



Doctoral School of Regional Sciences and Business Administration

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PASSING ON THE TORCH: UNDERSTANDING THE PREDECESSORS' MIND
PATTERNS

Doctoral dissertation

Supervisor: Zoltan Baracscai, DSc

Viktor Dörfler, PhD

Győr, 2022.



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Author's Declaration

No portion of the work referred to in this dissertation has been submitted in support of an application for another degree or qualification of this or other university or other institution of learning.

Furthermore, this dissertation contains no material previously written and /or published by another person, except where an appropriate acknowledgment is made in the form of bibliographical references.

Abstract

Abstract of the dissertation submitted by:

Katalin Darabos

For the degree of Doctor of Philosophy and titled: **PASSING ON THE TORCH:
UNDERSTANDING THE PREDECESSORS' MIND PATTERNS**

Month and year of submission: April 2022

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 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 (and there cannot be one) 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 than searching for a single one-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 dissertation's first contribution is the insight 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 suitable tool to analyse the mindset patterns and the “if-then” rules make it possible to find logical connections. The new attitude (logical rules between aspirations) is actually a more important result than the rules 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 dissertation 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 dissertation is to provide an argument for this approach.

Acknowledgements

Albert Einstein said that “Once you stop learning, you start dying”. I always planned that the last piece on my knowledge board would be de doctoral program. After acquiring all necessary qualifications that my work life needs I started on this path to widen my knowledge. Lifelong learning, intellectual adventures are part of who I am.

All classes, seminars, presentations, conferences during these years helped me to widen my intellectual interests, and thought me to push my limits further. The insights, the inspirations that the lecturers brought to us formed my thinking and my personal reality. All that the program provided helped me, guided me on my journey to explore the Rules of new aspirations in ownership shift in small family businesses.

I am especially grateful for my supervisors DSc. Zoltan Baracscai and Viktor Dörfler who accompanied me as supervisors and mentors. I feel privileged that we could share thoughts and interest and that they persevered by me on this sometimes bumpy road.

I am highly appreciative of the support provided by the PADME foundation.

Finally, I am thankful to my family that they provided all the support and encouragement that was necessary in order to finish my dissertation.

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Key to abbreviations

AI: Artificial Intelligence

CBR: Case Based Reasoning

KBS: Knowledge Based System

RBR: Rule Based Reasoning

1 Introduction

In this dissertation the aim was 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 typical knowledge differences between the predecessor (generation 1) and the successor (generation 2) is examined. 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. The predecessors virtually never have 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 will graduate. In order to gain an insight into what makes a succession successful, the predecessor's decision-making process in terms of knowledge differences is explored. Succession is a multidimensional process influenced by a huge palette of variables, many of which are qualitative.

1.1. Required and available knowledge: Family businesses succession

Family businesses form a highly diversified, heterogeneous group, which has prompted researchers to develop different classification systems to help understand this complex system. In the dissertation the diversity of conceptual approaches are demonstrated because there is no generally accepted conceptual definition of family businesses, and enterprises can be classified into this category of entrepreneurs on the basis of the characteristics specified by researchers. All this is important because in defining the qualitative research sample - for the sake of validity - it is necessary to take into consideration different types of family businesses. In relation to the examination of the conceptual framework of family business - the model that is often used in the literature - I refer to the two-circle model, which gives a kind of system theory approach to family businesses, which is a set of family-business interactions, where the interaction between the family subsystem and the business subsystem can be characterized by positive and

negative mechanisms. The result of these interactions is the family business, and the first phase of the literature review is a systematic presentation of the definitions of family business. In family business research, family includes not only the nuclear family but also the older and younger generations, such as cousins, uncles and aunts, and in other approaches, the family, which includes several generations, is considered a large family group (Gersick et al. 1997). One aspect of the demarcation level of the family is cultural issues, as the Latin American and Asian family models are very different from Western European ones. Based on the processing of relevant domestic and international literature, I agree with Melin and Nordqvist 2007 that the concept is a diverse collection category, and with Littunen and Hyrsky 2000 that there is no commonly accepted definition of family business. One aspect of diversity, in my view, is that there are different views on defining the concept of family, depending on the range and composition of the persons who are related to each other in the family. Family businesses are quite heterogeneous and there is no consensus among researchers about their definition (Chua, Chrisman, and Sharma 1999; D. Miller et al. 2007). The greatest difficulty in defining family businesses stems from the diversity of family businesses, as it poses the challenge of providing a comprehensive, precise definition that meets both the demands of science theory and at the same time allows the specific characteristics of family businesses to be summarized regardless of company size. The consequence of the conceptual confusion in the family business sector is that empirical research has difficulty distinguishing between family and non-family businesses and raises a number of additional methodological concerns (such as sampling, comparability of different research results). In order to develop one's own research design, it is indispensable to become familiar with this diverse conceptual system and to review the qualitative and quantitative characteristics that underlie the distinction between family and non-family businesses and the basis of definition creation (Klein 2000).

Researchers agree that family influence is key to the operation of family businesses, and the interpretation of the term family business shows a mixed picture. The intensity of the work in the field of definition is well illustrated by the fact that between 1989 and 1999, 44 different formulations were made (Habbershon and Williams 1999), even though they are not general. (Handler 1989) is associated with the first conceptual systematisation, which identifies four defining aspects in the definitions of family business published between 1964 and 1988. The following figure gives an overview of Handler's conceptual

organization. Litz (1995) concluded with the review of definitions that there are so-called “structure-based” definitions that build on the ownership and management structure of family businesses and the so-called intent-based concepts that build on the values and preferences of family members that express a commitment to family.

In the work of Poutziouris (2001) the so-called closed and open definitions are distinguished, where closed definitions are defined by a measurable set of criteria, whereas open definitions mean the intention to become a family business and self-definition. Rogoff and Heck (2003) associate family business with family ownership, the involvement of family members in management, the role of the family in running the business, and the full involvement of family members of different generations. On this theoretical basis, Chrisman, Chua, and Sharma (2005) divide definitions of family businesses into two groups: There are definitions based on participation criteria (family ownership, family management, and control by the family) and there are more restrictive approaches based on the essential elements of the family business that emphasize the particular behavior resulting from family presence. According to Chrisman, Chua, and Sharma (2005) the criteria for family involvement include family involvement in matters of ownership, supervision, governance and the desire to succeed within the family, while essential elements of family businesses include:

- exercising strategic influence over the family;
- maintaining the vision and control of the family over generations;
- family business behaviour Chrisman, Chua, and Sharma (2005);
- and the so-called "Familianness".

Those who consider a business to be a family business are less restrictive in management issues, even if the family member owner relinquishes management functions to achieve the growth goals of the business and ensures the continuity of the family business by employing an external manager (Blumentritt, Keyt, and Astrachan 2007). In my empirical research, applying the approach of Blumentritt et al. (2007), I do not exclude family-owned and family-owned businesses managed by a professional manager from the sample of family business. Some of the definitions provided give fairly narrow interpretations to family businesses, but tendencies tend to make broader interpretations more acceptable as they allow the full range of family businesses (e.g., start-up family owned, family-owned business, external manager-run family-owned family business, etc.) to be

cognizable and researchable, as opposed to overly narrow interpretations that focus on a subset of family businesses that also reduce comparability of research findings. In my opinion, the nature of family businesses can be grasped with the help of definitions based on essential elements too, so without a description of these, it is not possible to fully describe the conceptual system of family businesses.

The so-called family businesses of soft definitions, I would highlight the following: Lea (1998) gives the following definition, which is quite difficult to operationalize: family business is an enterprise that is driven by a family need, based on the capabilities of the family, the work of the family hand and soul, driven by the moral and spiritual values of the family, characterized by a lasting commitment to the family, and which survives as a child's legacy, as does the family name that represents value. Chua, Chrisman, and Sharma (1999) define a family business as an enterprise that is interested in pursuing and shaping the corporate vision beyond generations, which is dominated by a coalition of one or a few families. Astrachan, Klein, and Smyrnios (2002), in their study of the literature, conclude that there are three groups of definitions: The first group consists of content-focused definitions that are classically focused on ownership, family management, and generation change, and more recently highlight the cultural characteristics of a family business. There are many definitions for research purposes, primarily to facilitate the separation of family and non-family businesses and to categorize family businesses. The third group of definitions are those that help interpret theory, such as setting up a family business in the context of evolutionary theory. According to Poza (2013) a business can be considered as a family business where ownership control (where control is 15% or higher) is exercised by two or more members of the family or by family associations. In addition, family members exert a strategic influence in the management of the company, whether through active management, culture, participation as an advisor or member of the board, or active shareholder involvement. Furthermore, the caring for family relationships and intention or possibility of continuity are present in the operation of the business. The result of the work of A. R. Anderson, Jack, and Drakopoulou Dodd (2005) is an extended Bulls eye model that treats and categorizes each grade in its interpretation of family businesses, away from the dual view of family business definitions. The diversity of definitions is further demonstrated by a study carried out in 2008 on behalf of the European Commission's Directorate-General for Internal Market, Industry, Enterprise and SME (then DG Enterprise and

Industry), covering 33 countries (EU-27, Iceland, Norway, Lichtenstein, Turkey, Croatia and Macedonia) that analysed the national concepts and explored common elements in the definitions that could lead to a uniform European definition. Mandl (2008), based on the 90 definitions revealed, did not find a uniform and generic definition of the category of "family business" that would be widely and exclusively applied in all conceivable areas, such as public and political debates, legislation and statistical reporting and socio-economic research. The definition proposed by the expert group includes three criteria: family, business and ownership, as follows: A business is considered to be a family business when the natural person(s) who set up the company or the natural person(s) who own the business or have direct descendants of the spouses, parents, children or children of the foregoing, have direct or indirect decision-making powers, or have at least one representative of the family or the relatives involved in the management of the business or listed companies if the founder (or buyer) or the family or descendants of the company owns at least 25% of the voting stock.

As a result of the diversity of family businesses, many classification systems have been developed with the aim of gaining insight into the operating mechanisms of this complex system. Examination of existing family business typologies has led to the following finding (Basco and Pérez Rodríguez 2009; Birley 2001; Corbetta 1995; J. A. Davis 2008; Dyer 2006; Lubatkin et al. 2005; Poza 2013; Sharma 2004; Sharma and Nordqvist 2008) that most typologies rely on a one-sided approach despite the diversity of family firms.

The main concern of family businesses, according to research by Chrisman, Chua, and Steier (2003), is related to the issue of succession. About one third of all European entrepreneurs will retire from business within 10 years (European Commission, 2006). Thus, in general, the succession of a family business is not a rare event, but on individual family businesses the succession process is rare, occur only in every 20-25 years. Research on family business succession typically presents a complexity that is rare in entrepreneurial families when a family successor assumes the top leadership position in a family business (Gersick, Lansberg, Desjardins, & Dunn, 1999). Several studies have shown that the failure rate in the succession process is very high. Only one-third of family businesses survive in the second generation, and only about 10–15 percent go into the third (Beckhard and Dyer, 1983; Bierly and Chakrabarti, 1996; Solomon et al., 2011; Ward, 1987). The topicality and significance of the succession process has been noticed in the European Union as well as in Hungary as a member state. Interest in the topic of

succession of family businesses is also reflected in the intensification of research activity on the topic. Nowadays, the importance of family business is unquestionable - world renowned universities taught family business courses, research has growing significance, the scientific achievements are published in journals dedicated to this field's research, such as *The Family Business Review* and the newly published *Journal of Family Business Strategy* and *Journal of Family Business Management*. The issue is a significant and sensitive issue, mainly due to the role of the companies concerned in employment. According to estimates, European companies one-third face the challenge of succession over the next ten years, involving the transfer of 610,000 small and medium-sized enterprises, which provide nearly 2.4 million jobs (Mandl 2008; Flören 2010). Experience has shown that more and more transfers are taking place outside the family, and many entrepreneurs only want to run the company they start for a shorter period of time and then plan to sell it. In some cases, not only the age of the entrepreneur appears as a driving force for the transfer of the company, but also other personal and family reasons and changes in the market environment. Fears of succession affecting family businesses are not unfounded based on international experience. However, a successful generational change is not yet clearly good for the future of the business. Intergenerational disputes over succession can also become a barrier to growth (D. Miller and Le Breton-Miller 2006). Examining Croatian first, second, and third generation family businesses, Pfeifer, Sonfield, and Lussier (2006) found that the more generations work together in a family business, the fewer female family members are employed, and succession planning and long-term planning are becoming more common.

According to the European Union Expert Group, the most important tasks for member states are: facilitating the transfer of companies to external and third parties, facilitating employee buy-outs, applying special inheritance and tax rules for succession and company transfers, and facilitating the retirement of entrepreneurs (Flören 2010). In addition to the interest of practitioners, succession has also attracted the interest of science. Dyer and Handler (1994) is credited with identifying the five main strands of succession research, i.e., succession as a process; the role of the predecessor; perspectives for the next generation; multi-level analysis of the succession process and factors influencing the efficiency of the succession process, such as the definition of research directions. According to the integrated model of the examined factors of succession research (Kesner and Seborá 1994), one branch of succession research is the examination

of the antecedents of succession (organizational factors, leadership role factors and candidate-related factors), the second is examining succession as an event in the process - along finding the successor and selection factors, while the third is the assessment of consequences. According to Bocatto, Gispert, and Rialp (2010), one branch of succession research examines succession as an organizational function and the other focuses on the impact of succession on organizational performance. The latter is internationally one of the controversial issues is the impact of succession and the origin of the successor on changes in corporate performance, in connection with which a number of contradictory research results have emerged.

These data make clear the importance of successful succession and how relevant the topic is to today's business world. It is not surprising, therefore, that much has been written over the years about the successors of family businesses (Chittoor and Das, 2007; De Massis et al., 2008; Royer et al., 2008; Venter et al., 2005). Sharma et al. (2004) estimate that one-third of the family business literature focuses on succession. The succession process is arguably the most critical problem for families, after all, succession is a central issue that needs to be addressed in order to ensure the survival of the family business from generation to generation (Applegate, 1994; Harveston et al., 1997; Ibrahim et al., 2001). Success of succession can be determined by the subsequent positive performance of the firm and the ultimate viability of the firm, or stakeholder satisfaction with the succession process (Cabrera-Sua' rez et al., 2001; Dyer, 1986; Handler, 1990; Morris et al., 1997; Sharma et al., 2001). Succession is a multidimensional process influenced by a huge palette of variables. In analysing these processes, the literature focuses on factors that facilitate or hinder the transfer of power from one generation of the family to another (De Massis et al., 2008; Le Breton-Miller, Miller, & Steier, 2004). In the family business literature, most are the factors in office that mainly plan the founder's reluctance to succeed because of a number of issues, including the founder's strong attachment to the business, fear of retirement and death, and other interests (Cabrera-Sua' rez and et al., 2001; Handler, 1990; Lansberg and Astrachan, 1994; Levinson, 1971). Other related factors focus on the successor's business skills, leadership skills, knowledge of how the company operates, and attitudinal tendencies toward managing the business (Barach and Ganitsky, 1995). Several authors have also examined the micro level, focusing on how family relationships and the specific characteristics of successor and / or current CEOs affect the effectiveness of the succession process (e.g., Lubatkin et al., 2005; Sharma et

al., 2004). The literature on process factors deals with the extent to which succession depends on aspects such as the process of selecting the successor, nurturing and developing the successors, corporate governance structures, and shared visions (Dyck et al., 2002; Lansberg, 1999; Sharma et al., 2001). Financial factors are related to external financing as well as taxes, which both influence the succession process. Inheritance is closely related to financial risk and investment (Chittoor and Das, 2007; Davis and Harveston, 1998). Of course, there are a number of external variables (contextual factors) that influence inheritance, such as market demand conditions, the state of the economy, buyout offers from potential investors, and financial pressures from lenders and other resource suppliers (Morris et al., 1997). Other studies have focused on process factors. This work suggests that actual succession is a function of how the succession process itself is organized (Barach & Ganitsky, 1995; Handler and Kram, 2004; Lansberg, 1999). An additional category concerns personal relationships within the family, between members, and outside the family (relationship factors). The main issue here concerns trust, cohesion, and communication between family members (Chrisman et al., 2005a; Kets de Vries, 1993; Ward and Aronoff, 1990). The rejection of a family business leader or the sharing of power with other family members, as well as his or her resentment, is an important topic that requires further investigation (Handler, 1990; Keogh and Forbes, 1991). In this regard, the importance of common values and agreements about loyalty and /or common traditions is emphasized (Davis and Harveston, 1998; Dyer, 1986; LeBreton-Miller et al., 2004; Nelton, 1991), along with factors such as commitment, loyalty and family turnover (Handler, 1990; Morris et al., 1997).

While the work discussed above has provided significant insight into the succession of the family business, it is mostly rooted in what Sarasvathy (2001) calls a “causal” approach. In this respect, the creation and development of successful family businesses is a linear and strategic process in which the family develops a specific goal and begins the action planned to achieve them. These goals may not be rational in a purely economic sense, as family businesses often prioritize family and other non-economic goals beyond commercial goals.

Before analysing the process of the succession, it is necessary to examine the successor as one of the main actors in the succession process according to its origin, as most previous research highlights origin as a characteristic in addition to successor competencies. Most authors apostrophize potential successors as internal and external

successors. Zhang and Rajagopalan (2004) authors' categorization of successors differs from the previous dual approach in that it distinguishes between in-house successor (working for the company for at least two years) and industry successor (working in the organization for less than two years, but with more than two years' employment with another company) or a non-industry successor (less than two years of experience in the industry). In her research, Karaevli (2007) summarized the results obtained in terms of the impact of succession on organizational performance. Based on the collection of literature, it can be stated that there is no unified position regarding the characteristics of succession and the direction of the change in the performance of the organization.

