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SELECTION OF RISK IDENTIFICATION INSTRUMENTS

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***Abstract**: The growing volatility in the business environment fosters the importance of risk identification. This step as part of the risk management process builds the basis for every further stage. The prospective risks need to be analysed closely as they reveal potential threats and opportunities. Creativity tools are used here to overcome biases like hindsight or conservativism as these often occur when evaluating past data. However, not one single technique offers the solution but a combination is necessary to identify potential risks. To identify all importantones a diversified group is best suited as they are able to identify more risks than individuals. A combination of internal and external experts is useful for effective risk identification. The techniques used thus need to be customized to the involved persons and business environment to provide a starting point for the decision making. If the importance of risk identification is not seen by companies one of the many negative effects this can have is a weakening of the market position and lagging behind the competitors.*

***Keywords**: Risk Identification, Creativity tools, Brainstorming, SWOT-Analysis, Interview, Delphi-Technique, Bisociation, Synectics*

Introduction

"Thinking the unthinkable", a statement by the author Hermann Kahn, needs to be the main aim of risk identification in order for a business to survive in the long run. Risk identification is one step in the risk management process as outlined below (Nowack et al. 2011, 1).

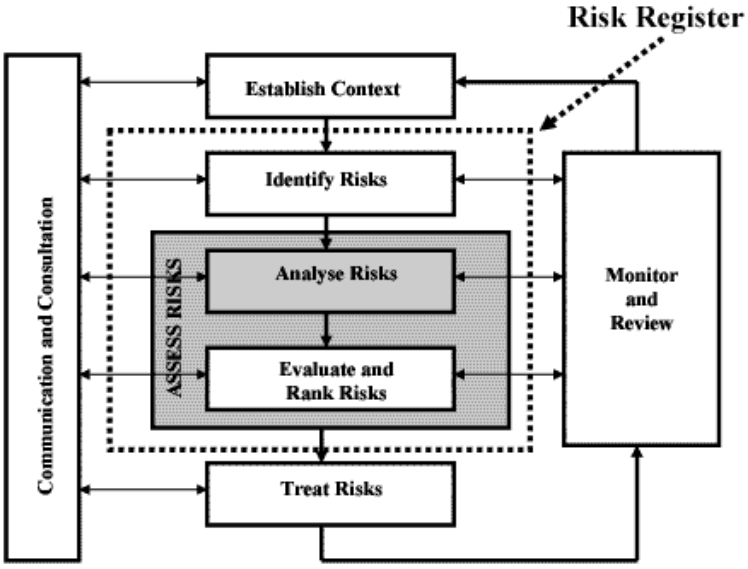

Figure 1: Risk management process according to ISO 31000 (Source: The Scottish Government n.d.)

As the second step in this process risk identification builds the basis for all further analysis and evaluation. Due to this fact step two is of critical importance to the process and influences all tactic and strategic decisions (Häntsch and Huchzermeier 2013, 130).

Within the risk identification procedure several instruments have been outlined. The graph below provides an overview about the possible techniques.

Collection methods	Search methods	
	Analytical instruments	**Creativity tools**
Checklist, SWOT-Analysis, RIM, Interview	Questionnaire, Morphologic method	Brainstorming, Brainwriting, Synectics, Delphi Technique, Bisociation
Retrospective Risk Identification	**Prospective Risk Identification**	

Figure 2: Risk Identification methods (Source: own diagram, based on data from Sartor and Bourauel 2013, 42)

In order to identify potential threats and opportunities in the future search methods are best suited. Collection methods are usually best to identify risks that have already occurred in the past and experience in its handling is available. The use of these collection methods can lead to unsatisfactory results as biases are involved.

One of these biases is named the hindsight bias or "I-knew-it-all-along". It describes the state of having knowledge about the actual outcome and thus, one is tempted to see the action as it would have been clearly foreseeable in the past (Wu et al. 2012, 1).

Furthermore, overconfidence is often involved in the risk identification process. Historic success leads to enhanced confidence which is good up to a certain extent, however, extensive confidence in the ability to predict risks can lead to drastic failure. This bias should not keep the company from undertaking a balanced risk identification process (Gino and Pisano 2011, 5).

The last example of biases which has an influence on risk identification mentioned in this article, although there would be many more to name, is the conservativism bias. People are prone to overestimate the low outcomes and underestimate the high values. So the negative effects are stronger in people's memory (Hilbert 2011, 14).

