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RESILIENCE, PEOPLE AND INFORMATION, A TRIANGLE TO BUILD SUSTAINABILITY

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Abstract

Digital revolutions and developments have been changing the way we work, socialize and experience the world. In our complex reality dynamic changes occur with an increasing frequency, where the role of IT is obvious. The COVID pandemic highlighted this development even more and made us realize that the old ways of working are no longer valid.

In this conceptual paper we sketch different scientific views to offer practical solutions to deal with challenges. We focus on dynamic developments on concepts from ecology and economics, identify some traps and link the insights to management, leadership, teams and the requirements for a successful cooperation.

Our goal is to identify the most crucial elements of sustainability: resilience, people and information, offer organizations developing solutions using the Adaptive Cycle of Resilience and help the reader to develop understanding social responsibility towards resilience and sustainability.

Keywords: Resilience. adaptivity, disruptive change, human behavior, the role of information

I. INTRODUCTION

Digital revolutions and developments have been changing the way we work, socialize and experience the world. In a complex world where dynamic changes occur with an increasing frequency, the need for different views on the evolving reality, in hand with the role of modern IT, is obvious. The COVID pandemic highlighted this development even more and made us realize that the old ways of problem solving are no longer manageable. Combining different scientific views helps us to build a new one on the emerging reality. In this conceptual paper we sketch this to offer practical handicrafts for dealing with the challenges of today. We will focus on dynamic developments based on concepts from ecology and economics, identify some possible traps to avoid. We will link these insights to management and leadership, teams and the requirements for a successful cooperation. The description will help the reader to develop its understanding of social responsibility towards resilience and sustainability.

Our goal with this paper is to identify the most crucial elements of sustainability: resilience, people and information. Using this trinity, we offer organizations to be more prepared for new developments, which can happen anywhere and at any time, changing the field of play completely. Developing a solution space in dynamic times requires leadership, information and knowledge, thus well-prepared people. Using the Adaptive Cycle of Resilience and the accompanying learning approaches, organizations may find solutions by linking better their people's abilities to solve the challenges they face and considering sustainability for the future of us all.

II. ACOR: THE ADAPTIVE CYCLE OF RESILIENCE

In a world faced with unforeseen developments - such as the current Corona virus - organizations need to respond adequately to an unknown future. There is often a great deal of uncertainty about how people can be educated to do this. Which route or process should they follow? In practice, the Adaptive Cycle of Resilience (ACoR) may offer efficient tools to understand the unforeseen future(s) and to be able to shape it adequately.

The ACoR model (Abcouwer and Smit 2015; Abcouwer et al. 2020; Takács and Abcouwer 2020) represents a standard route which the organisations – whether individuals or teams and companies or collaborative chains - pass within the boundaries of what they ***want-must-can*** (Heene 2002). It shows a cyclical development with the characteristic of infinity of the change process. We will analyze the different movements with possible traps managers and leaders may fall in, then move through the cycle considering the type of people and information are necessary for success. We will see that it is the level of resilience that moves the cycle and ensures a sustainable development.

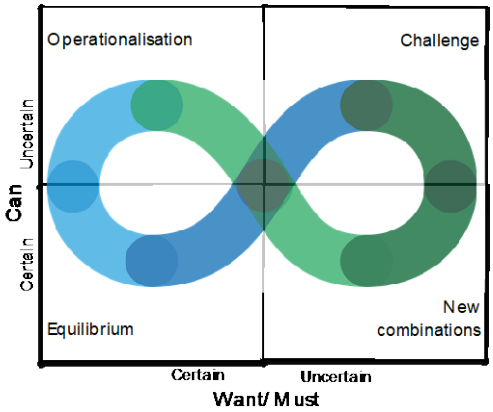

Figure 1. the Adaptive Cycle of Resilience (ACoR) model

Dynamic moves in the ACoR

The ACoR model helps to understand the change process by the different objectives strived for, the process moving the organization from quadrant to quadrant in line with the human decisions with individual objectives.

Equilibrium quadrant:

Rationalizing, efficiency and effectiveness form the base for preparing for challenges and preventing being hit by a crisis. The focus is on *preventing problems to happen*.

Figure 2. Equilibrium

- **Moving from *Equilibrium* to *Challenge* – Release**

  At a given moment, the complexity can become that high - also due to unthought and unexpected but impactful external developments that the organization is no longer capable of dealing with it. As soon as it becomes obvious, a so-called *Gestalt switch* (Weick and Quinn 1999) occurs, bringing the organization from confidence to insecurity, which the actual events cannot explain. Therefore, the point that marks the challenge into being is based mainly on perception. In the ACoR model, the transition to the challenge quadrant is a fact. In literature, the term *release* is used for this transition (Gunderson and Holling 2002).

