

DESIGNING TRANSFORMATION FOR SUSTAINABLE BEHAVIOR CHANGE AND ORGANIZATIONAL MANAGEMENT

Agnis Stibe, EM Normandie Business School Metis Lab, France
TRANSFORMS.ME, agnis@transforms.me

ABSTRACT

Transformation is inevitable, as rapid changes have always been part of any evolution. In business organizations and management, just like everywhere else, continuous improvements have been assuring the success of every company and project. Moreover, also outside forces have always kept pushing for more rapid organizational change. Such conditions require corporations and managers to master transformation, so that their organizations can become the drivers of change, instead of being desperate followers. This paper provides scientific knowledge and practical methodology for leaders designing transformation. The paper outlines a landscape of organizational transformations, a typology of change, a concept of vectoral transformation, a transformation framework containing eight applicable tools, an application example, and three case studies deploying this methodology. It demonstrates how transformation, instead of being mystical and difficult, is actually practical and achievable. Scholars and professionals are encouraged to expand this understanding by deploying the transformation tools and design methodology.

Keywords: Business Transformation, Change Management, Technology Design, Transforming Wellbeing Theory

TRANSFORMATION LANDSCAPE

Many forms of transformation have emerged in the management vocabulary over the last decades. From more broader encompassing, such as *social transformation* (Dutra & Karp 2019) and *structural transformation* (Bachtler et al. 2019), to more particular forms, like *organizational transformation* (Brynjolfsson & Hitt 2000), *business transformation* (Westerman et al. 2014, Tardieu et al. 2020), *process transformation* (Hermann et al. 2019), and the recent advent of *digital transformation* (Vial 2019, Wessel et al. 2020). Indeed, changes are inevitable. Thus, management scholars and practitioners have been continuously working on enriching the knowledge and applicability of transformation. However, previous progress in transformation research has predominantly been focused on studying environmental factors around people (Table 1), instead of uncovering the role of human factors in transformational change processes.

Table 1. Transformation landscape with major concepts.

Social Transformation (Castro-Arce & Vanclay 2020)	Social innovation can be defined as the creation, renewal or transformation of social relations in the development of new ways of working together to achieve societal goals.
Structural Transformation (Herrendorf et al. 2014)	Reallocation of economic activity across three broad sectors (agriculture, manufacturing, and services) that accompanies the process of modern economic growth.
Organizational Transformation (Kirkley 2017)	Organizational transformation can be defined as profound, fundamental changes in thought and actions, which create irreversible discontinuity in the experience of a system.
Business Transformation (Morgan & Page 2008)	Business transformation can be defined as the orchestrated re-design of the genetic architecture of the entire enterprise.
Process Transformation (Fujiwara et al. 2007)	Quantitative process improvement objectives for the organization are captured and continually being revised to reflect changing business objectives.
Digital Transformation (Reis et al. 2018)	The use of new digital technologies that enables major business improvements and influences all aspects of customers' life.

While studying various aspects of the transformation landscape is necessary, ever higher importance is to integrally address the areas related to human attitude and behavior change. Why? Because the most resilient obstacles for organizational hyper-performance are predominantly hidden in human minds. Despite the advancements in other kinds of transformation, the understanding about efficient ways for removing the performance barriers residing in human attitude is still quite scarce. To help organizations and societies accelerate their envisioned and oftentimes inevitable changes, the aim of this paper is to reveal ways for properly addressing human factors in transformation science and practice. The major questions are:

1. How to integrally address human factors in the transformation design process?
2. How technology design can amplify and accelerate organizational transformations?

TYOLOGY OF CHANGE

The *Typology of Change* summarizes three main kinds of change: *transactional* (Burke & Litwin 1992, Griffith 2010, Taylor 2019), *transitional* (Long & Spurlock 2008, Ramirez & Drevon 2018, Amado & Ambrose 2018), and *transformational* (Golm 2009, Angel-Sveda 2012, Waddock 2020). The typology clarifies how each kind of change exhibits particular properties and is tied to specific motivators (Figure 1).

