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EDITORIAL

Transforming Technology for Global Business Acceleration and Change Management

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Increasing Importance

The majority of global problems and organizational challenges are byproducts of poor human attitude and behavior (Stibe, Röderer, Reisinger, & Nyström, 2019). Every crucial domain in our lives continuously provides evidence of how things are getting unbalanced despite the progress in building increasingly capable technological innovations, such as artificial intelligence, blockchain, augmented reality, autonomous vehicles, and drones, just to name a few. Managers and employees often look for and find reasons outside of themselves for why there are weak performing organizations and global environmental issues.

Societies, communities, businesses, organizations, and industries, basically everyone, need help in making their transformations succeed and sustain positive directions (Waddell, Creed, Cummings, & Worley, 2019). Many people want to change, but it is also well known how often their new year's resolutions end in February. People tend to perceive changes as something difficult, impossible, and mystical, thus are willing to avoid them. Such attitude naturally leads to poor decisions and consequent behavioral outcomes for societies and corporations.

While transformation research has gained more traction in multiple contexts over the last several years (Malar, Arvidsson, & Holmstrom, 2019), this particular transforming work is emerging as an inevitable response to the ever-growing imbalance in our lives across the globe. Advanced information technologies are being continuously developed to make our lives better and businesses grow. However, the fundamental question still remains: *With all the evolving information technology, has there been significant success in achieving happier societies and strong organizations?*

Transformation Theory and Practice

Present knowledge on persuasive and transforming information technology often reveals how behavior change designs and interventions are limited in sustaining their effects (Fogg, 2009). There is an increasing need for innovative ways to create information technology and spaces that help organizations and people not only to achieve their goals, but also to support their newly developed processes and habits. Novel and transforming information technologies should ultimately empower people and organizations to succeed in their desired and more often even inevitable changes.

Therefore, this work aims to explain how *Transformation Theory and Practice* extends the managerial understanding beyond limitations of traditional information systems, change management, and behavioral designs. It summarizes the state-of-the-art scientific insights and practical applications to transform lives and organizations at the global scale. It demystifies transformation by introducing

- *Typology of Change* – that clarifies the variety of changes and provides ways to consciously separate them to develop impactful information technologies (Stibe & Cugelman, 2019),
- *Transformation Framework* – that contains eight applicable tools for immediate use (Stibe et al., 2019), and

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Table 1. Types of change and their characteristics.

	Transactional Change	Transitional Change	Transformational Change
Definition	An occurrence producing an outcome that differs from previous preferences.	A period in which certain outcomes significantly differ from what was habitual before.	A continuum having direction as well as magnitude to produce apparently irreversible shifts.
Description	To carry on or conduct something to a conclusion or settlement.	Relating to a period during which something is changing from one state or form into another.	To change completely the appearance or character of something or someone, especially so that that thing or person is improved.
Perspective	One-time decision	Steps toward a goal	Paradigm shift
Time	Short-term	Defined-term	Timeless
Orientation	Cost-benefit	Goal	Self-connection
Nature	Bargaining	Achievement	Directional
Metric	Decision	Milestones	Personality traits
Psychology	Economical	Motivational	Spiritual
Example	Changing a password to an information system only once.	Complying to all of the password resetting requests for one year only.	Becoming fully compliant to all required information security requirements.

- *Transformation Design* – that blends technological innovations with human nature to empower sustainable and scalable changes (Stibe & Larson, 2016).

Due to its scientific richness and practical nature, this *Transformation Methodology* is applicable in many essential life contexts, including health and wellbeing, innovation management, transforming cities, business acceleration, social change, and, generally, to facilitate progress toward the United Nations global goals for sustainable development.

Typology of Change

When thinking about organizational change, managers way too often tend to rely on reward (positive or carrot) or punishment (negative or stick) incentives that lately have been increasingly criticized for their ability to only achieve rather short-term effects. Such motivational instruments are very limited in achieving sustainable changes, as they draw the employee's attention on an external outcome rather than an internal need for attitudinal reconsideration of one's identity.

The current knowledge on influential information technology reveals how behavior change designs and managerial interventions are often poor in sustaining their effects, thus leading mostly to *transactional* or *transitional* rather than *transformational* changes. Transactional change is usually defined as an occurrence producing an outcome that differs from previous preferences. Transitional change is often defined as a period, in which certain outcomes significantly differ from what was habitual before. However, transformational change manifests itself as a continuum having direction as well as magnitude to produce apparently irreversible shifts. The three types of change have specific characteristics as described in Table 1.

Transformation Framework

Despite acknowledgeable progress in designing impactful information technologies, many behavioral design interventions and managerial practices still produce unsustainable effects on employee performance and organizational results. To help scientists and managers creating information technology designs for sustainable changes, a science-driven *Transformation Framework* is proposed.

