability.
- **Digitalization Feasibility:** Evaluates the feasibility of digitalizing this international approach using real technology-based applications.
- **Comprehensive Impact:** Examines the holistic impact, including effects on mental and physical well-being alongside financial gains, of implementing this international model.

### 3.2 The main five components of the DSGM

This innovative model holds the potential to reshape the economic landscape by fostering sustainable digital growth while prioritizing individual well-being and economic stability.

#### 3.2.1 Sustainable Growth Theory (SGT)

*“Sustainable Growth Theory (SGT) asserts that all entities, including natural resources, money, time, and talent, can be represented as data. Data serves as a new form of energy, analogous to energy sustainability principles, allowing for transformation and transfer. This forms the foundation for sustainable growth, requiring technology to facilitate data circulation within communities for socio-economic advancement. Achieving equilibrium, akin to biological systems, is essential for this growth, measured through the Growth Sustainability Key Performance Indicator.”*

#### 3.2.2 Growth Sustainability Key Performance Indicators (GSKPIs)

GSKPIs are a fusion of specific economic and social indicators interlinked to mirror sustainable human growth. On one side, they encompass factors like GDP, innovation index, productivity index, and total debt, while on the other side, they encompass metrics like marriage rate, birth rate, psychological well-being, and crime rate. This holistic framework offers insight into the overall equilibrium within the community, gauging its ability to foster and sustain growth.

#### 3.2.3 Sustainable State Model (SSM)

Considering the insights gleaned from the Sustainable Growth Theory and its KPIs, a paradigm shift leads to the reevaluation of the conventional “Welfare State Model”,

deemed unsustainable in developed Western nations. *The Sustainable State Model encompasses:*

- **Value:** The core state value is peace, fostered by equitable equality and prudent democracy. The state’s role is to safeguard citizens’ freedom and privacy through advanced technology, while preserving digital sovereignty.
- **Social:** Personalized care spans various sectors across individuals’ lifetimes, tailored to their unique attributes and needs, yielding cost-effective services.
- **Economic:** Continuous innovation becomes a norm driven by the Sustainable Growth Theory. Recognizing talent as the richest natural resource, nurturing and sharing innate creativity is a government imperative.
- **Financial:** Transitioning from conventional “labor-tax” transactions to digital “data-value” transactions bolsters economic resilience. Data, an asset, can transform into diverse forms of value like services, products, currency, or bonds.
- **Digital:** A virtual counterpart to the physical state operates as a 24/7 intelligent decision-making hub, offering services and support. It acts as a buffer against global crises and fosters economic and financial independence.

#### 3.2.4 The Sustainable Growth Technology (SGT)

Essentially, SGT is the indispensable technology for executing the growth theory and its applications. Termed Growth Media, it represents the evolution of social media. The concept behind Growth Media is to provide all segments of society - individuals, institutions, businesses, and governments - with tools to manage the equilibrium between social and economic advancement. It facilitates ongoing, intelligent information exchange among these societal elements.

Technically, Growth Media constitutes a multi-modular digital network that interlinks every facet of a single community. Each individual gain authority over their private data and comprehension of their online interactions. This empowerment empowers them to utilize this data for solving challenges and fostering innovation - pivotal processes for maintaining sustainable growth in social and economic realms.

The problem-solving endeavor may be confined to ad-hoc groups or broadened to encompass entire communities. Ultimately, the network empowers society to leverage its information to steer its growth trajectory.



### 3.2.5 Applications of growth media

*The Maestro* This multinodular network represents a nationwide implementation of the Sustainable State Model:

It seamlessly connects the government, companies, and individuals within a country to foster their well-being. The Maestro Network serves as the next-generation welfare model. It requires meticulous design specifications that facilitate the problem-solving process and safeguard control and information privacy. Additionally, measures are implemented to ensure user data protection while they engage with other online networks.

These design specifications adhere to criteria established in the Laboratory, spanning from the Dream City Clubs model to the ultimate configurations of the Maestro Network. As a result, Maestro transforms into an intelligent socio-economic network that establishes digital boundaries and upholds a country's sovereignty.

*BankRabbna* A Pioneering Innovative Digital Technology for the 17 SDGs:

The conventional understanding of banking, originally devised to manage physical assets and monetary resources, has evolved significantly in the wake of technological advancements. This evolution extends beyond traditional parameters, encompassing intangible yet valuable assets such as time, data, talent, and ideas. As we enter an era of unprecedented interconnectedness, the imperative of sustainable development has taken center stage. Addressing the United Nations' 17 Sustainable Development Goals (SDGs) has become paramount, necessitating innovative solutions that traverse diverse fields.

*Fourqan* In essence, the development and deployment of tailored AI models stand as a pivotal strategy for nations aiming to harness the transformative potential of artificial intelligence. This approach not only aligns with the distinctive identity of each country but also acts as a cornerstone for national development, innovation, and sustainable progress. Key Features of the National AI Models:

- **Personalized Service:** The customized AI models prioritize delivering personalized services to citizens. This tailoring ensures that individuals receive solu-

tions and support that resonate with their unique needs, enhancing the overall citizen experience.