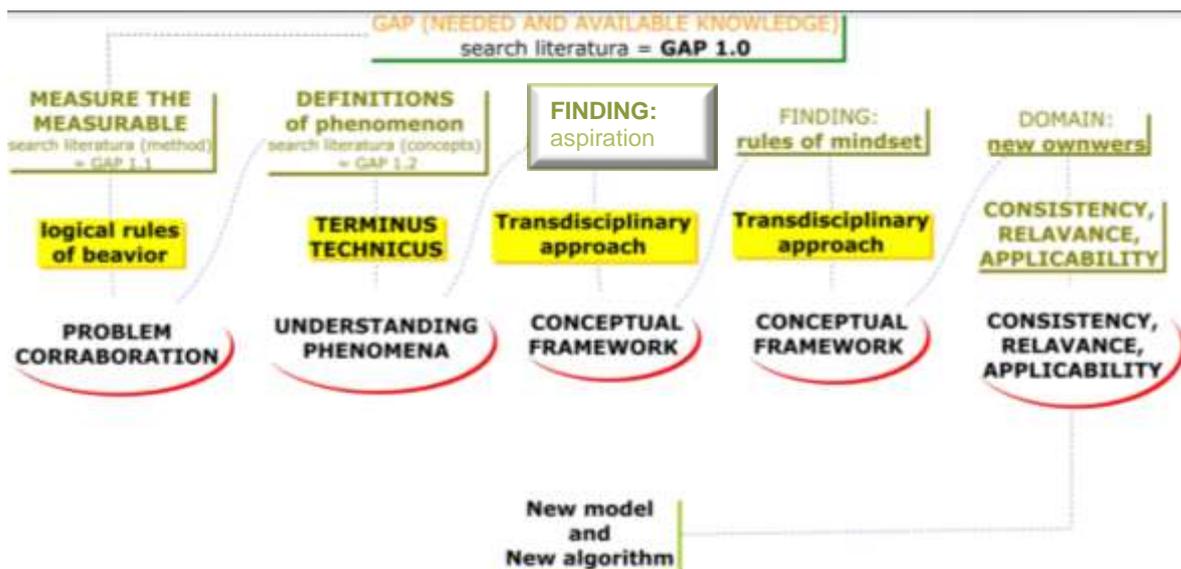
Purpose of the research is to understand the mindset patterns of the founder (generation 1) when making succession decision. In order to fulfil this purpose, the objectives are formulated in answering the following research questions:

- 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?

1.2. Problem space

Based on the required and available knowledge described in the previous section, I narrowed the original problem space to five problem areas, that gave a structured map. These four areas on one hand represent the journey to understand predecessor's tentative problem solving, on the other hand provide four stand-alone areas for more thought-provoking topics. The map identifies the problem, the tentative problem solving and the finding that enables us to build up a conceptual model by the discussion. The initial concept-map was the foundation upon which the steps for the journey was identified. During the research process, there were no major changes to it. Revisions were rather due to narrowing of the problem space, purification of the concepts, notions and frameworks. One representation of the problem space is visible in Figure 1.1.

1.1. Figure Problem space



As the knowledge background based on the previous paragraphs as available knowledge is compared to some relevant questions as the lack of knowledge, some research gaps were identified which was then summarized in the problem space with five pillars and levels.

The paper-based dissertation format requires that the different papers be meaningful wholes in themselves, which does not mean that there are repetitions between the papers, 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 the journey of this PhD study, 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. Therefore, the findings should not be viewed as making up a part of the answer each, but rather as points of reference and viewpoints shaping the path for us through concepts, conceptual frameworks, and the methods contributing to formulating the topic of the subsequent area.

1.3. Methodological considerations

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.”

1.3.1. 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 (G. A. 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 Twersky and Daniel Kahneman (Tversky and Kahneman 1974) have occasionally considered decision-making.

Expert knowledge is a combination of a conceptual understanding of the problem and a collection of heuristic problem-solving rules that experience has shown to be effective in the domain (Sun and Finnie 2000). Expert systems (ES) are constructed by obtaining this knowledge from human experts and coding it into a form that a computer may apply to similar problems (see e.g. Dörfler 2021). This reliance on the knowledge of domain expert for the system’s problem-solving strategies is a major feature of ES (Zoltán Baracscai, Velencei, and Dörfler 2007; Brachman et al. 1983; Lenat and Feigenbaum 1992). An ES mainly consists of a Knowledge Base (KB) and an Inference Engine (IE). The KB contains the knowledge used by human experts, in contrast to knowledge gathered from textbooks or nonexperts. The IE consists of all the processes that manipulate the KB to

produce information requested by the user- forward or backward chaining. Thus, we can briefly formalize it as:

$$ES = KB + IE$$

Even though intuitive decision makers emphasize that the knowledge bases of their tools cannot have more knowledge than the experts whose knowledge has been represented, sometimes the illusion still arises. The knowledge base in the expert system will not be able to think differently than the decision maker who was the source of that knowledge (Velencei et al. 2019). As Liao (2005) said, the development of methodological approaches in expert systems shows expert orientation in ICT-related disciplines, and suggests that there is a possibility of a different orientation in human and social studies. One of the novelties of the DoctuS Knowledge-based System (Zoltan Baracska, Velencei, and Dörfler 2005) is its ability to show the informativity of the attributes of the decision maker through an entropy-gain method based on a modified ID3 (Quinlan 1979; 1986) algorithm. The mindset of the predecessor can be discovered through the informativity of these attributes. In our studies Doctus Knowledge Based System is used, where the aspects of the decision are called attributes.

From the idea that if it is possible to find out the outcome based on attributes and rules, it should also be possible to find the attributes based on the other two. Well, this is not entirely true, as it is impossible to define the rules and the outcomes without describing the attributes first. However, we can also observe that the case-based graph, the graphical display of the inductive reasoning, normally does not contain all the attributes, only a few of them. That means that although we cannot find the attributes based on the rules and the outcomes, we can find out which attributes are relevant in a particular decision. This is what we can read from the case-based graph – the informative attributes. Reductive reasoning always follows the case-based reasoning. Based on the most informative attributes identified during case-based reasoning, the system generates a new rule-based knowledge base (Doctus can convert the outcome of the inductive reasoning, i.e. the accepted case-based graph, into a deductive knowledge base) by a click of the mouse. As the number of the attributes is thus reduced this type of reasoning is called reduction or reductive reasoning. It is important that, while we have fewer attributes in reductive knowledge base, it classifies all the cases in the same way as when we used all the attributes in inductive reasoning and what a complete deductive knowledge base featuring all the attributes would provide. It can be said therefore that the reductive knowledge base

is denser than a corresponding deductive one. It is possible that there will be no complete rule sets in some of the nodes of the new single-level rule based graph but these will usually indicate impossible case situation or, at any rate, a sort of a case that the experts have not seen before. (Zoltán Baracscai et al. 2014)

The research of the topic 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" (Zoltan Baracscai and Dorfler 2017).

1.3.2. Research scope

In order to shed light on some aspects of the data collection process, decision support systems (DSSs) need to be briefly introduced. In general terms, DSSs provide support for decision makers by bringing together human judgment and computerized information in an attempt to improve the effectiveness of decision-making (Turban and Aronson 1998). The general purpose of a DSS can be stated as "to supplement one or more of a decision

maker's abilities" (Clyde and Andrew 1996). Intelligent human-like support is needed for decision-making support, but human decision makers should make the final and critical decisions (Macintosh 2004).

At first stage pattern and case recognition are modelled by case-based reasoning and can produce simple decision systems in which patterns or cases are unequivocally associated to predefined decisions and actions (coded in tables for recognition primed decisions). This can be deemed intelligent depending on the number of cases in the case base and on the possibility of learning by adding new cases or adapting the table based on feedback from previous decision made or making decision by analogy using a measure of the distance between the case at hand and available recorded cases (Gilboa and Schmeidler 2005). The second stage where intelligence can be introduced in decision support lies in the reasoning and many DSS are designed to make intelligent "what-if" analysis on models and data. The principle is that of a heuristic search at different levels of representation. Here the main difficulty for designers is to complete the overall model of search by introducing the evaluation function expressing the preferences of the decision maker. When this is not possible, the decision maker must remain in the loop and the system is interactive, the decision maker expressing his or her preferences by directing the search and stopping it when they are satisfied (or they have reached a satisfying outcome, as in the concept of "bounded rationality" described by Simon).

A multiplicity of criteria and the resulting non-optimization are among the features of bounded rationality that contributed to the rapid development of multicriteria decision. The multicriteria aspect has always been present in bounded rationality, with 'partial ordering of payoffs' as a consequence (Simon 1955). This multidimensional character is the result either of having a large number of incommensurable objectives (Simon 1967), or of the fact that several individuals are involved in a group decision. This led Simon to conclude that the quest for a global optimum did not make sense. On this point Simon has had much following and multicriteria DMSSs are now commonplace. The two remaining aspects of bounded rationality that led to further research are the question of the endogeneity of the preference and the problem of limited attention. In DSS research and practice, the former has been solved by letting the decision maker express his preference using interactive features of the system, while the latter has been addressed by developing simple, easy to handle systems rather than involved systems.

1.3.3. 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.

From a research perspective, experiences are problematic because of their subjective components (i.e. qualia), 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 “inherited background”, I decided to investigate predecessors during the succession making process. This personal involvement provided me with an “insider view” (Stierand and Dörfler 2014; Olekanma, Dörfler, and Shafti 2022) meaning the social practice against which practitioners implicitly make sense of their actions (Hardy et al., 2005, Philips et al., 2004, Kogut and Zander, 1996) and thus it is easier to access the subjective dimension of the lived experiences of predecessors and the intuitive decision-making process. In order to take advantage of the “insider view” as a source of insight rather than something that affects the findings in unknown ways, bracketing has been practiced throughout the problem-solving process (Dörfler and Stierand 2020).

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 (Appendix 4):

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 therefore 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 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. 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.

1.3.4. Data analysis

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

1.3.4.1. 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 1.1: 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; Factor 4 – 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.

1.3.4.2. 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.

1.4. Contribution of the papers

The rest of the dissertation presents four works developing conceptual models for the identified problem areas. Following Popper's (1992) tentative problem-solving process from the original problem through the research, new, even more captivating problems arose. The results from the four problem areas should not be viewed as each forming a part of our conclusions, but they should rather be deemed as results which determined the next problem areas' frameworks and helped identify the next area.

From a research perspective, experiences are problematic because of their subjective components (i.e. qualia), 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 "background", I decided to investigate predecessors during the succession making process. This personal involvement means the social practice against which practitioners implicitly make sense of their actions (Hardy et al., 2005, Philips et al., 2004, Kogut and Zander, 1996) and thus it is easier to access the subjective dimension of the lived experiences of predecessors and the intuitive decision-making process.

Nevertheless, the conceptual model incorporated some of the findings from previous problem areas as well. All the conclusions have limitations. When addressing the study and resolution of real problems, it is natural to use concepts from several disciplines, including the use of lesser-known new concepts as well. Needless to say, the majority of the concepts are presented with references and/or quotes, which might not be sufficient for the accustomed treatment of the concepts. I do not claim that definitions are not helpful, but they cannot lead to a clear overall picture view.

I am not convinced that it is possibly to describe the phenomenon using exclusively new concepts. There were also discipline specific concepts in the quantitative and qualitative data analysis. The presentation of the artificial intelligence based KBS functionalities would be difficult without the use of existing notions from the field of decision support. The concept of “aspiration” (March and Simon, 1958) is well-known and accepted in the study of decision-making. However, for those standing outside of this field, “aspiration” is probably a noun with a different meaning than for those involved in the study of decision-making. The use of concepts from any other profession or discipline, or the use of a new concept, would equally make it harder for the reader. The use of concepts and frameworks from distinct disciplines limit the approach to the resolution of real problems. Therefore, as argued in the methodology section, to explore this thought-provoking problem space, it is needed to step out from the disciplinary boundaries and adopt a transdisciplinary approach.

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.

1.4.1 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.

1.4.2 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.

1.4.3 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.

1.4.4 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. Ariely (2008) suggests that almost everyone has problems with procrastination and self-control, but those who recognize and admit these weaknesses are more successful in overcoming them. Our expectations influence our views of subsequent events. 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.

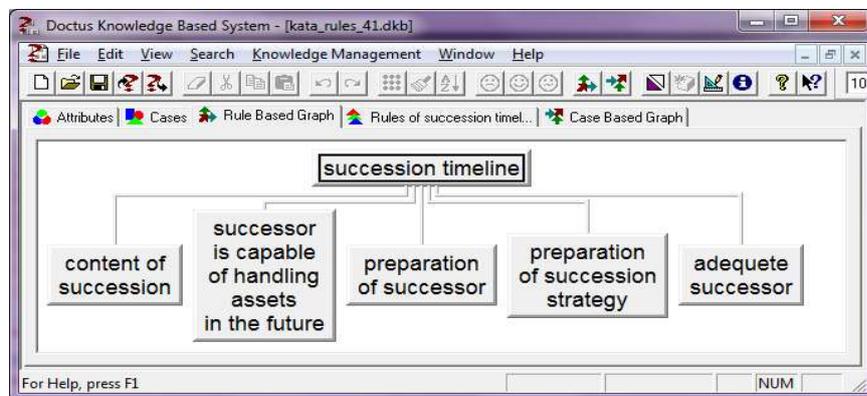
1.5 Contribution of the dissertation

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.

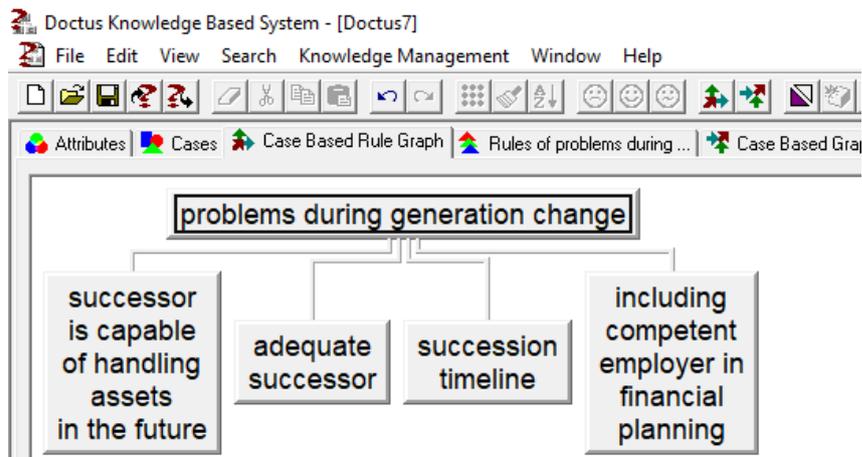


Source: Screenshot from Doctus

1.2. 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

1.3. 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 coui 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 rather do not c
absolutely	already found it	not planned at all	*	rather count on it
rather yes	*	*	rather not necessary	rather count on it rather do nc
absolutely	probably did not find it	*	*	rather not count on it

Source: Screenshot from Doctus

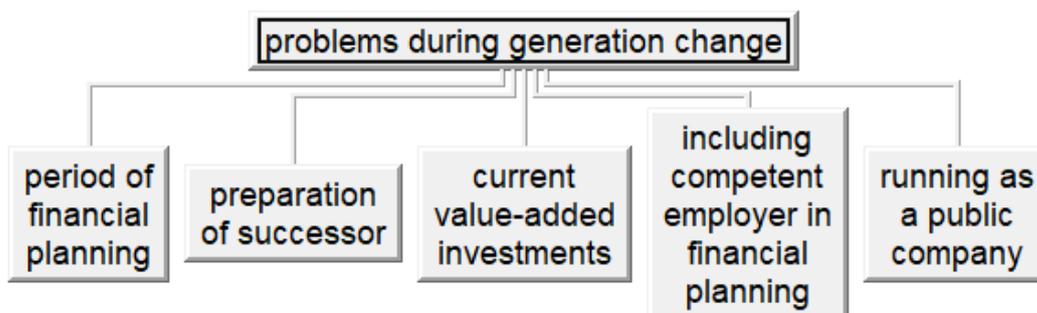
1.4. Figure: Rules – Phase 2 dataset – problems during generation change

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

1.5. 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.

2 Conceptual Model for Family Business Strategies in Chaotic Ecosystems

Darabos, K.¹ and Baracscai, Z.² (2018) ‘Conceptual Model for Family Business Strategies in Chaotic Ecosystems’ in Van der Meer, H., Enthoven, G., and Schiuma, G. (eds) Proceedings IFKAD 2018. Delft, Netherlands

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Structured Abstract

Purpose – This paper explores and maps the strategizing process of family businesses in the state of chaos. 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 chaos.

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.

Design/methodology/approach – 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.

Originality/value – Family businesses can be thought of as complex systems. Chaos theory ‘proposes a broad set of loosely related theoretical and meta-theoretical orientations to the behaviour of complex (non-linear) systems’.

Rejecting the view that systems can be understood in terms of, or reduced to, their constituent elements and the predictable, linear relationships between those elements, chaos theory recognises the complex, unpredictable and dynamic nature of systems. Many researchers come to the conclusion that succession planning can result in significantly improved chances for a business's continuation. However, based on complexity theory and emergent strategizing, we question this conclusion, and whether planning is really the only option for a successful family business succession.

Practical implications – 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.

Keywords – chaos theory, emergent organizations, family business

Paper type – Academic Research Paper

Author's short bio

Short Biography – Katalin Darabos is a graduated economist and chartered accountant employed in the financial sector. Currently working at their family business in the field of tax advisory – audit – accounting field with an ongoing Ph.D. at Széchenyi István University (Győr, Hungary) Management specialization, focusing on Succession in Family Businesses.

Short Biography – Zoltán Baracscai is an Associate Professor at the Széchenyi István University, Győr, Hungary and holds part-time and visiting professorial positions at several universities in Hungary, Croatia, Bosnia and Romania. His interest is focused on mindset of decision maker. He has written 16 books and 100+ conference and journal papers on these topics. Zoltán with his team, developed the Doctus knowledge-based expert system shell to support executive decision takers and he conducted 160+ consultancy projects where decision support was provided using Doctus and worked on

many of these as a knowledge engineer. Over the last few decades Zoltán designed a dozen postgraduate schools and degree courses.

2.1 Introduction

All over the European Union family firms are credited as a major part of entrepreneurship. Nowadays, the importance of family business is unquestionable - world renowned universities taught family business courses, research has growing significance, the scientific achievements are published in journals dedicated to this field's research, such as *The Family Business Review* and the newly published *Journal of Family Business Strategy* and *Journal of Family Business Management*. Despite of the growing interest in this field of study one can argue if the subject of the family business would be an independent discipline. Although the issue as an independent discipline is questionable, its significance and its growing and increasing importance however is not.

