



Doctoral School of Regional Sciences and Business Administration

Katalin Darabos

PASSING ON THE TORCH: UNDERSTANDING THE PREDECESSORS' MIND
PATTERNS

Doctoral dissertation

Supervisor: Zoltan Baracscai, DSc

Viktor Dörfler, PhD

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1 Introduction

The aim of this doctoral study is to understand succession decisions in family businesses from the first generation, typically the founder, to the second generation. The starting assumption is that it is the predecessor (generation 1) who takes the succession decisions, therefore the experience of the predecessor leading up to this decision is explored. In order to do this, the examination covered the typical knowledge differences between the predecessor (generation 1) and the successor (generation 2). From what has been observed in the field, predecessors are usually educated in the specialist field (discipline, industry, or craft), meaning that the founder of a tailoring company is likely a tailor and of a chemical company is likely a chemist. Generation 1 virtually never has any education in management. Therefore succession planning is usually not a planned elaborate process as it is taught in MBA programmes, instead the predecessors intuitively make up their mind regarding just in time to initiate the succession process and who the successor should be. In contrast, the successor candidates, often the children of the founder, often have business degrees, including MBAs, and the success of the company largely determines from how good institution the successors graduate. In order to gain an insight into what makes a succession successful, the predecessor's decision-making process is explored in terms of knowledge differences.

From a research perspective, understanding the succession of generation 1, without experience, is a specific problem area, distinguishable from subsequent generation changes, because of their subjective components, which cannot be put precisely into words and therefore are difficult to study. This does not mean that two people who have experienced the 'same' phenomenon could not discuss these experiences inter-subjectively (see e.g. Jackson, 1982, Lewis, 1929), since qualia can be accessed through self-observation (i.e. introspection) (Sadler-Smith, 2008, Varela and Shear, 1999a, Varela and Shear, 1999b). Since I share the same personal background, in discussion with my supervisors I decided to focus on the predecessors during the succession process. This personal involvement provides the context of social practice against which practitioners implicitly make sense of their actions (Hardy et al., 2005, Philips et al., 2004, Kogut and Zander, 1996); this makes it easier to access the subjective dimension of the lived experiences of predecessors and the intuitive decision-making process.

The data collection took place in Hungary. Being a European country in transition, provides an excellent opportunity for an exploratory study since in most family businesses in the country the first generational changes are happening nowadays or will be happening in the near future. The main method of data collection of this exploratory study is a survey, which was used to build a conceptual framework. For making sense of the data, I made use of my insider view, as I work in a family business that is in the process of the first generational change. The data was analysed searching for patterns (sets of rules), in order to understand the process of succession. Based on experience with the data, I challenge the unitary construct assumption adopted by the vast majority of studies on succession in the field of family businesses. In other words, the study suggests that there is no single model that describes all generational changes. Instead, it is suggested that different models are needed to describe the succession phenomenon under different circumstances, as all the conditions are impossible to account for within a single model. By accepting that there is no generic, comprehensive model, predecessors can focus on what decision aspects are worth considering within their particular set of circumstances, rather searching for a single on-size-fits-all model. The impossibility of the single-model approach that this exploratory research highlights is limited to the scope of the first generational change. An implication of accepting that there is no single model is that the model of the predecessor can include considerations that would not work for subsequent generational changes. Being an exploratory study in an interpretivist epistemological framing, our findings are not directly generalizable, but what is learned, is more generic than the studied cases; in other words, the learning from this study provides basis for a possible explanation of the succession phenomenon and suggests ways of further thinking and/or action (Dörfler and Stierand 2019).

In order to understand the behaviour (mindset) of the first generation owners (i.e. predecessors), a two-phase problem-solving process has been designed. The first step was to assume some aspirations, expectations. The thesis's first contribution is that they live up to those expectations. More so since they understood and accepted these aspirations, the second problem area became analysing the rules between expectations. This step is crucial for the first part as this made the comparability of the particular cases possible. The second step uses factor analysis and case-based reasoning (CBR) of a knowledge-based system, a model with "if-then" rules between the identified aspirations in order to describe the mindset patterns of the predecessors during the succession decision-making process. Case based

reasoning is a fitting tool to analyse the mindset patterns and the “if-then” rules make it possible to find logical connections. The new attitude (logical rules among aspirations) is actually a more important result than the rules ourselves that we found in this pattern. For those who want to solve such a problem in the future, the attitude means more than the result itself. In other words, the meta-level of the findings is the main contribution of this study.

The thesis suggests a new approach: instead of looking for correlations or other statistical indicators of behaviour, it is more useful to look for the logical rules between them. The outcome of this study implies that there are no strict rules for succession decision making of the first generation, as it is illustrated by sample covered in this study. For applied knowledge (i.e. for practitioners) this means that everyone who starts with such an attitude in the future will come to the conclusion that there are no strict rules that apply at all times, and will focus on discovering their own unique preferences and patterns instead. Therefore, this study does not offer guidelines for successful change of ownership, but “guidelines” for others to examine and understand that these are the expectations and rules that apply there and then. Furthermore, the approach developed as part of this study can be used in other cases to uncover those unique expectations and rules here and now for a new succession case of generation 1. The purpose of this thesis is to provide an argument for this approach.

2 Methodological approach and design

The demarcated problem space for this research determined the approach. In accordance with the principle of complexity, the problem space above requires an extraordinary approach, since it cannot be solved within a mono-, multi or interdisciplinary framework. Therefore, I adopted a transdisciplinary approach, which is the doctoral schools' basic principle. I based the work on Nicolescu's (2014a) conceptualization. Creating and understanding a conceptual framework for the whole, the transdisciplinary approach is appropriate. It means that I have a home - or even I can say that – a host discipline as the decision sciences, but in order to see the big picture from different perspectives we go also beyond some other disciplines, for instance management sciences, anthropology, complex systems or even chaos. I do this because if this complex problem is examined from the framework of decision sciences, one would get a partial or subjective vision of it, therefore, one might think that the observation of the reality is as it is, even though there is not only one correct answer to the research question. As Basarab Nicolescu writes about this in his book titled *From Modernity to Cosmodernity* (2014) “Classical binary logic confers its patent on either a scientific or non-scientific discipline. Thanks to this, rigid norms of truth, a discipline can pretend to contain all knowledge within its own field. If the discipline in question is considered as fundamental, as a touchstone for all other disciplines, its scope is thereby enlarged so that it appears to encompass all human knowledge.”

