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Development of a Re-invention Curve for Organizational socio-cultural Resilience: Conceptual Framework and Potential Risk Evaluation for the Mobility Industry.

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Abstract:

This paper develops a conceptual framework for the development of organizational resilience in relation to risks using the example of the mobility industry in Germany. From the new ISO standard for resilience and security as well as the current theory for organizational innovativeness, risks of the mobility industry are evaluated according to external and internal factors and derived in a probability-impact-matrix. The result is a re-invention curve that shows how companies in the mobility industry can build up refractiveness against crises. Our analyses revealed that the main categories encompass social and cultural resilience for companies, such as creativity, openness to change, collaboration, continuous improvement, cultural support as well as effective and empowered leadership. The results are deductively elaborated with a modern methodological design but are limited to specific research approach.

1 Introduction

The age of disruption is characterized by a fast-changing world, dynamics of disequilibrium withal intensive competition among a plethora of new market entrants. Consequently, turbulent environments, in which flexibility, preparedness and continuous innovation for customers are required for survival, have enhanced alternatives to traditional management concepts within the 21st century. Different scholarly work revealed that the average lifespan of companies on the Fortune-500 Index has never been shorter and decreased by more than 50 years in the last decade (*Foster*, 2012; 2018). Successful companies typically exist nowadays for only 15 years, while 40% of today's Fortune-500 companies will no longer exist in less than ten years. Indeed, innovativeness with its six-dimensional construct that includes creativity, openness to change, future orientation, risk-taking, proactiveness as well as collaboration and internationalization, has probably emerged as the most important nonfinancial goal and appears as an additional factor for organizational performance, continuity, and business success (*Acar* and *Özşahin*, 2018). Contrarily, this insight attempts to stimulate discussions in long-established firms relating to the transformation of business models. Likewise, companies need to implement protective mechanisms in advance of a disturbance that incorporates readiness and flexibility. According to this tendency, the direct linkage between corporate resilience (CR) and organizational innovativeness (OI) results in an elusive understanding of the necessary interaction of capability building in organizations. However, there is

still a limited understanding of firms' resilience and its related antecedents in the strategic management literature. Together, these points highlight two substantive gaps in the current research work: (1) How do mobility providers determine the nine ISO 22316:2017 on Security and Resilience elements in terms of internal and external risks, and (2) How powerful is the relation between innovativeness and resilience in such situations?

This paper, therefore, focuses on exploring the relationship between firm innovativeness and resilience within different stages and streams of company crises by shedding some light on an effective corporate infrastructure for risk assessment. Moreover, we consider how environmental change and organizational innovativeness interact to influence a firm's risk-taking capability. Due to the restrictive global accessibility of primary data, all analyses are concentrating on data basis of available company reports of the mobility industry. Finally, we conclude with a new practice model for socio-cultural crisis management as well as directions for future research.

2 Literature Review

2.1 Organizational Resilience

Resilience refers to the resistance and flexibility of an organization to internal or external influences. The effectiveness of a resilient infrastructure or enterprise depends upon its ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event (*Hoffmann*, 2016). In 2007, *Sutcliffe* and *Weick* identified five principles of resilience corporations: creating a diversity of perspectives, creating sensitivity, pursuing resilience, introducing a culture of mistakes, and providing external support in decision-making (*Sutcliffe* and *Weick*, 2007). The term organizational resilience (OR) refers to the term of high-reliability organizations (HRO). Those Organizations need to be better prepared than other organizations in times of crisis. The Berkeley group has identified principles that allow HROs to remain operational even in critical situations (*Endreß* and *Maurer*, 2015). Moreover, a resilient enterprise can emerge by assessing vulnerabilities, reducing the likelihood of disruptions, collaborating on security, building in redundancies, designing resilient supply chains and investing in training and culture (*Sheffi*, 2007).