In every small and medium sized family firm succession is a common phenomenon and it is considered as the most critical issue that is commonly faced by the family firms. Organizations need an integrated approach to drive systematic, constructive change and minimize the destructive barriers to change, as well as addressing the consequences of making the change. Many approaches and methods have been suggested to manage change in general, yet organizations undergoing generational change have a surprisingly high percentage of failure. This high proportion of failure justifies the multiple number of research on the topic of successful generational change. When one talks about managerial success, academic research and literature in management is still frequently based on an implicit assumption of stability and mechanistic view of organization. Predictability and replicability suggest a rational and mechanistic organization, which view has already been challenged by researchers. (Thietart & Forgues, 1995.) Organizations are presented as nonlinear dynamic systems subject to forces of stability and forces of instability which push them toward chaos.

Complexity theory is a study of emerging patterns of order and self-organisation. (Stacey, 1995). By definition therefore, organisations from a complexity perspective are dynamic. Complex adaptive systems are driven by negative and positive feedback loops whereby paradoxical states of stability and change, predictability and unpredictability are constantly emerging. Interpreting the previously mentioned characteristics, family businesses are complex adaptive systems where new and unexpected structures emerge between and at

the edge of order and chaos through self-organisation. By assuming and adopting the complexity perspective on family businesses one can understand and map the possible tensions that potentially exist at the intersections of family and business. Complexity theory gives a framework to understanding the emergence, novelty and self-organisation of dynamic interactions of agents within family business environments. This entails that, initially, they show imperceptible differences, but over time those small differences become magnified by self-reinforcing processes.

2.2 Ownership shift

2.2.1 Complexity

Complexity science includes a set of ideas that have emerged over the last 40 years from several disciplines, such as computer science, evolutionary biology, information technology and cognitive psychology. In that discussion, the distinction between complexity theory and chaos theory is often blurred. Chaos and complexity are often discussed together, but are quite different. There are many characterizations of the differences. Cohen and Stewart (1994), for example, claim that complexity is about how simple things arise from complex systems, and chaos is about how complex things arise from simple systems.

Fundamentally, the more general name for the field of chaos is, “complexity theory,” under which “chaos” is a particular mode of behaviour. Specific systems that display complexity are dynamic and stable/unstable systems. Dynamic systems are complex when they can change over time without providing a verifiable clue to their transformation. Stable and unstable systems can both display unpredictable behaviour when affected by disturbance, change, or external influence. Chaotic systems are dynamic systems that are essentially somewhere in-between stable and unstable systems, where stable systems move to instability under a specific design or pattern. Shifts in stable, unstable, or dynamic systems that are random and do not produce a pattern are not covered by “chaos,” per se, but fall under the general category of complexity. Unpredictable behaviour that has causal relationships is covered by the science of chaos. This must be contrasted with complex behaviour that is random and follows no pattern. Random behaviour can be defined as an event without cause, thereby rendering the behaviour unpredictable, even in principle. At its best, random behaviour can only be predicted with probability. In this case, the paper shall focus on action within succession,

where chaos is bounded instability - in between stable equilibrium and explosive instability.

Chaos theory is an interdisciplinary theory stating that within the apparent randomness of chaotic complex systems, there are underlying patterns, constant feedback loops, repetition, self-similarity, fractals, self-organization, and reliance on programming at the initial point known as sensitive dependence on initial conditions. Study of the chaos theory began with mathematicians in the late 19th century. Since that time different scientific fields expressed interest in these studies such as physics, chemistry and economics. Chaos theory helps identify patterns that were perceived in the past as randomness. Chaos theory as used in biology, physics, and mathematics is about how to recognize, describe, and make meaningful predictions from systems that exhibit that property. Complexity theory (or the study of complex systems) is really about how a system that is complicated (usually by having many interactions) can lead to surprising patterns when the system is looked at as a whole.

With the tools of systems dynamics, business competition can be thought of as a complex system. The term complexity has many meanings, but it can be seen as the phenomena which emerge from a collection of interacting objects, which compete for scarce resources. “Emergent” is a key notion in complexity science, for a universal feature of complex systems is that they are capable to organize themselves: it appears to be alive. This is possible thanks to feedback loops, a circular chain of cause and effect between two or more variables.

As with other dynamic systems, both the growth of the firm and the evolution of its industrial structure are subject to negative and positive feedbacks. Negative feedbacks stem from decreasing returns to the growth of the firm, which may occur because the firm becomes “bureaucratically” congested or administratively limited. Decreasing returns to the growth of the firm are stabilization forces that hinder the growth of the firm and prevent the eventual emergence of an infinite-size firm. The growth of the firm and the structure of the industry where it competes depend to a great extent on positive feedbacks; that is, on increasing returns to the growth of the firm.

2.2.2 Change management and Strategizing

There are a variety of approaches to change, and that an important element in achieving successful change is to choose the most appropriate approach for the type of change being

undertaken and the circumstances in which it is being undertaken. Though there are many different approaches to organizational change and many ways of categorising these, there is a general agreement that the two dominant ones are the planned and emergent approaches. In the change management literature there is considerable disagreement regarding the most appropriate approach to changing organisations. This disagreement accounts for many managers having doubts on the validity and relevance of the literature, and confusion when considering which approach to use.

Planned change has dominated the theory and practice of change management for the past 50 years and is based principally on the work of Kurt Lewin. Lewin saw that planned change is primarily aimed at improving the operation and effectiveness of the human side of the organization through participative, group- and team-based programmes of change. This approach views organisational change as a process that moves from one “fixed state” to another through a series of pre-planned steps and can, therefore, be analysed by a construct such as Lewin’s (1951) “action research” model. Another planned approach to organisational change is Lewin’s (1958) “three-step model” which describes the three learning stages of freezing – clinging to what one knows, unfreezing – exploring ideas, issues and approaches, and refreezing – identifying, utilising and integrating values, attitudes and skills with those previously held and currently desired. This approach recognises that, before any new behaviour can be adopted successfully, the old one has to be discarded. Only then can the new behaviour be fully accepted.

Nevertheless, by the early 1980s, with the oil shocks of the 1970s, the rise of corporate Japan and the severe economic downturn in the West, it was clear that many organizations needed to transform themselves rapidly and often brutally if they were to survive. Given its group-based, consensual and relatively slow nature, planned change began to attract criticism as to its appropriateness and efficacy, especially from the culture-excellence school, the postmodernists and the processualists. In place of Lewin’s model, culture-excellence called for organizations to adopt flexible cultures which promote innovation and entrepreneurship and that encourage bottom-up, continuous and co-operative change. Its advocates maintained that top-down coercion, and rapid transformation, might also be necessary to create the conditions in which this type of approach could flourish. The other important perspective on organizational change which emerged in the 1980s was the processual approach. Processualists argue that change is continuous, unpredictable and essentially political in nature. This approach is, in theory, better able to achieve a broader

understanding of the problems of managing change within complex environments. Organisational change is seen to be less dependent on detailed plans and projections than on reaching an actual understanding of the complexity of the issues involved and identifying the range of possible options.

While planned change has many followers, it also has a number of critics. The main critics of planned change tend to assemble under the banner of emergent change, a relatively new concept that lack the formal history of the planned approach. Emergent change consists of ongoing accommodations, adaptations, and alterations that produce fundamental change without a prior intentions to do so. Underpinning the rise of the emergent approach were new perspectives on the nature of change in organizations. The planned approach is based on the assumption that everyone within the organisation agrees to work in one direction with no disagreement. Unfortunately, this is not always the case. Within any group of individuals, differences of opinion on important matters will always exist. Implicit in the emergent change argument is the assumption that if organisations operated in more stable and predictable environments, the need for change would be less and it might be possible to conceive of it as a process of moving from one relatively stable state to another. Consequently, for the proponents of emergent change, it is the uncertainty of the environment that makes planned change inappropriate and emergent change more pertinent. Whilst there has been a growing chorus of disapproval of planned change over the last 20 years, and increasing support for a more emergent view of change, there is also a view that just one approach to change may be sub-optimal.

2.2.3 Generation change in family businesses

It is evident that a multitude of factors both inside and outside the organization affects the organization. This is where a systems view of organizations becomes important, as systems are characterized by relationships that are neither linear by design nor in existence. Chaos theory supports this premise, as small changes can have significant impact on systems. Interestingly, chaos theory seems to counter Kurt Lewin's planned change theory. Lewin's theory identifies that organizational change is the result of both driving and restraining forces seeking equilibrium. Lewin posits that increasing driving forces and reducing restraining forces can move a point of equilibrium. Therefore, if you want to make change successful, you need to increase the driving forces for change while lessening the restraining forces for change. Chaos theory indicates there is not

equilibrium, as systems never return to the same exact state. Interestingly, some aspect of chaos theory would indicate the impossibility of organizations to achieve lasting change.

When the issue of succession arises managing the conflicts between the two layers – namely between the demands of the business and those of the family - becomes more urgent. Since succession is not only about the transfer of equity and/or ownership of the business, but involves the transfer of managerial responsibility as well, incompatibility and squabble tend to arise. Succession is a prolonged process where problems can occur at different points in time and involve different members of the family.

A lot of research (Von Schlippe 2013., Hatak 2015.) has been already conducted on the conflicts pervading family businesses. The system theory states that the relationship between the family and the enterprise system, and the competition between them carries the conflict, which is a part of the family business itself. This phenomenon has been identified as the inherent value conflict of family businesses. Business and family are based on a different value system. The enterprise produces, is profit orientated, is featured by organizational hierarchy and culture, is customer-oriented and has contractual relationships, while the family is consumption-oriented, the main value is love, the hierarchy is determined by the birth order and relationships are based on trust. When managing the tensions and conflicts in business it is often difficult to identify the real cause of conflicts because family members tend to argue on the surface problems instead of the real, deep ones. In the family business life cycle there can be lot of challenging situations, but succession is perhaps one of the most conflicting process. The expressed and unspoken expectations, the predecessor and the offspring, or the competition between potential offspring and the insecurity atmosphere caused by change are all about making the opposites – that are the essence of the family business anyway - larger.

Since the two layers in a family business counteract with each other constantly pushing the system once towards stability other times towards instability a chaotic organization will appear. Counteracting forces are at play in most organizations. Some might be dominated by forces of stability, some by forces of instability or, finally, both forces might be at play in a balanced manner and lead to deterministic chaos. We know that many nonlinear dynamic systems are frequently chaotic when the number of system variables is equal to or greater than three. This is obviously the case for many organizations. Chaos is also more likely when the system variables follow different

periodicity patterns and are highly coupled with each other, a condition which is frequently met in organizations.

Simply stated, chaos theory ‘proposes a broad set of loosely related theoretical and meta-theoretical orientations to the behaviour of complex non-linear systems’. Rejecting the Newtonian view that systems can be understood in terms of, or reduced to, their constituent elements and the predictable, linear relationships between those elements, chaos theory recognises the random, complex, unpredictable and dynamic nature of systems. However, although denying the predictability of systems, it does not suggest that they are inevitably random and disordered. Rather, it proposes that chaotic systems can self-organise and self-renew, with periods of order broken by sudden transformations whose direction has elements of chance and cannot be reversed. In other words, chaotic systems, when viewed holistically and over time, demonstrate the ability to re-establish stability, structure and order (Seeger, 2002). As Levy (1994, p. 169) suggests, ‘it is the promise of finding a fundamental order and structure behind complex events that probably explains the great interest chaos theory has generated in so many fields.

2.3 Methodological framing

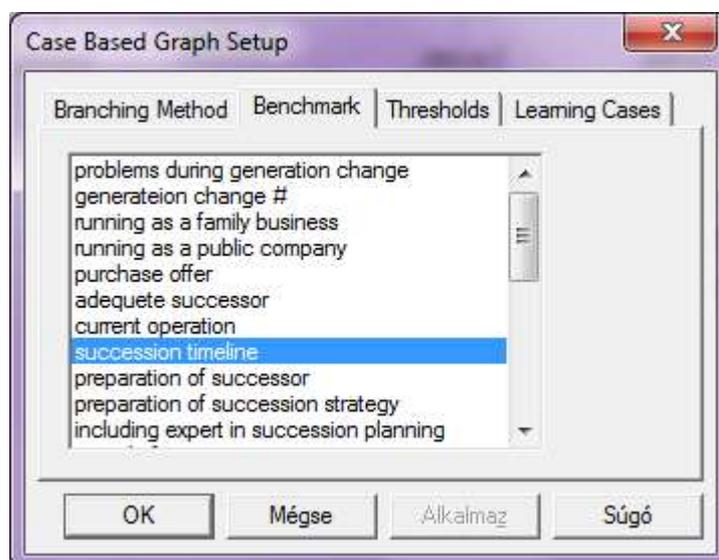
To test the process of the generation change in family businesses a qualitative research approach was defined. After the construction of the survey of 26 closed-questions, four main sub-topics were identified: classification, succession planning, business planning and wealth management. After having reached the more than the targeted answers (51 answers in total) the database was further analysed with the help of a computer program.

A software tool, Doctus (<http://www.doctus.hu>) KBS was used for simulation and testing with the aim to organise the qualitative research data into an executable form and develop models. A knowledge-based system is a computer program that uses and reasons a given knowledge base, to solve complicated and compound problems. Doctus expert system represents knowledge with symbolic logic, which means that its elements are symbols which are connected by logical rules in “if...then” form. Therefore Doctus belongs to domain of Symbolic Artificial Intelligence. Since the program is able to evaluate decision alternatives; Doctus belongs to Decision Support Systems as well. Once the first ideas/hypotheses are developed and a knowledge base is generated cases can be added to the database. If the aspects are clear, but they cannot be distinguished by importance the software can identify rules describing the cases that is called Case-Based Reasoning.

2.4 Conceptual model

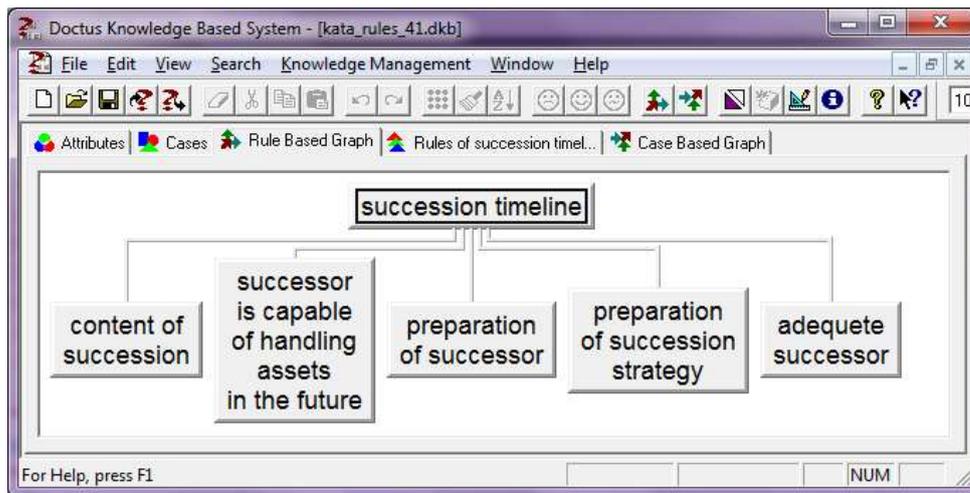
The essence of our result lies in the fact that from the identified 26 attributes one can find those that will lead to highlight the concepts that can be formed. „In a sense, we could say that Doctus here is a validation tool, particularly as we introduced various consistency checking functions. By building a knowledge base for validating consistency of the new transdisciplinary knowledge, we create a conceptual model. The conceptual model will be used as a starting point for examining the relevance. We start by asking the question whether this conceptual model is relevant to the phenomenon of interest. At the beginning of this process, Doctus does not function so much as a modelling tool; it is mainly used as a presentation tool.” (Baracscai & Dörfler 2017).

The qualitative research mentioned in the previous paragraph allowed us 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.



2.1. Figure Benchmark attributes

Among all tested patterns the succession timeline was highlighted as the most informative attribute and therefor was accepted as basis for further research. The rules of the formed Case-Based Graph will be than extracted and transformed into a Rule-Based Graph which is now a single level graph.



2.2. Figure Rule Based Graph

This new knowledge base will be than used for Rule-Based Reasoning and will give the same results as its parent case-based knowledge base – that is the essence of the model. With built-in templates a webserver client was generated (html page with enabled on-page reasoning) that made the exported knowledge base available to various users. Since the key attributes are identified, users need to fill in only few fields to get the same information they would get from the parent research.

kata_rules_41

Name	<input type="text" value="Herbária Zrt"/>
content of succession	<input type="text" value="ownership and management together"/>
successor is capable of handling assets in the future	<input type="text" value="rather yes"/>
preparation of successor	<input type="text" value="rather conscious preparation"/>
preparation of succession strategy	<input type="text" value="planning has started"/>
adequete successor	<input type="text" value="already found it"/>
<input type="button" value="Reason"/> <input type="button" value="Reset"/>	
succession timeline	6 to 20 years

2.3. Figure Exported knowledge base

2.5 Discussion

In the social science, a new concept and/or conceptual framework is born that can attract the interest of the thinkers, even if they do not find complete or immediate acceptance among scholars. The essence of the conceptual framework is internal harmony - its internal consistency. If its external consistency sometimes does not stand out, that means: either you have no luck - bad time at the wrong place or the conceptual frames are in many cases irreparable. If its internal consistency is unacceptable, then it is irreparable.

If you do not like the overall picture of the outside world, there is nothing to improve. What is here and now, after decades of chattering, is a clever conceptual framework, coaching.

In theory, one theory replaces the other, or at least that's how it looks from soft disciplines. In the social science, the old and the new conceptual framework can coexist for a long time, and, in the greatest agreement, they are contradictory to each other. Art and science cannot meet the same expectations. If all is science, then the set that really could be science, disappears. We have to believe in something that cannot be verified, despite the fact that it is untraceable and deal with it accordingly. With a conceptual framework, only another conceptual framework can be challenged.

A conceptual framework cannot fight empiricism or reality, but can fight with expertise and other myths.