1.1.1. Transdisciplinary approach

Daniel Kahneman (Kahneman 2011) states, “fast thinking includes both variants of intuitive thought – the expert and the heuristic – as well as, the entirely automatic mental activities of perception and memory, the operations that enable you to know there is a lamp on your desk or retrieve the name of the capital of Russia”. Expert systems have hardship finding their domain of validity. “There were many published cases of systems that did not go beyond the basic validation of the application rules and so this pulled down the overall averages” (Wagner 2017). Knowledge gathered in the knowledge-based system always comes from the memory of the intuitive decision maker. The mind is not tuned for arithmetic, but to the memories of experience. We not only tell stories when we decide we are going to tell stories. Our memory is also telling us stories, in other words, what we have kept from our experiences is the story. As Daniel Kahneman puts it: “We actually don't choose between experiences, we choose between memories of experiences. And even when we think about

the future, we don't think of our future normally as experiences. We think of our future as anticipated memories. And, basically, you can look at this, you know, as a tyranny of the remembering self, and you can think of the remembering self-sort of dragging the experiencing self through experiences that the experiencing self doesn't need" (Kahneman 2010). Based on George Armitage Miller's idea of "The Magical Number Seven, Plus or Minus Two", published in 1956, the research results of working memory (WM) experiments have been just as defining for cognitive psychology (Miller 1956). "The proposal of the episodic buffer clearly does represent a change within the working memory framework, whether conceived as a new component, or as a fractionation of the older version of the central executive. By emphasizing the importance of coordination, and confronting the need to relate WM and LTM [long-term memory], it suggests a closer link between our earlier multi-component approach and other models that have emphasized the more complex executive aspects of WM. The revised framework differs from many current models of WM in its continued emphasis on a multi-component nature, and in its rejection of the suggestion that WM simply represents the activated portions of LTM. It also rejects the related view that slave systems merely represent activations within the processes of visual and verbal perception and production. Although WM is intimately linked both to LTM and to perceptual and motor function, it is regarded as a separable system involving its own dedicated storage processes" (Baddeley 2000).

Nothing guarantees that the predecessor behaves according to mathematical intelligence. It is impossible to prove, that mathematical intelligence leads to better decisions than other forms of intelligence. This might indeed be at the core of the difficulty in understanding the predecessor's mindset; the different disciplines are captive in their respective cages. Developers of machine learning held to their own concepts and methods, occasionally looking to cognitive psychology. Cognitive psychologists, for example Amos Tversky and Daniel Kahneman (Tversky and Kahneman 1974) have occasionally considered decision-making.

The research of the thesis resist to mono-, multi- or interdisciplinary frameworks. To be able to link disciplines such as researchers in decision-making to cognitive psychology with machine learning/AI and philosophy, a transdisciplinary approach was adopted. Nicolescu (2014) conceptualized transdisciplinarity in which the two otherwise parallel research paths may meet. Transdisciplinarity examines what lies beyond the different disciplines (opening the doors of the bird cages to allow flying freely – meaning going beyond the disciplinary

boundaries. It seeks to have an overall picture, an integration of a fuller understanding. Transdisciplinarity can address the relation between science and society, that is why it is a research method perfect for complex problems. Gibbons (1994) states that transdisciplinary knowledge production is characterized by a constant flow between fundamental and applied, theoretical and practical. Disciplinary boundaries and distinctions between applied and pure research become less relevant, the focus shifts to the problem area. Transdisciplinary approach is the hermeneutic transformation of knowledge into action, in our words the pragmatization of knowledge according to Findeli et al. (2008)

To understand and observe the predecessor's reality on personal level we must free ourselves from the cages of disciplines and hope to reach another result through meta-knowledge and a transdisciplinary approach. In this approach we must also decide on what level we wish to examine reality: through models, methods or tools. "We describe decision making with the following three levels of reality: (1) Models of decision makers' behaviour, (2) Methods used to support intuitive decision makers, (3) Tools we use to implement the support of intuitive decision makers" (Baracskaï and Dorfler 2017).

Purpose of the research is to understand the mindset patterns of the founder (generation 1) when making succession decision. In order to fulfil this purpose, the objectives are formulated in answering the following research questions:

- Are there identifiable mindset patterns of the predecessor during the succession decision making process? If yes, how do they manifest?
- What method is suitable to identify the mindset patterns of the successor during the succession decision making process?

1.1.2. Data collection

Both the data collection and analysis included qualitative as well as quantitative processes, which are elaborated in the respective papers for the different problem areas. In our studies, two types of data collection methods were utilised: observations and surveys. In understanding and influencing the characteristics of extremely complex processual problems such as succession / business transfer in family businesses, in addition to the collection of international, comparable data using surveys, the use of qualitative research techniques should also be pursued (Makó, Csizmadia, and Heidrich 2015). The main method of data collection of this exploratory study is a survey, which I use to build a conceptual framework.

To test the process of the generation change in family businesses a qualitative research approach was defined. Since there was no validated questionnaire to study the phenomenon, a survey of 26 closed-questions was constructed and four main sub-topics were identified:

1. classification
2. succession planning
3. business planning
4. wealth management.

It is important to note that all answers came from family business that are either beginning the succession process or that are already in the process or that have recently finished it. The survey was validated through a pilot study with a six-member focus group.

The data collection was initiated by targeted emails sent to family businesses which gave us the basis of the study. The survey was validated with an eight-member focus group.