A new standard on Security and Resilience – Organizational resilience – Principles and attributes published by ISO in 2017 gives guidance for any business to meet the challenges within an ever-changing world. It cannot yet be used for certification, but rather serves as an umbrella with a wide range of management disciplines. In particular, the framework sheds light on nine attributes that are listed in Tab. 1 contributing to more resilient organizations. Especially the combination with evaluation activities and principles provides certain research gaps in the area of organizational resilience. While the system mentioned above management standards induce foundation for strategy building, there are no concrete measurement criteria that can be used for monitor and evaluate the organization's overall status of resilience maturity and performance. We, therefore, propose one reporting tool for intelligence and management information that can be integrated into existing monitoring processes. Thus, one resilient territory embodies OI that contains structural

characteristics of intra- and inter-company networks which are crucial to understanding the concept of organizational resilience.

2.2 The six dimensions of organizational innovativeness

The term innovativeness refers to the organizational climate on the ability to continuously initiate and implement innovations over time that lead to new products, services, or processes in order to create a paradigm shift in the science, technology, or market structure within an industry (*Rubera* and *Kirca*, 2012; *Ruvio et al.*, 2014). It is not about the term innovation as discussed in the literature, but rather embodies a more holistic system-wide approach at the strategic management level. The importance of tuning opportunities into innovations that underlines a firm's ability of for competitiveness is highlighted by different previous research work. In that regard, five main areas developed by *Shoham et al.* (2012) and *Ruvio et al.* (2014) will be mostly taken into consideration with minor changes to deploy the construct of OI, namely creativity, openness to change, future orientation, risk-taking, and proactiveness. Additionally, the construct is extended by the sixth dimension with regard to the collaboration and internationalization dimension coined by *Frey et al.* (2006) and *Thomson et al.* (2007), referring to as an important driver of corporate agility.

2.3 The intersections of organizational resilience and innovativeness

All key drivers will now be described in greater detail by combining them to the nine attributes for organizational resilience in Tab. 1. As a step in this direction, it includes a number of the concepts as part of the innovativeness and resilience literature with important definitions and identifies similarities for further guidance of our crisis-specific matrix. We tried to make a clear assignment, but there were occasional overlaps to several areas.

Tab. 1 illustrates the intersection of innovativeness and resilience in three main areas, which are marked below as culture (yellow), leadership (green), and know-how (blue). These three categories can be summarized and abstracted as cultural and social factors of companies to create resilience and ensure innovativeness.

⇨ / ⇩ Innovativeness / Resilience	Creativity	Openness to Change	Future Orientation	Risk-Taking	Proactive-ness	Collaboration & Internationalization
Ability to anticipate and manage change		Willingness to change with a positive attitude about the potential consequences through flexible and adaptive structures as an aspect of a firm's culture.				
Supporting continual improvement						
Effective and empowered leadership	Creativity is influenced by social behavior through personality traits, intrinsic motivation, work environment, leadership style, culture, structure.					
A cultural supportive of organizational resilience						
Shared information and knowledge						Collaborative relationships increase intrafirm knowledge and capabilities exchange, opening of silos, and combining knowledge within and between departs through organizational learning.
Understanding in influencing context						
Development and coordination of management disciplines			A firm's preparedness for future environmental changes by building and positioning flexibility into management disciplines through communication, coordination, cooperation.			
Shared vision and clarity of purpose				Managers' ability to seize and explore hazardous growth opportunities as a key to overcome inertia at all levels with a diverse set of skills.		
Availability of resources					Forward-looking perspective with structural resource capital development.	

Culture Leadership Know-How

Tab. 1. Intersections of organizational innovativeness and resilience concepts.

3 Selection of internal and external business risks for the mobility industry

A risk analysis typically measures more than just financial effects. It contains four types of crises that can be classified into uncontrollable natural or company-related events, technology breakdowns, economic and market forces as well as business-relationship crises (*Harvard Business Press*, 2008). In our case, we extended the supercategories by criteria that are typical for the

mobility branch of industry in order to confront its most life-threatening problems. This stage of crisis recognition is often considered as the most challenging issue, because "companies sometimes misclassify a problem, focusing on the technical aspects and ignoring issues of perception" (*Augustine*, 1995). The conflict normally lies between the relation of espousing and enacting the corporate strategy.