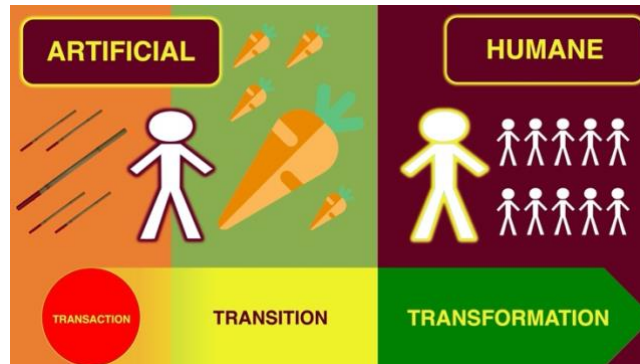


Figure 1. Typology of Change.

In the typology, transactional change is defined as an occurrence producing an outcome that differs from previous preferences. In other words, to carry on or conduct something to a conclusion or settlement. For example, changing a password to an information system only once. It is a one-time event, which often can be also described as a form of exchange. In the earlier example, that implies a creation of new password to avoid potential punishment (like a stick). Transitional change is defined as a period, in which certain outcomes significantly differ from what was habitual before. In other words, relating to a period during which something is changing from one state or form into another. Using the same example, it would mean for the person complying to all of the password resetting requests for a period of one year. Especially, in case if there is an attractive reward (like a carrot) promised at the end of the year for good performance. Psychologically, such kind of change still makes it difficult to continue after the period is over. Why? Because human brain perceives such deadlines as a temporary obstacle that will go away eventually. Thus, it does not require people to reconsider any deeper underlying factors that drive their current decisions and consequent behaviors. Therefore, transformational change removes the endpoint. Transformational change is defined a continuum having direction as well as magnitude to produce apparently irreversible shifts. In other words, to change completely the appearance or character of something or someone, especially so that the thing or person is improved. In the earlier example, it means that the person becomes fully compliant to all required information security requirements.

Traditional motivators, such as rewards or carrots and punishments or sticks, have been conventionally used in business transformation and change management for decades. By definition, rewards and punishments are created by people, so they bear a degree of artificial flavor for basic human nature. In other words, such motivators are produced and maintained by the intellectual mind. Now, it is clear why these alternatives can lead to a limited set of outcomes, namely transactional and transitional changes. Contrary, one of the most prominent drivers for sustainable long-term transformational changes is social influence. It explains how individuals continuously change their minds and actions based on others. For ages, social context and dynamic has been shaping human evolution, so making this form of influence deeply engrained and humane in individuals and societies. It has seven widely studied forms that can serve as technology design features (Stibe & Cugelman 2019). While social influence provides an innate source of motivation, technology design helps amplifying its reach up to global scale.

VECTORAL TRANSFORMATION

The definition of transformational change suggests that it expresses a continuum having direction and magnitude to produce irreversible shifts. The Typology of Change depicts such change as an arrow (Figure 1), which well resonates with the nature of its description. Thus, transformational change can be illustrated as a vector (an arrow) that starts today and points to an infinity. Individuals and organizations are encouraged to embrace this notion before initiating any transformation. It is recommended to draw the central (green) vector for a desired transformational change, and then other vectors (yellow and red) directing sideways to other outcomes (Figure 2).

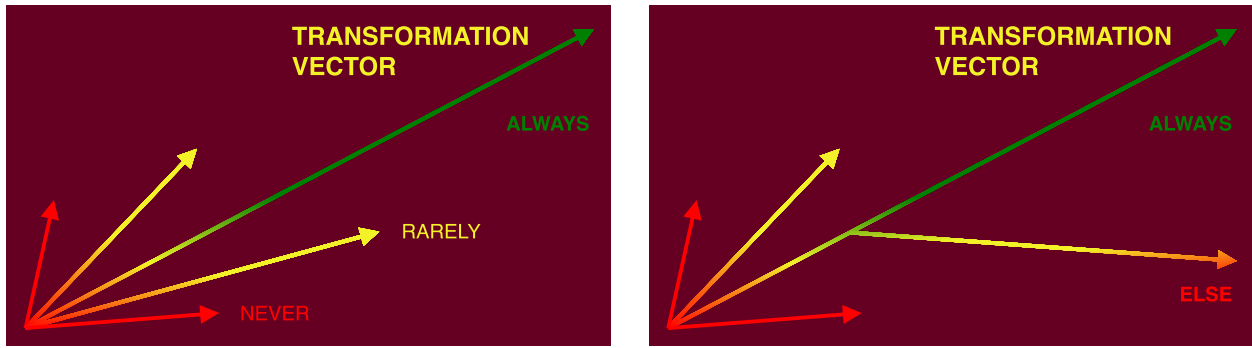


Figure 2. Vectoral Transformation.