The **data collection** took place in Hungary. Being a European transition country, provides an excellent opportunity for an exploratory study since in the countries of the Central and Eastern European region, family businesses are faced with the succession problem for the first time: the first generation of entrepreneurs since the collapse of socialism is approaching retirement age, so the transition of the management as well as the transfer of ownership will be a key challenge in the near future. In the post-socialist countries our empirical knowledge, as well as theoretical and methodological research, on the problems relating to transformation management or intergenerational succession, is therefor rather underdeveloped (Csizmadia, Makó, and Heidrich 2016) since the lack of previous experience, tradition and role model of succession. Economic and socio-institutional environment has been dramatically changed in the last three decades (Gubányi et al. 2015), that also increases the challenge of successful business transfer.

As the generation of predecessors approaching to succession started their businesses after the collapse of the state socialism, their professional socialisation started before the changes, so most of them had to adapt to the market economy in their 40s. From what I have observed in the field, predecessors are usually educated in the specialist field (discipline, industry, or craft), meaning that the founder of the tailoring company is likely a tailor and of a chemical company is likely a chemist. Generation 1 virtually never has any education in management. Therefore, succession planning is usually not a planned elaborated process as it is taught in

an MBA, instead the predecessors intuitively make up their mind regarding the right time to initiate the succession process and who the successor should be. In contrast, the successor candidates, often the children of the founder, often have business degrees, including MBAs, and the success of the company largely determines from how good institution the successors graduate. This generates a knowledge difference between predecessor and successor which is addressed in paper 3.

Paternalism as a leadership attitude especially in the founding stage of development is naturally present in family businesses. The strong and proud culture built around the personality and success of the founder however can become a major hindering factor upon succession. Paternalism can be grouped into the following types: authoritarian, benevolent, moral and enlightened (Rivers 2015). It has been observed by Heidrich et. al that paternalism is a stage in the process of leadership style changing from participative to autocratic (or vice versa) and that the preferred leadership style in Central Europe is a more autocratic or paternalistic style, their study suggests that there are more driving than restraining forces for family firms adopting a paternalistic style. (Heidrich, Németh, and Chandler 2016) The enlightened paternalism can be even supportive to the successors work as new leaders such as mentoring, guiding the family members and the enforcement of ‘familiness’ through the passing on of the family owner’s values and judgements to the children, however, the more traditional autocratic paternalism might appear as a burden of smooth succession (Heidrich, Csákné Filep, and Mosolygó-Kiss 2018).

Data collection had three phases:

Phase 1: pilot study. For the pilot study a total of 51 responses were processed in early 2018. The pilot study was conducted as a validation. We considered the dataset as a starting point for an initial attempt to understand the phenomenon. By building a knowledge base for validating consistency of the new transdisciplinary knowledge, a conceptual model is created. The conceptual model will be used as a starting point for examining the relevance, the results of the current study could be considered as the starting point for future enquiries, for additional data-collection, or alternatively for refinement of the aspects of the decision-making. The question was whether this conceptual model is relevant to the phenomenon of interest.

Phase 2: full study. For the full study the original data set was expanded, a total of 141 responses were received by January 2019. Given Hungary's historical background, the majority of the generational changes that have been happening in the last 5 years are from generation 1 to generation 2. As there is no official record on the number of family businesses or the number of completed or in-process successions, to estimate the size of the family business population, we rely on the data of the Hungarian Statistical Office. According to this source, in 2018 there were 748,951 SMEs registered in Hungary ('A kis- és középvállalkozások jellemzői, 2018' 2018). 94% of these are micro-businesses who have been eliminated from this study. That leaves 39,792 SMEs operating in 2018. We estimate that about 70% of these SMEs are family businesses and we need those who are in operation at least for 20 years, to maximise the chance of the succession process is happening or will be happening in the near future. According to the Hungarian Statistical Office between the years of 1990 and 1993 there were 145,447 SMEs, 8,723 of those were not micro-businesses. We estimate that among those 8,723 enterprises around 25% is still in business, which narrows the data pool to around 2,180 family businesses near or in process of generational change. Considering the estimated size of the data pool and the response rate the findings from our dataset are not generalizable. However, we have excellent data for an exploratory study, the outcome of which can serve as a starting point to understand the phenomenon of succession, to identify tentative commonalities and differences in the mindset patterns of the predecessors during the succession decision process.

Phase 3: modified data set. In 2021 we repeated the data collection among those attendees who in the Phase 2 answered the generation change will be happening in less than 5 years and the change process has not begun yet or has already begun at the time of the original study. The total number reduced to 48 for those who estimated the generation process in less than 5 years, and the second criteria (generation change has not begun or is already in the process) reduced the new data set to 30 cases. this reduced data set was then analysed in terms of the original answers and the new dataset to find out how the reasoning has changed in time.

This approach entails a phenomenological aspect of this methodological framing: the focus is on the lived experience of the research participants, this experience is contextualised in the Dasein and the Lebenswelt (life-world) of the participants, during the problem-solving process the insider view was used for obtaining additional insights while practicing bracketing in order to keep the study rigorous (Dörfler and Stierand 2020; Stierand and

Dörfler 2014). I analyse the data searching for patterns (sets of rules), in order to understand the generation change.

1.1.3. Data analysis

The responses from the survey were analysed with factor analysis and a Knowledge Based System (KBS).

1.1.3.1. Data analysis by factor analysis

The assumption was that the mindset patterns of the predecessor during the succession decision can be understood by identifying the drivers and their values. After coding the survey results of Phase 2, factor analysis was performed on the whole dataset. The factor analysis with settings (Principal axis/Varimax, 4 factors) could describe 41,73% of the phenomenon with 4 factors (Table 6).

Table 2.1: VARIMAX – Phase 2 dataset – Total Variance Explained

Component	Total Variance Explained								
	Initial Eigenvalues			Loadings			Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,826	15,941	15,941	3,826	15,941	15,941	2,433	10,136	10,136
2	2,360	9,833	25,774	2,360	9,833	25,774	2,035	8,480	18,615
3	2,241	9,339	35,114	2,241	9,339	35,114	2,015	8,397	27,013
4	1,590	6,624	41,738	1,590	6,624	41,738	1,817	7,570	34,582
5	1,557	6,489	48,227	1,557	6,489	48,227	1,804	7,515	42,098
6	1,217	5,069	53,296	1,217	5,069	53,296	1,731	7,211	49,309
7	1,169	4,871	58,167	1,169	4,871	58,167	1,437	5,988	55,296
8	1,099	4,578	62,745	1,099	4,578	62,745	1,409	5,869	61,166
9	1,014	4,226	66,971	1,014	4,226	66,971	1,393	5,806	66,971

The identified factors were named as follows: Factor 1 – Adequate successor; Factor 2 – Experience (timeline); Factor 3 – Wealth Management; Factor4 – Including competent expert. Factor analysis showed that in the case of such a complex phenomenon, only partial justification (67%) is possible.