Release -> Lock in -> Fear for future

If the organization is unable to break free from the old, the trap to lock-in is likely to arise (Gunderson et al. 2010). From a human point of view, fear for the unknown is often the basis for this trap. The characteristic of this setting is that it becomes clear that traditional problem-solving does not work any longer (Christensen 1997; Taleb 2010). The management will have to let go of the good old proven approaches and start an intensive process of searching for alternative new paths. Due to high performance reached in the past with a constant focus on raising performance and being more efficient, the system has lost some of its resources to be resilient. A natural tendency arises to stay, as the old way of working performed well, and should thus avoid losing that certainty.

Learning perspective

When an organization is in an equilibrium state optimalization, and rationalization is key for successful performance. Employees should be educated to be well prepared for the today's job. Education is focusing on building the right competencies with the staff. It has merely a short-term objective.

Challenge quadrant:

Figure 3. Challenge

When the organization faces a challenge (or even a crisis), there is an urgent need for creativity. Focus should be on finding solutions for the disruptive change. If this capability is not available, then to build it up. The focus is thus *designing new solutions.*

- **Moving from *Challenge* to *New combinations* – Reorganization**

  If the management's attitude is uncertain during the challenge, the creative powers came to fruition. It creates optimism, a nucleus of confidence and hope for the future and enables a far-reaching restructuring. In literature, this is the phase of *reorganization* (Gunderson and Holling 2002).

Reorganization -> Poverty -> Lacking creativity

While facing a disruptive development, the organization needs to deal with it in the shortest possible timeframe. Highly creative solutions may be necessary. This process requires open divergent thinking, broad views, initiating new insights and alternative interventions. In a word, creativity. But what happens when an organization is lacking the ability to be creative? The literature identifies it as the poverty trap (Gunderson et al. 2010), which in many cases is the result of poor management. Lacking resources to renew, makes the organization more vulnerable to change.

Learning perspective

When an organization faces a challenge, creatively finding new opportunities is a main requirement for the staff. Employees should be educated to be well prepared for unforeseen futures. Education is focusing on building the right competencies for being creative and open to new insights. It has clearly a long-term objective.

New combinations quadrant:

Figure 4. New combinations

After finding a set of potential solutions, a choice to prepare for evolving towards operationalization must be made with an analysis to judge which combination should be best helping the organization to deal with the challenge. These require leadership and awareness of management issues. The focus is thus *choosing the appropriate intervention*.

- **Moving from *New combinations* to *Operationalization* – Exploitation**

  In terms of perception of the situation, making a definitive choice means replacing being hopeful with confidence in the future. Believing that we made the right choice is partially based on rational and on emotional grounds. It is impossible to prove future success. However, there is no need for finding new initiatives but striving to promote solidarity towards the chosen solution. The literature describes this phase with the term *exploitation* (Gunderson and Holling 2002).

Exploitation -> Isolation -> Lacking courage and persuasiveness

While in the New combination phase the focus is on developing alternatives, at a certain moment we must choose to initiate the development towards a new equilibrium. When the organization cannot propose the intervention, it may fall into an Isolation trap (Gunderson et al. 2010). There are several options available in this situation, but we also realize low connectivity to implement them. Low resilience is the logical result, especially when those who developed the new options lack courage or are not persuasive.

Learning perspective

An organization in a new combination state should focus on making the right choices. Employees should be educated in the field of decision making. Education must assure that employees are able to decide on the measure to use for making the right choices. It has clearly a mid-term objective.

Operationalization quadrant:

Figure 5. Operationalization

After choosing a preferred approach to deal with the challenge, the preferred solution(s) requires cooperation and different specialisms. The focus is on management and optimization based on leadership choices, thus *prepare for implementation* (Gunderson and Holling 2002).

- **Moving from *Operationalization* to a new *Equilibrium* – Conservation**

As soon as the choices are made, one needs to pay attention to their operationalization and improvement. Rationalization of processes, attention to efficiency and effectivity become important. The regaining of bureaucratic structures will be necessary to re-establish routines that result in the organization ending up in a new business-as-usual (equilibrium) situation. At that stage, solidarity reaches again a peak and optimally utilizes the qualities and potential of those involved in the change process. It changes the manager's state of mind from conviction regarding the choice for the future into confidence in the present. This new business-as-usual situation is different from the old one. In literature, the term *conservation* is used for this phase (Gunderson and Holling 2002).