Vectoral Transformation is defined as a method that uses vectors for explaining, mapping, and maintaining progress towards any long-term sustainable and transformational change. It demonstrates geometrically that any decision away from the transformation vector cannot lead back to the same direction anymore. In line with the previously described example about the security compliance behavior, the green transformation vector is working as long as the person always follows all relevant requests. The yellow vector appears for those that rarely or inconsistently respond to security requirements. The red arrow exemplifies a behavioral pattern for complete non-compliance. There can also be situations when everything goes well in the beginning, but a divergent decision is made on the way (Figure 2 on the right). That is the most common behavioral trap. People oftentimes think that a one-time inconsistency will not produce any undesired long-term outcomes. Now, the Vectoral Transformation method explicitly demonstrates how a smallest deviation ruins any desired long-term changes in lives and organizations. The next chapter will suggest ways for keeping the intention on desired outcome and the attention moving on the transformation vector.

TRANSFORMATION FRAMEWORK

Transformation Framework is a methodological approach that helps scholars and practitioners to design technologies for achieving sustainable change (Stibe 2020). The framework provides eight applicable tools (Figure 3) that are scientifically driven and practically proven to yield transformational effects on organizations and societies.

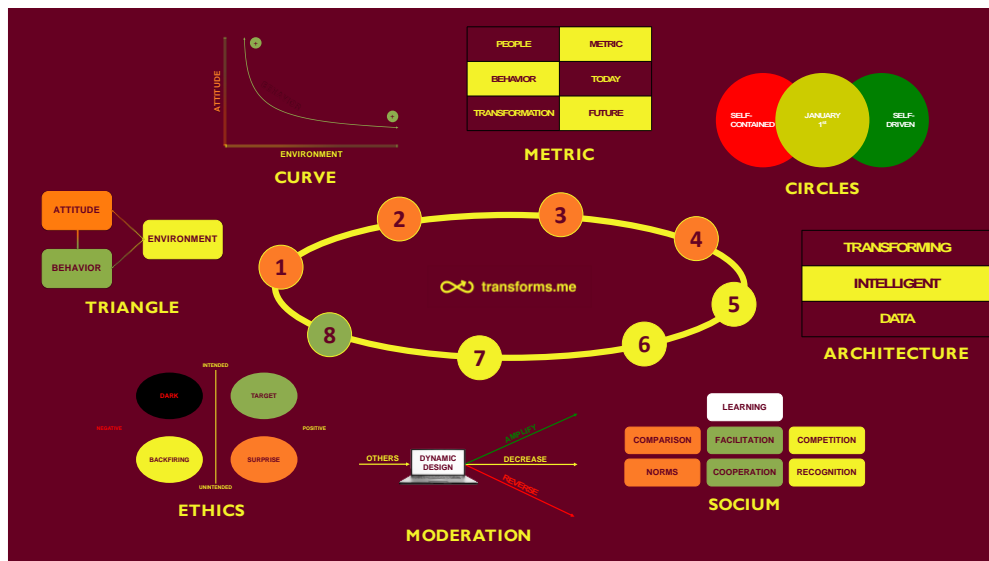


Figure 3. Transformation Framework for designing sustainable change.

For any real-life behavioral challenge, the first four tools (investigation phase) help to find the major root cause underlying the problem. These steps also help to understand the context and conditions around the challenge. The next three tools (design phase) help designing novel human-technology experiences to address the root cause and overcome the challenge. The last tool sheds light on ethical implications and potential risks of backfiring or dark patterns.

The *investigation phase* of the framework contains four tools. The first tool is *Triangle* – explaining triadic reciprocal determinism (Bandura 2005). It explains how human attitude and behavior is interrelated to the surrounding environment. It also suggests that most of the root causes for behavioral challenges reside in human attitude. The only place in Triangle that is not transparent enough. The second tool is *Curve* – that portrays elaboration likelihood (Petty & Cacioppo 1986) and behavioral (Fogg 2009) modeling. It helps locating a particular behavioral challenge on a two-dimensional plot of negative to positive attitude and hard to easy environment. That helps understanding a comparative impact of both factors to smarter address them in the later design phase.