As the phenomenon is poorly understood, no strong rule-sets were priorly shaped, and the identified four factors describe it only partially. However, this outcome did not lead to revealing the decision maker's mindset patterns, while a central point of the dissertation was that understanding the predecessor's mindset is essential to understanding the succession phenomenon. Consequently, the results of the analysis was supplemented with KBS that can refine the results.

1.1.3.2. Data analysis by expert system

The data collection process for KBS is called knowledge acquisition (Wagner, 2017). The participants of the knowledge acquisition process are the knowledge engineer and the domain expert or decision-maker. The knowledge engineer works with the expert to acquire the aspects of the decision, describing previous cases, or articulating rules from the decision-maker's experience. Knowledge engineering is the process to create a representation of the decision-maker's knowledge (Wielinga, Sandberg and Schreiber, 1997; Baracscai, Velencei and Dörfler, 2007). Different knowledge representation techniques are in use, like cognitive maps, frames or rules (Wagner, 2017; Gavrilova and Leshcheva, 2015). By knowledge representation the expert's reasoning becomes transparent. Rule-based reasoning (RBR) and Case-based reasoning (CBR) are the most widely known and applied functionalities of the Knowledge Based Systems. In the case of RBR or deductive reasoning, the knowledge engineer works with the decision-maker or expert to identify the aspects of the decision and the logical rules between them. CBR or inductive reasoning is applied when the cases can be described by the same aspects based on the decision-maker's previous experience.

In our studies we used the Doctus Knowledge Based System (Baracscai, Velencei and Dörfler, 2007), developed based on Simon's (1977) conception of bounded rationality. In Doctus KBS the aspects of the decision are called attributes. The knowledge representation in Doctus KBS is based on symbolic artificial intelligence (AI). Doctus KBS delivers CBR using an entropy-gain method based on a modified ID3 algorithm (Quinlan, 1986; Velencei et al., 2015). Reductive reasoning, the unique functionality of Doctus KBS always follows CBR. Based on the most informative attributes identified during CBR, the system generates a new rule-based knowledge base. In our studies we used all three functionalities (rule-based reasoning, case-based reasoning and reductive reasoning) of Doctus KBS. The details regarding the knowledge acquisitions, reasonings and knowledge representations are included in the respective papers.

Doctus is able to identify relevant patterns from previous decision situations by other decision makers, learning from which can be helpful to the decision makers with the decision situation at hand. Thus reductive reasoning supports reusing previous decision experience. The thinking behind the idea of reductive reasoning follows the logic describe by Handy (2008): try to fit the whole thing into our minds but to know where the find what is relevant, how to approach it and what to do with it once we find it. It is not simply a knowing process

but a more complete cognitive process (Dörfler and Szendrey 2008) or as Taleb (2007) states, although men's tendency for certainty is natural, it is still more about an intellectual passion.

3 The contributions of the papers

The title of the current thesis "PASSING ON THE TORCH: UNDERSTANDING THE PREDECESSORS' MIND PATTERNS" and the four problem areas cover the problem space.

I argued that understanding and supporting the decision-makers' thinking and mindset require a transdisciplinary approach, that is the reason why the presented set of papers draws upon organizational behaviour, artificial intelligence, behavioural economics, knowledge management and computer sciences among other disciplines. These papers illustrate different deliberations about decision support with the experienced decision maker in focus.

Based on the problem areas examined, I have drawn the appropriate conclusions and outlined possible further directions for research on each topic, which could be valuable contributions to the disciplines listed above.

3.1 Contribution of the first paper

The **first problem area** we analysed and mapped the strategizing process of family businesses facing succession. The aim was to establish a model that can help all stakeholders to better understand and manage issues arising during change. First ("Chapter 2") we aimed to explore and map the strategizing process of family businesses in the state of uncertainty such as the succession. The aim is to establish a model that can help all stakeholders to better understand and manage issues arising during change. The model is built around the patterns of five attributes that were identified as 'most informative' for strategizing of family businesses in state of uncertainty. Studies from all over the world suggest that family firms account for the majority of businesses and contribute strongly to the growth of national economies. In every small and medium sized family firm succession is a common phenomenon and it is considered to be one of the most critical issues commonly faced by these firms. In this paper we developed a conceptual model for family business strategizing in the state of chaos. The study was conducted with a Knowledge Based Expert System, the Doctus KBS. We have identified five informative attributes by using the KBS algorithms to

map strategy elements in chaotic domains. Patterns can then be built using 'if, then' rules, which become a model for Family Business strategy in Chaotic Ecosystems. The most informative attributes describe the new knowledge and experience that has been identified as relevant from strategic perspectives. The outcomes of the tentative model demonstrate that identified attributes, in this case (1) Content of succession, (2) Successor is capable of handling assets in the future, (3) Preparation of successor, (4) Preparation of succession strategy and (5) Adequate successor, are to be recognized as patterns for strategy making in the state of chaos. The paper provides a tentative model of strategizing applicable to one specific family business, but based on our experience, we believe that this model could be built for other family businesses as well, as we have noticed similar characteristics in our observation of many family businesses. This study was considered as a pilot study that has validated the problem space and led us to further problem areas. Data analysed and presented to support the premise that family business owners' control over their company can be affected. The expectations during succession in family businesses are not prefixed but are constantly formed on the go as they sense the decision situations and possible paths.