- **Constant Innovation:** Embedded within the framework of the national AI models is the commitment to fostering a culture of constant innovation. This dedication to ongoing creativity becomes a driving force, propelling the nation forward in the rapidly evolving landscape of technology and societal progress.

- **Human Cognitive Friendly:** The model is trained not only to provide assistance but also to co-develop and train users to enhance their cognitive functions. It encourages individuals to actively participate in the development of their cognitive abilities, promoting self-sufficiency and preventing complete dependence on the AI system.

## 3.3 The sequence of concrete outcome and examples

### 3.3.1 PROGRESS 1

The cornerstone for initiating sustainable progress lies in establishing a well-founded motivation, essentially providing a robust answer to the fundamental question, "WHY". This necessitates commencing at the individual level, triggering motivation within each person to instigate collaborative efforts.

This pivotal concept is thoroughly elucidated in the book titled "WHY", where a structural presentation explores the activation of our innate capabilities for seeking peace and harmony. The book substantiates its assertions with scientific evidence, delving into the distinctions between right and left-brain functions and emphasizing the role of the corpus callosum in coordinating these functions.

The differentiation and coordination between these brain functions are directed towards aiding the optimization of abstract and objective information processing. This optimization serves as a constant foundation for generating solutions, fostering harmony within ourselves and in our surroundings.

Building upon these foundational aspects, the subsequent sections of the book went into various levels of coordination, illustrating the efficacy of communal living in perpetuating continuous socioeconomic well-being. Additionally, the book sheds light on the limitations posed by information overload and explores the disruptive impact of digital life on cognition and behavior.

### 3.3.2 PROGRESS 2

The groundwork laid in the book "WHY" serves as a springboard for the subsequent exploration in the book "Learn Innovation Your Style". This book is dedicated to maximizing individual contributions within collaborative

problem-solving endeavors, particularly in the realm of social or professional life. Documenting the outcomes of our efforts, it articulates the most convenient approach to adopting a digital tech strategy for streamlining innovation activities.

Within the pages of this book, we elucidate the findings that establish a connection between the cognitive science principles of Carl Jung, encompassing the eight cognitive functions, and their alignment with various phases and roles in the innovation process. This alignment forms the bedrock for creating algorithms utilized in different platforms, such as Novogenie, designed for social interactions and informal collaboration to enhance innovation capacities within a social framework.

Furthermore, the book explores additional applications that focus on the seamless development of innovations. Two platforms, namely GenieTeam and Geniemontor, were instrumental in testing the viability of integrating work and training seamlessly. This integration, undertaken as a subtle element, has proven to be inspiring, fostering a sense of continuous personal development among individuals involved in these collaborative efforts, transcending mere financial incentives.

### 3.3.3 PROGRESS 3

The applications of these findings unfold in two strategic directions. The first trajectory is explored in the social sphere, elucidated in the book “Sweet Marriage Twist”. This publication unveils a novel perspective on marriage, envisioning it as an innovative team with a primary objective of fostering collaboration for effective problem-solving between partners. Beyond the immediate benefits, the book also articulates the broader goal of transferring this collaborative concept to the next generation, ensuring a continuous legacy of problem-solving skills. The overarching purpose of “Sweet Marriage Twist” is to enhance the quality of couple life, mitigate socio-economic stress, and disrupt the progression of the sustainability cascade into further and more positive levels.

### 3.3.4 PROGRESS 4

The second application of these findings extended to broader scopes, encompassing national and international levels, with a specific focus on scaling the results for implementation in the labor market. The objective was to address the efficiency of the labor market and bridge the gap between demand and supply.

An initial challenge encountered in this process was the fragmentation of the digital market for unemployment products, lacking a standardized approach to digitalization. To overcome this challenge, a comprehensive analysis of available platforms worldwide was conducted,

leading to the formulation of a unified standard. This standard aimed to evaluate the efficiency of digital products, assess skills sets, maintain individual motivation for continuous lifelong learning, facilitate easy transfer or switching of skill sets, offer diverse opportunities for contribution in the labor market, and foster innovation.

This standardized approach evolved into a groundbreaking concept known as the “Talent Stock Market”, operating on principles akin to the stock market. The core premise of this innovative concept was to empower individuals to create the maximum possible value from their time spent in both the digital and physical realms. Leveraging technology, particularly the Navigator platform, individuals could capitalize on this value, earning credits and continually offering their skills in the innovation market. This has been after screening the entire categories of the Talent technology using the following evaluation standard:

#### **Standardized Scoring System for Talent Platforms in the Labor Market**

**Introduction:** A standardized scoring system is crucial for effectively comparing and distinguishing diverse talent platforms in the labor market. The absence of a manual for best practices led to the development of a systematic evaluation framework based on the NICE handbook, focusing on the Academic Training of Career Guidance and Counselling Professionals in Europe.