The third tool is *Metric* – outlining the essential components for defining and measuring transformation (Stibe & Larson 2016). It requires to diligently define the following: a selected target audience, its current behavioral challenge, its desired future behavior, a trackable variable representing the behavior, the current value of the variable, and the future desired value of the variable. It is highly important to find the best possible variable, i.e. metric, as it will allow measuring and assessing the progress of transformation after deployment. The fourth tool is *Circles* – that helps grouping the target audience based on their susceptibility to a particular behavioral change (Stibe & Larson 2016). People with a negative attitude towards the envisioned change will fall into the *Self-Contained* (red) circle. People who are already performing the behavior will fall into the *Self-Driven* (green) circle. The remaining people will fall into the *January 1st* (yellow) circle. These individuals would predominantly express a desire to change but having hard times to exhibit the related behaviors. In the following design phase, the yellow circle is the target audience.

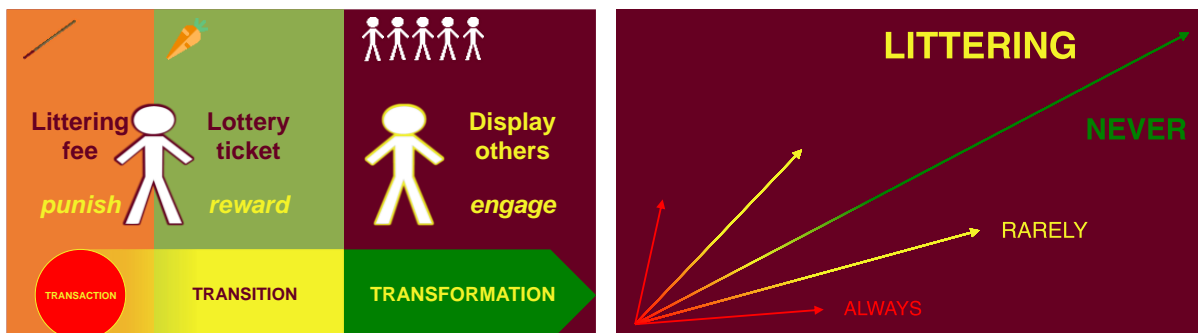
The *design phase* of the framework contains three tools. To continue the previous numeration, the fifth tool is *Architecture* – the key layers of transforming technology design (Stibe & Larson 2016). It starts with the *Data* layer, which should provide an instant stream of raw data input according to the chosen Metric. The *Intelligence* layer helps with real-time calculations to turn the incoming data into the three groups of behavioral patterns corresponding to the Circles. Finally, the *Transforming* layer suggests designing an instant feedback loop for reflecting positive behaviors of green people to the target audience, the January 1st group. Technology design can amplify such feedback loops, especially when integrated with strong social motivators.

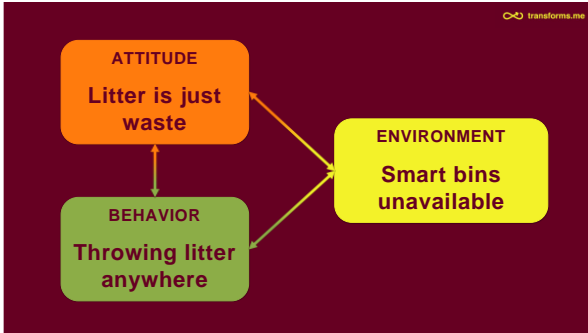
Therefore, the sixth tool *Socium* – provides the fundamentals of socially influencing systems (Stibe 2015a). It describes seven social influence principles for designing very impressive user experience that leads to long-term transformational effects. Properly design socially influencing systems are by definition achieving transformational change (Stibe & Cugelman 2019). The seventh tool is *Moderation* – explaining the typology of computer-supported influence (Stibe 2015b). It explains that the power of transformation design is dependent on the presence and engagement of users exhibiting positive behaviors. As it is impossible to predict such engagement, the designers of transforming technology have to enhance its algorithms to avoid negative social influence. After the design phase, the remaining eighth tool is *Ethics* – emphasizing the possibility of dark patterns and persuasive backfiring in transformation design (Stibe & Cugelman 2016).