The aforementioned biases can all be found while executing collection methods as they are handling past data as well as the users of analytical instruments tend to fall for these misperceptions. Only by using creativity tools these biases can be limited as the past data is consciously excluded from the knowledge base of participants in the risk identification process.

The main part of the article deals with most used risk identification methods and outlines also some limitations that can be especially found during risk identification. To overcome these limitations three alternative techniques are described, however, these are only rarely in use in today's practice.

Instruments in the process of risk identification

Most frequently used methods

The instruments that are commonly used are Brainstorming, Interviews and the SWOT-Analysis as studies conducted by Gorzén-Mitka and Dinu revealed , this will also be the set of tools analysed in the first part to outline the major weaknesses imposed although the high practical importance. (Gorzén-Mitka 2013, 7; Dinu 2012, 69).

Brainstorming

Brainstorming is one of the oldest and most used tools to identify new risks as well as to obtain any kind of collection of ideas as it was developed by Alex Osborn in 1953 (Symanowitz 2014, 24). A rather small group of people gathers to find ideas about a clear topic with explanation from the moderator who also guides the discussion. The time frame for this meeting should be rather short and limited as the concentration shrinks the longer it takes (Coyne and Coyne 2011, 1; Gobble 2014, 64). The main purpose of this team is to generate a massive amount of ideas in an as short time period as possible, so to state it in other words "Focus on Quantity, not Quality" (Symanowitz 2014, 24). In this process the advantage of Brainstorming is the group diversity to generate ideas. These ideas tend to be superior to individually generated ones (Gobble 2014, 64).

Limitations

This definition already imposes the first problematic issue. Symanowitz names that only concentrating on quantity will not necessarily lead to the right or even all risks that possibly threat the business, thus, if people do not focus on quality the result might not be useful (Symanowitz 2014, 24f).

The first essential question that arises is the one of which people to include in the Brainstorming process. The most suitable would be in this case the once involved directly into the problem area. However, if only employees of the same department are gathered the variety of information and risks identified will be smaller than with a diversified team (Coyne and Coyne 2011, 4).

Employees meet for the Brainstorming process only for a few hours and should develop all potential risks that may occur in future. This time pressure may lead to lacking creativity. A further constraint can be the setting, if it is too rigid people are hemmed to think creatively. Ideally the situation does not constraint time or resources but in practice this is rarely possible. As people are not used to think outside the box they need time to adapt to this change of daily routine, therefore, the time needed to produce ideas is higher than usually granted to groups. On the other hand more time does not necessarily lead to a higher creativity (Coyne and Coyne 2011, 3; Gobble 2014, 64).

Another fact is that, extroverted persons are likely to extensively contribute in the Brainstorming process whereas more calm people will hide their ideas. This can lead to an omission of the best ideas. This factor is even strengthened by the controversial fact that only few managers know about the rules of Brainstorming, although it is that frequently used. One of these rules includes keeping judgement for a later stage and collect all upcoming ideas first. This judgement is a natural behaviour of people and even more of managers who evaluate first all the pros and cons. This immediate criticism can hinder introverted persons from contributing actively and share potential risks (Valin 2014, 20f).

Furthermore, an aspect that might hinder individuals to contribute in the risk identification is the groupthink bias. Groupthink is defined as:

> "Premature consensus is reached through inadequate formulation of alternatives or a limited perspective regarding the number of acceptable alternatives. The lack of critical thinking together with high cohesiveness among group members are the central features identified." (Sarver 2013, 32)

In order to obey the before mentioned rules a facilitator is necessary to moderate the process of Brainstorming. This moderator can, however, easily influence and turn the discussion into a more preferable direction as he needs to keep the Brainstorming in flow and asks questions to focus the participants' attention.

Once the process of Brainstorming is finished the attendees are freed and return to their daily task, often seeing the step of Brainstorming as distraction or just time consuming. If there is no communication of the decision or feedback session included as a separate process step the candidates will not see the positive point of it. Coyne claimed that people are desperate to receive feedback if immediately communicated. Some managers may allow the group to decide on their most favoured solution. This gives rise to its importance and the implementation is strongly

supported. A negative consequence the decision of the group might have is that the criteria are not known and thus the decision will not be accepted by management (Coyne and Coyne 2011, 8).