According to various research work, companies in technology-driven industries must nowadays reinvent themselves (*Augustine*, 1997). The industry is composed of long-established companies that have little experience in renewing their business models, which often lead to a reinvention including engineer breakdowns. Even the diverse sets of steering mechanisms that should guide a company through change processes have become obsolescent, as they only reveal weak points in the current state of the system. Studies from different management work reveal areas like transformation, leadership, and culture as main drivers for typical internal and external corporate risks outlined in the following Tab. 2 applied on the mobility branches (*Kotter*, 1995; *Starr et al.*, 2018).

With the help of the analysis mentioned above, we identified seven main categories of internal and external risks, namely political & legal, economical, culture & social, technological & innovation, resources, venture, and environmental issues (see Fig. 1). The database was gathered from different sustainable value reports and annual reports of the automotive industry (e.g. *BMW Group*, 2017; *VW Group*, 2017 incl. *Audi*, 2017), as well as middle and long-term strategic plans from other mobility service providers (e.g. *BlaBlaCar*, 2017; *Deutsche Bahn*, 2017; *Lufthansa Group*, 2017; *Uber*, 2017).

Criteria	***Internal business risks***	***External business risks***
Organizational Management Issues	structure (strong hierarchical levels, silos), decision making and coordination, supervision, loss of Corporate Identity, corporate strategy and vision	-
Operational Issues	financial performance, assets, hatching, compliance, product protection/IPR, product safety and file suing	-
Resource Management	supply chain, raw materials (energy, waste, water)	supplier dependency, scarcity of raw materials (e.g., cobalt, lithium)
Socio-Cultural & Human-Factor	empowerment/leadership, staff, knowledge transfer, union strikes, war for talent, culture	trends, conscious environmental behavior, demographic change, sharing economy, share- & stakeholders changing needs
Political & Legal Factors	incentive and reward schemes, corporate communications	taxes, tariffs and trade, im- and export laws, law changing rules, war, pollutant emissions

Innovation & Technology	data protection, outsourcing of research and product development, IT management, infrastructure, processes	IT attack, digitalization, Internet of Things (IoT), Artificial Intelligence (AI), Industry 4.0
Environmental Issues & Change	corporate climate, new business models	earthquake, storms, harvest failures, volcano
Economy & Competitors	-	economic climate, financial crisis, purchasing power, corruption, urban space, mobility trends and concepts (autonomous driving, car sharing, e-mobility), new entrants

Tab. 2. Criteria overview of internal and external business risks for the mobility branch.

After assessing the internal and external business risks, the criteria were benchmarked to their status-quo risk potential ranging from "developing" over "established" to "leading" risk maturity (see Fig. 1). Cultural and social drivers were the most developing criteria and are therefore upcoming risks in the age of disruption. The other fields were rather classified as "established" or "leading" within the mobility branch of industry and are saturated fields within the research perspective. Nonetheless, the customary term of organizational culture became fashionable within the 1980s and is often presumed as a soft topic with hard consequences (*Hofstede et al.*, 2010). In particular, this sociological view initiated a deeper assessment of social and cultural risk programs that include aspects of leadership, empowerment as well as behavior and needs. As a result, this dimension will be taken into further consideration and will be applied for our new model, which is a convenient way to adapt the cultural concept of mental programming from *Hofstede*.