APPLICATION EXAMPLE

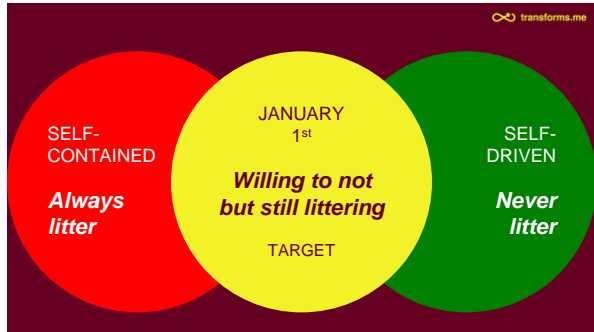
The described methodology has been already applied to various real-life challenges, for example to littering behavior. The Littery tries saving the planet from litter and plastic pollution by turning litter into e-lottery tickets. It uses technology to reframe litter into e-lottery tickets causing an instant transactional change due to the innate human optimism bias. To extend their work, the transformation design methodology was applied and integrated (Table 2).

Table 2. Applying transformation design methodology to The Littery.





City dwellers	% of litter collected from bins vs. ground
Throw litter anywhere	Today 70%
Throw litter in The Littery bins	After a year 90%



TRANSFORMING

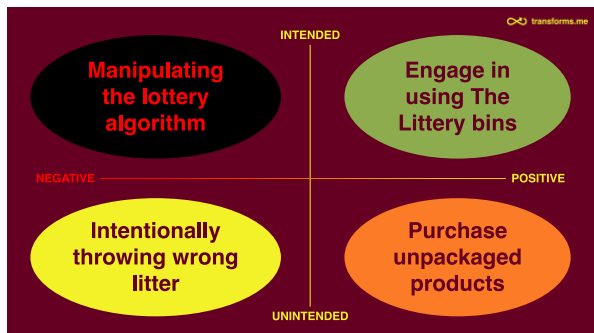
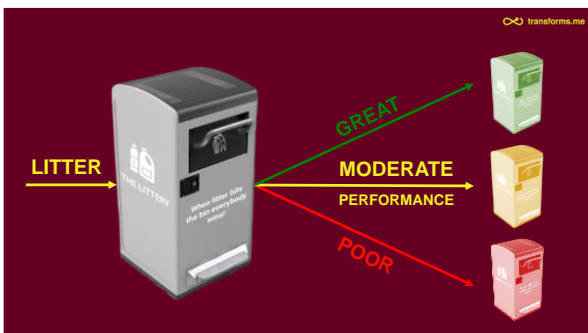
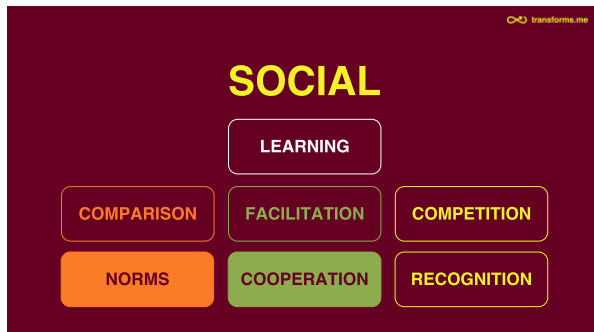
Instant feedback through interactive displays, colors, and sounds