Interview

Interviewing is one possible method of the information gathering techniques for risk identification. It is a very flexible tool, easy to manage (Häntsch and Huchzermeier 2013, 130) and can be adapted to any kind of Interviewee and topic. As a preparation for a qualitative Interview only some but well prepared specific open-ended questions should be generated instead of building up a pre-established closed-ended questionnaire (Chenail 2011, 255). An additional advantage of Interviewing is that the interviewer gets an impression of the interviewee's feelings arising during the questioning (Chenail 2011, 260).

In most cases Interviewing is a method that analyses risks in a retrospective way that means recording and documenting risks that are already known within a company (Schmitt and Schumacher 2011, 180), instead it can also be used to identify new risks and sources of uncertainty (Hopkins 2011, 1) as it is practiced by David Hughes within the Hospital Corporation of America.

David Hughes, Assistant Vice President of Enterprise Risk Management and Business Continuity Planning at Hospital Corporation of America, explains that conducting Interviews to identify risks of a company is a very successful method. About 80 people, especially Board Members and people from the Executive Management Team and Middle Management Team are annually asked in face-to-face Interviews in order to get a broad view at risks across the company and its environment. An Interview should last about 20 to 30 minutes per person and the involved people therefore are the interviewer, the transcript writer and the interviewee. Simple questions should be asked such as:

- "Mention the top three business risks over the next 24 months that could have an impact on the company or the company's strategic goals and objectives."
- "What are you aware of that the company is doing to address those risks and to mitigate those risks?"

The aim of such Interviews is to include the answers in the company's annually budgeting process (Hughes 2011).

Limitations

Despite the advantages of the Interviewing method it also has its limitations. The most difficult part of the Interview is to interpret what you hear from the interviewees and to classify the developed risks properly (Hughes 2011). This is a question of perception and biases. The interviewer or transcript writer has to avoid thinking subjectively but as objectively as possible to get a realistic view of all identified risks that can have an influence on the company.

In the case that the Interviewing method is used to identify risks in a retrospective way the result is depending especially on the experience and expertise of every single Interviewee (Häntsch and Huchzermeier 2013, 130).

It takes training and practice to write open-ended questions (Chenail 2011, 256) and to lead the interviewed person to a specific direction in order to get fundamental answers. Another drawback is that carrying out Interviews is very time-consuming concerning its preparation, Interviewing process, documentation, transcription and converting data afterwards (Adams 2008,

26). Creativity may not be as strongly enhanced as Brainstorming is able to (International Electrotechnical Commission 2009, 29). Amongst other reasons Interviewing is not that often used for risk identification as for example Brainstorming or the SWOT-Analysis (Adams 2008, 26).

SWOT-Analysis

The SWOT-Analysis has its origin in the military sector and in the 1960s when the Harvard Business School has suggested using the SWOT-Analysis in the entrepreneurial competition (Pelz 2012, 6). This tool is a frequently used strategic analysis method, which divides the environment of an entity into internal and external sections, the former includes strengths and weaknesses and the later consists of opportunities and threats (Zhou and Yang 2010, 1).

This tool is used to identify impediments and advantages and exploiting opportunities in a wide variety of situations. An entity can determine how to leverage its strength, reduce weaknesses, seize opportunities and avoid potentially harmful threats or at least monitor them through more consistent environmental scanning. The SWOT-Analysis also can be used to assess a product evaluation, an innovative business idea, mergers and acquisitions decisions, outsourcing options et cetera (Karvelli et al. 2008, 4).

The SWOT-Analysis is executed with the usage of a matrix with four quadrants: strengths, weaknesses, opportunities, threats. It starts with a blank matrix and the next step is to fill out the four quadrants, in many cases Brainstorming is used to generate ideas for possible existing strengths, weaknesses, opportunities and threats. Similar arguments should be summarised and ranked according to their importance, beginning with the most important one (Rauch 2007, 416).

		Helpful	**Harmful**
Internal Origin	(attributes of the organisation)	**S** Strengths	**W** Weaknesses
External Origin	(attributes of the environment)	**O** Opportunities	**T** Threats

Figure 3: Risk Identification methods (Source: own diagram, based on data from Zhou and Yang 2010, 1)

The SWOT-Analysis illustrates a "snapshot" at a point of time. It can be expanded with the inclusion of a broader scope of viewpoints including Interviews with key company stakeholders, governmental leaders and other policy makers (Helms et al. 2011, 283).