2.6 Conclusions

All over the European Union family firms are credited as a major part of entrepreneurship. In every small and medium sized family firm succession is a common phenomenon and it is considered as the most critical issue that is commonly faced by the family firms (Ibrahim, Soufani & Lam, 2001). Organizations need an integrated approach to drive systematic, constructive change and minimize the destructive barriers to change, as well as addressing the consequences of making the change. Many approaches and methods have been suggested to manage change in general, yet organizations undergoing generational change have a surprisingly high percentage of failure. This high proportion of failure justifies the multiple number of research on the topic of successful generational change.

The counteracting forces of change and stability lead to a chaotic organization. These two powers drive an organization for order and chaos at the same time. The forces of change are destabilizing because they tend to push the organization out of the “equilibrium”. Succession indeed can be a cause for destabilization and instability. The demands dictated by the succession itself are not necessarily consistent with the planned objectives – even if there is a succession plan. Even if change is a source of internal disorder, it is however paradoxically a force that will lead to a new form of order and stability. Chaos gives the opportunity to explore new ways of doing business. It also helps to facilitate adaptation

of newly identified demands of the environment. Order on the other hand can create the illusion of management. However order can be an unsettling force as well. With the illusion of order organizations can act incoherently.

In family business research the use of planned research is widespread. There are over 1 million hits on any search engine for the term “succession planning”. Succession planning is a process for identifying and developing new leaders who can replace old leaders when they leave, retire or die. It increases the availability of experienced and capable employees that are prepared to assume these roles as they become available. Many researchers come to the conclusion that succession planning can result in significantly proved chances for a business's continuation. Complexity theory and emergent strategizing however are able to question this statement, whether it is really the only option for a successful family business succession.

The conceptual model developed in this research and the expert system analysis made one aspect of the generation change easier to analyse. On-page reasoning means that without the help of any expert system if such a model is available for use in the cloud then users can access it any time and look at along these identified five attributes when their family business succession is expected to take place. With this research work we have achieved that we do not have to be an artificial intelligence expert, nor a family business expert and yet anyone can check their own business appliances from other experiences gained in the qualitative research. Nevertheless even if then the predecessor decide to alter from the given result the model can provide decision support. By considering the result from our modelling process, relevant players can have a better understanding of strategizing. Therefore, in this paper we establish what could be a widely used model for family business strategizing under chaotic states, i.e. generational change. There is still room for further research to compare the outputs from the knowledge base to the observational outcomes.

3 Rules of individual owner behavior in Family-Owned businesses

Darabos, K.¹ and Baracscai, Z.² (2019) Rules of individual owner behavior in family-owned businesses, Economic and Social Development: 34th International Scientific Conference on Economic and Social Development – XVIII International Social Congress (ISC-2018) : Book of Proceedings, Russian State Social University, (2018) pp. 167-173. , 7 p.)

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ABSTRACT

In this paper we like to solve problem to recognize the mind-set of the owner during succession in family businesses. It is 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 used Richard Thaler's misbehaving to describe the behavior of the owner in that original decision when the succession is decided.

This phenomenon we want to integrate into our conceptual framework. 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." Data analysed and presented to support the premise that family business owners' control over their company can be affected by becoming joint-stock companies. 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.

Keywords: misbehaving, narrative, nostalgia, ownership shift

3.1 Introduction

When analysing an economic and social landscape, family businesses represent a prevalent and prominent form of enterprise. The importance of the sector is inevitable: conservatively between 65-80% of the global economy is constituted by business enterprises that are owned or managed by families (Dreux, 1990.). A large part of the Hungarian economy relies on the successful small businesses. According to CSO (Central Statistical Office) data, 70% of the entire SME sector is currently a family business. Given that statistical research has been carried out to date on the topic of generation change, most of these businesses will face the generational change over the next five years. The proportion of family firms in the United Kingdom and in the European Union is estimated to be 75% and 85%, respectively. In the United States, approximately 50% of the gross national product is generated by family businesses (Harvey, 1994).

During the literature review we have found that there are several articles on the topic of succession in the recent years, but it seems like the »fuss« is slowing down. By taking a new approach and widening the problem space towards social narratives and cultural anthropology we can however bring new insights into the study of succession in family businesses.

Our new insights suggest a new frame. This is a new conceptual model based on owners “original decision”. We would like to point out that chaotic process starts with misbehaving. Our finding urges to change the traditional question. The question of future research should be the type of the owner’s cognitive pattern.

According to the idea of homo economicus people are totally (infinitely) rational. They make choices by optimizing: choosing the best action based on the available information, their preferences and their calculation of costs and benefits – they are the perfect calculators.

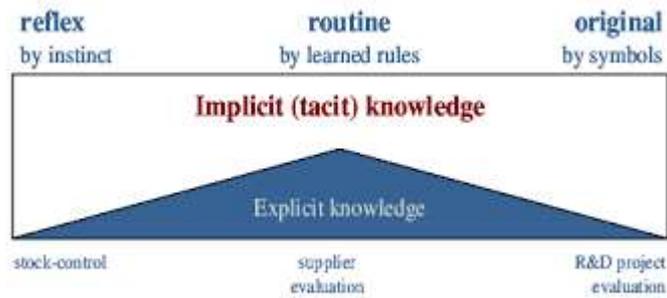
In this case all the solutions are considered, and they are compared according to each and every feature. It is not hard to see why this behavior is impossible: simple technical issues, there are too many solutions to find all of them; identification of some of the attributes would require knowledge that is not yet acquired; if all the decision alternatives and attributes have been identified there is still the task to gather data about each and every alternative, considering each and every attribute; and there is also a time-limit.

From a theological perspective, it is extremely unlikely that humans can ever be in control—after all, we never created the earth, the sun, the plants and animals, or the universe. March and Simon (1993: 157) examined the limitations of rationality; and they show that the above-mentioned limitations on the number of attributes and alternatives are direct consequences of cognitive and organizational limits. Simon distinguished the programmed from the non-programmed decisions. Programmed decisions are those that frequently occur thus one can have elaborated procedures how to handle them; these could literally be programmed. The non-programmed decision is a novel situation what one meets for the first time thus there cannot be any elaborated procedures available; such situations need tailored procedures, they can certainly not be programmed.

We have already discussed the unknown mind-set of the predecessor in our paper presented during IFKAD 2018. During those proceedings we have demonstrated one of the result of our research, namely that with logical connections a pattern can be drawn to describe the demeanour of this behavior. According to Steven Pinker: “The typical imperative from biology is not "Thou shalt... ," but "If ... then ... else.” We have also described the mind-set of family business owner decision with logical rules. Our aim – after two years of research already made on this field – is to describe this problem are better. Since in Middle Eastern Europe the succession theme is just becoming urgent – due to historical reasons the first generation will take over in the next five years – we have been focusing on this area. Our propositions of the problem solutions are based on understanding the unpredictable effect of succession and cultural background of expectations.

3.2 Original decision of succession

The programmed and the non-programmed decisions are non-existing extremities (black and white) of a continuum (greyscale) in which the real-life decisions can be found. As a further development of this conception the decisions can be described using three corner stones (Figure 1):



3.1. Figure Decision types

Reflex Decisions: We were interested whether there are thinking processes underlying every decision. We have observed that there are habitual activities that we do without thinking, as by instinct only; a private example could be buying a cigarette, and business examples are paying the salaries or controlling the stock.

Routine Decisions: There are decisions taken by managers following some set of rules, of which rules they have explicit knowledge. A private example could be buying a car (not the first one, of course), and business examples are to decide about the type of the framework contract we want with a customer or a supplier. The knowledge used in these decisions comes from the experience we got by taking similar decisions and we are aware of the decision aspects (attributes) and of the rules between the values of these attributes. Routine decision is the closest real-life resemblance of programmed decisions but it they are not the same. Although routine decisions incorporate a vast amount of attributes and rules, the importance of individual remains in focus. Sometimes we may need a new logical rule between the values of the attributes or consider some new attributes or ignore some of the old ones.

Original Decisions: There is a first time for every decision – these we call the original decisions. Succession decision is one of the best examples on an original decision. In these situations, de we come the closest to the nonprogrammed decisions, although, they are not the same as we always know something even about the novel situation. This decision type has an additional feature: there are no well defied attributes, they are defined using symbols and metaphors. Excellence is up to original decisions while spending time to take reflex decisions has negative effects on competitiveness. Defining rules for routine decisions facilitates delegation of decisions

Disorder, unintended consequences of actions, and turbulence followed by calmer periods are part of the everyday experience of individuals in organizations as a consequence of

the many small interactions among individuals and organizations. Chaos theory help capturing the dynamism and unpredictability. The scientific definition of chaos comes from mathematics and physics: chaos is an aperiodic, unpredictable behaviour arising in a system extremely sensitive to variations in initial conditions, exhibited by phenomenon such as turbulent flow, long range weather patterns or road traffic. The unpredictable behaviour is believed to come from the fact that variations in initial conditions are unpredictable only because science has not developed to the level to determine it. Chaos can be defined as unpredictability of specific behaviour within a predictable general structure of behaviour. In order to be able to identify systems as chaotic or not we have to be able to define distinguishing characteristics. Chaos theory examines nonlinear dynamic systems where relationships between time-dependent variables are nonlinear. It is easy to see that organizations are dynamic systems governed by nonlinear relationships. When there is simultaneous influence on counteracting forces deterministic chaos can be found.

Since traditional and conventional management approaches are linear in essence, much of the existing management approaches are reversed by chaos theory. Chaos theory establishes that there is that spark of creativity and change in the realm beyond linear thinking. Computers and algorithms usually are programmed to deal with linear models, or stochastic ones. To draw an example: in the weather forecast programs if the computer model suggested something unexpected i.e. a tsunami, then the programmer simply overrode the equations and made changes to the program so that it would predict the expected outcome. Applying fractals are preparing AI to help understand non-linear systems as well.

The main problem to be solved with original decisions is that there is no tradition to rely on. This is the first experience and there is no chance to validate a theory – neither in favour nor against it, or if it is the same here than on the other side of the Earth.

3.3 The source of owner's expectations

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. We assumed cultural dimensions values determine the owners expectations.

Arjun Appadurai's phrase "nostalgia without memory", referring to one the cultural dimensions of globalization, relates a postmodern, commodity sensibility based on nostalgia for a "complex transnational construction of imaginary landscapes." (Appadurai, 1990, p.4). He is concerned with the cultural flows that move between and across national boundaries in a newly globalized world and comments on the possibility of "nostalgia without memory." This places the Jamesonian mode of nostalgia, understood as a form of pastiche, in a culture of world image systems. Appadurai suggests that "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). This is the phrase we want to integrate into our conceptual framework. Do we have to grapple with nostalgia, as a special form of pastiche and imitation? We could just acknowledge it and leave it at that. If culture is a set of values here and now, then where do these values originate from? The biggest problem would be denying such a thing exists, because everything that forms our values are experiences from our memory. In this part of Europe, family business owners are in their first generation. It emerged as a form of business at the end of the 1990's. The moment of inception could be illustrated with a story. There was a conference where the presenter held up a piece of paper in front of 140 participants and asked them what they thought it was. Nobody answered. It was one of the shares that my grandfather had owned and that had failed between the two world wars. The point was to understand that these papers either bring something or they don't, which means that owning such a paper is good for some and not for others. Well, this is one of those things that could not be in the memory of the family business owners who were starting out at the end of the nineties. 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."

The "global village" has been created, and it is now time to bring it in harmony with the "local" one. We desire to live in a place where life is balanced and happy, where one finds their place, where there is plenty of time and energy for rest and leisure next to work. Perhaps we are seeking a "glocal citizen" on the edge of the local, where we are not closed off from the events of the world, we are not left behind or miss out in areas where we don't want to be different from other "local villages", but can still retain what is important for us to be unique and to hold onto our identity and values. Many have come to believe that the Internet bore out the "glocal" citizen at the edge of the local village. Others hold

that the era of television marks the connection of people to the global world. Perhaps even the radio had already brought about "being there" without physically being there. We can all be the citizens of the global village, but perhaps not all of us can "be there". The connection to the global village perhaps truly started with the 1960 Olympic Games in Rome, which was broadcast around the world. So which village might we belong to? The millions watching the Olympics on the screen, or the local supporters at the pub? And who am "I" in this question? Based on the work of Nobel-laureate economist Paul Krugman, we cannot all belong to a single local village, no matter how big it is. And we cannot live in the global village either, because then we will only be visitors in the local one. However, if we use the world wide web well, we can become citizens of the global village while still living in a local village. This is neither global, nor local, but the "glocal citizen", living on the edge of the local. Nevertheless, as Arjun Appadurai pointed out, there is an obstacle to this; we do not know how to diffuse the tension between cultural homogenization and cultural heterogenization.

The big question is, where are values born? "Decision Making 5.0 accepts that the expectations of a decision maker in the Global Village are not prefixed, but are constantly formed on the go as they sense the decision situations and possible paths." (Velencei, Baracskaï, 2016). Values born in a local village become knowable to other local village citizens elsewhere through connection to the global village. However, this does not mean that their domain of validity is also global. It is impossible for all family business owners in their respective local villages to interpret the narratives spreading on the internet in the same way. In order to create locally functioning conceptual models, it is not enough to have access to global knowledge; there must also be a milieu where they understand the core of family business. Perhaps the watching of the global world and the tradition of local learning will create a milieu where it is not mandatory to imitate big business. While Friedman (Friedman, 2005) acknowledges the advantages of globalization, he often uses the term "glocal citizen" to emphasize the importance of keeping local traditions and values. Laxity allows for the free flow of knowledge within local spaces and between them. This resists control and intervention. Confucius said, that if the ruler himself is behaving virtuously, then he need not command; all things will go on their path. If he himself is not virtuous, then commands are in vain; no one will follow them. Glocal citizens, if they go far enough, but not too far, from the local, can get to know, as a good neighbour would, the "then-and-there" ruling values. There is, however, an

uncomfortable and cruel question lurking here: can I protect my own place? Loyalty is easily just a pile of light-hearted promises, which is missing the dignity of the servant. It is unlikely that someone can be a good servant of one's own place if they are always cooing over others'. "In knowledge refreshing – which is not the same as educating – the rigid curriculum and formal learning are replaced by cross-functional content that can satisfy curiosity and thus, informal learning can occur. Today, the digital culture is having a profound effect on the world just like the disruptive technologies of previous eras and new solutions often have an impact on each other as well as on human behavior. The development of the internet is advanced not only by the technological innovations but also the evolving imagination and desires of millions which give again new momentum to the technological innovations." (Velencei, Szeghegyi & Szoboszlai, 2014, p. 244).

3.4 Conclusion

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.

4 The Founder's Decision About the Successor

Working paper:

Darabos, K.¹, Baracscai, Z.² and Dörfler, V.³ (Family Business Review, 2021 - SAGE Journals) – under review

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Abstract

In this paper we seek to identify patterns (a rule or set of rules) of transferring ownership from the first to the second generation in family businesses by examining experiences. This exploratory study is based on participant observations and a survey of family businesses in Hungary, where it is exactly these days that generation 1 is being replaced by generation 2. Our findings suggest that the first-generation succession decision is distinctly different from the subsequent ones and they do not follow a single model but a variety of succession pathways that can be understood analysing narrative and behavioural patterns.

4.1 Introduction

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.

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 we use to build a conceptual framework. We make use of the insider view of the first author, who works in a family business that is in the process of the first generational change, when making sense of our data. 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 assumption 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, 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 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 generalizable, but they do provide basis for a possible explanation of the succession phenomenon and suggests ways of further thinking and/or action.

The succession process is influenced by a large variety of variables including non-quantitative ones, which is why succession is considered a multidimensional process. In analysing these processes, the literature focuses on the transfer of shareholder control and ownership, in particular on the challenges and enablers of this process (De Massis, Chua, and Chrisman 2008; Le Breton–Miller, Miller, and Steier 2004). In the family business literature, most numerous are the factors that hinder the succession, mainly due to the founder's reluctance for which many reasons are identified, including the founder's emotional ties to the business, fear of changing life stages and passing of time, and other perceived or real forms of self-interests (Cabrera-Suárez, De Saá-Pérez, and García-Almeida 2001; Handler 1989; Lansberg and Astrachan 1994). Other related factors investigate the successor's business skills, leadership skills, knowledge of how the company operates, and attitudes toward managing the business (Barach and Ganitsky 1995). Several authors have also researched the micro level effecting the success of the transfer process, meaning the dynamic nature of the family and the specific personality traits of successor and/or predecessor (Lubatkin et al. 2005; Sharma 2004; Sharma et al. 2001a). Financial indicators such as taxation, internal and external financing are can significantly impact the succession process. Investment and financial risk influence the transfer process to great extent (Chittoor and Das 2007; P. S. Davis and Harveston 1998). On the other hand, there are a number of external factors (contextual status) that influence the succession process, such as state of the economy, purchasing offers received from potential buyers, market demand conditions, and financial pressures from internal investors (Morris et al. 1997). Many studies have focused on process factors. One group of literature on process factors deals with the range to which succession depends on aspects such as the shared vision of predecessor and successor, training and development of the successor, selection process of the successor, corporate governance (Dyck et al. 2002; Lansberg 1999; Sharma et al. 2001b). Other process-focused studies suggest that the actual resulting decision of the successor are achieved by a step-by-step process (Barach and Ganitsky 1995; Handler and Kram 1988; Lansberg 1999). An additional

category concerns the relationships within the family, between the family members and outside context of the family (relationship factors). The identified main problem sources include commutation issues, level of trust, and family cohesion (Aronoff and Ward 1995; Chrisman, Chua, and Sharma 2005; de Vries 1993). The predecessors' unwillingness to share power with other family members, as well as the successors' grudges, constitute an important topic that is only marginally addressed in the literature and requires further investigation (Handler 1990; Keogh and Forbes 1991). In this regard, the importance of shared family values and agreed vision about loyalty and/or traditions is studied (P. S. Davis and Harveston 1998; Dyer 1986; Le Breton–Miller, Miller, and Steier 2004; Nelton 1991), along with factors such as devotedness, allegiance and family turnover (Handler 1990; Morris et al. 1997).