**Scoring Methodology and Basics:** The evaluation covers key dimensions crucial for effective career guidance:

#### 1. **Assessment (Max. 30 points):**

- *Duration (Max. 6 points):* Score based on test duration (1 point per 15 min).
- *Engagement (Max. 5 points):* Evaluate user engagement (scale 1–5), multiplied by duration score.
- *Accuracy Impression (Max. 9 points):* Assess accuracy impression of test outcomes (5 points).

#### 2. **Credibility (Max. 6 points):**

- Analyzes user’s ability to influence outcomes and whether the platform provides content or advice (0 or 3 points each).

#### 3. **Usability (Max. 50 points):**

- Judged on a scale of 1 to 5 for 10 sentences, totaling 50 points for digital development.

#### 4. **Gamified Testing (Max. 3 points):**

- Scored based on assessment experience quality.

#### 5. **Social by Design (Max. 40 points):**

- Evaluates four features on a scale of 0 to 5, emphasizing social aspects for system performance.

#### 6. **Backend Algorithm Precision (Max. 15 points):**

- Rewards precision in career matching (1 or 2 points), connecting users with real-world opportunities.

#### 7. Cost (Max. 5 points):

- Free systems earn five points for wider reach; deduct 5 points if there's a monthly fee.

#### *Interpretation of Total Scoring:*

- **0–30 Points:** Low Performance - Requires significant improvements across multiple dimensions.
- **31–60 Points:** Basic Competence - Adequate performance but lacks excellence in certain aspects.
- **61–90 Points:** Good Performance - Demonstrates proficiency with room for refinement.
- **91–120 Points:** Excellent Performance - Strong overall performance with commendable strengths.
- **121–144 Points (Maximum):** Outstanding Performance - An exemplary talent platform excelling in all evaluated dimensions.

The Talent Stock Market transformed the dynamics of interaction between citizens and businesses, establishing an equitable relationship resembling buying and selling in a traditional stock market. Individuals contributed ideas, feedback, skills, time, and effort to businesses based on the exchange of valuable data. This revolutionary process, extensively detailed in the book “3.0 PAUL ROMER’S”, not only outlined the step-by-step creation of this standard but also demonstrated its practical application through the development of an application for the Digital Single Market in the EU.

#### 3.3.5 PROGRESS 5

The insights derived from the Talent Stock Market concept laid the groundwork for the subsequent phase: the structuring of all state functions to foster a balanced relationship between businesses and citizens across various stages of development. This endeavor led to the conceptualization of the “Maestro”. Functioning as a multimodal decision-making system, Maestro is founded on the systematic integration of governmental and private digital transformations within a harmonized national digital environment accessible to individuals, private entities, and public sectors alike.

In essence, Maestro serves as the digital twin of the nation, enabling individuals from birth to death to navigate and process their information, making informed decisions. This innovative platform goes beyond mere information processing; it provides personalized socio-economic services spanning education, health, social welfare, and the economy. The underlying framework of Maestro is bolstered by a national model of AI named “Al-Forqan”.

Al-Forqan operates as an AI system uniquely tailored to each country, aligning with its specific values, constitution, and legal framework. The primary function of Al-Forqan is to actively contribute to and promote the growth of the nation by leveraging artificial intelligence in a manner consistent with the foundational principles of that particular country.

#### 3.3.6 PROGRESS 6

Throughout the progression of sequential innovations, a profound realization emerged: the feasibility of establishing a digital media platform that facilitates a fast, efficient, and coordinated loop for the exchange of information and prompt responses. This realization marked the technical manifestation of our visionary concept, backed by detailed know-how. We coined the term “Growth Media” to describe this transformative digital medium, positioning it as the next generation of media succeeding social media.

The most recent innovation involved elevating the Maestro concept to a global scale to address the disparities in developmental speed among nations. This culminated in the creation of the international version of Maestro known as “BankRabbna”. This platform enables 24/7 access to socio-economic services worldwide. Importantly, BankRabbna aligns with the 17 Sustainable Development Goals (SDGs) and provides a cost-effective, comprehensive digital tool to ensure the attainability of these global objectives.

## 4 Discussion & outcome

Throughout this discourse, we employ our original analogy as a backdrop—a **surgical approach**—to navigate the intricacies of the sustainability gap. In this narrative, we metaphorically depict the entire scenario as a surgical operation, enhancing clarity and facilitating a comprehensive understanding. The “sustainability gap” represents the ailment, and “the body” signifies the socio-economic fabric on both national and international levels.

This medical approach encompasses various elements:

- **Diagnosis:** Drawing parallels to the medical field, we engage in a diagnostic process to identify the root causes of the sustainability gap. This involves a meticulous analysis of economic, social, and technological factors contributing to the challenge.
- **Surgical Intervention (Root Cause Handling):** In the surgical context, this corresponds to addressing the identified root causes. Our approach involves digital innovation as the operative procedure—a methodical and targeted intervention to tackle the core issues contributing to the sustainability gap.