Opportunities and threats consist of external variables and are typically not under the control of the management in the short run, for example political, societal, environmental and industry risks. To be effective in risk identification the appropriate time and effort must be spent on thinking about the organization's weaknesses and threats. A later discussion and development of a risk map based on consensus will ensure that these discussion results are robustly analysed. In the case of mergers or acquisitions, a SWOT-Analysis should include explicit identification of risks (Shenkir and Walker 2007, 7).

The participants of a SWOT-Analysis tend to be more productive when they come from different units of the organisation and have a certain diversity concerning background and experience. An open communication and a close or good working relationship is necessary to face possible weaknesses and threats objectively (Karvelli et al. 2007, 10).

Limitations

The SWOT-Analysis is mostly used to identify existing and obvious risks (Romeike et al. 2013, 20), so it is not suitable to identify future risks, which are of especial importance.

A further limitation of the SWOT-Analysis is the challenge of an adequate categorization into the given four quadrants. A strength, that is not maintained, may become a weakness and opportunities not taken but adopted by competitors, may turn into threats. Furthermore, certain combinations within and of the sectors of the SWOT-Matrix may not be considered.

The absence of a quantitative method supporting the decision process based on the SWOT-Analysis can also be criticised. The selection of the strategy is mainly based on a qualitative analysis, capabilities and expertise of the persons participating in the planning process (Rauch 2007, 416).

Alternative instruments

The second step of this article deals with practically only little known techniques and the aim is to outline how a possible substitution or combination can lead to overcoming afore mentioned drawbacks.

The selection of these tools was again based on a study (Garrido et al. 2011, 248) that led to the conclusion that amongst others these three creativity tools are rarely in use.

Delphi Technique

The classic Delphi Method includes a panel of experts in a certain sector that needs to be examined. The participants are granted full anonymity. These experts provide their judgment and respective justification in written usually by answering a questionnaire. The answers are given independently in the first round, however, usually more than one round is included so the experts are able to revise their opinion. Afterwards a summary of the facilitator is generated to terminate the previous round. These feedback loops can be repeated as often as necessary as shown in the graph below (Kerr and Tindale 2011, 18).

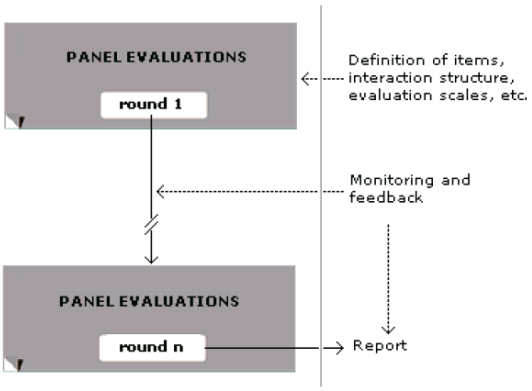

Figure 4: The Delphi Method (Sarver 2013, 23)

Using this method allows to generate ideas faster and more accurately than individuals are able to. Furthermore, the Delphi Technique is claimed to identify "deeply uncertain risks" (Markmann et al. 2013, 2ff).

Another important factor to consider is that experts identify the risks so the answers will be of a higher quality due to their knowledge compared to risk owners who are directly involved and are not trained to identify more abstract future risks.

Next to the classic Delphi Techniques some further developments have been made to be able to work more efficiently in the business context.

The rank type Delphi Method is named as the most effective type compared to other Delphi Techniques in order to define future management actions, thus it also refers to the risk identification process (Paré et al. 2013, 2).

The process in this type of the Delphi Technique is to start with a Brainstorming of all participating experts to identify all the necessary risks and through the next rounds the experts prioritize the risks identified earlier. This ranking can be especially vital to the next steps of the risk management process (Paré et al. 2013, 5).

This evolvement is a combination of Brainstorming and the Delphi Technique and can be used for more abstract macroeconomic risks.

Limitations

A major drawback the Delphi Technique includes is if the experts have similar perspectives they might prioritize the wrong risk or omit another crucial one. As expert opinions are rarely questioned their identified risks are considered to be complete and correct, however, experts can be wrong as well (Kerr and Tindale 2011, 22).