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, Marchisio, and Astrachan 2008)). In this paper we narrow our focus to succession transfers to family members, even if this is only one of the many possibilities (Le Breton–Miller, Miller, and Steier 2004), in order to achieve sufficient similarity within our data. This is particularly important, as we argue for different models being needed in different situations. Since small and medium family enterprises have a distinct preference to transfer leadership within the family, we limit our research to these enterprises (Bjuggren and Sund 2001).

The remainder of the paper is structured as follows. The first section provides an overview of the conceptual work and research history that shaped our research topic. We focus on the conceptual frameworks of family businesses in the national and international literature and describe models of family businesses including models that describe family businesses as complex systems. This approach allows for considering different types of family businesses, which can be diverse. The phenomenon of succession is introduced in the second subsection. The following section describes the methodological approach and offers an argument for choosing a knowledge-based system as a tool for this study. Our analysis and findings are presented in section 4, followed by the Concluding Remarks.

4.2 Literature Review

In this section we provide a summary of the conceptual work or research history that shaped the formulation of our research topic, namely the examination of the behaviour of the predecessor in family businesses during the succession decision by identifying different mindset patterns. We focus on defining the conceptual frameworks of family businesses in national and international literature, and describing models of family businesses and models related to the complex system of family businesses.

4.2.1 The concept of family business

As a basis for family business research, we first attempt to delineate the conceptual frameworks by comparing a number of alternative definitions in the literature. Family businesses form a highly diversified, heterogeneous group, which has prompted researchers to develop different classifications to help understand this complexity. We consider the demonstration of the diversity of conceptual approaches important because there is no generally accepted definition of family businesses, and enterprises can be classified into this category of entrepreneurs on the basis of the characteristics specified by researchers. In what follows, we present the main attributes of family businesses and the different types of family businesses from the literature.

Considering the different types of family businesses is important for identifying a valid research sample. The first conceptual framework of family business we consider is referred to as the two-circle model. This popular model offers a system theory approach to family businesses, which are described through the family-business interactions; the interaction between the family subsystem and the business subsystem are characterized by positive or negative. The characteristics of the two subsystems are set out in Table 1.

Table 4.1: The areas of conflict between family and business subsystems

Areas of conflict	Family subsystem	Business subsystem
Goals	development of family members and ensuring their financial background	profit, sales, efficiency, growth
Relations	personal relationships that have priority	impersonal or semi-personal relationships of secondary importance
Regulation	informal expectations (common practice)	written, formalized rules, reward and punishment

Valuation	rewarding family members for their efforts; unconditional love and support	remuneration depends on performance and results, employees can be promoted or dismissed
Succession	as a result of death or divorce	as a result of retirement, promotion or retirement

Source: (Dyer 1992)

The result of these interactions is the family business, and the first phase of the literature review provides an overview of definitions of family business. In family business research, the notion of family includes not only the immediate family but also the older and younger generations, as well as their branches, such as cousins, uncles and aunts; the family, which includes several generations, is considered a large family group (Gersick et al. 1997). One aspect of demarcation is cultural issues, as e.g. the Latin American and Asian family models are very different from Western European ones. Based on the processing of relevant domestic and international literature, we agree with Melin and Nordqvist (2007) that the concept is a diverse collection category, and with Littunen and Hyrsky (2000) that there is no commonly accepted definition of family business. One aspect of diversity is that there are different views on defining the concept of family, depending on the range and composition of the persons who are related to each other in the family. Family businesses are quite heterogeneous and there is no consensus among researchers about their definition (Chua, Chrisman, and Sharma 1999; D. Miller et al. 2007). The greatest difficulty in defining family businesses stems from the diversity of family businesses, as it poses the challenge of providing a comprehensive, precise definition that meets both the demands of science theory and at the same time allows the specific qualities of family businesses to be summarized independently of company size. The consequence of the conceptual confusion in the family business sector is that empirical research has difficulty distinguishing between family and non-family businesses which raises a number of methodological concerns, such as sampling, comparability of different research results. Therefore, it is useful to become familiar with this diverse conceptual system and review the qualitative and quantitative characteristics that underlie the distinction between family and non-family businesses (Klein 2000).

Researchers agree that family influence is key to the operation of family businesses, and the interpretation of the term family business shows a mixed picture. The intensity of the work in the field of definition is well illustrated by the fact that between 1989 and 1999,

44 different formulations were proposed (Habbershon and Williams 1999), even though they are not general. (Handler 1989) is associated with the first conceptual systematisation, which identifies four defining aspects in the definitions of family business published between 1964 and 1988.

Litz (1995) suggests that there are “structure-based” definitions that build on the ownership and management structure of family businesses and the “intent-based” concepts that build on the values and preferences of family members that express a commitment to the family.

Poutziouris (2001) distinguishes between closed and open definitions, where closed definitions are given by a measurable set of criteria, whereas open definitions mean the intention to become a family business and self-definition. Rogoff and Heck (2003) associate family business with family ownership, the involvement of family members in management, the role of the family in running the business, and the full involvement of family members of different generations. On this conceptual basis, Chrisman, Chua, and Sharma (2005) divide definitions of family businesses into two groups: (1) definitions based on participation criteria, such as family ownership, family management, and control by the family, and (2) more restrictive approaches based on the essential elements of the family business that emphasize the particular behaviour resulting from family presence. According to Chrisman, Chua, and Sharma (2005) the criteria for family involvement include family involvement in matters of ownership, supervision, governance and the desire to succeed within the family, while essential elements of family businesses include:

- exercising strategic influence over the family;
- maintaining the vision and control of the family over generations;
- family business behaviour Chrisman, Chua, and Sharma (2005);
- and the so-called “Familianness”.

Some are less restrictive regarding management issues, and consider a business to be a family business even if the family member owner relinquishes her/his management function and hires a manager outside the family e.g. in order to achieve growth goals or ensure survival (Blumentritt, Keyt, and Astrachan 2007). Similarly, in this paper we do not exclude family-owned businesses managed by a professional manager.

Table 4.2: Defining a family business according to defined criteria

Author(s), Year	Definition of “family businesses”
(Westhead and Cowling 1997)	more than 50% of the voting preference shares are owned by a family (and relatives related to it) and consider themselves a family business.
(Smyrnios, Tanewski, and Romano 1998)	at least one of the following: (1) the family holds at least 50% of the ownership; (2) members of some families own at least 50%; (3) a group of family members has control over the business; (4) a significant part of senior management comes from the same family
(Klein 2000)	family ownership in a business (%) + proportion of family members on the board of directors (%) + proportion of family members in the supervisory board (%) \geq 100%, then it is considered a family business
(McConaughy, Matthews, and Fialko 2001)	the CEO of the company is the founder or her/his family members
(Claessens et al. 2002)	the family is the majority shareholder and the family holds at least 10% of the controlling rights
(R. C. Anderson and Reeb 2003)	founding families have a stake in the company or members of the founding families participate in the board
(Cronqvist and Nilsson 2003)	the family holds the largest share of ownership, which is at least 25%
(Barth, Gulbrandsen, and Schønea 2005)	a person or family owns at least 33% of the shares
(Jaskiewicz et al. 2005)	the family holds more than 25% of the voting rights and the so-called power subscore of the F-PEC scale is above 0.5
(Zahra 2005)	Family firm is what the company's CEO or highest senior executive classifies as family business.
(Barontini and Caprio 2006)	the family is the largest shareholder and either the family controls more than 51% of the indirect voting rights or the family-controlled direct voting rights are more than twice the voting rights of the second largest shareholder
(Ben-Amar and André 2006)	an individual or family has control over the company
(Corstjens, Peyer, and Van der Heyden 2006)	one or more individuals or families are the ultimate owners and have the largest shareholding
(Lee 2006)	members of the founding family or their descendants hold a stake in the company or are represented on the board
(Maury 2006)	the controlling owner owns more than 10% of the voting rights
(Nowak, Ehrhardt, and Weber 2006)	more than 50% of the voting rights are concentrated in the hands of the family. The founding family is a member of the supervisory board and / or board of directors

(Martínez, Stöhr, and Quiroga 2007)	more than 50% of the board members are family members
(Sraer and Thesmar 2007)	the founder or a member of the founder's family is a so called blockholder and owns more than 20% of the voting rights
(Allouche et al. 2008)	the largest shareholders are family members and they hold management positions or are members of the board of directors
(Andres 2008)	the founder of the company and/or his/her family members hold more than 25% of the shares or, if less than 25% of the voting rights, they are represented in the executive body or the supervisory board
(Arosa, Iturralde, and Maseda 2010)	the majority of the ordinary shares are in the hands of the founder or its family and family members are actively involved in the business
(Kowalewski, Talavera, and Stetsyuk 2010)	family ownership over 25%, and the chairman and managing director are family members
(Okoroafo and Koh 2010)	Family business is one which its owner identifies as a family business.
(Okoroafo and Perry 2010)	Family business is one which its owner identifies as a family business.
(Galve-Górriz and Salas-Fumás 2011)	owners of the same surname hold the largest (direct and indirect) stake
(Arregle et al. 2012)	A family firm is one in which ownership by persons outside the family does not exceed 49%.
(Colli, García-Canal, and Guillén 2013)	Family businesses are companies in which the founder or a member of the family is the company director or owns more than 5% of the firm's equity.
(Mitter et al. 2014)	Applying the F-PEC Scale, an FB is a firm with a Substantial Family Influence (SFI) indicator higher than 1.
(Calabro et al. 2016)	A family business is one in which at least 50.1% is owned by one family.
(Fernández-Olmos, Gargallo-Castel, and Giner-Bagües 2016)	FBs are firms where they self-classify themselves as a family business based on the involvement of a family group in the control.

source: Based on (Kraicz 2013), (Lindow 2013), (Cano-Rubio, Fuentes-Lombardo, and Vallejo-Martos 2017) and own collection and editing

Table 3, summarises specific criteria suggested in the literature from 1987 to the present. Some of the definitions give a fairly narrow interpretations of family businesses, broader interpretations seem more acceptable as they allow the full range of family businesses (e.g., family owned start-ups, family-owned business, external manager-run family-owned business, etc.) to be cognizable and researchable, as opposed to overly narrow interpretations that focus on a subset of family businesses that also reduce comparability of research findings.

Lea (1998) gives the following definition, which is quite difficult to operationalize: family business is an enterprise that is driven by a family need, based on the capabilities of the family, the work of the family hand and soul, driven by the moral and spiritual values of the family, characterized by a lasting commitment to the family, and which survives as a child's legacy, as does the family name that represents a value. Chua, Chrisman, and Sharma (1999) define a family business as an enterprise that is interested in pursuing and shaping the corporate vision beyond generations, which is dominated by a coalition of one or a few families. Astrachan, Klein, and Smyrnios (2002), suggest three groups of definitions: (1) Content-focused definitions that typically consider ownership, family management, and generational change, and more recently highlight the cultural characteristics of a family business. (2) Definitions for research purposes facilitate the separation of family and non-family businesses and categorize family businesses. (3) The third group of definitions are those that help interpret theory, such as setting up a family business in the context of evolutionary theory. According to Poza (2013) a business can be considered a family business where ownership control (15% or higher) is exercised by two or more members of the family or by family associations. In addition, family members exert a strategic influence in the management of the company, whether through active management, culture, participation as advisor or board member, or through active shareholder involvement. Furthermore, the caring for family relationships and intention or possibility of continuity are present in the operation of the business. A. R. Anderson, Jack, and Drakopoulou Dodd (2005) extend Bulleyes model by treating and categorizing each grade in its interpretation of family businesses, away from the dual view of family business definitions. The novelty of this model is that it extends the investigation of family businesses to the so-called out-of-town companies (that are considered as a non-family business by the most rigorous conceptualisations).

The diversity of definitions is also illustrated by a 2008 study on behalf of the European Commission’s Directorate-General for Internal Market, Industry, Enterprise and SMEs (then DG Enterprise and Industry), which examined 33 countries (EU-27, Iceland, Norway, Lichtenstein, Turkey, Croatia and Macedonia) analysed the national concepts and explored common elements in the definitions that could lead to a single European definition. The study has identified 90 definitions of “family business” however Mandl (2008) could not identify or construct a single unified, generally applicable definition that can be widely used in all related areas, such as economic, socio-economic research, public and political debate, legislation and statistical reporting. The definition proposed by the expert group includes three criteria: family, business and ownership: “A business is considered to be a family business when the natural person(s) who set up the company or the natural person(s) who own the business or have direct descendants of the spouses, parents, children or children of the foregoing, have direct or indirect decision-making powers, or have at least one representative of the family or the relatives involved in the management of the business or listed companies if the founder (or buyer) or the family or descendants of the company owns at least 25% of the voting stock.”

As a result of the diversity of family businesses, many classifications have been suggested with the aim of gaining insight into the complex landscape of family businesses. Table 4 summarises the examined family business typologies (Basco and Pérez Rodríguez 2009; Birley 2001; Corbetta 1995; J. A. Davis 2008; Dyer 2006; Lubatkin et al. 2005; Poza 2013; Sharma 2004; Sharma and Nordqvist 2008); we suggest that most typologies rely on a one-sided approach despite the diversity of family firms.

Table 4.3: Summary of family business typologies

Author	Typing criteria
(Gersick et al. 1997)	Life cycle
(Poutziouris 2001)	Future goals
(Gomez-Mejia, Nunez-Nickel, and Gutierrez 2001)	Level of strategy and trust
(Walker and Brown 2004)	Reason for founding
(Winter et al. 2004)	Reason for founding
(Dyer 2006)	Family and agency cost
(D. Miller and Le Breton-Miller 2006)	Strategy
(Pittino and Visintin 2009)	Innovation and strategy
(Dekker et al. 2010)	Professionalization and formalization

Source: Author based on own collection

The main concern of family businesses, according to research by Chrisman, Chua, and Steier (2003), is related to the issue of succession; we outline this topic in the next section.

4.2.1.1 The succession process

About one third of all European entrepreneurs will retire from business within 10 years (European Commission, 2006). Thus, in general, the succession of a family business is not a rare event, but for specific family businesses the succession process is rare, occurs only once every 20-25 years. Research on family business succession typically presents a complexity that is rare in entrepreneurial families when a family successor assumes the top leadership position in a family business (Gersick et al. 1999). Multiple research findings indicate a high failure rate of the succession process. The survival rate from first to second generation is about 33% and to the third generation merely 10-15% (Beckhard and Dyer 1983; Bierly and Chakrabarti 1996; Solomon et al. 2011; Ward 1987). The topicality and significance of succession has been noticed in the European Union as well as in Hungary. Interest in the topic of succession of family businesses is also reflected in the intensification of research activity on the topic. As one-third of European companies will face the challenge of succession over the next ten years, involving the transfer of 610,000 small and medium-sized enterprises, which provide nearly 2.4 million jobs (Mandl 2008; Flören 2010). Experience has shown that more and more transfers are taking place outside the family, and many entrepreneurs only want to run the company they start for a shorter period of time and then plan to sell it. In some cases, not only the age of the entrepreneur seems to drive the leadership transfer of the company, but also other personal and family reasons and changes in the market environment. Fears of succession affecting family businesses are not unfounded based on international experience. However, a successful generational change is not a guarantee for the bright future of the business. Intergenerational disputes over succession can also become a barrier to growth (D. Miller and Le Breton-Miller 2006). Examining Croatia's first-, second-, and third-generation family businesses, Pfeifer, Sonfield, and Lussier (2006) found that the more generations work together in a family business, the fewer female family members are employed, and succession planning and long-term planning are becoming more common.

According to the European Union Expert Group, the most important tasks for member states are: facilitating the transfer of companies to external and third parties, facilitating employee buy-outs, applying special inheritance and tax rules for succession and

company transfers, and facilitating the retirement of entrepreneurs (Flören 2010). In addition to the interest of practitioners, succession has also attracted the interest of scholars. Dyer and Handler (1994) are credited with identifying the five main strands of succession research, i.e., succession as a process; the role of the predecessor; perspectives for the next generation; multi-level analysis of the succession process and factors influencing the efficiency of the succession process, such as the definition of research directions. According to the integrated model of the examined factors of succession research (Kesner and Sebra 1994), one branch of succession research is the examination of the antecedents of succession (organizational factors, leadership role factors and candidate-related factors), the second is examining succession as an event in the process (along with finding the successor and selection factors), while the third is the assessment of consequences. According to Bocatto, Gispert, and Rialp (2010), one branch of succession research examines succession as an organizational function and the other focuses on the impact of succession on organizational performance; so far a number of contradictory research results have emerged in this area.

The above outlined discussions from the literature support the relevance and importance of a successful transfer of family business. This supports the premise that many researchers studied the successors of family businesses (Chittoor and Das 2007; De Massis, Chua, and Chrisman 2008; Royer et al. 2008; Venter, Boshoff, and Maas 2005). According to Sharma et al. (2004) about 33 percent of the family business literature focuses on succession. The succession process has been identified as the most pressing issue for families, after all, it needs to be addressed to enable the successful continuity of the family business within the family from generation to generation (P. S. Davis and Harveston 1998; Ibrahim, Soufani, and Lam 2001). The following factors have been identified as key contributors for a positive outcome of the succession process: stakeholder satisfaction with the process, business viability and the subsequent positive performance of the firm (Cabrera-Suárez, De Saá-Pérez, and García-Almeida 2001; Dyer 1986; Handler 1990; Morris et al. 1997; Sharma et al. 2001a).