Conservation -> Rigidity -> Resistance against change

Upscaling the new approaches to optimize the effect of the newly developed problem-solving methods will only be successful when the organization is open for the change. However, many face an intensive command-and-control culture that brings all kinds of forces and resistance against change into practice. In addition to the command-and-control culture, rigidity traps (Gunderson et al. 2010) have other characteristics, including (1) avoidance of learning (from past mistakes), (2) lack of trust among management institutions and stakeholders, and (3) strong feedbacks that maintain core elements of the status quo. Implementing the new development successfully is far from obvious.

Learning perspective

An organization in the operationalization state focuses on convincing and assuring the implementation of the required changes. Education deals with the resistance to change and rationalization of the processes. It also has a mid-term objective.

An integrated view on organizational change, using the ACoR approach

Escaping these traps poses some of the most challenging and frustrating issues resource managers face. They are best confronted by active adaptive management approaches to unravel the complexity of these traps. Applying management actions designed to help to understand and meet other social objectives can prove promising but requires well educated personnel.

Integrating the above-mentioned reasoning into one grand view on organizational change in contemporary contexts leads from an insight based on confidence to one based on uncertainty. Following the ACoR, the organization might come back to a new state of confidence based on trust in ones' own capabilities leading to a state of being hopeful about the future.

The process requires different states of minds of the involved humans, which leads to the question of how to prepare and equip for challenges those involved in the process. Implications for HR are thus necessary to further elaborate.

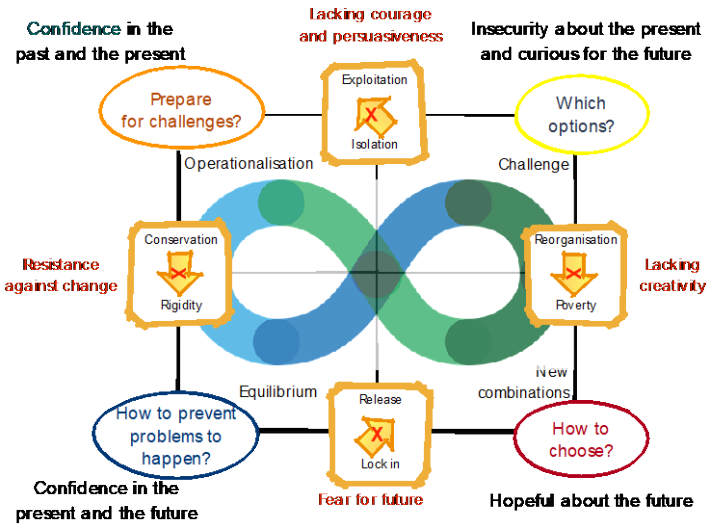

Figure 6. The grand view of the ACoR model

III. MANAGERS OR LEADERS NEEDED?

In the literature on Business studies, many scholars describe the relevant differences between managers and leaders. In most cases, the descriptions are only partly linked to the phased change process.

Considering the certainty of the challenges the organization is facing, we distinguish between the different types of managers/leaders.

Figure 7. Manager or Leader needed?

As described by Lunenburg (2013), managers using a proven technique mainly focus on rationality, while leaders prefer using innovative ideas and focus on the challenge. In this paper we add resilient managers, who can deal with ecological resilience, are the ones that we call a switch from one side of the ACoR model to the other. They identify both the need for renewal and determine which new ways and methods they will bring into operation. The competencies of the identified managers require different skills of the person involved.

Managers using proven techniques

When a manager faces a known problem-setting, in many cases, they prefer to use the already proven problem-solving techniques (Christensen 1997; Fiksel 2015; Tsoukas and Shepherd 2004). The rational manager trusting the previously gained experiences and developed abilities will initiate the actions. The rational manager should *guide* and *inspire* the implementing team based on the previously built-in knowledge and solutions repertoire.

However, situations can be so complex that remembering past experiences will not always work. In cases where doubt rises whether the proven techniques fell short, the need for a *new way of working* glows on the horizon (Fiksel 2015; Tsoukas and Chia 2002). A traditional manager will most probably postpone the *shift* if possible, to change from the proven techniques to a different way of working.

Resilient managers

In scientific literature, the moment of the switch from proven approaches to solving problems with new and creative alternatives is hardly studied. We limitedly recognize that *change* in problem-solving practices is an undeniable *necessity*. The resilient manager is supposed to realize the need for change. As a person, he must decide the right moment to initiate the switch and let go of the past.