INTELLIGENCE

AI recognition calculating the METRIC and CIRCLES

DATA

Real-time data streams from The Littery bins

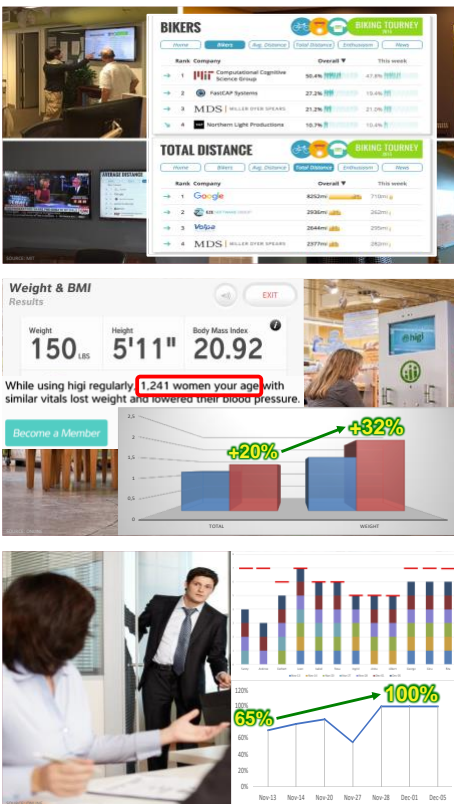


The Littery case is particularly interesting as it combines all three types of change. Every lottery ticket drives a one-time transactional change. The waiting period for receiving a winning award implies transitional change. And the applied transformation design methodology induces transformational change. Among the illustrations of applied methodology (Table 2), two design proposals for *social norms* and *social cooperation* are also included. In the example of norms, an interactive display is instantly projecting how many other people are actively using the bins in the neighborhood. In the example of cooperation, every piece of litter in the bins adds one brick in building the tower.

CASE STUDIES

Over the last decade, the transformation design methodology has been effectively helping organizations and societies to accelerate their desired changes. Implementations have yielded profound results across multiple domains. Most visible deployments include the following cases: biking tourney, higi kiosks, and late meetings (Table 3).

Table 3. Productive deployments of the transformation design methodology.



Biking Tourney is a large-scale study designed at the Massachusetts Institute of Technology in collaboration with the Austrian Institute of Technology (Stibe, & Larson, 2016). It engaged 239 employees from 14 companies around Greater Boston Area, including Google, iRobot, Volpe, and others, who collectively rode around 30 000 miles in six weeks. In this study, the transformation design methodology was applied to help employees reconsider their mobility choices for daily commutes to work and back. As a result, this application increased the engagement in biking commutes by 26% across the participating employees.

Higi kiosks (higi.com) allow users to measure and track their blood pressure, pulse, weight, and body-mass index. Anyone can use the kiosks and their services anonymously or become a member by creating an account, which allows members to store and retrieve their previous measurement data anytime in the future. In this case, the transformation design methodology helped to facilitate the conversion of anonymous users into account holders. 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.

Among other use cases in Europe, the transformation design methodology was applied to address one of the most common and frequent organizational challenges, i.e., *employees arriving late to meetings*. Very often that creates unwanted disturbance, may reduce overall productivity, and can negatively impact key performance indicators. According to the transformation design methodology, an interactive technology was created and deployed in a meeting room at one of the organizational units in Latvia. The results were impressive. The percentage of employees arriving timely grew from 65% to 100% in less than 6 meetings.

IMPLICATIONS

Rapid technological evolution not only disrupts innovation possibilities, but also requires reconsidering its effects on human behavior and organizational change. That makes life changing transformations inevitable. To succeed, scholars and practitioners need to be skilled about human nature playing its important role in every transformation. The transformation design methodology empowers businesses and individuals to create technology-driven innovations and influencing user experiences that make behavioral and attitudinal changes last. Organizational management and societal leadership can now integrate this design methodology to transform corporations and communities. The fastest acceleration is possible in the areas that currently have larger behavioral components. Inside organizations, those typically are related to human resources, employee performance, and managerial decision-making accuracy. Outside an organization, it can be related to digital marketing, sales, customer relations, consumer behavior, user experience, distribution channels, and supply chain management. Finally, very important are the areas related to the bigger picture, such as corporate social responsibility, empowering communities, quality of life, smart cities, environmental impact, and climate change, among other goals of sustainable development and transforming wellbeing theory.