A further limitation is the choice of the personnel included in the risk identification process. As the persons involved need to be experts in the related field the selection crucially influences the outcome. The related coordination-effort is increasing the more experts are involved.

Synectics

Synectics, also known as the Gordon Technique, is one of the less used methods for risk identification (Adams 2008, 26). This creative thinking method was developed by William

Gordon in 1960 and is based on Brainstorming. The aim of Synectics is to find new solutions for a defined problem by building analogies, comparing different thoughts, combining irrelevant matters and developing creative thinking (Aiamy and Haghanib 2012, 611). A problem should be regarded in different perspectives (Holzer 2011, 12) and it is most suitable for complex problem identification and idea development (Proctor 2014, 194). Synectics and Brainstorming promote more creativity development than the standard creativity tools (Aiamy and Haghani 2012, 610).

Therefore a group with a maximum of ten participants is instructed by a moderator. Every team member is enabled to contribute to the results with his or her own background and experience (Tang et al. 2011, 4). Guertler et al. summarizes the steps of Synectics as shown in the following figure (Guertler et al. 2013, 195):

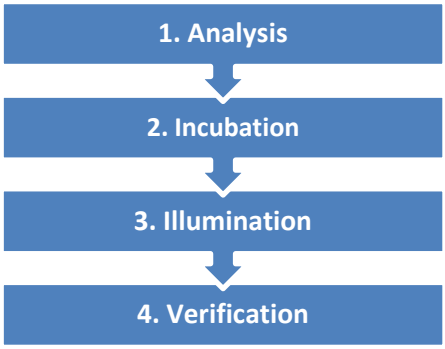

Figure 5: Own figure, based on: Guertler et al. 2013, 195

1. Analysis: In this step the group is instructed to define the problem. First solutions are already collected and documented.
2. Incubation: The second phase is characterized by building analogies. For example the group tries to build personal-, direct-, symbolic- and fantasy analogies. The outcomes of this phase are abstract solutions of the problem.
3. Illumination: In the third step the documented analogies get analysed and transferred to the defined problem.
4. Verification: At the end, the prepared approaches are used to elaborate solution concepts.

The advantage of this creativity tool is that all team members have unlimited areas for discussion and they can express their ideas without fearing criticism (Al-Ghamdi 2004, 5).

Limitations

The Synectics method is relatively complex and time-consuming and has to be carried out well by an experienced moderator (Holzer 2011, 12), if not the contribution that is required by the team members will not be achieved adequately (Proctor 2014, 199). In this analogy method all participants need to be open-minded and uninhibited especially in the step when building personal analogies (Schawel and Billing 2011, 254). They have to be convinced of their point of view (Garrido et al. 2011, 245).

Although Synectics and expert Interviews have the highest potential for generating the broadest list of risks (Adams 2008, 28), these risk identification tools are not that often used in companies because of their above mentioned limitations.

Bisociation

The concept of Bisociation was developed by Arthur Koestler in the 1960s and combines concepts of two contexts or categories of objects that are normally considered separately. This concept has the aim to distinguish the type of metaphoric thinking that leads to the acts of great creativity from the more associative way of thinking, with which people are more familiar in their everyday lives. Bisociation means to join unrelated information in a new way (Dubitzky et al. 2012, 16).

With the approach of Bisociation an entity can develop the ability to recognise two apparently disparate information sets and combine them in a way, that results in a new design and so the entity improves its ability of transformation. With this process new insights and opportunities can be generated and the organisation can change the view of itself and its competitive environment. This new approach can be the basis of developing new abilities of an organisation (Richta 2012, 108).

Bisociation can also be used to solve problems with extraordinary solutions, where potential solutions can be developed for example by using randomised pictures. It is important, that the pictures are not associated with the problem on the first view and that the participants have fun with the picture and it draws their interest. It should not be too complicated and be understood by everyone. After choosing one picture, it will be described in detail and afterwards relations to the problem will be explored. In the next step solutions will be prepared and evaluated (Lippmann 2013, 135).

Concerning risk identification Bisociation can be a useful tool to activate the creativity of the participants and to generate ideas and potential risks and threats no one would have thought about before. The problem of having become blind to shortcomings in the company processes can be avoided and people start to think beyond their own horizons. With this tool an organisation has the chance to track a broad range of potential risks and opportunities which could be important in the future and to be prepared if they would come true.