3.2 Contribution of the second paper

In the **second problem** area we observed the mindset of the owner during succession in family businesses. The expectations during succession in family businesses are not prefixed but are constantly formed on the go. In the second conference paper ("**Chapter 3**"), "Rules of individual owner behavior in family-Owned businesses", we liked to solve problem to recognize the mind-set of the owner during succession in family businesses. We identified that it is a typical non-linear process, when small change (owner succession) result in unpredictable effect. Our problem propositions are: (1) "The past is not a land to return to in a simple politics of memory. It has become a synchronic warehouse of cultural scenarios." (Appadurai, 1990, p. 4). and (2) we can use Richard Thaler's misbehaving to describe the behaviour of the owner in that original decision when the succession is decided. The belief in the sanctity of private property and ownership could only enter the values systems through narratives, and as such, it fits the concept of "nostalgia without memory." In perfect world of Econs, there is a lot of misbehaving which leads to the economic models that are based on bad predictions. There are many cases when Humans do make good decisions within real-life constraints. Just think about firefighters, critical care nurses and chess masters. They are all forced to act immediately and quickly without realizing why. The owner's mind-set during succession can be characterized as an original decision which result in unpredictable

effect. Thaler's view of Econs and Humans are linked with Kahneman's view of analytical thinking. Kahneman said, »Thinking is to humans as swimming is to cats; they can do it but they'd prefer not to«. If the inexperienced person would wait until they became experienced, they would never become so, for they would forego the process of gaining experience. Experience is not the reason for cognition, but its product. What we have found during our research on the topic of the individual owner behavior in family-owned businesses that analytical thinking can not be at help, and that leaves us with misbehaving. We suggest not to rely on stochastic relations or analytics rather researchers should understand that this is a »now and there« situation where original decisions are made. We would like to extend our research further since we have found that in this kind of situations trust coming from a time spent working together is an inevitable element. We would like to analyse and understand the nature of trust in our next step. Data analysed and presented to support the premise that family business owners' control over their company can be affected. The expectations during succession in family businesses are not prefixed but are constantly formed on the go as they sense the decision situations and possible paths. The conceptual model developed in the two conference paper served as the foundation for the studies for the succeeding problem areas.

3.3 Contribution of the third paper

Our finding, the developed model drove us to **the third problem** area, which was to identify patterns of transferring ownership from the first to the second generation in family businesses by examining experiences. The third paper (“**Chapter 4**”), “The Founder's Decision About the Successor” (Darabos, Baracscai, Dörfler, 2021) presents the identified patterns of transferring ownership from the first to the second generation in family businesses by examining experiences. This chapter presents our conceptual model, which demonstrates predecessor's mindset during succession through visual presentations. In this paper we aim to understand succession decisions in family businesses from the first generation, typically the founder, to the second generation. Our assumption is that it is the predecessor (generation 1) who takes the succession decisions; we explore the experience of the predecessor leading up to this decision. In order to do this, we examined the typical knowledge differences between the predecessor (generation 1) and the successor (generation 2). From what we have observed in the field, predecessors are usually educated in the specialist field (discipline, industry, or craft), meaning that the founder of the tailoring company is likely a tailor and of a chemical company is likely a chemist. Generation 1 virtually never has any education in management. Therefore succession planning is usually

not a planned elaborated process as it is taught in an MBA, instead the predecessors intuitively make up their mind regarding the right time to initiate the succession process and who the successor should be. In contrast, the successor candidates, often the children of the founder, often have business degrees, including MBAs, and the success of the company largely determines from how good institution the successors graduate. In order to gain an insight into what makes a succession successful, we are exploring the predecessor's decision-making process in terms of knowledge differences. We analyse the data searching for patterns (sets of rules), in order to understand the process of succession. Based on our experience with the data, we challenge the unitary construct assumptions adopted by the vast majority of studies on succession in the field of family businesses. In other words, we suggest that there is no single model that describes all generation changes. Instead, we suggest that we need different models to describe the succession phenomenon under different circumstances, as all the conditions are impossible to account for within a single model. By accepting that there is no comprehensive model, predecessors can focus on what decision aspects are worth considering within their particular set of circumstances, rather searching for a single comprehensive model. The impossibility of the single-model approach that our exploratory research highlights is limited to the scope of the first generation change. An implication of accepting that there is no single model is that the model of the predecessor can include considerations that would not work for models of subsequent generation changes. Being an exploratory study in an interpretivist epistemological framing, our findings are not generalizable, but they do provide basis for a possible explanation of the succession phenomenon and suggests ways of further thinking and/or action.

3.4 Contribution of the fourth paper

The **fourth problem** area addressed the thinking process of the decision maker. We attempted to order their intuitive knowledge and aspirations to surface the aspirations, intuitive knowledge of decision makers, in order to deepen our understanding of the succession decision making phenomenon. From the findings of these four identified problem areas originated the resolution for our defined knowledge gap. This resolution is more than the sum of its parts. The five partial results, must be regarded as delineating the final solution. Starting from a distinct problem definition for the problem space, different results could have been achieved. The fourth paper (**Chapter 5**), “Intuitive Decision: When to begin the succession process” (Darabos, 2021) addressed the thinking process of the decision maker. We found that in understanding the phenomenon on the personal level of reality, and

understand decision-making process of succession, the decision maker's thinking process and aspirations have to be taken in consideration. Our aim was to search for the understanding of a phenomenon: the succession decision in family businesses, where, based on the survey, we attempted to order their intuitive knowledge and aspirations. The goal of our research was to surface the aspirations, intuitive knowledge (Kahneman, 2013) of decision makers and understand how they change over time in order to deepen our understanding of the succession decision making phenomenon. Kahneman (2013) provided several evidences that one cannot estimate the size of the population, consequently a number estimated intuitively cannot be validated by rational thinking process, reasoning. According to their studies these apparently analytical estimates are always biased, as stated by them we think metaphorically, on the other hand statistics requires us to think about many things at the same time, which is not the way System 1 works. Our overconfidence is the bottleneck to acknowledge our ignorance and the uncertainty of the world we live in. Therefore, in this study and everywhere else, the results from surveys have to be handled with care and responsibility. The antagonist of our story is the predecessor. In the decision-making process, solutions and expectations are not known but have to be discovered or developed. This introduces uncertainties and errors; decisions are intended to be rational but are bounded by human limitations. Therefore, aspirations and search rules are adjusted over time in response to experience (March, 1991). Our aim was to search for the understanding of a phenomenon: the succession decision in family businesses, where, based on the survey, we attempted to order their intuitive knowledge and aspirations. The goal of our research was to surface the aspirations, intuitive knowledge (Kahneman, 2013) of decision makers, in order to deepen our understanding of the succession decision making phenomenon.