REFERENCES

- Amado, G., & Ambrose, A. (Eds.). (2018). *The transitional approach to change*. Routledge.
- Angel-Sveda, A. (2012). Organizational change. Basic theoretical approaches. *Revista de Administratie Publica si Politici Sociale*, 9.
- Bachtler, J., Martins, J. O., Wostner, P., & Zuber, P. (2019). *Towards cohesion Policy 4.0: Structural transformation and inclusive growth*. Routledge.
- Bandura, A. (2005). The evolution of social cognitive theory. *Great minds in management*, 9-35.
- Brynjolfsson, E., & Hitt, L. M. (2000). Beyond computation: Information technology, organizational transformation and business performance. *Journal of Economic perspectives*, 14(4), 23-48.
- Burke, W. W., & Litwin, G. H. (1992). A causal model of organizational performance and change. *Journal of management*, 18(3), 523-545.
- Castro-Arce, K., & Vanclay, F. (2020). Transformative social innovation for sustainable rural development: An analytical framework to assist community-based initiatives. *Journal of Rural Studies*, 74, 45-54.
- Dutra, R., & Karp, U. (2019). Emerging Design and the Embodiment of Social Transformation. *Economía Creativa*, 44-57.
- Fogg, B. J. (2009). A behavior model for persuasive design. In *Proceedings of the 4th international Conference on Persuasive Technology* (pp. 1-7).
- Golm, H. (2009). *Examining the relationship between transformational, transactional, and change-oriented leadership and their influence on leadership effectiveness*. Columbia University.
- Griffith, R. (2010). Rethinking change. *Tackling wicked problems through the transdisciplinary imagination*, 251-259.
- Hermann, M., BÜcker, I., & Otto, B. (2019). Industrie 4.0 process transformation: findings from a case study in automotive logistics. *Journal of Manufacturing Technology Management*.
- Herrendorf, B., Rogerson, R., & Valentinyi, A. (2014). Growth and structural transformation. In *Handbook of economic growth* (Vol. 2, pp. 855-941). Elsevier.
- Fujiwara, K., Ramachandran, B., Koide, A., Benayon, J., & Kano, M. (2007). Business process transformation wizard: a bridge between business analysts and business process transformation technology. In *IEEE International Conference on Services Computing (SCC 2007)* (pp. 83-90). IEEE.
- Kirkley, W. W. (2017). Organizational Transformation and Strategic Success: The Role of Values. In *Business Students Focus on Ethics* (pp. 19-34). Routledge.
- Long, S., & Spurlock, D. G. (2008). Motivation and stakeholder acceptance in technology-driven change management: Implications for the engineering manager. *Engineering Management Journal*, 20(2), 30-36.
- Morgan, R. E., & Page, K. (2008). Managing business transformation to deliver strategic agility. *Strategic Change*, 17(5-6), 155-168.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In *Communication and persuasion* (pp. 1-24). Springer, New York, NY.
- Ramírez, R., & Drevon, C. (2018). The role and limits of methods in transitional change process. In *The Transitional Approach in Action* (pp. 195-226). Routledge.
- Reis, J., Amorim, M., Melão, N., & Matos, P. (2018). Digital transformation: a literature review and guidelines for future research. In *World conference on information systems and technologies* (pp. 411-421). Springer, Cham.
- Stibe, A. (2015a). Towards a framework for socially influencing systems: meta-analysis of four PLS-SEM based studies. In *International Conference on Persuasive Technology* (pp. 172-183). Springer, Cham.
- Stibe, A. (2015b). Advancing typology of computer-supported influence: moderation effects in socially influencing systems. In *International Conference on Persuasive Technology* (pp. 253-264). Springer, Cham.
- Stibe, A., & Larson, K. (2016). Persuasive cities for sustainable wellbeing: quantified communities. In *International Conference on Mobile Web and Information Systems* (pp. 271-282). Springer, Cham.
- Stibe, A., & Cugelman, B. (2016). Persuasive backfiring: When behavior change interventions trigger unintended negative outcomes. In *International conference on persuasive technology* (pp. 65-77). Springer, Cham.
- Stibe, A., & Cugelman, B. (2019). Social Influence Scale for Technology Design and Transformation. In *IFIP Conference on Human-Computer Interaction* (pp. 561-577). Springer, Cham.
- Stibe, A. (2020). Transforming Technology for Global Business Acceleration and Change Management. *Journal of Global Information Technology Management*. DOI: 10.1080/1097198X.2020.1752077
- Tardieu, H., Daly, D., Esteban-Lauzán, J., Hall, J., & Miller, G. (2020). Measuring the Transformation—KPIs for Understanding Transformation Progress. In *Deliberately Digital* (pp. 201-208). Springer, Cham.
- Taylor, M. (2019). Overcome the barriers to successful team and organisational change part one. *HR Future*, 34-35.
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*.
- Waddock, S. (2020). Thinking Transformational System Change. *Journal of Change Management*, 1-13.
- Wessel, L., Baiyere, A., Ologeanu-Taddei, R., Cha, J., & Jensen, T. (2020). Unpacking the difference between digital transformation and IT-enabled organizational transformation. *Journal of Association of Information Systems*.
- Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading digital: Turning technology into business transformation*. Harvard Business Press.