The Transformation Framework embodies eight tools that leverage prior scientific knowledge. The framework demystifies transformation to reveal it as a practical process for designing and implementing sustainable information technology solutions globally. The framework helps to address real-life organizational challenges with ease. The first four tools help to locate the root

Table 2. The eight tools of transformation framework.

Triangle	Even when you see a behavioral problem, you not always are able to see the reasons behind it. The Triangle helps to decompose any visible behavioral problem into essential parts, and then allocate some parts of the problem to obstacles in the surrounding environment and some to attitudinal barriers in the minds of people.
Curve	Your observed behavioral problem most likely will land close to the area of low attitude and difficult environment. The Curve helps to understand that you have to either make the environment less difficult or make the attitude more positive. Changes in the environment rarely bring expected results, because the major resistance often emerges from what people think.
Metric	For successful transformation, it is essential to find a way to measure changes in an easy, reliable, and comprehensible manner. The Metric helps to define variables for proper measuring of the observed problem behaviors. Usually, such variables should be as simple as counting times, frequencies, durations, and so on. The same variables will help monitor progress and results.
Circles	Although you see a group of people that you would like to change, remember that there are always others that perform well. The Circles help to have all the related groups of people in the same picture. Red people that will never change, yellow people that are willing to change, but lack something, and green people that will serve as a positive example for the yellow ones.
Architecture	Only now you can start designing solutions for the situations that you have understood well enough using the first four tools. The Architecture assures that you will use proper data sources in designing your solution. Then, you will use intelligent tools to classify your data according to the groups you discovered in the Circles tool. Finally, you will design transforming feedback loops.
Socium	Motivators that are based on rewards and punishments are very limited in their performance, thus becoming obsolete. The Socium offers infinite sources of motivation for designing truly transforming experience and solutions. As social beings, we are constantly influenced by others around in multiple ways.
Moderation	You will not always have other people around that exhibit positive behavioral examples to use in your solution. The Moderation explains how to manage the power of social influence, when it is designed using technologies. For situations of low availability of green people, your solution has to enable access to a wider view based on previous positive historic data.
Ethics	Transforming solutions can be very sensitive instruments that should be understood properly and used ethically. The Ethics help the designers of influential solutions to see the spectrum of concerns related to morality of their work. Such solutions not only can be produced with intended positive or negative outcomes, but they can also surprise and backfire.

causes of present issues. The next three tools guide technology design and implementation process. And the last tool handles ethics. The tools are listed below:

(1) *Triangle* – triadic reciprocal determinism (Bandura, 2005),
(2) *Curve* – elaboration likelihood and behavioral modeling (Fogg, 2009),
(3) *Metric* – essential components for defining transformation (Stibe & Larson, 2016),
(4) *Circles* – susceptibility to influence and change (Stibe & Larson, 2016),
(5) *Architecture* – key layers of transforming technology design (Stibe & Larson, 2016),
(6) *Socium* – fundamentals of socially influencing systems (Stibe & Cugelman, 2019),
(7) *Moderation* – typology of computer-supported influence (Stibe et al., 2019),
(8) *Ethics* – dark patterns and persuasive backfiring (Stibe & Cugelman, 2016).

The Transformation Framework is highly instrumental for scholars and practitioners designing influential information technologies, as it helps internalize and apply science-driven tools for achieving sustainable organizational changes. Managers can use the framework to substantially improve organizational performance and achieve more than previously expected. All of the eight tools are described in Table 2 and available online (transforms.me).

Transformation Design

When information technology is seamlessly embedded with human nature to empower sustainable organizational and societal changes at scale, *Transformation Design* is created. It addresses a highly important future direction that influences the advancements of ever-increasing technology-supported organizational practices and environments.

According to Social Science (Bandura, 2005), environmental, personal, and behavioral factors are locked into triadic reciprocal determinism, meaning that all three are strongly interconnected and continuously reshape each other. Thus, environmental design is a strong influencer on human behavior and attitude. In other words, quite often it is sufficient to improve information technology design to achieve better organizational performance. This is a very powerful vision as it encompasses not only behavior change, but also the potential of transforming organizational and societal behavior at scale.

Transformation Design empowers organizations and individuals to create transforming technologies and influencing spaces that make behavioral and attitudinal changes last. Moreover, such design also employs knowledge about strategies from *behavioral economics, gamification, nudging, persuasive technology, rhetoric, psychology, neuroscience*, and *social influence*, which can lead to attitudinal transformation. By definition, Transformation Design expands the ways of attaining long-term permanent behavioral changes at all scales, be it at individual, organizational, or societal levels.

New transforming design concepts can also enable multiple ways of advancing societal and organizational shifts in future cities. Urban design interventions can target choices involving physical activity, nutrition, socializing, networking, co-working, business acceleration, dwelling, and mobility. For example, urban transforming design can activate social comparison by publicly displaying how quickly bicycles move compared to cars on the same street via street signage. Organizations also can employ transforming information technology to steer their employees toward better performance in various aspects. Managers can use the Transformation Framework to design novel experiences for their employees, for example, to choose healthier and more sustainable mobility modes while getting to work and back.