3.5 Synthesis

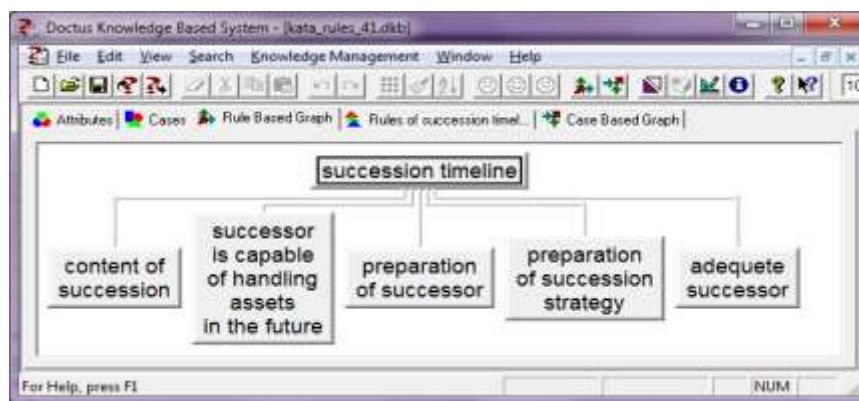
From the findings of these four identified problem areas originated the resolution for the defined knowledge gap. This resolution is more than the sum of its parts. The partial results must be regarded as delineating the final solution. Starting from a distinct problem definition for the problem space, different results have been achieved.

Understanding the behaviour (mindset) of the first generation owner - ie predecessor can be learned by assuming some aspiration, expectations. The dissertation's other contribution is that they live up to those expectations. More so since they understood and accepted these aspirations, the second problem area became analysing the rules between expectations. The

second part deals with establishing through factor analysis and case-based reasoning of a knowledge-based system a model with “if-then” rules between the identified aspirations in order to describe the mindset patterns of the predecessors during the succession decision making process. Case based reasoning is a fitting tool to analyse the mindset patterns and with the “if-then” rules we are able to find the logical connections.

The qualitative research allowed me to identify and draw model graph patterns. The cases from the qualitative research were added to the database, but in that form they merely show a structured form. From this disordered set benchmark values add the order, which means that cases in one subset have the same benchmark value. That attribute will be identified which contributes the most to the order.

Based on Phase 1 dataset (51 cases) and succession timeline being the benchmark value the following rule based graph was built.

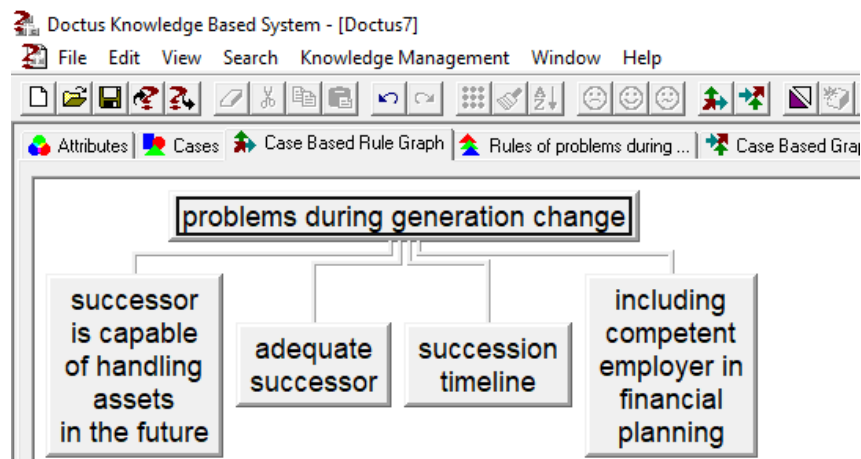


Source: Screenshot from Doctus

3.1. Figure Rule Based Graph – Phase 1 dataset – succession timeline benchmark

Succession timeline attribute can be described with these five attributes, and since rules were formed this can serve as a decision support tool. For anyone who wants to find out the timeline it is enough to consider these five attributes instead of the whole dataset (26 attribute).

Based on Phase 2 dataset problems during generation change was the benchmark attribute.



Source: Screenshot from Doctus

3.2. Figure: Case Based Rule Graph – Phase 2 dataset – problems during generation change

From the visualized graph rules can be extracted which then help further understand and analyse the decision at hand

successor is cap	adequate successor	succession timeline	including competent employer	problems during generation change
absolutely	already found it	more than 20 years	*	definitely count on it
absolutely	did not find it	*	*	definitely count on it
absolutely	already found it	less than 5 years	*	definitely count on it
absolutely	already found it	6 to 20 years	*	definitely count on it
rather yes	*	*	rather necessary	definite rather count on it
absolutely	probably found it	*	*	definit rather count on it
rather yes	*	*	definitely must	definit rather count on it
not at all	*	*	*	defini rather cou: rather not cc do no
rather yes	*	*	not necessary at all	defini rathe rather not count on it
rather no	*	*	*	de rather count on it
absolutely	already found it	not planned at all	*	rather count on it
rather yes	*	*	rather not necessary	rather count on it
absolutely	probably did not find it	*	*	rather not count on it