Limitations

Most of the already mentioned limitations for creativity tools also apply to Bisociation, they are time-consuming and the right participants have to be chosen in order to get useful results.

Conclusion

The following table provides a short overview about the analysed set of tools that are most frequently used in practice in comparison to instruments less frequently used. This graph should assist in the decision making about which techniques to use in practice.

	Brainstorming	**Interviews**	**SWOT-Analysis**
Advantages	Group has more resources available Risk owners involved Easily understandable Fast identification process	Can be adapted to any kind of topic Flexible Get an impression of the Interviewee's feelings The more face-to-face Interviews, the more input and ideas	Well-known Clear framework Internal and external view Gives an overall picture of the situation of the company
Disadvantages	Ideas can lack quality Not able to identify abstract risks Best ideas can stay hidden Groupthink Bias Creative ideas do not come on command Facilitator can influence results substantially Large amount of ideas makes the decision complicated Loss of trust in process if no feedback granted	Biases Possible subjectivity of the interviewer Results depend predominantly on the experience of the interviewee Time-consuming Training necessary to write open-ended questions	Not suitable to identify abstract risks Adequate categorization in the four quadrants is not ensured No additional quantitative method provided for supporting decision-process Constrained creativity

Alternatives

Delphi Technique	Synectics	Bisociation
Higher quality of risks identified Influence of moderator limited More feedback loops can be installed to converge ideas - eases the decision making process	Enhanced creativity More perspectives included	Enhanced creativity Motivates to think out of the box Can generate extraordinary problem solutions and points of view Many varieties possible

For different situations or stages in the risk identification process different tools will provide the right solution. Risk owners will be able to judge problems occurring in the daily routine and directly attributable prospective risks. This constitutes the first step in most risk management processes. More sophisticated or abstract risks (e.g. macroeconomic risks) might be easier to identify by external experts at a later stage. The combination of techniques is thus a possible solution to effective risk identification. (Sartor and Bourauel 2013, 42)

As Dr. Lehner states the instrument needs to be customised to the people involved in the process and the risks that want to be identified. One instrument cannot provide the full solution, thus the only way to correctly identify all important risks is to find the right mix of techniques.

The covariance that exists between individual risk factors needs to be identified in this process as well. This interdependence crucially affects the results as an isolated view on the risks may distort the overall picture.

A further crucial criterion for the selection of tools is the selection of people involved in the identification. How evolved is their creativity development competence? Does she/he have deep knowledge about the situation and risks the company faces? Answering these questions might help to make the right choice.

The time frame for this identification process needs to be accurately assessed and tailored to the situation the company is facing.

These criteria build the basis for the risk identification but cannot grant for the solution to evolve.

Creativity tools activate people to think out of the box and to identify a broader range of risks. They give an impulse to think about potential risks and opportunities, but they do not generate complete problem solutions (Lehner 2014).

Outlook

The risk identification will gain in importance in future as the surrounding of companies becomes more volatile. The practical implementation nowadays outlines that the identification is only conducted in rare cases, the benefit it can have for the company overrides the drawbacks the individual tools might have.

The process identifies not only risks but also opportunities. The knowledge about the potential chances can foster company success and strengthen the market position. If this future advantage is not realised one may lag behind the competition and this can weaken the market position.

To avoid this negative development the volatile surrounding needs to be analysed carefully and the selection of techniques is vital in future.

As already mentioned above one tool is not able to identify all the potential threats and opportunities an organisation faces, only the combination can grant successful identification. This mix needs to be tailored to the company itself and its culture, its environment as well as major changes the company might faces in the near future, like mergers or acquisitions.

Another vital factor is the composition of the group that is included in the risk identification techniques. As Dr. Lehner also mentioned a more diversified group is able to generate a broader range of risks and opportunities. This should be complemented by external expert knowledge.

The Delphi Technique already offers an approach to gain the knowledge of external experts, however, it does not offer the possibility that internal and external people cooperate in this process. The combination of internal and external experts diversifies the group even more and allows broadening the perspectives of outcomes (Lehner 2014).

Organisations face a future with uncertainty and new challenges which are difficult to predict, So, "thinking the unthinkable" should be the basis of every company that wants to be successful in the future and be prepared and willing to adap<t to changing circumstances.

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