The movement from creativity to rationality again requires a strong trust in entrepreneurship and operationalization focus on success to identify the moment of the switch to get the organization starting to move. This shift can only be successful when three characteristics are arranged: choosing the right moment, deploying the power and convincing the team to form the dominant coalition as switch is the only choice and cooperation.

In these two switching processes, the resilient manager plays a role in leading the teams from guiding to inspiring and vice versa.

Leaders using innovative approaches

After deciding about the new interventions, the organization needs to prepare for the new countermeasures. Co-creation (Maciuliene et al. 2018), cooperation and cooperative learning (Abcouwer and Takács 2018a). All available creativity will be necessary to co-create solutions, approaches, and alternatives. Therefore, new dominant coalitions will take part in the co-creation process for building up the unknown future into a well-developed and accepted or appreciated reality.

These three types of managers and leaders move the process from proven techniques to innovative ones, then back to the proven ones again, in line with the ideas behind the adaptive cycle of resilience.

Understanding the different roles required for the phases of the change process can bring a clearer focus on the type of managers or leaders needed and fit best for successful and sustainable operation in our dynamic era.

The adaptation and the implementation of the changing process require different roles by the management, while cooperating teams play an autonomous role in adding creativity in the solution to push the organization forward.

IV. THE ROLE OF THE TEAMS

According to Lencioni (2002) there are two critical truths. “First, in most organizations, genuine teamwork remains as elusive as it has ever been. Second, they fail to achieve teamwork because they unknowingly fall prey to five natural but dangerous pitfalls, called the five dysfunctions of a team. These dysfunctions can be mistakenly interpreted as five distinct issues that to address in isolation. They form an interrelated model, making susceptibility to even one of them potentially lethal for the success of a team.” In practice, teamwork is challenging because it requires *levels of discipline and persistence* that few teams can master.

Teamwork ultimately comes down to practicing a small set of principles over a long period. Success is not a matter of mastering subtle, sophisticated theory, but embracing common sense with uncommon levels of discipline and persistence. Ironically, teams succeed because they are exceedingly human. By acknowledging the imperfections of their humanity, members of functional teams overcome the natural tendencies that make trust, conflict, commitment, accountability, and a focus on results so elusive.

When we link the approach of Lencione to the ACoR model, we can easily identify the logic of reasoning. We can link these moves to the dysfunctions of teams who influence the movements.

In a setting where the organization is in equilibrium, people highly trust each other. The tendency to continue to apply authenticated modes of analysis is driving the organization forward. But dynamics force to situations where these approaches no longer are applicable. This development makes that success is declining and that people within the organization no longer **trust** each other. The challenges the organization is facing leads to a setting to develop new solutions. And because nobody knows already the ‘right’ solution, different insights will confront all forms of **conflict**. The ability to use conflicts productively and develop interventions require an open mind. After creating new combinations as measures to deal with

the challenges, someone needs to choose and implement one of the potentially successful interventions. Everyone involved in this process must **commit** to ensuring success in the organization's ability to deal with the necessary change. The operationalization of this chosen measure will require participants in the change process to be **accountable** for the proper implementation. It is the only way to assure the success of the change process the organization goes through. So, the first four factors for effective cooperation ensure the organizational ability to be successful (**result**).

As we recognize, it is the people, who can move with the cycle, based on the available information and resilience. First, we focus on resilience, integrating the underlying views, then highlight the role of learning.

V. THE CONCEPT OF RESILIENCE

In different societal sectors, the term resilience has become increasingly central during the last decade. This attention is relevant given the changes organizations face. In practice, there is no generally accepted definition of this concept. Based on different in literature stated insights, we will define a practical approach to understand the concept of resilience in the light of the ACoR model.

Practical definition

The focus of resilience is on the internal/external issue (where often context is leading) and the ability of the organization to deal with that from the ground up, stressing that the concept is especially crucial because of multi-state occurrences. The concept of resilience highlights the fact that it is an ongoing process that every organization goes through. Based on these perspectives, we concluded that there are four types of resilience.