Global Impact

The framework has already helped businesses and communities across the globe.

In the US, it was used to facilitate a behavioral conversion from anonymous users to account holders at Higi (higi.com) kiosks. Higi users can track blood pressure, pulse, weight, and body-mass index (BMI). Everyone can just come and measure their vitals anonymously. However, one can also become a member by creating an account, which allows members to store and retrieve their previous measurement data. As a large portion of activity at the Higi health stations happened anonymously, the business challenge for Higi was to convert the anonymous users into account holders. After applying the Transformation Framework, the results revealed an overall conversion rate increase of 19.50% for the transformed Higi stations and even higher increase of 31.60% for the weight concerned users.

Another successful implementation was the Biking Tourney (Stibe & Larson, 2016), a large-scale study designed by researchers from Massachusetts Institute of Technology (MIT Media Lab) and Austrian Institute of Technology (AIT). The study engaged 239 employees from 14 companies around Greater Boston Area, including Google, iRobot, Boston Children's Hospital, Volpe, and others, who collectively rode around 30,000 miles in six weeks. Such transforming technology design naturally encouraged more people to reconsider their mobility choices in their daily commutes to work. As a result, this Transformation Framework application increased the engagement in biking commutes by 26% across the study participants.

In Europe, the framework has been practiced in collaboration with Austrian Institute of Technology, University of Hradec Králové, as well as companies like The Littery, U-Sentric, and Specifii. Among many other use cases, it was also applied to address a quite frequent behavioral challenge that many organizations and businesses are facing on daily basis, i.e., employees arriving late to meetings. Obviously, that usually creates an unnecessary distraction that often leads to reduced productivity during the meetings, as well as negative impact on key performance indicators of the companies. The Transformation Framework was used to design an interactive

technology that later was deployed in a meeting room at one of the organizations in Latvia. The results were impressive. The percentage of employees arriving timely grew from 65% to 100% in less than 6 meetings.

In Australasia, the Transformation Framework has been already introduced and is practiced in multiple organizations and communities, including the leading company in producing healthy breakfast across Australia and New Zealand, Sanitarium Health & Wellbeing. It was also discussed and applied to existing behavioral challenges at the University of Technology Sydney, Red Hat Open Innovation Labs, and UX Psychology Global Community that originates out of Melbourne, Australia.

Globally, the Transformation Theory and Practice has generated a positive impact on businesses and cities across five continents. In Chile, the framework was considered in collaboration with Inter-American Development Bank, Ministry of Transport, and the Pontifical Catholic University of Chile. In Asia, the methodology and tools helped working with the National Chiao Tung University in Taiwan, as well as the Nagoya University and companies like Denso, Toyota, and NHK in Japan. The recent advances have been warmly appreciated by the Transformative Technology Lab in Silicon Valley.

Future Direction

The Transformation Theory and Practice described herein provides a methodology and tools that are applicable for creating novel information technologies that go beyond solely improving their own performance, thus assisting with behavioral and attitudinal shifts in organizations and beyond. It is instrumental for businesses and communities that are undergoing transformations, as it helps internalizing tools and methodology for designing information technologies that can achieve sustainable organizational and managerial transformations.

The transforming paradigm unifies knowledge about designing information technologies for business acceleration across continents. It explains how disruptive innovations can go beyond limitations of traditional organizational designs and outdated motivational tools. This work demystifies human change and reveals the secrets of transformation, thus making it accessible for everyone to improve lives and organizational performance globally. Frequent updates are accessible via the transformation gateway, i.e. the website of *Transformation Science and Practice* (transforms.me).

Notes on contributor

Agnis Stibe is a professor and global thought leader on science-driven transformation as well as a founder of TRANSFORMS.ME, visiting continents with countless academic and professional events. At Massachusetts Institute of Technology (MIT), he established research on Persuasive Cities (now Transforming Cities) that encourage healthy and sustainable transformation. In his vision, business acceleration and societal well-being can be achieved through purposefully designed innovations that successfully blend technological advancements with human nature. He keeps developing the Transforming Welleing Theory (TWT) that leverages socio-psychological science in the creation of transforming innovations aimed at improving well-being and accelerating business. His expertise combines behavior design, user experience, gamification, nudging, persuasive technology, and neuroscience. He has worked for Fortune 100 companies, including Hewlett-Packard and Oracle. He has received multiple awards, including from the MIT Media Lab (USA) and Nokia Foundation (Finland). He serves on several advisory boards, including ETH Library Lab (Switzerland) and Sanitarium Health & Welleing (Australia). His three TEDx talks keep gaining global popularity.

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