The succession process is influenced by a variety of variables, including non-quantitative ones, which is why it is considered a multidimensional process. The literature focuses on the transfer of shareholder control and ownership, and in particular on the challenges and enablers of this process (De Massis, Chua, and Chrisman 2008; Le Breton–Miller, Miller, and Steier 2004). In the family business literature, most numerous are the factors that

hinder the succession, mainly due to the founder's reluctance, for which there are many identified reasons, including the founder's emotional ties to the business, fear of changing life stages and passing of time, and other perceived or real forms of self-interests (Cabrera-Suárez, De Saá-Pérez, and García-Almeida 2001; Handler 1989; Lansberg and Astrachan 1994). Other investigated factors include the successor's competence in business operations, management, and leadership attitude (Barach and Ganitsky 1995). Several authors have also researched the micro-level effecting the success of the transfer process, meaning the direct dynamic nature of the family and the specific personality traits of successor and/or predecessor (Lubatkin et al. 2005; Sharma 2004; Sharma et al. 2001a). Financial indicators such as taxation, internal and external financing can significantly impact the succession process; investment and financial risk were found to significantly influence the transfer process (Chittoor and Das 2007; P. S. Davis and Harveston 1998). There are also numerous external (contextual) factors that influence the succession process, such as the state of the economy, purchasing offers received from potential buyers, market conditions, and financial pressures from investors (Morris et al. 1997). Many studies have focused on process factors. One group of literature on process factors examines how much succession depends on aspects such as the shared vision of predecessor and successor, training and development of the successor, selection process of the successor, corporate governance (Dyck et al. 2002; Lansberg 1999; Sharma et al. 2001b). Other process-focused studies suggest that decision regarding the successor are achieved by a step-by-step process (Barach and Ganitsky 1995; Handler and Kram 1988; Lansberg 1999). Yet another literature category studies the relationships within the family, between the family members, and outside context of the family (relationship factors). The main identified problem sources are communication issues, level of trust, and family cohesion (Aronoff and Ward 1995; Chrisman, Chua, and Sharma 2005; de Vries 1993). The predecessors' unwillingness to share power with family members, as well as the successors' grudges, constitute an important topic that is only marginally addressed in the literature and requires further investigation (Handler 1990; Keogh and Forbes 1991). In relation to this, shared family values including loyalty and devotedness (Handler, 1990; Morris et al., 1997) and common agreement about vision and traditions are studied (P. S. Davis and Harveston 1998; Dyer 1986; Le Breton-Miller, Miller, and Steier 2004; Nelton 1991).

All the research findings above are valuable but they regard the succession of the family business as a linear process in line with strategic planning and specific goals of the predecessor, what (Sarasvathy 2001) calls a “causal” approach. The predecessors develop their family business in line with strategic and personal goals and takes planned actions to achieve them. From an economic perspective, however these goals may not be rational as other emotional and personal family factors influence the business goal settings.

Much of the previous research suggests that before analysing the process of the succession, it is useful to examine the successor’s origin in addition to her/his competencies. Most authors apostrophize potential successors as internal and external successors; Table 4 summarizes the different internal and external successor interpretations.

Table 4.4: Differences in internal and external successor interpretations

AUTHOR	INTERNAL SUCCESSOR	EXTERNAL SUCCESSOR
(Brady, Fulmer, and Helmich 1982)	founding owner, a larger stake relative, a larger stake member in the business	professional external manager
(Weisbach 1988)	-	who has no responsibility within the company, ie who is not an employee, relative, accountant, consultant, and not an employee of a company that has a relationship with the company
(Sarros and Santora 2001)	employed within the organization	has no management experience from within the company

Source: Author based on own collection

Zhang and Rajagopalan (2004) categorize successors differently from the previous dual approach in that they distinguish: (1) in-house successors (working for the company for at least two years), (2) industry successors (working in the organization for less than two years, but with more than two years ’employment with another company), and (3) non-industry successors (less than two years of experience in the industry). Karaevli (2007) summarized the impact of succession on organizational performance. Based on the collection of literature, it can be stated that there is no unified position regarding the characteristics of succession and the direction of the change in the performance of the organization.

4.3 Methodological Approach

In this section we describe the transdisciplinary approach adopted for the research project, then we introduce the survey method of data collection, and finally, we overview the two methods used for data analysis.

4.3.1 Transdisciplinary research design

In order to understand and observe the predecessor's reality on a personal level, we chose to transcend specific disciplines and apply cognitive meta-level thinking through a transdisciplinary lens. In this section we unpack what this sentence means. Our study does not fit a mono-, multi- or interdisciplinary framework. We wanted to incorporate disciplines such as decision-making, cognitive psychology, machine learning/AI, and philosophy; but only taking from each of these what we needed, sometimes a perspective, other times a concept and in some cases a tool. Furthermore, we wanted to allow for findings in the space that is not only in-between these disciplines but beyond them, therefore we adopted a transdisciplinary approach, as conceptualised by Nicolescu (2014), as an intersection of two or more otherwise independent research pathways. The aim is to build a holistic integrated understanding underpinned by multiple disciplinary domains. Transdisciplinary research often explores the relation between science and society, which makes it perfect for studying complex problems. According to Gibbons (1994) 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, the pragmatization of knowledge (Findeli et al., 2008). In order to study the mindset of the predecessor when making a decision about the successor, we loosely connect the disciplines cognitive psychology, machine learning, economics, finance, behavioural science. During the research process our perspective moved between different levels of reality: models, methods, and tools (Zoltan Baracscai and Dorfler 2017).

4.3.2 Data collection using a survey

Trying to understand the process of the generational change in family businesses we have envisioned a qualitative research approach. 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. We received a total of 141 responses 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. Therefore the aim of this study is to offer basis for future studies, either for validating our findings through additional data collection or for refinement of the aspects of the decision making through analysis. The

purpose of this exploratory study was thus to explore the behaviour of the predecessor by observing which factors are affecting their decision-making process, in order to understand their different mindset patterns.

4.3.3 Data analysis

We have used two different methods for data analysis : Varimax Factor Analysis (VFA) to identify the factors which describe the phenomenon and a knowledge-based system (KBS) to reveal the logical relationships between the predecessor's aspirations. We consider VFA to be a well established and known method, therefore here we focus on introducing the KBS.

KBS are primarily established as decision support systems (DSS) which combine human judgement and computerized information in order to improve the decision-making process, and enable decision makers (Turban and Aronson 1998). "The general purpose of a DSS can be stated as to supplement one or more of a decision maker's abilities" (Clyde and Andrew 1996). For decision-making support an intelligent human-like support is needed, but however human-like the support is, final and critical decisions should be made by human decision makers (Macintosh 2004).

We observe the same principles when we use KBS as a research tool. At the first level, we use case-based reasoning to identify patterns in case characteristics, where cases are uniquely associated with predefined decisions and actions. This can be considered intelligent, depending on the number of cases in the case base and the possibility of learning from them (Gilboa and Schmeidler 2000). The second level at which intelligence can be introduced into decision support is in reasoning, and many DSS are designed to perform intelligent "what-if" analyses of models and data. In the approach we adopted here, the decision maker must remain in the loop and the system is interactive, with the decision maker expressing preferences refining the model iteratively and stopping when (s)he finds the model acceptable.

The multidimensional character of the succession decision may lead to a large number of incommensurable goals (Simon 1967). This consideration led Simon to conclude that the search for a global optimum is not useful, and we have found this to apply to the succession decisions.

The predecessor being the source of the knowledge provided the knowledge base, developing a knowledge representation making the examination of mindset patterns possible (Velencei et al. 2019). As a research tool, we used the Doctus KBS, where the aspects of the decision are called attributes, along which cases are described by values on ordinal scales. The Doctus KBS (Zoltan Baracscai, Velencei, and Dörfler 2005) uses an entropy-gain method, based on a modified ID3 algorithm, to make the informativity of the decision makers' attributes transparent. The mindset of the predecessor can be mapped through the informativity of these attributes.

A KBS is a computer program that uses and reasons knowledge representations of external environments stored in knowledge bases. Doctus represents knowledge using symbolic logic, which means that its elements are symbols connected by logical rules in "if... then" form. Doctus uses AI, specifically machine learning to extract rules from cases for which the outcomes are already known; this is called case-based reasoning (CBR). Once this is done, the resulting knowledge base can be transformed into one that can apply the induced rules to new cases; this is called rule-based reasoning (RBR). For the purpose of this study, as Wagner (2017) suggested, data collection can be regarded as the process of knowledge acquisition. The decision maker, with the help of the knowledge engineer, defined the aspects of the succession decision. The role of the knowledge engineer is to elicit the knowledge from the decision maker creating a representation of the decision maker's knowledge (Zoltán Baracscai, Velencei, and Dörfler 2007). In our study the knowledge elicitation took place using the questionnaire, from that point onwards the modelling resembled the typical knowledge engineering process.

The steps of our empirical study were: data collection; attribute and value assignment; data evaluation with factor analysis (responses from the survey were coded for this purpose); and analysis using the KBS (the responses were translated into succinct attributes and values for this purpose). Table 5 depicts the observed attributes.

Table 4.5: Attributes

Name	
problems during generation change	≡
generation change #	≡
running as a family business	≡
running as a public company	≡
purchase offer	≡
adequate successor	≡
current operation	≡
succession timeline	≡
preparation of successor	≡
preparation of succession strategy	≡
including expert in succession planning	≡
period of succession strategy	≡
content of succession	≡
period of financial planning	≡
including expert in financial planning	≡
including competent employer in financial planning	≡
historical data use in financial planning	≡
diversification in product portfolio	≡
effect of generation change on business plan	≡
regular investment/profit rewind currently	≡
regular investment/profit rewind in the future	≡
current value-added investments	≡
future value-added investments	≡
current assets cover long term operation	≡
successor is capable of handling assets in the future	≡
future operation will require loans	≡

Source: Screenshot from Doctus

4.4 Analysis and Findings: Mindset Patterns in Generational Change

In this section we explain the analysis using two methods: VARIMAX factor analysis and a knowledge-based expert system.

4.4.1 Results of the factor analysis

Our 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, we performed factor analysis 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 4.6: VARIMAX

Total Variance Explained									
Component	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; Factor 4 – 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, we were not content with this outcome, since it did not lead us much closer to revealing the decision maker’s mindset patterns, while a central point of our thesis was that understanding the predecessor’s mindset is essential to understanding the succession phenomenon. Consequently, we searched for a method using which we can refine the previous results. Next, we present the results of the analysis supplemented with KBS. With Doctus, several different acceptable mindset patterns unfolded as we considered different attributes as benchmarks.

4.4.2 KBS results

We chose case-based reasoning (CBR) to identify which attributes have the greatest descriptive power. The easiest way to think of CBR is as a machine learning system that extracts the rules from a set of cases by classifying them according to the values of an outcome attribute. The logic of the process is the following. We consider the set of cases to be disordered, and we define order as subsets of cases each of which have the same value of the outcome attribute (benchmark). The machine learning process in case-based reasoning uses a modified ID3 algorithm based on assigning informativity to the particular attributes based on how much they contribute to the order; the order here is represented by entropy and the contribution to order is the entropy gain (Velencei et al.

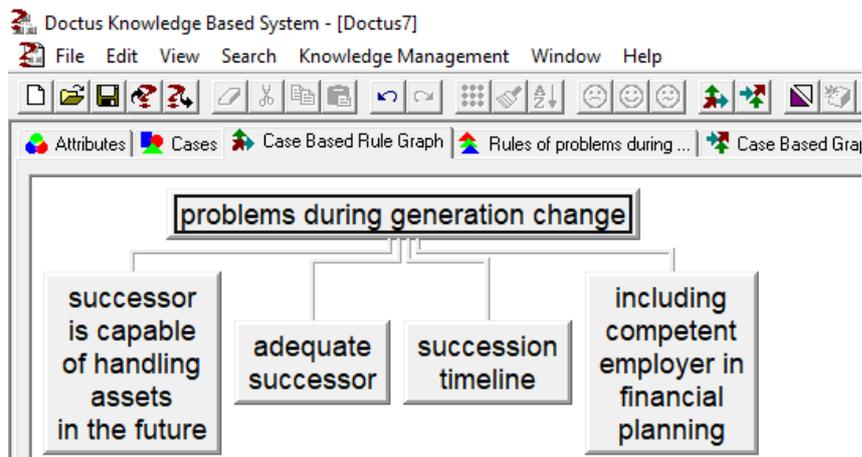
2019). In order to implement this logic, the following steps are taken (in-principle description, disregarding some technical details): First, we take an arbitrary attribute, and group the cases according to the values of this attribute; then examine how similar this grouping is to the grouping by the values of the outcome attribute (benchmark); this similarity is the entropy gain of the examined attribute. We repeat the process for all the attributes, and then choose the one with the highest entropy gain, this is the most *informative* attribute for the given case set. We then form subsets of cases by the values of the most informative attribute. Cases in some of the subsets may have all the same value of the outcome attribute (benchmark); these subsets are considered ‘in order’, we leave them as they are for the moment. Instead, we focus on the subsets in which cases do not all have the same value of the benchmark; we repeat the whole previous process on these subsets, iteratively, until all subsets are ordered. As a classification system is very sophisticated, as the different subsets are formed according to the values of different attributes, while the AI learns the rules connecting the values of the informative attributes; these rules correspond to a simple explanation that describes all outcome values. The list of attributes according to informativity is shown on Figure 1.

Attribute	Informativity	Density
successor is capable of handling	0.1176	18.26
adequate successor	0.0797	12.38
preparation of successor	0.0687	10.67
succession timeline	0.0623	9.68
preparation of succession strategy	0.0437	6.79
running as a family business	0.0431	6.70
period of succession strategy	0.0411	6.39
current assets cover long term operations	0.0387	6.01
running as a public company	0.0332	5.15
current operation	0.0331	5.14
regular investment/profit rewind in	0.0317	4.93
including expert in succession planning	0.0300	4.66
diversification in product portfolio	0.0290	4.51
period of financial planning	0.0282	4.39
future operation will require loans	0.0259	4.02
generation change #	0.0245	3.81
content of succession	0.0244	3.78
including expert in financial planning	0.0241	3.74
regular investment/profit rewind calculation	0.0239	3.70
effect of generation change on business	0.0238	3.69
including competent employer in financial planning	0.0197	3.05
future value-added investments	0.0182	2.83
historical data use in financial planning	0.0136	2.12
purchase offer	0.0108	1.68
current value-added investments	0.0078	1.21

Source: Screenshot from Doctus

4.1. Figure: Informativity of Attributes

The strongest explanatory power (highest informativity) is the attribute “Successor is capable of handling assets”; this attribute serves as the primary grouping attribute. During the analysis we found that four attributes describe the problems during generation change: “Successor is capable of handling assets in the future”, “Adequate successor”, “Succession Timeline”, and “Including competent employer in financial planning”. Next, we have converted the previous knowledge base into a rule-based one (see Figure 2).



Source: Screenshot from Doctus

4.2. Figure: Case Based Rule Graph

Once the new rule-based graph was ready, we can display the rules between the four most informative attributes. Figure 3 represents the if-then rules in a tabular form. The values of the attributes can be read from left to right; the asterisk (*) means that the attribute does influence the particular rule.

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	*	*	definitb rather count on it
rather yes	*	*	definitely must	definitb rather count on it
not at all	*	*	*	defini rather coui rather not cr do no
rather yes	*	*	not necessary at all	defini rather rather not count on it
rather no	*	*	*	de rather count on it rather do not c
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

4.3. Figure: Rules

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.

4.5 Concluding Remarks

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 and Szendrey 2008). Furthermore, as Taleb (2007) suggests, although the human tendency for certainty is natural, it is still more about an intellectual passion.

5 Intuitive Decision: When to begin the succession process

Working paper:

Darabos, K.¹ (2021): INTUITIVE DECISION: WHEN TO BEGIN THE SUCCESSION PROCESS Corvinus Journal of Sociology and Social Policy

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“Though by forebears well provided,
He just barely does exist,
Of the things that would be needed,
He has nothing, long the list.
Not his fault, he's Magyar, in his
Land there is a shibboleth,
Which since ancient times declared that:
"There's plenty of time for that!"

Mr Pato – Sándor Petőfi translated by: Kery, Leslie A.

ABSTRACT

Family business succession research usually focuses on the problems that make many companies fail during or as a result of succession, to focus on the individual process of decision making itself is rare. 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. This can lead to uncertainties and errors; decisions are predetermined as being rational human limitations border them. Therefore, aspirations and search rules are adjusted over time in response to experience (March James 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 to surface the aspirations, intuitive knowledge (Kahneman 2011) (Kahneman 2011) of decision makers, in order to deepen our understanding of the succession decision making phenomenon.

Keyword: family business, succession, aspirations, intuitive decision

5.1 Introduction

Many of us tend to procrastinate. Human beings are intuitive thinkers and human intuition is imperfect, with the result that judgments and choices often deviate substantially from the predictions of normative statistical and economic models. Homo economicus, on the other hand, is rational. In this paper, we study how to model the behaviour that is irrational according to the classical economic interpretation. According to Herbert A. Simon (1977) decisions are intended to be rational, but are bounded by cognitive biases. James G. March (1978) press that the driving force of decisions are expectations, incentives and desires drive the decisions. Daniel Kahneman's (2011) thoughts inspired us in several aspects, and in our search for mindset patterns we reflected on concepts like intuitive knowledge and planning fallacy. While according to Ariely (2008), expectations shape stereotypes. He argues that “We don't even know what we want to do with our lives- until we find a relative or a friend who is doing just what we think we should be doing.” (Ariely and Jones 2008).

In this paper we illustrate the mindset patterns of a self-interested decision-maker ie the predecessor who sometimes - after a certain period of time - changes his/her mind, ie. makes intertemporally inconsistent decisions. Since the spread of neoclassical economics, frequently used models and examples have been based on assuming rational behaviour, but experimental and behavioural economics, psychology, also show, based on everyday patterns, that it has less and less legitimacy as an exclusive idea. The aim was to find acceptable solutions to decisions in unknown territory in the complex multitudes.

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 we use to build a conceptual framework. We make use of the insider view of the first author, who works in a family business that is in the process of the first generational change, when making sense of our data. 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 assumption 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, 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 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 generalizable, but they do provide basis for a possible explanation of the succession phenomenon and suggests ways of further thinking and/or action.

This paper is organized as follows: the theoretical background section presents a short overview of human decisions for a tentative definition of the aspiration levels, and intuitive decision-making process. The following section describes the Approach, where the use of Knowledge Based System as a method is described. Our findings of the analysis are presented in the Mindset patterns section, followed by the Discussion and Concluding remarks.

5.2 Theoretical background

Proponents of rationality in the economic sense argue that the high average should behave rationally, so that the economy as a whole can be well described using classical models. And those who deviate from this are unique and their study belongs to the field of psychology or sociology. However, it can already be seen that there are types of irrational features that occur at the system level. As an example, a significant proportion of individuals make mistakes in estimating certain statistical phenomena (Kahneman 2011). “The focus and attention of economists have shifted from assuming the rational decision-making of individuals towards hypothesizing a limited role for rationality in decision-making. Previously, standard economic theories assumed that individuals made decisions rationally, but failed to explain the decisions that individuals make when, for instance, they make choices that are not in their best interest, or are sometimes even harmful to themselves” (Manasoontorn 2020). So as to ease on decision-making, these decisions are deeply influenced by heuristics – a rapid sort of thinking that makes sufficient but not

optimal solutions to accelerate the decision-making process (Wansink and Chandon 2006; Haws, Reczek, and Sample 2017).