Source: Screenshot from Doctus

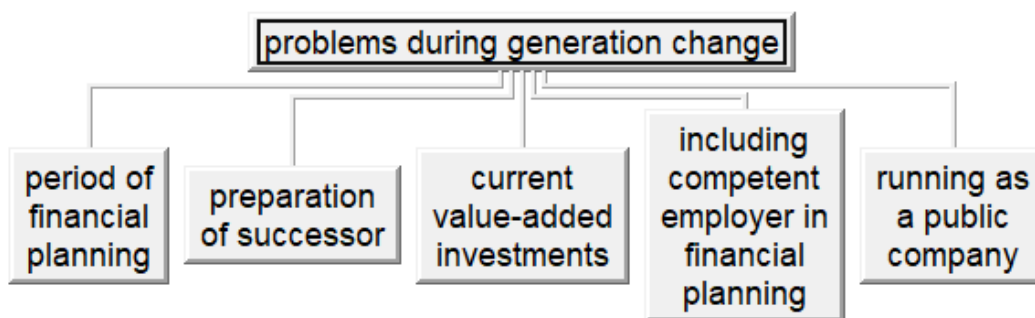
3.3. Figure: Rules – Phase 2 dataset – problems during generation change

Below we include a couple of example “if... then” rules for illustration:

- if the *Successor is capable of handling the assets in the future* “absolutely” and the *Adequate successor* is “already found it” and the *Succession timeline* is “more than 20 years” then *Problems during generation change* is “definitely count on it”
- if *Successor is capable of handling the assets in the future* “absolutely” and the *Adequate successor* is “probably did not find it” then *Problems during generation change* is “rather not count on it”.

There can be different explanations for these results; machine learning can identify patterns but cannot judge the significance of the particular patterns or dig deeper to figure out what is behind the observed patterns. Furthermore, this approach to modelling mindset patterns is highly sensitive to the level of expertise of the predecessor. The diversity of the identified rules suggests that the first generational change does not happen according to a single model but rather a variety of pathways are followed depending on the context.

In Phase 3 the total number of cases was reduced to 48 for those who estimated the generation process in less than 5 years, and with the second criteria (generation change has not begun or is already in the process) reduced the new data set to 30 cases. We analysed this reduced data set in terms of the original answers and the new dataset to find out how the reasoning has changed in time. The reduced dataset had the same benchmark, than in Phase 2, to make the comparison possible.



Source: Screenshot from Doctus

3.4. Figure Graph – Phase 3 reduced dataset – problems during generation change

There can be different explanations for these results, but we can say that aspirations and search rules are adjusted over time in response to experience (March, 1991). Machine learning can identify patterns but cannot judge the significance of the particular patterns or dig deeper to figure out what is behind the observed patterns. Furthermore, this approach to modelling mindset patterns is highly sensitive to the level of expertise of the predecessor. The diversity of the identified rules suggests that the first generational change does not happen according to a single model but rather a variety of pathways are followed depending on the context.

It is important to highlight that the reasoning in all phases of analysis of the mindset patterns was reduced to 2-5 attributes, which indicates that in these cases rules were formed, set. The new attitude (logical rules among expectations) is actually a more important result than the

rules ourselves that we found these patterns. For those who want to solve such a problem in the future, the attitude means more than the result itself. The mindset patterns only represent what could be learned from the cases included in the knowledge base. The findings are therefore only valid within these boundaries. Adding new cases to the existing knowledge base through future research, could reveal further rules. At present, however, the findings are not generalizable, but they provide basis for an explanation of the succession phenomenon.

The dissertation beside the built up models suggests a new approach of addressing such problems: do not look for correlations or other statistical indicators of behaviour, but look for the logical rules between them. Common sense dictates to all contributors that there were no, are no and cannot be strict rules for succession decision making as we have shown this in our sample and everyone who starts with such an attitude in the future will come to the conclusion that there are no strict rules that apply at all times. Therefore we are not offering a guideline for a successful change of ownership, but a “guideline” for others to examine and understand that these are the expectations and rules that apply there and then. This is the approach we want to convey.

3.6 Limitations and directions for future research

To test the process of the generation change in family businesses a qualitative research approach was defined. Our personal experience with succession was a good source of inspiration in the construction of a survey for our study. 26 attributes were collected in the knowledge-base according to four main sub-topics: classification, succession planning, business planning, wealth management. We must note that among the expectations that could be derived from financial data, no attributes are included. From the perspective of the analysis it is important to note that all answers came from family business who are either beginning the succession process or who are already in the process or who are finished with it. The survey was validated with a six-member focus group. Our findings were based on our previously mentioned observations and the survey responses we received in early 2019. The original data collection was performed by targeted email sent to family businesses which gave us the basis of the study. We received a total of 141 responses as of January 2019. Given Hungary’s historic background the majority of the generation changes that has been happening in the last 5 years are first ones. Despite this fact, there is no official record neither on the number of family businesses nor the number of finished or in-process successions

within family businesses. In 2021 we repeated the data collection among those attendees who in the original poll answered the generation change will be happening in less than 5 years and the change process has not begin yet or has already begun at the time of the original study. The total number reduced to 48 for those who estimated the generation process in less than 5 years, and the second criteria (generation change has not begun or is already in the process) reduced the new data set to 30 cases. We analysed this reduced data set in terms of the original answers and the new dataset to find out how the reasoning has changed in time. Based on our findings, we challenge the unitary construct assumptions adopted by the vast majority of studies on succession in the field of family businesses. In other words, we suggest that there is no single model that describes all generational changes. Instead, we suggest that we need different models to describe the succession phenomenon under different circumstances, as all the conditions are impossible to account for within a single model. By accepting that there is no comprehensive model, predecessors can focus on what decision aspects are worth considering within their particular set of circumstances, instead of searching for a single comprehensive model. The impossibility of the single-model approach that our exploratory research highlights is limited to the scope of the first generational change. Further research is needed to cover subsequent generational changes. The mindset patterns presented here only represent what could be learned from the cases included in the knowledge base.