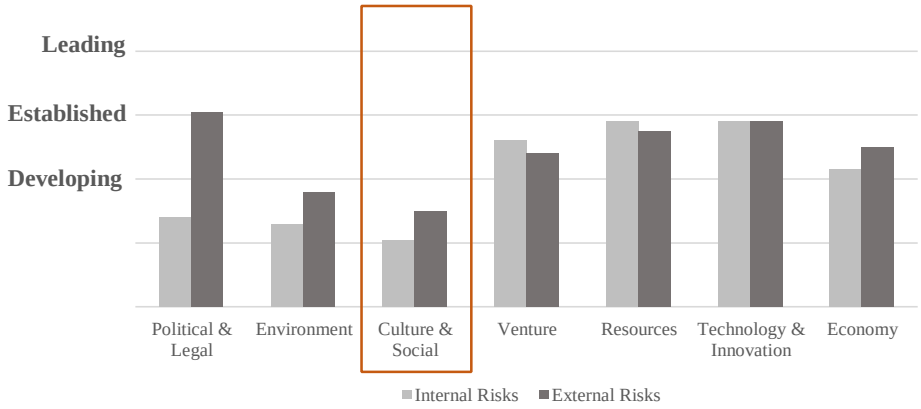

Fig. 1. Internal and external risk maturity benchmark for the mobility industry.

4 Methodology and Research Design

In general, risk assessments can be conducted via qualitative, semi-quantitative and quantitative ways. In this paper, we used the probability-impact-matrix, which is one of the most commonly used qualitative methods for risk assessment. All results usually have a descriptive nature and do not include a specific quantification of risk. Nevertheless, there are several reasons why qualitative assessments are formal being preferred, such as more accessibility, better understanding with a wider range of unidentified perspectives. In a further step, it will be possible to improve the risk profile by a quantitative measurement. The study will proceed deductively by existing theory from our literature analysis and will be examined by the qualitative content-analysis (*Brymann* and *Bell*, 2011; *Mayring*, 2015).

Moreover, a qualitative risk analysis has been done on the basis of a primary gathered data on internal and external risk factors for the mobility industry. As a result, the analysis proceeds with the classification of risk categories, illustrated in a probability-impact-matrix.

The combination of probability and impact of internal and external business risks forms a risk graph as shown in Fig. 2, where the top right corner is the high-risk area and the bottom-left indicates the low risk one. The matrix visualizes the risk status from low, field 1-1 to high risk in field 5-5. Also, the need for action from “no immediate action” to “immediate action” required is deposited. Within the matrix, the rhombs illustrate an internal or external risk compound.

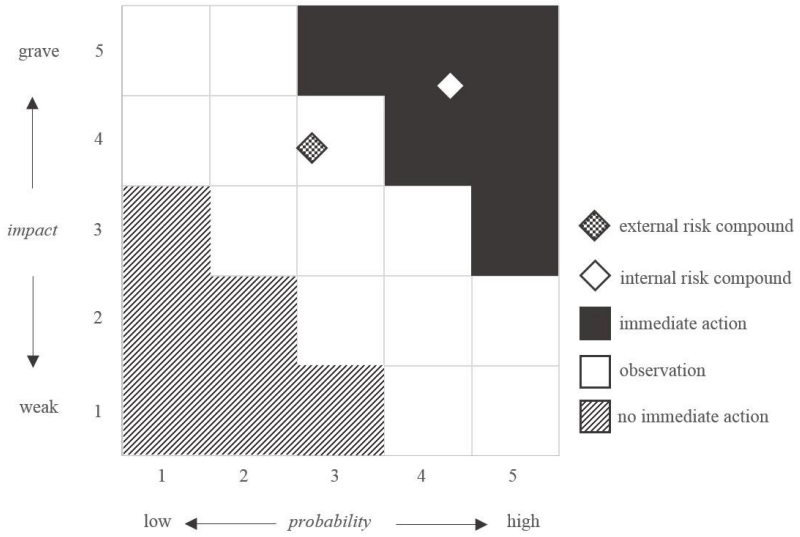

Fig. 2. Risk partition within the probability-impact-matrix.