- Operations (Digital Innovation): Analogous to surgical operations, digital innovations serve as the procedures undertaken to rectify the diagnosed issues. These innovations are strategic and precise, aiming to bring about transformative changes in the socio-economic fabric.
- Outcome: Finally, akin to assessing the success of a surgical procedure, we evaluate the outcomes of digital innovations in addressing the sustainability gap. This involves analyzing the impact on economic stability, social well-being, and the overall resilience of the socio-economic structure at both national and international levels.

#### 4.1 The approach

Indeed, employing this medical analogy proved highly effective. Tackling the complexity of the sustainability gap posed a unique challenge with no existing benchmarks or guidelines (Kurien 2004). Utilizing the medical analogy provided an abstract blueprint, offering a systematic and step-by-step approach to navigate the intricate landscape. This approach proved efficient and clear, providing a well-balanced mix of scientific academic knowledge and swift, effective deployment in the real world, fostering progress with vigilance.

The systematic approach facilitated the identification of parallels between the roles of a System Analyst and a Surgeon (Forrest et al. 2020). The use of innovation and digitalization served as the surgical intervention for this chronic and complex socio-economic problem. Not only was this approach effective, but it also demonstrated scalability and transferability to other centers and professionals, whether within academic institutions or research and development in business (Alter 2004).

Diverging from the design thinking approach, our method exhibits a notable distinction by emphasizing precision in reaching the root cause for treatment or intervention (Buchanan 1992). In comparison, design thinking often falls short in achieving this level of accuracy, leading to a false sense of progress that, upon closer examination, reveals lingering problems or even worsening conditions. This discrepancy may contribute to the persistent and widening nature of the sustainability gap. Despite ambitious initiatives such as the 17 Sustainable Development Goals (SDGs) and earlier Millennium Goals, the anticipated level of results, relative to the resources invested, remains elusive (van Niekerk 2020).

Another dimension that enhances the efficiency of our approach is the personal motivation embedded in the decision to address the sustainability challenge independently, free from public funds (Sosa 2015). This deliberate choice creates a power dynamic at the survival

instinct level, compelling us to relentlessly pursue progress and explore various avenues for advancement. This sense of urgency is often lacking in governmental, academic, or professional entities focused on sustainability, where funding options may create a more comfortable and relaxed environment. While this condition fosters a semblance of motion, it often results in stagnation of the underlying problem (Haferkamp and Smelser 1992).

In contrast, our approach, driven by a constant need for survival and progress, generates innovation within the lab. While replicating this specific environment may not be advisable, there is a need to instill a healthy level of stress and motivation in other workplaces dedicated to sustainability. The concept of “innovate or die” has historically proven to be a natural survival mechanism, compelling entities to innovate in response to challenges (IOSCO and OECD 2018).

#### 4.2 The diagnosis

At the heart of socio-economic stress and the sustainability gap lies the root cause—an imbalance in power that has evolved over time between demand and supply, represented by individuals and businesses. Any viable solution must commence by rectifying this foundational issue, thereby restoring balance. This diagnosis elucidates why previous attempts to eliminate the sustainability gap have fallen short and uncovers the paradox of intervention—addressing the restoration of uneven power dynamics between citizens and businesses through their transactions.

The term “uneven power” essentially encapsulates the concept of inequality, a focal point among the 17 Sustainable Development Goals (SDGs). However, the diagnosis reveals that this issue extends beyond limited contexts, such as gender pay gaps or justice and human rights, and permeates various layers of our socio-economic fabric. Uneven power manifests more broadly than the localized levels typically addressed, with the economic domain reaping the benefits of technological advancement and automation at a faster pace than the social sphere. Consequently, the economic side gains more power, assuming the role of the master driver, while the social system becomes subservient, tasked with serving and sustaining the economic master.

Notably, the impending digitalization further accelerates this power shift, propelling the economic side into a higher gear and exacerbating the already substantial gap with the slower-paced social side. This precise and clear diagnosis directs attention to the nature of the issue and underscores the urgency of intervention in a highly specific manner.

### 4.3 The intervention

Building upon the earlier diagnosis, we now comprehend that the chronic issue of sustainability has morphed into an entirely new and urgent form, assuming an acute nature. This transformation elevates the status and urgency of the matter within the community, necessitating heightened attention and a concentrated effort to find swift solutions, akin to an acute surgical procedure (Csikszentmihalyi 2008; Pink 2011; Locke and Latham 1991).

For instance, in developed nations, a longstanding symptom of uneven power was the decline in birth rates. However, the current landscape presents more acute manifestations, such as a persistent increase in psychological illnesses (Kessler et al. 2005). Additionally, psychologists themselves are grappling with unprecedented rates of decompensation and burnout, highlighting the urgency of addressing an acute problem without an immediate solution, which is intensifying (Amabile 1996).