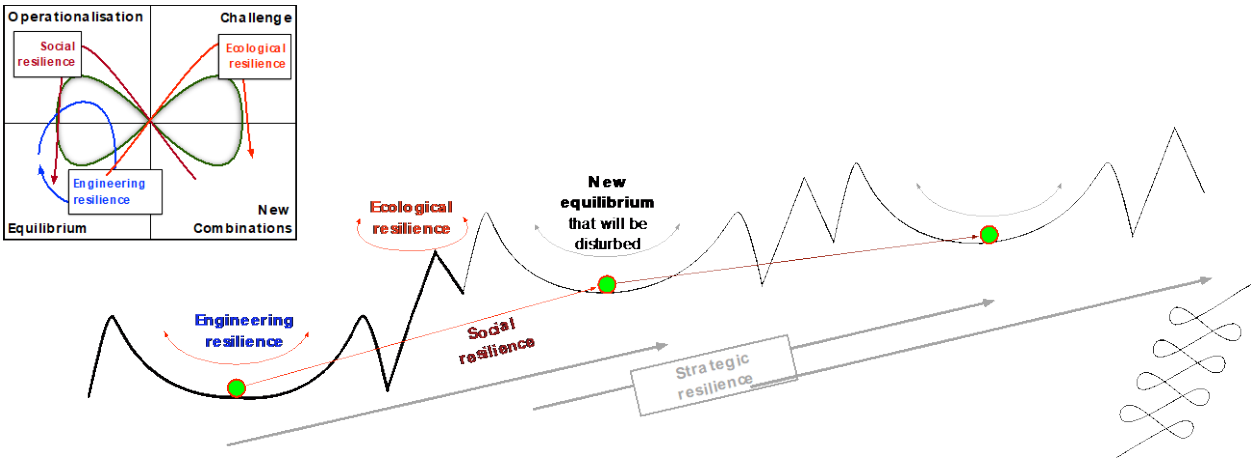

Figure 8. Resilience in the ACoR model

1. *Engineering resilience*: The speed of 'bounce-back' to a natural equilibrium condition. The ability to recover from (minor) disturbances. It represents the organization's ability to stay in a more or less stable equilibrium state.
2. *Ecological resilience:* The degree of disturbance reaches a level that the system requires change. Change is considered normal, where we work on alternative stable states rather than on single state equilibria. It represents the moment the need for change arises.
3. *Social resilience:* The ability of a system to evolve to a new equilibrium state, given that authenticated modes of dealing with challenges are no longer applicable. It indicates the ability to deal with an occurring challenge.
4. *Strategic resilience:* The ability to continuously change in a reaction to the stream of challenges the organization keep facing. It shows the ability to face a sequence of disruptive changes continuously.

Figure 8. shows that this view on resilience fits very well with the theory of the ACoR. However, the process is not a single loop. As we have stressed earlier, organizations must deal with continuous developments. Related to that, the fourth type of resilience is necessary. Figure 8. shows this approach to resilience. While the top-left part links to the ACoR model, in the middle part, we unfold the cyclical movement to a time-based development, assuring the organizational ability to deal with unforeseen futures (in plural).

Based on this view, we shift our focus on the role of knowledge and information.

VI. INFORMATION AND MANAGEMENT IN ORGANIZATIONS

There is no doubt about the importance of information in a modern organization. We must make a distinction between information as an initiator and facilitator for change. In both cases, there is no question about the role management plays in modern organizations. But it is still necessary to focus on the specific roles of information and management for helping the organization change. The change itself will be initiated in many cases by information (technology) but other change initiations are evenly well possible. In the different phases of the cycle, the role of information is quite different. The left-side of the model focuses on exploiting the strength of the organization, while the right-side deals with exploration (Dyer and Ericksen 2008; Mintzberg and Westley 1992).