The risk categories identified in Section 3 are assigned by values for probability and impact. In that regard, it is presumed that internal business risks have a higher likelihood to occur in comparison to external risks since the majority of the latter are predominantly exceptional (e.g. technological changes and product-life-cycle), whereas internal risks cannot be regarded as uncommon events. In contrast, it is expected that external business risks such as political-legal factors or customer satisfaction will have a higher impact since their occurrence is normally accompanied by grave consequences. The risks can be depicted in a portfolio regarding the dimensions probability and impact based

on a Likertscale (*Wittmann*, 2000). The psychometric scale includes at least a five layeredgrating scale (*Bortz* and *Döring*, 2016). Ranging from one, the lowest rating, to five, the highest.

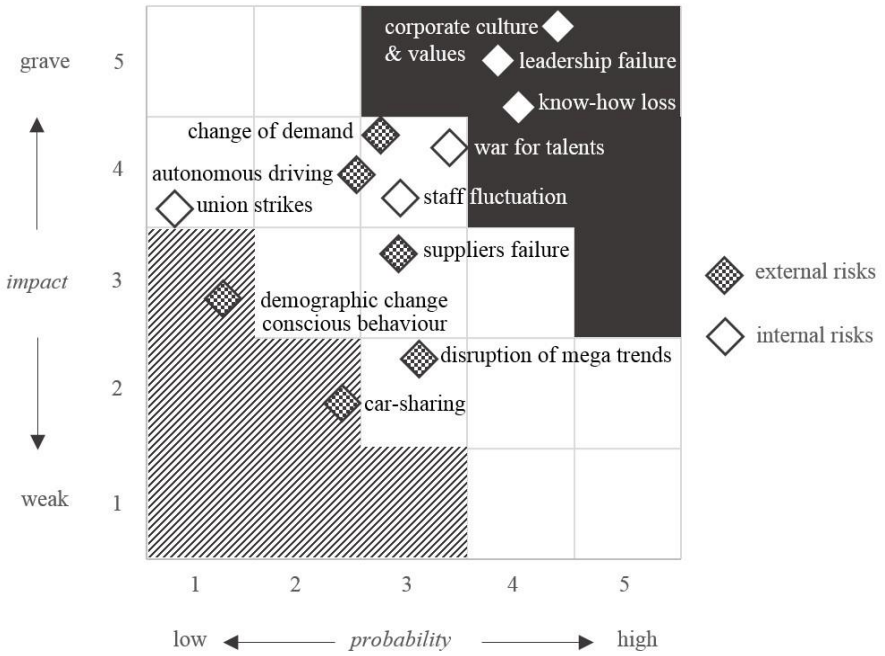

Fig. 3. Social & cultural risks within the probability-impact-matrix.

Sorting in, the internal and external hazard, of the risk category social and cultural into the probability-impact-matrix it gets obvious that familiar and assessable risks are weak and the need for immediate action is low. Noticeable is that only external risks appear in that matrix field. Contrary in the top-right field, only internal risks appear. Those risks require immediate action from the ventures. Since these are internal risks, these can be directly influenced by the companies. Looking at the categories of risks, it is possible to conclude the overlapping areas of resilience and innovativeness attributes from Chapter 2.

5 Findings

In Chapter 2 we found out that the resilience attributes and the innovativeness dimensions have three overlapping areas namely culture, leadership, knowhow. In the next steps, we analyzed primary data from the mobility branch regarding internal and external risk factors, which resulted in our probability-impact-matrix as illustrated in Chapter 3. As a result, it can be stated that the literary theory is confirmed for the three evaluated areas. But the ISO Standard perspective is limited and backward-looking and is reaching its boundaries in performance and effectiveness if we observe developing risk events. Therefore, we have to consider reference models with a forward looking-perspective on an industry that deals with future transformation processes. The so-called s-curve model, a widely recognized example attributed to *Foster* and made famous by *Christensen*, discusses how successful industry got wiped out over time (*Christensen*, 1997).