This stress has triggered a cascading effect on sustainability gaps, leading to an upsurge in violence within Nordic communities, new forms of crimes across different age groups, and unexpected incidents of violence in schools, including bullying, harassment, physical altercations, and even drug dealing. The list could go on, detailing the symptoms and signs of exacerbating the sustainability gap from chronic to acute levels across various domains, including health system overload, social service strains, and unemployment (Wang and Chen 2022; Li et al. 2022; Kretschmer and Khashabi 2020).

In response to this urgency, adopting a medical blueprint, akin to stabilizing vital signs before surgery, we took preemptive life-saving measures. This involved fully documenting all necessary solutions at every level in books and disseminating them among different strata, with a focus on self-help, particularly for psychological and family issues. Simultaneously, scientific publishing was pursued to share these findings at expert and decision-making levels, drawing attention to the acute nature of the problem and laying the groundwork for innovative interventions (Légaré et al. 2018).

### 4.4 The procedure

To facilitate engagement of all stakeholders in a unified procedure and signify the restoration of balance, diverse forms of representation in both physical and digital realms were implemented. For instance, at the macroeconomic level, the equation was framed as:

$$\text{Social} = \text{Economy}$$

At the microeconomic level, the equation took the form:

$$\text{Consumer} = \text{Business}$$

This approach eradicated the illusionary boundary between macroeconomics and microeconomics, emphasizing a clear message that all must strive towards a common goal. To achieve this goal, economists should adopt a socialist perspective and vice versa (Brynjolfsson and McAfee 2014; Digital Single Market, European Commission; Porter and Heppelmann 2014; Kraus et al. 2021).

From a technical perspective, our digitalization, likened to a surgical procedure, is grounded in the well-established theory of endogenous growth proposed by Paul Romer. We developed digital applications for the popular AK model (Romer 1990). Romer's work substantiates that leveraging innovation is the key to economic growth. It became evident that the ultimate function of our digital model is to continuously channel the innovation process at all sustainability levels, 24/7 worldwide. Although Romer's work originated in the early stages of the digital economy era, mainly describing productivity during the industrial period, its relevance persists in the contemporary digital economy era. Considering digital thinking and options, we redefined Romer's theory to align with the urgency of the sustainability gap in both historical and future contexts. The outcome of this endeavor is the Digital Sustainable Growth Model.

### 4.5 Discussion the main outcome which presented in the results section earlier: Digital Sustainable Growth Model and its applications

The transformative journey illuminated crucial lessons that underscore the significance of restoring balance in the power dynamics between demand and supply, i.e., individuals and businesses. The pivotal concept that emerged from this exploration is the "citizen transaction", a mechanism seeking to redress the historical power imbalances between citizens and businesses.

Sustaining this transaction necessitates a comprehensive approach, envisioning the automation of the labor market and the broader societal landscape. This envisaged automation functions as a closed loop, facilitating the constant exchange of information with swift responses—a concept encapsulated in the idea of a "smart nation" led by the Maestro decision-making system.

Moreover, fostering global connectivity is imperative. The BankRabbna platform emerges as a dynamic force in this regard, uniting people across the globe within a more agile framework. This connectivity aims to level the playing field, creating equal opportunities for welfare among individuals globally.

The integration of these mechanisms holds the promise of eliminating gaps, whether within a nation or on a global scale. It introduces novel possibilities for an

effective and sustainable approach to achieving goals across various levels, ultimately contributing to the realization of sustainability objectives worldwide (Barkalova et al. 2016; Farmer and Axtell 2022).

#### 4.5.1 Core component of sustainable digital growth model

A pivotal discovery at the heart of this model is the concept of the citizen transaction. This transaction aims to restore equilibrium between the demand from businesses and the supply of talent. Achieving this balance is made possible by empowering citizens with appropriate technology, allowing them to harness the value of their data throughout their life cycle, from birth to death. Simultaneously, this technology aids individuals in leveraging their talents to actively contribute to the innovation process in the labor market, ensuring a continuous cycle of contribution from birth to death (Thomas et al. 2023; Sorescu 2017; Fischli 2022; Micheli et al. 2020; Chen et al. 2023; Stienstra et al. 2010).

#### 4.5.2 Key elements

**Data Value Leverage:** The model emphasizes empowering citizens to leverage the value of their data responsibly. This involves creating opportunities for individuals to benefit financially from their data throughout their lifetime, while prioritizing data privacy.

**Talent Contribution:** Through technology, individuals are enabled to actively participate in the innovation process within the labor market. This continuous engagement with the workforce enhances the overall innovation cycle.

**New Revenue Model:** The proposed model introduces a novel revenue stream to the economy based on data mining and the seamless integration of individuals into the innovation process. This new economic model aims to ensure that everyone has a consistent income throughout their lives.