Kahneman (2011) describes the thought process using the metaphor of two systems. “System 1” produces fast thinking. It makes quick judgments based on familiar patterns and works automatically and effortlessly. “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” (Kahneman, 2011). “System 2” produces slow thinking. Meaning it takes more excessive focus, needs more attempt and engages methodically. The interaction between the two systems is continuous but do not always run smoothly. To understand the succession decision-making process of the predecessor, the decision maker’s thinking process and aspirations have to be taken in consideration. In accordance with Simon (1960), we understand the process of taking action on a decision as comprised of three principal phases: “finding an occasion to make a decision, exploring different courses of action and, finally, choosing from those courses of action”. In the study of the human thought process, the concepts Econs and Humans emerged ((Thaler and Ganser 2015). Homo Economicus (Econs) is rational and economical models supported the idea that each one decision is constitutionally rational. From that perspective, there is no differentiation between what we want and choose; choices simply reveal preferences. That is why to understand behaviour there is a need to study “Humans” rather than Econs”. Due to the heterogeneous characteristics of succession decisions, including lack of experience and the variety of aspirations, the Econ-mindset does not give us relevant insights regarding the future of family businesses. Therefore, in accordance with Thaler and Ganser (2015), we reflect on an important concept, self-control, which arises when preferences are inconsistent across time or context. Ariely and Jones (2008) suggests that almost everyone has problems with procrastination and self-control, but those who recognize and admit these weaknesses are more successful in overcoming them. Our view of consecutive events is affected by our expectations. They are an aspect of stereotypes, which can be considered as a way of categorizing information. Our cognitive processes do not restart every time when faced with new scenarios, instead, they build upon previous experiences. Bruner (2020) argues that we organize our experiences and our memory of events mainly in the form of narratives, stories, and myths. Recently, the situation has reversed. Therefore, family business

owners should be aware that even if they don't have narratives about succession, they are exposed to several narratives related to it.

According to J. G. March (1978), the driving force of decisions are expectations, incentives and desires drive the decisions. The evaluation process starts with the possible solutions, that is followed by the consequences, and then one has to be able to choose those solutions which promise consequences most congruent with one's desires. In the decision-making process, solutions and expectations are not known but have to be discovered or developed. This can lead to uncertainties and errors; decisions are predetermined as being rational human limitations border them. Therefore, in response to experience aspirations and search rules are adjusted over time (March, 1991). Despite of the important role of narratives in development of thought process, researchers resisted studying narratives. Aspirations that inspire here and now decisions are determined by these narratives. The goal of our research was to surface the aspirations, intuitive knowledge (Kahneman, 2011) of decision makers, in order to deepen our understanding of the succession decision making phenomenon.

5.3 Methodology

The concept of "aspiration" (J. S. March and Simon 1958) is well-known and accepted in the study of decision-making. However, for those standing outside of this field, "aspiration" is probably a noun with a different meaning than for those involved in the study of decision-making. The use of concepts from any other profession or discipline, or the use of a new concept, would equally make it harder for the reader. This short elucidation perhaps helps the reader to accept that the use of concepts and frameworks from distinct disciplines limit the approach to the resolution of real problems. Therefore, as we argued in the methodology section, to explore this thought-provoking problem space, we needed to step out from the disciplinary boundaries and adopt a transdisciplinary approach.

Transdisciplinary approach has been considered a way to address complex societal problems, which cross disciplinary boundaries (Costanza 1992; Horlick-Jones and Sime 2004; Pohl 2008; Popa, Guillermin, and Dedeurwaerdere 2015; Polk 2015; del Cerro Santamaría 2015; Guimarães et al. 2019). To understand the mindset pattern of predecessor during succession decision we need to consider concepts like human decisions and social narratives. The concepts for our study come from sociology,

behavioural economics and cultural anthropology. Therefore, we share the view on the notion of transdisciplinary as being considered to go beyond the conceptions of scientific disciplines and to try to integrate and synthesize many different disciplinary perspectives. According to Jahn, Bergmann, and Keil (2012), the transdisciplinary approach should use simple language shared by disciplines and understandable by society. “The capacity to transgress disciplinary or professional boundaries, by common understanding to “think out of the box” is taken into account as a characteristic of transdisciplinary inquiry” (Lawrence (2015). Harmonized with the ontological axiom of Nicolescu (2014a; 2014b) that every predecessor’s succession decision is made on a personal level, we observe the mindset patterns on the personal level. In our study we exclude both the organizational and the social levels.

Within the field of Artificial Intelligence Knowledge Based Systems have been maturing for decades, with application in several areas, fields of research (Wagner 2017). Knowledge representation techniques also range from rules to cognitive maps, frames (Gavrilova and Leshcheva 2015; Wagner 2017). Knowledge base systems have two components: a framework or a shell, and the knowledge base. In pathfinding, they connect concepts, that are the expectations of the decision maker with a few thousand ‘if...then’ rules. The system then embodies the symbolic representation of knowledge, describing the practitioner knowledge with concepts that are connected by ‘if...then’ rules. After the formulation of the aspects of the decision the knowledge acquisition process can start in the Knowledge Based System. First, we have to collect the cases – meaning the appropriate alternatives and the expectations – meaning the attributes to the alternatives. After the data collection is done the knowledge engineering process can start within the knowledge-base. The tool used is called Doctus Knowledge-based Expert System tool (documentation available at www.doctus.hu/en/software). Aspects of the decision or aspirations, as defined by March James (1991), are called attributes in the Knowledge Based System. The attributes and their values are given by the expert, decision maker. That is why we can call an attribute a decision benchmark. Once the attributes and their values are defined, the outcome for each of the cases needs to be recorded. The knowledge acquisition process for the knowledge base in this study consisted of building the survey, validating the survey and the coding of the responses. The aspirations and the levels of them were exposed through this process. To represent knowledge, the Knowledge Based System uses symbolic logic, in which knowledge is expressed by logical statements, if-

then rules between the attributes. During the collection of knowledge, a kind of argot is formed. The then-and -there valid interpretations of concepts are outlined.

The Knowledge Based System used in our research is equipped with Case Based Reasoning functionality, which by an entropy-gain method infers the if-then rules. We chose case-based reasoning (CBR) to identify which attributes have the greatest descriptive power. The easiest way to think of CBR is as a machine learning system that extracts the rules from a set of cases by classifying them according to the values of an outcome attribute. The logic of the process is the following. We consider the set of cases to be disordered, and we define order as subsets of cases each of which have the same value of the outcome attribute (benchmark). The machine learning process in case-based reasoning uses a modified ID3 algorithm based on assigning informativity to the particular attributes based on how much they contribute to the order; the order here is represented by entropy and the contribution to order is the entropy gain (Velencei et al., 2019).

In order to implement this logic, the following steps are taken (in-principle description, disregarding some technical details): First, we take an arbitrary attribute, and group the cases according to the values of this attribute; then examine how similar this grouping is to the grouping by the values of the outcome attribute (benchmark); this similarity is the entropy gain of the examined attribute. We repeat the process for all the attributes, and then choose the one with the highest entropy gain, this is the most informative attribute for the given case set. We then form subsets of cases by the values of the most informative attribute. Cases in some of the subsets may have all the same value of the outcome attribute (benchmark); these subsets are considered 'in order', we leave them as they are for the moment. Instead, we focus on the subsets in which cases do not all have the same value of the benchmark; we repeat the whole previous process on these subsets, iteratively, until all subsets are ordered. As a classification system is very sophisticated, as the different subsets are formed according to the values of different attributes, while the AI learns the rules connecting the values of the informative attributes; these rules correspond to a simple explanation that describes all outcome values. The advantage of Case Based Reasoning is that the number of attributes is reduced, leaving only the most informative attributes. In the Case Based Reasoning process, several attributes can be considered as benchmark attributes. The benchmark attributes are the ones that are evaluated based on the remaining attributes. From the results of Case Based Reasoning,

the important aspects of the decision can be obtained by reduction by extracting the rules from the induction tree. Reductive Reasoning, which follows Case Based Reasoning, aims to describe the phenomenon at hand with the smallest number of attributes that can be evaluated according to the fitness function as defined by Tam and Cheung (2000).

Kahneman (2011) 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 results of this study add to the literature by understanding that the three stages of decision-making as described by Simon (1977) are relevant and have to be considered in the study of mindset patterns as people in different stages have different expectations, aspirations, and are influenced by different narratives. Based on the work of Dreyfus, Dreyfus, and Athanasiou (2000), the process of decision making is a process of thinking and reasoning. Cognitive psychology research established that if we find an objection less (not necessarily the best) solution, we choose it and make a decision (Simon, 1997).

5.4 Mindset patterns

To test the process of the generation change in family businesses a qualitative research approach was defined. As illustrated in Figure 5, 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. Table 1 summarizes the assigned three or four values to the attributes.

Name	Value 1	Value 2	Value 3	Value 4
problems during generation change	definitely count on it	rather count on it	rather not count on it	do not count on it at all
generation change #	once	multiple times	have already begun	did not begin yet
running as a family business	young	middle-aged	old	
running as a public company	thought about it	did not think about it	is already a public company	
purchase offer	received, was a thoughtful offer	received, but rejected	searched the opportunity, but was unsuccessful	did not even begin to search
adequate successor	already found it	probably found it	probably did not find it	did not find it
current operation	satisfied with it	rather satisfied with it	rather not satisfied with it	not satisfied with it
succession timeline	less than 5 years	6 to 20 years	more than 20 years	not planned at all
preparation of successor	conscious preparation	rather conscious preparation	rather not conscious preparation.	not conscious preparation
preparation of succession strategy	already exists	planning has started	planning did not start yet	do not plan on it at all
including expert in succession planning	definitely must	rather necessary	rather not necessary	not necessary at all
period of succession strategy	less than 1 year	1 to 5 years	6 to 10 years	more than 10 years
content of succession	ownership and management	just management transfer	just ownership transfer	do not plan on succession at all
period of financial planning	less than 1 year	1 to 5 years	6 to 10 years	more than 10 years
including expert in financial planning	definitely must	rather necessary	rather not necessary	not necessary at all
including competent employer in financial planning	definitely must	rather necessary	rather not necessary	not necessary at all
historical data use in financial planning	absolutely	rather yes	rather no	not at all
diversification in product portfolio	absolutely	rather yes	rather no	not at all
effect of generation change on business plan	definitely count on it	rather count on it	rather not count on it	do not count on it at all
regular investment/profit rewind currently	absolutely	rather yes	rather no	not at all
regular investment/profit rewind in the future	absolutely	rather yes	rather no	not at all
current value-added investments	absolutely	rather yes	rather no	not at all
future value-added investments	absolutely	rather yes	rather no	not at all
current assets cover long term operation	absolutely	rather yes	rather no	not at all
successor is capable of handling assets in the future	absolutely	rather yes	rather no	not at all
future operation will require loans	absolutely	rather yes	rather no	not at all

Table 5.1. Attributes in the knowledge-base with their values source: own elaboration

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 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.

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.

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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)

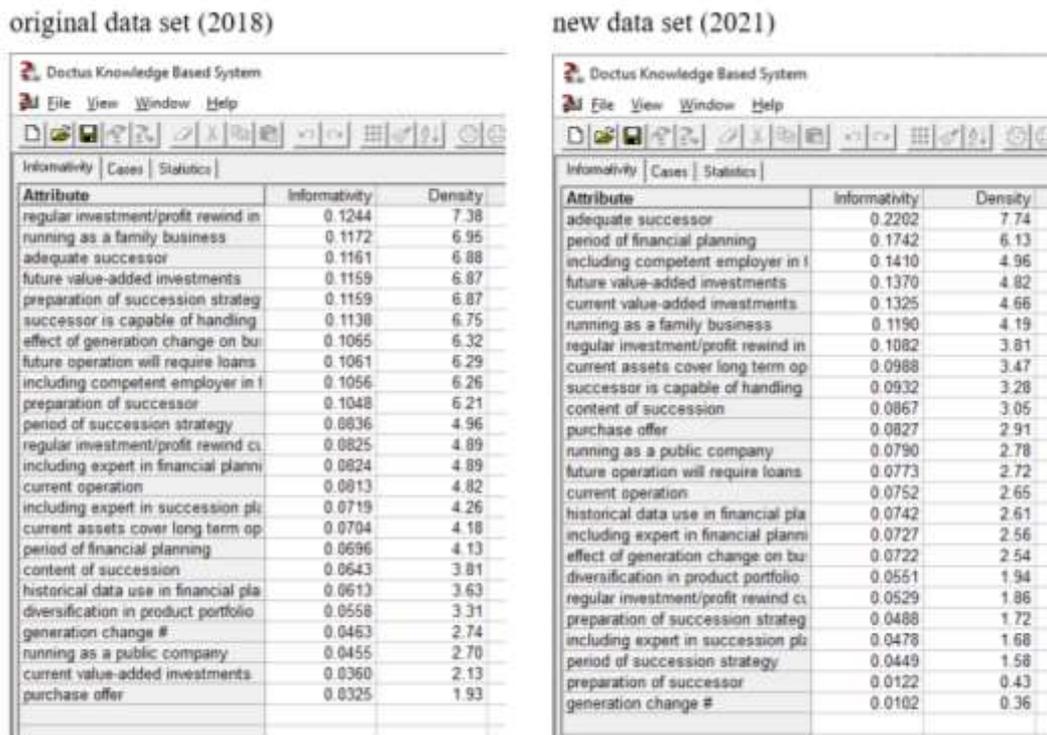
suggests, we try to fit the whole thing into our minds but to know where to find what is relevant, how to approach it, and what to do with it once we find it, is exceptionally important. It is important to understand that the succession decision is not simply a knowing process but a more complete cognitive 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.

If we sort the attributes by informativity, we get the following figures:

5.1. Figure Informativity of the attributes

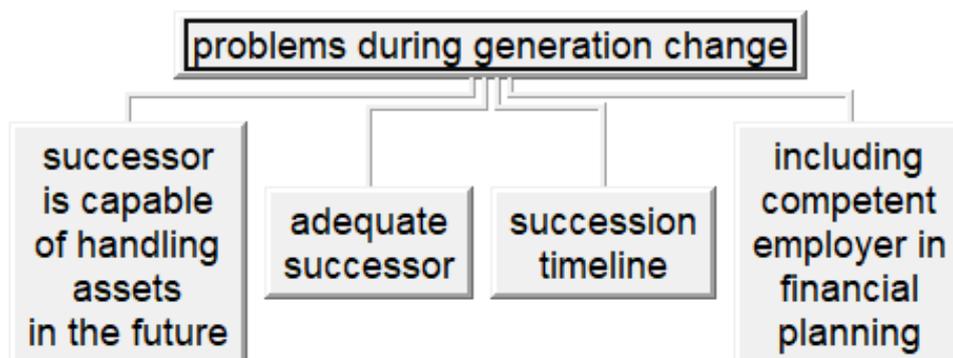


source: own elaboration

We can see that the most informative attribute changed significantly from regular investment/profit rewind to adequate successor.

During the original analysis we found that four attributes describe the problems during generation change: Successor is capable of handling assets in the future, Adequate successor, Succession Timeline, Including competent employer in financial planning.

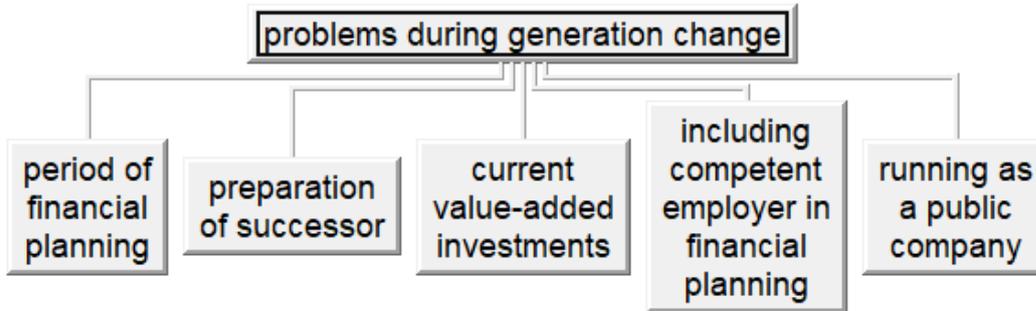
5.2. Figure Graph - original dataset



Source: Screenshot from Doctus

The reduced data set gave us a different perspective seen in Figure 3. Attributes of period of financial planning, preparation of successor, current value-added investments, including competent employer in financial planning and running as a public company became descriptive.

5.3. Figure Graph - reduced dataset



Source: Screenshot from Doctus

The following Figure represents the if-then rules in a tabular form. The values of the attributes are read from left to right. Asterisk (*) means that the attribute does influence the rule. First lets take a look at the rules from the original dataset:

Table 5.2. Rules (original dataset)

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	*	*	definite rather count on it
rather yes	*	*	definitely must	definite rather count on it
not at all	*	*	*	definite rather count on it
rather yes	*	*	not necessary at all	definite rather count on it
rather no	*	*	*	definite 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

Examples of if-then rules for Problems during generation change from the top and last at the bottom:

if 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 “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 “rather not count on it”

Rules from the reduced dataset can be read as the following:

Table 5.3. Rules (reduced dataset)

period of financial planning	preparation of successor	current value-added investments	including competent employee in financial planning	running as a public company	problems during generation change
less than 1 year	conscious preparation	+	+	+	definitely count on it
5 to 10 years	conscious preparation	+	+	+	definitely count on it
1 to 5 years	+	rather yes	rather necessary	did not think about it	definitely count on it
1 to 5 years	+	not at all	rather necessary	did not think about it	definitely count on it
less than 1 year	rather conscious prepara	+	+	+	definitely rather count on it
5 to 10 years	rather conscious prepara	+	+	+	definitely rather count on it
1 to 5 years	+	absolutely	+	+	rather count on it
1 to 5 years	+	rather no	+	+	rather count on it
1 to 5 years	+	rather yes	definitely must	+	rather count on rather not count on it
1 to 5 years	+	not at all	definitely must	+	rather count on rather not count on it
1 to 5 years	+	not at all	rather not necessary, not necessary at all	+	rather count on rather not count on it
1 to 5 years	+	rather yes	rather not necessary, not necessary at all	+	rather count on rather not count on it
1 to 5 years	+	rather yes	rather necessary	thought about it	rather count rather not co do not count
1 to 5 years	+	not at all	rather necessary	thought about it	rather count rather not co do not count
1 to 5 years	+	not at all	rather necessary	is already a public company	rather count rather not co do not count
1 to 5 years	+	rather no	rather necessary	is already a public company	rather count rather not co do not count

Source: Screenshot from Doctus

if Period of financial planning is “less than 1 year” and

the Preparation of the successor is “conscious preparation”

then Problems during generation change “definitely count on it”

if Period of financial planning is “1 to 5 years” and

if Current value added investments is “absolutely” and

then Problems during generation change “rather count on it”

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.