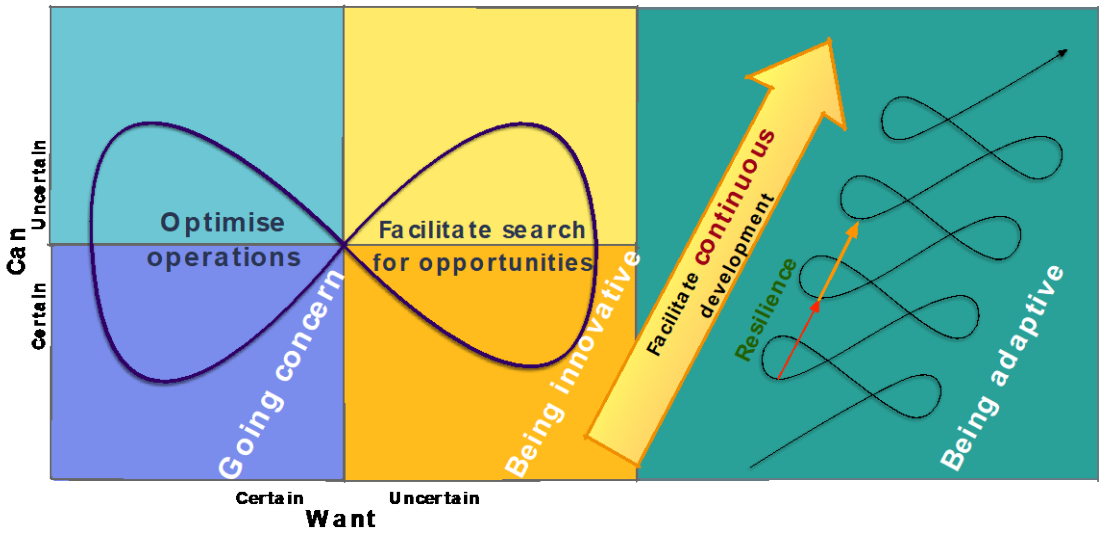

Figure 9. Information in a changing world

We can identify different roles for the information and the related management objectives in the ACoR model with the following three characteristics (Abcouwer et al. 2020; Takács et al. 2019):

1. **Going concern** with the management objective to *Optimize operations* and with the role of IT to facilitate the organizational processes: exploitation primarily based on evolutionary development. This role is significant on the left side of the model. Doing 'the same for less' or 'more for the same' is key to judge management qualities. Control is the central coordination mechanism within the organization (de Geus 1989; Keidel 1995).
2. **Being innovative** with the management objectives for *Facilitating search for new opportunities and solutions* and with the role of IT to support creativity, analysis, and experimentation: exploration aiming at preparing for a potentially revolutionary change. In terms of the need for being resilient, we refer to the concept of ecological resilience. The main coordination mechanism should be based on giving autonomy to organization members (de Geus 1989; Keidel 1995). This approach is different from the going concern role and thus requires other information system facilities. The crucial question is when to switch over from striving for bouncing back (engineering resilience) to the awareness (linked to ecological resilience) that new problem-solving approaches are needed right away (Westley 1995).

3. **Being adaptive** with the management objectives for *Facilitating ongoing change by interlinking the cyclical processes of change.* As mentioned above, the adaptive cycle makes it clear that the process of change is an ongoing one, and the process goes on to reach a new equilibrium. The main coordination mechanism stimulates cooperation between the members mainly working in teams (de Geus 1989; Keidel 1995) to increase the organizational flexibility and adaptivity. Trying to intervene, thinking of new ways of working, initiating changes to influence the future distinguishes good management from bad. Social and strategic resilience is essential in that respect.

In an actual organizational setting, all three above-described roles have their strengths, so all of them should be covered. In the different phases, a specific bias towards one of the roles may occur. This requires changing attention towards the role information systems play and the connected changing organizational position. Identifying the different roles in an organizational context, also clarifies that a 'one-size-fits-all' approach to modern organizations does not exist or make sense.

It is the responsibility of the management to be aware of these roles and it is necessary to find a balance between them. This assumes that management is aware of the phases of the adaptive cycle model and how to turn information systems into actual practice in the different phases. Also, to stimulate teams to optimally contribute to the organization's well-being in the different phases, and the members within the context to play a societal role.

VII. INTEGRATING MANAGEMENT, TEAMS AND INFORMATION

Finding a balance within an organizational context between management/leadership, the roles of teams, and how information systems can support the organization, is a complex issue. Especially when considering the dynamic and often disruptive changes, we need a mechanism to understand better the balancing act organizations face in contemporary society.

Even though general one-size-fits-all solutions do not exist, we attempt to formulate some guidelines for future behavior. Our remarks may not be strict guidelines for action, but a brief indication of a relationship with a logical cohesion between the elements. Below we identify three lines of reasoning:

1. Control bias (marked blue)
   Left in the ACoR model, an organization finds itself in a more stable setting. Most of the people know their tasks and expectations. Rational management leads the organization, and teams cooperate to reach the organization's objectives. The information systems facilitate the 'going-concern' approach, where there are clear requirements, or they can be formulated along existing lines of working. The organization highly trusts the knowledge of the past and present, and its teams work towards well-defined objectives. New systems should smoothen the organization's processes, and system development involves business professionals increasingly in the requirement analyses processes. In current society, this approach comes forward in high attention for Agile working, Dev-ops and other modern system-development approaches, based on utilizing the available knowledge. In a certain sense, these approaches are short-running and circular waterfall system developments. Dealing with disruptive challenges is not their strongest characteristic.