#### 4.5.3 Existing citizen transaction and challenges of fragmentation

The Citizen Transaction, though present in the market, grapples with fragmentation issues. Various revenue-sharing models, encompassing data or talent, exist in isolation. This includes advertising models employed by tech giants, content production platforms, open innovation hubs, freelancers' platforms, and entities engaged in market surveys or data collection. The major challenge lies in the absence of coordination and a unified comprehensive framework to harmonize and optimize the synergy among these diverse approaches. Lifelong learning platforms also face fragmentation,

hindering efforts to offer a cohesive and unified educational experience:

- **Coordination Dilemma:** The lack of a cohesive framework poses challenges in optimizing the overall balance between diverse revenue-sharing and learning approaches. The absence of effective coordination results in the underutilization of available resources.
- **Paradox of Incremental Approaches:** While different market players have attempted to incrementally address individual needs, this fragmented approach inadvertently leads to a paradox. The absence of a unified standard leaves stakeholders without a comprehensive system to coordinate innovations, establish a standardized crediting mechanism for recognizing lifelong informal learning, and implement robust career guidance.

#### 4.5.4 Expected outcomes

- **Economic Impact:** The model anticipates a positive economic impact by creating a sustainable revenue model. It reduces the burden on governments by generating additional tax revenue and minimizing expenses associated with unemployment and its associated mental and physical health challenges (Zhang and Huang 2023).
- **Constant Income:** Citizens, under this model, are provided with the opportunity for a continuous and reliable income stream throughout their lives, contributing to financial stability and well-being (Biller-Andorno et al. 2023).
- **Innovation Streamlining:** By actively involving citizens in the innovation process, the model facilitates a dynamic and continuous cycle of innovation within the labor market (Porter and Heppelmann 2014).

#### 4.5.5 Distinguishing features of the model

- **Holistic Sustainability Approach:** This model comprehensively addresses sustainability gaps at all levels—individuals, families, government, and the international community. By providing a unified framework, it aims to bridge gaps and create a sustainable ecosystem (Greco and Feroci 2020).
- **Integration of Social and Economic Dynamics:** The Sustainable Digital Growth Model integrates both realms, recognizing the symbiotic relationship between social and economic dynamics, present-



ing a more comprehensive understanding of societal development (Gu 2023).

- **New Socio-Economic Paradigm:** Positioned as a new socioeconomic model, the Sustainable Digital Growth Model advocates for a paradigm shift. It introduces elements distinct from traditional approaches to economic and social modeling, emphasizing an interconnected and balanced framework (Kraus et al. 2021).
- **Real-Life Application:** The model has not been confined to theoretical frameworks but has undergone real-life testing since its inception. This practical validation sets it apart from models developed solely in controlled environments (Bouchard 2020).
- **Platform Economy Integration:** Acknowledging the importance of platform economies, the Sustainable Digital Growth Model embeds itself within the platform economy framework. It serves as a practical guide, detailing the nuances of real-life applications in the evolving landscape of platform economies (Gu 2023).
- **Comprehensive “Know How” Series:** A series of comprehensive books titled “Know How To” accompanies the model. These books serve as a detailed resource, providing practical innovation know-how for entities involved. This ensures a clear and accessible pathway for open innovation adoption (Zhang and Huang 2023).
- **Anticipation of Current Economy Limitations:** The Sustainable Digital Growth Model demonstrates foresight by addressing the limitations of the current economy, particularly the cognitive hazards associated with Artificial Intelligence (AI). By proactively considering potential pitfalls, the model seeks to create a resilient and cognizant socioeconomic environment (Porter and Heppelmann 2014).

#### 4.5.6 *Illustration of the impact of the outcome on different levels of the sustainability gap*

This impact is hypothetical, fulfilling the wishes expressed either in some academic work or by other stakeholders who have identified the need for such outcomes or certain elements from it in ongoing activities. Throughout the innovation phases, we incorporated all these elements into our innovation, striving to satisfy them through the creation of feasible features and functionality. However, they remain a matter of thesis that will require further scrutiny and fine-tuning when the actual deployment of the entire model occurs, involving different stakeholders in a more detailed tuning process:

- **The Individual:** The intervention results in the establishment of a sustainable, lifelong personal motivation system centered around the overarching theme

of “innovation for peace”. This sustainability is maintained through personalized services in the digital realm. The individual benefits from a personal digital assistant based on the AI-Forqan model, accessible at both national and international levels through Maestro and BankRabbna. This outcome represents a radical shift, empowering citizens with even influence in comparison to the economic and business sectors. This positive empowerment resonates globally, contributing to the future sustainability of individuals (Zhang and Huang 2023).