In our case, we rather speak of a Re-Invention Curve, composed of the acronyms of Resilience and Innovativeness. It has been found out that socio-cultural resilience factors can be achieved for crisis prevention and the development of robustness for companies, enabling a proactive defense. Fig. 4 illustrates on the abscissa the risk rapidness over time and on the ordinate the positive growth of robustness with regard to socio-cultural resilience.

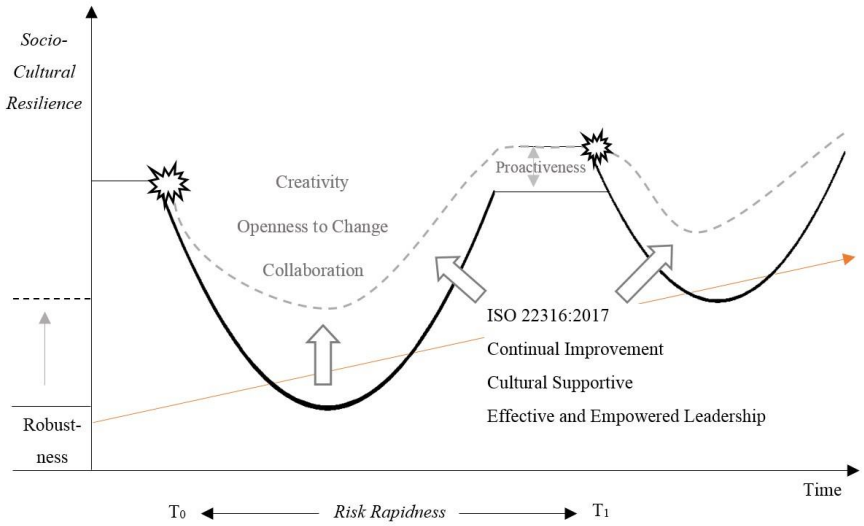

Fig. 4. The Re-Invention Curve for organizational socio-cultural resilience.

The increase in the curve describes the increase in robustness in terms of additional expenditure of proactivity. The factors mentioned in the paper are all internally controllable, but there is a risk to the company in the uncontrollable external factors. The controllable of the factors such as creativity, the openness for change and cooperation as well as the continuous improvement process, the cultural support and the effectiveness and empowerment of the leadership can be promoted by constant evaluation. The likelihood of getting back into crisis is frequently reduced by the establishment of risk defense mechanisms. As a result, a crisis is weakened in its strength by the creation of robustness.

Within a fast-changing environment, the gaps between risks become increasingly shorter. By the increase of robustness through the described three innovativeness dimensions, the socio-cultural resilience can be enhanced. The new dashed curve shows the new course in case of risk event with existing robustness created by resilience. This effect is illustrated in the trend-line (orangecolored arrow). For the next appearing crisis event the whole organization needs less effort to overcome inertia, which represents our new hypothesis that needs to be proven in a next step.

6 Discussion and conclusions

The presented results correspond in their relevance and significance to objective and non-contradictory results. But the investigation is limited to some points. As research limitations, the following aspects should be mentioned. This study focuses on the mobility industry exclusively. Further research could transfer the ideas to other sectors such as the consulting or IT, to test the general validity of the results. Additionally, an international survey would give interesting insights

concerning the degree of implementation in other countries or could identify social and cultural differences. The considered companies are mainly long-established and might have existing, unknown resilience factors that new markets entrants need to establish. Another aspect could focus on new entrants, who might have own new resilience drivers that have the power to overperform more than the average lifespan of traditional companies.

For future research, it is recommended to check the results quantitatively. This would require a survey within the mobility industry. Since the considered companies focused on large enterprises, it is also recommended to consider smaller mobility providers in the survey. Moreover, it is necessary to review the probability-impact-matrix for new impact factors constantly.

However, our probability-impact-matrix gives an answer to the research question (1) and classifies the most common internal and external business risks. The connection, interdependencies and proactive strengths of resilience and innovativeness (2) are depicted in our Re-Invention Curve.

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