Our findings are therefore only valid within these boundaries. Adding new cases to the existing knowledge base through future research, could reveal further rules. At present, however, our findings are not generalizable, but they provide basis for an explanation of the succession phenomenon. Further research could expand our approach of examining mindset pattern in terms of scope, venturing into other countries, subsequent generational changes, etc. or in terms of time, developing longitudinal studies. The KBS learned from previous decisions by identifying relevant patterns. This is, however, not the end but the beginning of understanding succession, because, as Handy (2008) suggests, we try to fit the whole thing into our minds but to know where to find what is relevant, how to approach it, and what to do with it once we find it, is exceptionally important. It is important to understand that the succession decision is not simply a knowing process but a more complete cognitive process involving feelings, emotions, and values (Dörfler & Szendrey, 2008). Furthermore, as Taleb (2007) suggests, although the human tendency for certainty is natural, it is still more about an intellectual passion. As is mentioned above these values are used in abstract form, without

numerical facts. In accordance with the Knowledge Acquisition method we assume that predecessors are able to evaluate the generational change problems that arise based on the thought patterns as cognitive schemas in their minds. So all these aspects are the kind of "soft" information that can only be captured from the minds of predecessors and nowhere else.

To obtain the most informative attribute that has the greatest descriptive power therefore should be first examined, inductive reasoning was chosen. It happened with "if...then" logical rules applied by the Knowledge-based System (KBS). When the expert articulates the important aspects of the decision as well as the rules, the system triggers these rules to obtain the valuation. We refer to this as deduction or Rule-Based Reasoning. It is useful when the decision maker has no experience in the field and the situation requires an original decision. KBS supports those decision makers who are experts in their decision domain. The KBS we applied uses the ID3 algorithm that builds an increasingly complex decision tree (hypothesis) from the available data (Quinlan, 1986). The tree is essentially a Rule-Based Graph created via the formula of entropy. From the findings of these four identified problem areas originated the resolution for our defined knowledge gap. This resolution is more than the sum of its parts. The four partial results, must be regarded as delineating the final solution. Starting from a distinct problem definition for the problem space, different results could have been achieved.

With the presented papers we aimed to demonstrate our journey to understand the phenomenon. All four identified problem areas have their own respective limitations. In the presented papers we highlighted the limitations of each study; however, we feel necessary to reinforce some of them. The received responses for our study, to understand the mindset patterns of predecessors during succession decision making, represent a snapshot in time for a limited group in Hungary. This could be viewed as a limitation. The survey in itself had its limitations; the pre-defined options limited the answers and the freedom to reflect on those questions individually. Our results are not generalizable even for the Hungarian firms. For the knowledge bases built to study the expectations and aspirations, the limitations were highlighted in the respective articles, though one important note to be made is the number of experts and cases examined. Following the presented iterative knowledge acquisition process, the conceptual models could be further refined. The models presented in the articles resulted from the included cases. Despite these limitations our models lead to conclusions

that drove us further in our exploration to understand the phenomenon. We limit our research to leadership succession and do not engage in the peculiarities of ownership succession, being aware that the two may and often do occur simultaneously (e.g. Mazzola et al., 2008). Our research addresses only succession kept within the family, although succession within the family is only one among many possibilities (e.g. Le Breton-Miller et al., 2004), in order to achieve sufficient similarity within our data. This is particularly important, as we argue the need for different models in different situations. Moreover, we limit our research to small- and medium-sized family enterprises as these enterprises have a strong preference to keep the leadership within the family (e.g. Bjuggren and Sund, 2001). The if-then rules identified in our conceptual model are not generalizable across all cases; they are only valid for the examined cases. Our results should be validated inside these boundaries. Adding new cases to the existing dataset through future research, could reveal new rules. It is important to highlight that the reasoning in several of the mindset patterns was reduced to 2-5 attributes, which indicates that in these cases rules were formed, set. Our aim was to search for the understanding of a phenomenon: the succession decision in family businesses, where, based on the survey, we attempted to order their intuitive knowledge and aspirations. Our findings are not generalizable, but provides basis for an explanation of a phenomenon which triggers thinking and/or action. For those interested in the phenomenon future research is suggested in the area of mindset pattern changes on a personal level through longitudinal studies or, alternatively, into the phenomenon on social and/or organizational level. Other future research area could be analysing the phenomenon in other countries preferably countries in transition.

In the research of this rising, real phenomenon, our study is one of the first ones to address it with a transdisciplinary approach. The set of papers presented in this dissertation take concepts, frameworks, thoughts from several disciplines, for example as the foundations of our understandings on succession decision making came from sociology, social narratives from cultural anthropology, human decisions from behavioural economics, and learning models from cognitive psychology. The results and findings we had not only depended on the questions we posed, but also the tentative solutions we proposed and the approach we had. Therefore, as we previously highlighted, the findings should not be viewed as making up a part of the answer each, but rather as waypoints shaping the path for us through concepts, conceptual frameworks, and the methods to formulate the topic of the subsequent area. Paper based format requires that the different papers be meaningful wholes in

themselves, it does not follow that there are repetitions in them, but only that each of them needs to address the aspirations and the rules between them. Another researcher unquestionably would have formulated different problem areas. However, throughout this journey the originally identified problem areas were not fundamentally altered. Modelling the mindset patterns and human behaviour with KBS provided unique insight into the reasoning of the Predecessors. The question then arises as to whether is it a challenge for a researcher to investigate such an area, the result of which is not a rigorous finding, a solution is a scratch that can be offered to those dealing with such a problem area. We believe that it is indeed worthwhile to do such research, the result of which is to rule out and question the misconception that there is a comprehensive universal model in this area and by that giving other researchers a chance to support this view. In our view, the task of science is not only to uncover clear hard evidence solutions, but also to point out that there are phenomena that cannot have eternal results.

We thought a lot about examining the great impact of tiny phenomena with the conceptual framework of chaos theory but we decided not to go in this branch as this would require a separate dissertation and it would break the current line of thought. Our conjecture is that it could have been led down that road as well. We add to literature by showing that for an actual real problem there exists a contemporary solution. Our efforts for publication brought several lessons. The novelty of our research results wasn't questioned, but rather was challenged where to fit. Our transdisciplinary approach was induced by the identification of the problem areas. However, journals with transdisciplinary focus (or scope) have rather a philosophical approach and are not concerned with our practical message. In our studies, we did not search for a single truth, we did not generalize, but searched for an explanation of a phenomenon, which hopefully will trigger thinking and action.

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