- **The Family:** Recognizing the family as a pivotal element for sustainability, the intervention introduces a novel perspective regarding couples as effective problem-solving teams. This redefines the family as a nurturing environment for humanity, capable of fostering both quality and quantity in individuals. By elevating the concept of couple collaboration, a new generation is nurtured to be fully functional in society and seamlessly integrated into the talent market from birth to death. Moreover, the potential for a constant lifelong income stream derived from monetizing individual data alleviates economic burdens and ensures long-term stability for couples (Biller-Andorno et al. 2023).
- **Impact at the National Level:** The implementation of the “Digital State Model” at the national level brings about comprehensive welfare enhancements for the Nordic state model across various dimensions (Gu 2023).
  - a) **Citizen Transaction and Social Services:** The model introduces the concept of “citizen transactions”, placing social services on equal footing with the economic wheel. This revolutionary shift enables the social side to contribute independently to the national budget, transforming it from a source of expenses to a sustainable income stream (Greco and Feroci 2020).
  - b) **Personalized Education for Innovation:** Establishing a standard for the innovation process distributed across social and professional domains through Maestro and BankRabbna, along with personal assistant guidance, alleviates the burden on the education system. Teachers can transition to higher levels, guiding students in team participation, imparting life principles, and fostering fundamental skills essential for survival in a sustainable society (Bouchard 2020).
  - c) **Personalized Healthcare:** The model places a strategic focus on primary healthcare and prevention. By leveraging technology, it facilitates improved care for basic physical and mental well-being, contributing to a healthier population (Gu 2023).

- d) Government's Innovative Index: The modular components of Maestro aim to elevate innovation and problem-solving activities within government and public organizations, aligning them with the efficiency metrics of business organizations (Bouchard 2020).
  - e) Democracy and Digitalization: The model envisions continuous citizen engagement, with opinions counting 24/7. Automation of government programs, policymaking, and the influence of AI underscore the importance of robust ethical foundations, promoting trust between citizens and governments. Ethical and transparent execution becomes paramount, reinforcing the idea that trust is a cornerstone of prosperity in a civilized world (Greco and Feroci 2020).
  - f) Digital Sovereignty: The model establishes equilibrium between policymakers and technology creators, emphasizing security, privacy, digital sovereignty, and the concept of a data stock market. By decentralizing big tech companies' business models and fostering a "people company" approach, it addresses the imbalance of power and ensures more neutral and effective governance (Gu 2023).
- Impact at the Regional and International Level: The application of BankRabbna serves as an exemplary digital platform, applicable to structures like the single digital market or the United Nations, offering benefits in various areas.
    - a) Global Challenges: BankRabbna contributes to addressing global challenges such as war, peace, and digital hazards. It emphasizes the need for innovation focused on achieving global harmony amid threats to both the environment and digital landscapes (Biller-Andorno et al. 2023; Zhang and Huang 2023).
    - b) Sustainable Development Goals (SDGs): The model encourages a shift from the traditional structure of the international community to a more profound and realistic approach, combine the concept of the United Nations to a more people-centric United People framework. This evolution aligns with the principles of sustainable development, fostering a collective global approach to shared challenges (Greco and Feroci 2020; Biller-Andorno et al. 2023).

#### 4.5.7 Limitations of the model and mitigation strategies

While the model may face limitations:

- Novelty and Technology Dependency: The model is inherently novel and heavily relies on advancements in technology, which may require time for optimization, especially when implemented on a broader scale. To address this, a phased approach to implementation is recommended, allowing for gradual optimization as technology evolves. Additionally, a continuous feedback loop with the tech community should be established to integrate the latest advancements seamlessly.
- Sequential Development and Modular Assembly: The model has been developed in sequential modules rather than being tested as a unified whole. This poses a challenge as the synergies between modules may not have been fully explored. To mitigate this, a comprehensive testing phase, starting with a pilot program, is essential. This will involve assembling all modules together and assessing the integrated performance to identify and address any unforeseen interactions or dependencies.
- Optimization of Growth Sustainability Key Performance Indicators (GSKPIs): The exact metrics and indicators for assessing Growth Sustainability Key Performance Indicators (GSKPIs) need further optimization. This includes defining, measuring, and refining the indicators to ensure they accurately reflect the model's effectiveness. To overcome this limitation, a dedicated phase of the pilot program should focus on refining and tailoring GSKPIs based on real-world observations and feedback.

#### Mitigation Strategies:

A strategic approach involving pilot implementations, multidisciplinary collaboration, and continuous R&D will provide the necessary foundation for optimization and adaptation. This iterative process is crucial for refining the model's effectiveness and ensuring its viability in real-world scenarios:

- Pilot Implementation in Real-Life Conditions: Initiate a pilot implementation of the model in real-life conditions, deploying a beta version. This will serve as a practical testing ground, allowing for the identification of challenges and opportunities for optimization. The pilot should involve a diverse user base and engage experts from various disciplines to ensure a comprehensive evaluation.
- Inclusion of Multidisciplinary Experts: Bring together experts from diverse disciplines during

the pilot phase. This collaborative approach ensures that the model is scrutinized from multiple perspectives, leveraging the collective expertise of professionals in technology, economics, sociology, and other relevant fields. Their insights will contribute to refining the model for broader applicability.

- **Continuous and Lean R&D:** Establish a continuous and lean Research and Development (R&D) framework guided by real-life usability metrics. This ongoing process will enable the model to adapt to evolving technological landscapes and societal needs. Regular updates, informed by user experiences and feedback, will facilitate continuous improvement and innovation.