2. Innovation bias (marked yellow)
   When authenticated working methods do not work any longer, the ACoR model states that control-based management is no longer able to deal with organizational challenges. Creativity must be called upon to help the organization find solutions. New and unknown opportunities are necessary, and every individual needs to contribute to this creative process. Up to a high level, autonomy should be allowed to employees to bring in new insights and solutions for the challenges facing. The key term here is being innovative. Traditional system development approaches no longer suffice, nor the agile way of working based on short cyclical waterfall comes. Managers have to allow experimenting, testing and simply trying a new solution both in organizational work and supporting information systems are an urgent need for an organization to survive. Success measurement for doing it cheap works counter intuitive and only increases problems. Finding a balance between stimulating creativity and allowing people to work autonomously versus focusing on effectiveness and efficiency appears challenging.

3. Adaptivity bias (marked red)
   This balance becomes even more provoking in the long run. Organizations must switch periodically between rationality and creativity. Finding the right moment for that switch is one of the critical problems for modern organizations. Success measures based on effectiveness and efficiency do not work in disruptive change and throw away money while experimenting and experiencing the effects of new interventions do not work either in the long run. Understanding this contradiction is hard to predict because not doing anything and sticking to old fashioned ways of working can be fatal to the organization and endlessly experimenting 'does not let the chimney smoke'.

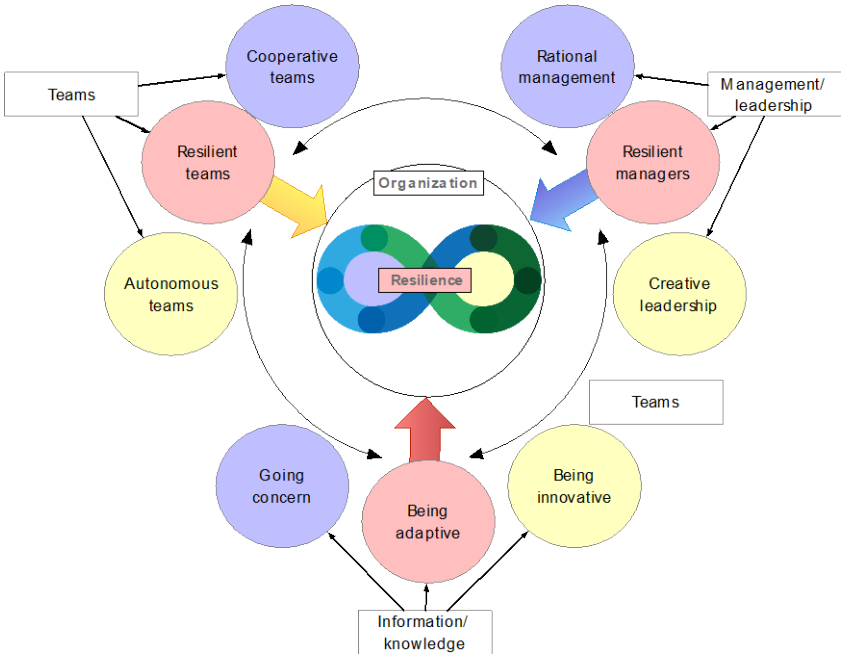

Figure 10. Resilience, People and Information - the triangle

An organization must be prepared for all these three circumstances (Weick and Westley 1996; Westley et al. 2002). A continuous search for potential causes for disruptions as well as a focus on efficiency and effectivity and self-development of employees by facilitating learning is a strict necessity. It means that learning in this setting is crucial.

VIII. THE ROLE OF LEARNING AND ADAPTIVITY

The dynamics of the current economic developments leads to a growing gap between the demand and supply of skills in many sectors. We characterize this development along the lines of 3 "*fits*":

1. The economy needs to improve the *Person/Job fit* (Carless 2005) with explicit requirements on how to educate the workforce. The change requirements are known for the problems; the society is facing. In many cases, the intervention repertoire is available and sufficient to deal with them. When in cases it isn't, new interventions can be developed, based on thorough analysis and design, using knowledge and skills available in the actual context of the problem.
2. Economy & industry can forecast future developments regarding skills and competencies. There is a strong need to educate the workforce to build up the flexibility to adapt to developments: *Person/Organization fit* (Cable and Judge 1996). We can foresee and forecast the developments as they will take place in a short-to mid-term timeframe. The necessary interventions will not be available on an instant basis but rather in general. A thorough analysis using the available professional capabilities will facilitate new measures to deal with the forecasted problems.
3. In the long run, developments are not predictable. The organizations and the workforce have to prepare for unknown futures so they can deal with unforeseen developments: *Person/Future fit* (Abcouwer and Takács 2018b; Abcouwer et al. 2018). With increasing frequency, the disruption of

the societal changes will lead to a situation where we do not know the requirements for the future. It means that we must find solutions in a situation where the problem is not even identified yet.