## 5 Conclusion

The Digital Sustainable Growth Model, developed over a 15-year period, serves as a progressive framework to actualize the primary goal outlined in the study. This goal is centered on unifying the global community into a cohesive entity, collectively striving for the betterment of human well-being and the establishment of lasting peace.

In reflection, the model demonstrates that the utopian vision of a dream city or nation, a theme explored by philosophers throughout history, is not merely a fantastical notion but an imperative reality in the digital era. The interconnectedness facilitated by digitalization not only makes this vision feasible but deems it a necessity. Failing to embrace this interconnected global approach risks exacerbating the sustainability gap, emphasizing the urgency of adopting innovative and collaborative solutions for the collective well-being of humanity.

## 6 Recommendations for practical implementation

The proposed model creates an opportunity for scientific experts across disciplines to collaborate on real-life data, replacing simulation models. It is imperative that we transition from keeping these brilliant minds behind closed doors to actively engaging with the real world. This paradigm shift is critical, and now, more than ever, we must empower knowledgeable individuals to lead and drive sustainability efforts.

The innovative strategies introduced by Maestro, BankRabbna, and Al-Forqan, particularly in focusing on citizen transactions and personalized talent care, offer a practical pathway for implementation. To propel sustainable development and socioeconomic progress, leveraging data as a pivotal force akin to the historical role of oil in economic advancement, the following key recommendations are suggested:

1. **Model Consideration:** Organizations and governments are urged to carefully consider and adopt the comprehensive model designed by the Human Information Technology Laboratory. This model, encapsulated in the books and implemented through Maestro and BankRabbna, provides a holistic framework for sustainable development.
2. **Pilot Country Deployment:** To test the efficacy of the model, it is recommended to identify and designate a pilot country. This will allow for controlled implementation, thorough evaluation, and iterative refinement before broader adoption.
3. **Continued Research and Development (R&D):** A commitment to ongoing research and development is vital. This includes staying abreast of technological advancements, refining algorithms, and adapting to emerging challenges. Continuous improvement ensures the model remains relevant and effective in a dynamic global landscape.
4. **Quantum Capability Integration:** The model should be designed with quantum capability in mind. Quantum computing has the potential to revolutionize data processing and analysis, and integrating this capability ensures scalability and future-proofing.
5. **Global Collaboration:** Sustainable development requires global collaboration. Governments, businesses, and communities worldwide should be invited to participate in and contribute to the implementation of this model. The emphasis is on fostering an inclusive environment that transcends geographical, cultural, and socioeconomic barriers.
6. **Common Purpose Alignment:** Success in this initiative hinges on finding partners who align with the values and goals of promoting human well-being and peace. The collaborative effort should be directed toward a common purpose, uniting diverse entities under the overarching aim of sustainable development.

## 7 Limitations of the study and key considerations

The intersection of sustainability and survival represents two facets of the same coin, and their connection is forged through innovation, problem-solving, unity, digitalization, and, fundamentally, the pursuit of peace. In the digital era, the overarching vision should be to “innovate for peace as one”, encompassing the entire sustainability cascade from individual well-being to global cooperation, including entities such as the United Nations.

Despite the inevitability of challenges in any ambitious undertaking, the experiences of the Human Information Technology Laboratory offer valuable insights for larger organizations. The laboratory’s journey, marked

by limited resources, persistent dedication, and a sincere commitment to a shared goal, serves as a testament to the triumph over limitations. The progress achieved underscores the potential to surmount obstacles and exemplifies the principle that genuine commitment can overcome adversity with these key considerations:

1. **Resource Constraints:** The laboratory's experience highlights that resource limitations, though present, can be navigated with strategic planning, efficiency, and a focus on priorities. Organizations should adopt a similarly pragmatic approach to optimize available resources.
2. **Persistence and Dedication:** The journey underscores the importance of persistence and dedication in the face of challenges. It demonstrates that sustained effort, coupled with a clear vision, can lead to meaningful outcomes even when faced with adversity.
3. **Sincere Intentions:** The laboratory's success is rooted in sincere intentions to achieve a shared goal. Organizations aiming for sustainability and innovation should prioritize fostering a genuine commitment to the greater good, as this can serve as a powerful driving force.
4. **Lesson for Larger Organizations:** Larger organizations can draw inspiration from the laboratory's experiences. The key takeaway is that a unified and dedicated approach, even in the presence of limitations, can pave the way for transformative progress.
5. **Global Vision:** Embracing a global vision of "innovate for peace as one" reinforces the interconnectedness of sustainability efforts. It encourages collaboration across diverse sectors, emphasizing the need for a unified approach to address challenges on a global scale.

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#### Declarations

##### Competing interests

This statement serves as a declaration that there are no conflicts of interest with any organization, and all the details mentioned in this article, including its intellectual property rights, exclusively belong to the author.

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