Along these lines of reasoning, a focus on continuous development is necessary. From different perspectives, we need to be aware that short-term approach is different from a mid- or long-term one. To develop adaptivity, all types of resilience are necessary to survive.

IX. THE APPROACH APPLIED IN PRACTICE

After building a coherent view on contemporary developments in this conceptual paper, a logical question is how it fits into practice. Because the approach is highly future oriented and future is unpredictable, we can only illustrate its relevance by showing an actual example.

Analyzing the current developments around the Coronavirus, we can try to understand what has been happening and apply it in our conceptual findings. Being in the middle of solving the pandemic, we cannot give a final judgement yet.

1. With the rise of the Coronavirus, we have seen that the first reaction was ignoration. 'Why should we change? Was not it only a light flue?' In the theory of the ACoR, we recognize a ***Lock-in*** trap. 'It is not such a big deal, it cannot affect us', etc. After the partial lock-down of the countries, we face a situation, when we do not know whether we will be able to deal with this crisis. ***Poverty*** characterizes the status we now found ourselves in.
2. Concerning the goals, we can make a clear distinction. The newspapers are full of finding vaccines as the primary approach for dealing with the crisis. But that does not provide ***long-term*** solutions. And attention needs to be paid to that, but for ***now***, the focus must be on preventing overburdening healthcare.
3. There is a need to develop various change routes in the short term, to relieve the burden of care and understand better the situation. Next, the solution was to create vaccines and medicines. For the long run, we should prepare for other connecting challenges. Some government plans provided for dealing with pandemics with a long-term approach, others for reaching a short-term result. The ACoR offers an alternative view on the problem.
4. After the developed vaccines, we need a rational approach to handle the problem. In the US in the first 100 days of the new government, they carried out more than 200 million vaccines in a military operation. In Europe, the speed of vaccination was way slower. Doubts were arising on the quality of a vaccine developed so quick, and several times the minimal risk of side effects limited the effectiveness of the vaccination campaigns. The need for a rational (blue) approach was not recognized enough.
5. As we see, many competencies are needed. These also may be deployed by thinking out-of-the-box. Education, resilience and building capabilities for dealing with future uncertainties is an apparent necessity.

In daily practice, the long-term needs are not incorporated in our usual ways of thinking. Whatever solutions in the short term are chosen, securing, cooperation and dissemination require a lot of attention. What, for example, did we learn from the SARS outbreak that came from 'wet markets' -the markets in China where a lot of living goods were traded? After SARS, these markets were virtually closed, but due to the economic importance for the local population, they were reopened over the years. Corona appears to originate exactly from those markets again, where the SARS came from almost 20 years ago. So, in many cases, short-term problem solving outweighs the long-term perspective. Our approach stresses that we need to find a balance between them. Dealing with challenges therefore stands or falls with the organization's ability to solve problems both in short- and in long-terms. Recognizing this, will help to avoid a relapse into old patterns, which is an identifiable risk to the organization's innovation capacity.

X. CONCLUSION AND REMARKS

In this conceptual paper, we have presented an approach to change and build sustainability and resilience with IS. We introduce the Adaptive Cycle of Resilience (ACoR), a tool for managing short- and long-term challenges, developing resilience and using resources: people and information to innovate. Our research

is based on thorough literature research and cases studies of organizations dealing with unforeseen challenges for many years now. The scientific demand for predictability - based on mostly statistical proof - appeared not to work here, because of the chaotic contexts of many of the cases we have studied.

We are unable to predict all potential disruptions by basing ourselves only on the past and the present. It does not work. So, it is not our intention to use this theory to predict future developments. Still, we aim at building up adaptive capabilities to be better able to deal with challenges as soon as they appear.

Does it mean that we must accept the unpredictability of future developments? We must realize that some of the challenges we will face in the near future, are quite well predictable.

What about the depletion of natural resources, the climate crisis, earth facing drought, the need for being circular, all developments we can expect to happen in the future? Even though we can prepare and act, neither governments, nor organizations or individuals prepare themselves for a sustainable future. This is because the impacts of the developments are unpredictable. So, we raise the question if there is a need for change. The approaches we presented, can provide another vision on the uncertain future, where the key is resilience. That is the objective of this conceptual paper!

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