The weakness of the Doctus Knowledge -based system and overall machine learning is that it is only capable to aid decision makers with natural intelligence meaning the tool can only detect the mindset patterns of those who have them. In order to avoid faulty judgement which is inevitable based on the imperfections inherent in the mindset patterns included in the

sample data and the statistical calculations applied, we need to control the termination condition of the machine learning algorithm to improve its outcomes. We would believe that the more examples we process for the given situation/problem scenario, the more accurate the Case-based Graph becomes which enables more precise valuation of the target attribute, however real experience shows that there is a plateau beyond 25 leaves.

5.5 Discussion and concluding remarks

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, 2011) of decision makers and understand how they change over time in order to deepen our understanding of the succession decision making phenomenon.

Kahneman (2011) 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 mindset patterns presented here help us to understand that aspirations and search rules are adjusted over time. The if-then rules 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 the mindset patterns was reduced to 4-5 attributes, which indicates that in these cases rules were formed, set. We do not generalize, but search 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 knowledge increase, into mindset pattern changes on a personal level through longitudinal studies or, alternatively, into the phenomenon on social and/or organizational level.

6 Limitations and directions for future research

The title of the current dissertation “PASSING ON THE TORCH: UNDERSTANDING THE PREDECESSORS' MIND PATTERNS” and the four problem areas introduced above cover the problem space which was disclosed on the research journey. As the original “map” was drawn up at the beginning of the journey, the problem areas evolved but no major changes were made.

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.

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 (Chapter 2-5) 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.

7 Appendix

7.1 Appendix 1

Table 7.1: Handler's categories of the concept of family business

Definitions based on ownership management	Definitions based on the relationship between subsystems
<p>(Alcorn Pat 1982), (Barry 1975), (Barnes and Hershon 1976), (Lansberg 1988), (Stern 1986)</p> <p>Dyer 1986: the family business is an organization, where ownership and managerial decisions are under the influence of one or more families</p>	<p>Beckhard and Dyer 1983: the four subsystems of the family businesses: (1) business, as an entity (2) family, as an entity (3) the founder, as an entity (4) the board linked to the organization</p> <p>Davis 1986: it is the interactions between the family and business subsystems that create the essential character and uniqueness of the family business</p>
Definitions focusing on succession	Definitions based on more than one criteria
<p>Churchill and Hatten 1987: if the business has already been taken over by a younger family member or expectations indicate that they are willing to take over the company from the older members, we are talking about a family business.</p> <p>Ward 1987: the company plans to carry out management and control tasks in the future through future generations within the family</p>	<p>Donnelley 1964: a business is a family business if at least two generations of a family are involved and mutually decide on corporate policy, family and business interests.</p> <p>De Rosenblatt et al. 1985: Any business in which the majority ownership and control is concentrated in the hands of a family and two or more families are directly involved.</p>

source: based on Handler 1989

7.2 Appendix 2

Table 7.2. Existing typologies

Author	Typing criteria
(Gersick et al. 1997)	Life cycle
(Poutziouris 2001)	Future goals
(Gomez-Mejia, Nunez-Nickel, and Gutierrez 2001)	Level of strategy and trust
(Walker and Brown 2004)	Reason for founding
(Winter et al. 2004)	Reason for founding
(Dyer 2006)	Family and agency cost
(D. Miller and Le Breton-Miller 2006)	Strategy
(Pittino and Visintin 2009)	Innovation and strategy
(Dekker et al. 2010)	Professionalization and formalization

Source: Author based on own collection

7.3 Appendix 3

Table 7.3.: Defining a family business according to defined criteria

Author(s), Year	Definition of “family businesses”
(Westhead and Cowling 1997)	more than 50% of the voting preference shares are owned by a family (and relatives related to it) and consider themselves a family business.
(Smyrniotis, Tanewski, and Romano 1998)	at least one of the following: (1) the family holds at least 50% of the ownership; (2) members of some families own at least 50%; (3) a group of family members has control over the business; (4) a significant part of senior management comes from the same family
(Klein 2000)	family ownership in a business (%) + proportion of family members on the board of directors (%) + proportion of family members in the supervisory board (%) \geq 100%, then it is considered a family business
(McConaughy, Matthews, and Fialko 2001)	the CEO of the company is the founder or her/his family members
(Claessens et al. 2002)	the family is the majority shareholder and the family holds at least 10% of the controlling rights
(R. C. Anderson and Reeb 2003)	founding families have a stake in the company or members of the founding families participate in the board
(Cronqvist and Nilsson 2003)	the family holds the largest share of ownership, which is at least 25%
(Barth, Gulbrandsen, and Schønea 2005)	a person or family owns at least 33% of the shares
(Jaskiewicz et al. 2005)	the family holds more than 25% of the voting rights and the so-called power subscale of the F-PEC scale is above 0.5
(Zahra 2005)	Family firm is what the company's CEO or highest senior executive classifies as family business.
(Barontini and Caprio 2006)	the family is the largest shareholder and either the family controls more than 51% of the indirect voting rights or the family-controlled direct voting rights are more than twice the voting rights of the second largest shareholder
(Ben-Amar and André 2006)	an individual or family has control over the company
(Corstjens, Peyer, and Van der Heyden 2006)	one or more individuals or families are the ultimate owners and have the largest shareholding
(Lee 2006)	members of the founding family or their descendants hold a stake in the company or are represented on the board
(Maury 2006)	the controlling owner owns more than 10% of the voting rights
(Nowak, Ehrhardt, and Weber 2006)	more than 50% of the voting rights are concentrated in the hands of the family. The founding family is a member of the supervisory board and / or board of directors

(Martínez, Stöhr, and Quiroga 2007)	more than 50% of the board members are family members
(Sraer and Thesmar 2007)	the founder or a member of the founder's family is a so called blockholder and owns more than 20% of the voting rights
(Allouche et al. 2008)	the largest shareholders are family members and they hold management positions or are members of the board of directors
(Andres 2008)	the founder of the company and/or his/her family members hold more than 25% of the shares or, if less than 25% of the voting rights, they are represented in the executive body or the supervisory board
(Arosa, Iturralde, and Maseda 2010)	the majority of the ordinary shares are in the hands of the founder or its family and family members are actively involved in the business
(Kowalewski, Talavera, and Stetsyuk 2010)	family ownership over 25%, and the chairman and managing director are family members
(Okoroafo and Koh 2010)	Family business is one which its owner identifies as a family business.
(Okoroafo and Perry 2010)	Family business is one which its owner identifies as a family business.
(Galve-Górriz and Salas-Fumás 2011)	owners of the same surname hold the largest (direct and indirect) stake
(Arregle et al. 2012)	A family firm is one in which ownership by persons outside the family does not exceed 49%.
(Colli, García-Canal, and Guillén 2013)	Family businesses are companies in which the founder or a member of the family is the company director or owns more than 5% of the firm's equity.
(Mitter et al. 2014)	Applying the F-PEC Scale, an FB is a firm with a Substantial Family Influence (SFI) indicator higher than 1.
(Calabro et al. 2016)	A family business is one in which at least 50.1% is owned by one family.
(Fernández-Olmos, Gargallo-Castel, and Giner-Bagües 2016)	FBs are firms where they self-classify themselves as a family business based on the involvement of a family group in the control.

source: Based on (Kraiczky 2013), (Lindow 2013), (Cano-Rubio, Fuentes-Lombardo, and Vallejo-Martos 2017) and author's own collection and editing

7.4 Appendix 4

Family Business strategy in Chaotic Ecosystems Doctoral studies research

Group no.1: Classification

How many years has the family owned the business? Hány éve áll a család tulajdonában a vállalkozás?

- Young – For less than 10 years
- Middle-aged – For 11-30 years
- Old – For more than 30 years

Has there been a generational change in the life of the business? Történt-e már generációváltás a vállalkozás életében?

- Yes, once
- Yes, multiple times
- It hasn't ended but it's in progress
- No

Have you thought about becoming a joint-stock company? Gondolkodott-e már részvénytársasággá való átalakuláson?

- Yes
- No
- It's already a joint-stock company Jelenleg is részvénytársasági formában működik a vállalkozás

Have you gotten a purchase offer on your business? Kapott-e már vételi ajánlatot vállalkozására?

- Yes, and I've been thinking about selling it
- Yes, but I still wouldn't like to sell it
- No, but I've been searching for the opportunity
- No and I haven't been searching for the opportunity

Have you found the right successor for your business? Megtalálta már a megfelelő utódot vállalkozásának folytatására?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Are you satisfied with the current operation of your business? Elégedett vállalkozása jelenlegi működésével?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Group no.2: Succession, planning

When would you like to transfer your business? Milyen időtávon készül a vállalkozás átadására?

- In 5 years
- In 6-20 years
- In 21-30 years
- For some reason I'm not planning to transfer my business (there isn't a right successor/I would like to sell my business) Nem készülök az átadásra valamilyen okból kifolyólag (nincs megfelelő utód/értékesíteni kívánom cégemet)

Are you consciously preparing your successor to take over the business? Tudatosan készíti utódját a vállalkozás átvételére?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Have you prepared a plan for the generational change? Készített már tervet a generációváltásra?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Do you think it is worth asking for an expert to help in the process of the generational change? Ön szerint érdemes szakértő segítségét kérni a generációváltás folyamatának előkészítéséhez?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

For how long do you think it is advisable to plan for a generational change? Ön szerint milyen időtávra célszerű tervet készíteni egy generációváltáskor?

- Less than 1 year
- 1-5 years
- 6-10 years
- More than 10 years

How do you plan to leave the company during the generational change? A generációváltás során hogyan tervezi a cégből való kiszállását?

- I will hand over the ownership as well as the management
- I will only hand over the management
- I will only hand over the ownership
- For some reason I'm not planning to hand over the business (there isn't a right successor/I would like to sell my business)

Do you think the generational change is going smoothly for your business? Ön szerint saját vállalkozása tekintetében problémamentesen lezajlik a generációváltás?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Group no.3: Business planning

For how long do you think it is appropriate to create a business plan? Ön szerint milyen időtávra célszerű üzleti tervet készíteni?

- Less than 1 year
- 1-5 years
- 6-10 years
- More than 10 years

Do you ask for expert help during the business planning process? Üzleti terveinek összeállításához igénybe veszi szakértő segítségét?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Do you use the help of your competent employees during the business planning process? Üzleti terveinek összeállításához igénybe veszi kompetens alkalmazottai segítségét?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Do you rely on past / experience data when compiling your business plans? Üzleti terveinek összeállításakor hagyatkozik múltbeli/tapasztalati adatokra?

- Definitely yes
- Rather yes

- Rather no
- Definitely no

Do you diversify your product portfolio during your business planning? Üzleti tervezése során diverzifikál a termék portfólióban?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Do you think generational change affects your business plans? Véleménye szerint a generációváltás hatással van üzleti terveire?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

4. csoport: Assets

Do you currently regularly invest / return profits in the operation of your business?

Vállalkozása működtetésébe jelenleg rendszeresen fektet be/forgat vissza nyereséget?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Do you plan to regularly invest / return profits in the future to run your business?

Vállalkozása működtetésébe a jövőben tervezi, hogy rendszeresen fektet be/forgat vissza nyereséget?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Are your investments in your business value-added? A vállalkozásba történő befektetései értéknövelő célúak?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Are you planning to make a value-added investment in your business in the future? Jövőben tervez értéknövelő befektetést végrehajtani a vállalkozásában?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

Do you think that the current assets of your business provide adequate coverage to maintain its long-term operations? Ön szerint a vállalkozásának jelenlegi vagyona megfelelő fedezetet nyújt a hosszútávú működés fenntartásához?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

In your opinion, is your successor suitable for the long-term management of the assets accumulated in your business? Véleménye szerint utódja alkalmas a vállalkozásában felhalmozott vagyon hosszútávú kezelésére?

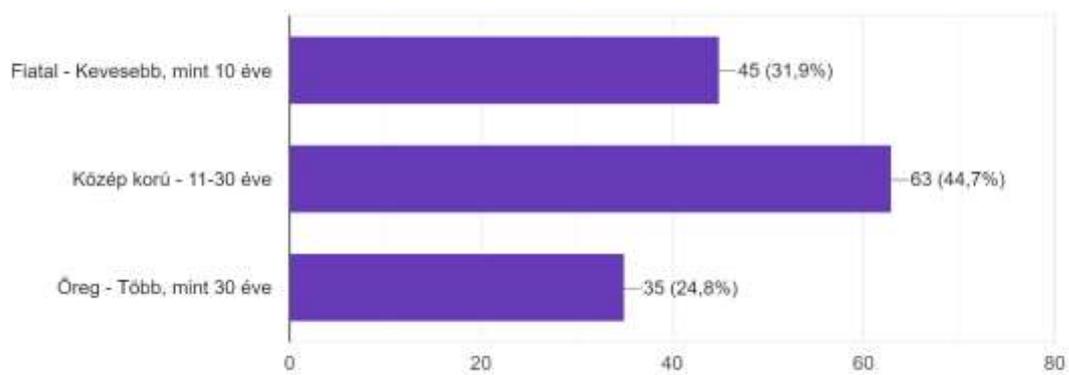
- Definitely yes
- Rather yes
- Rather no
- Definitely no

Do you want to use a loan to expand your business? Kíván-e vállalkozása bővítéséhez hitelt igénybe venni?

- Definitely yes
- Rather yes
- Rather no
- Definitely no

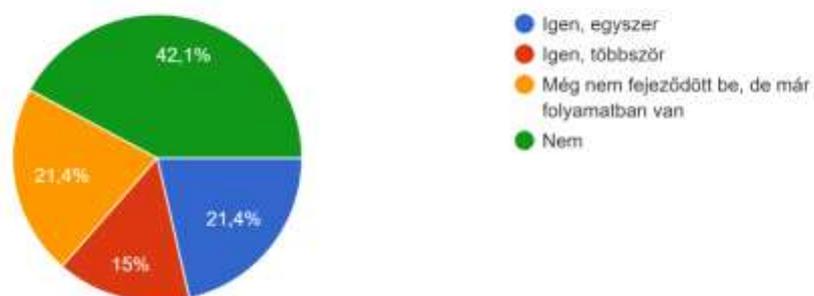
Hány éve áll a család tulajdonában a vállalkozás?

141 válasz



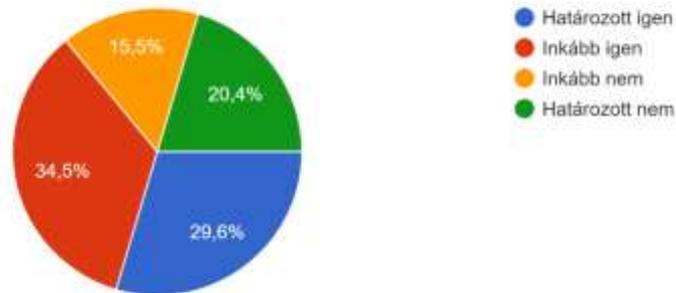
Történt-e már generációváltás a vállalkozás életében?

140 válasz



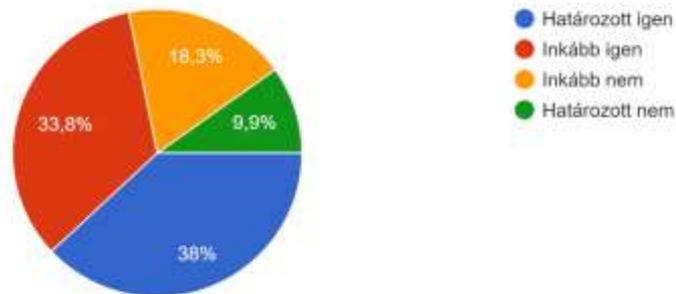
Megtalálta már a megfelelő utódot vállalkozásának folytatására?

142 válasz



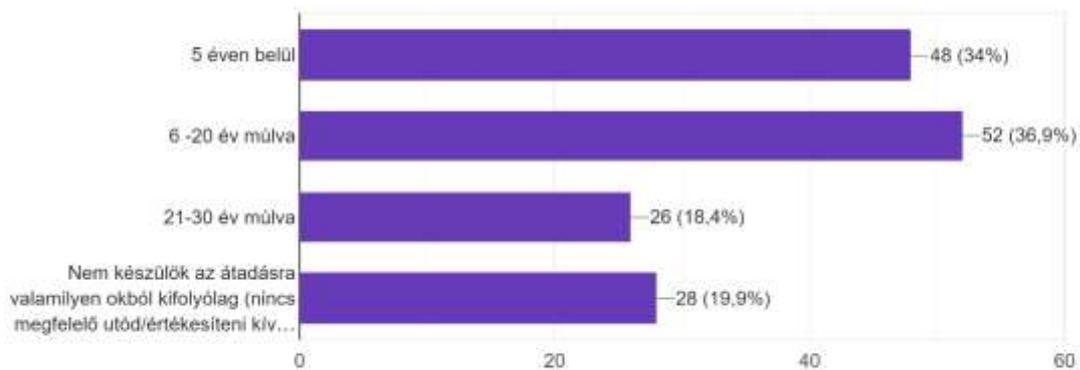
Elégedett vállalkozása jelenlegi működésével?

142 válasz



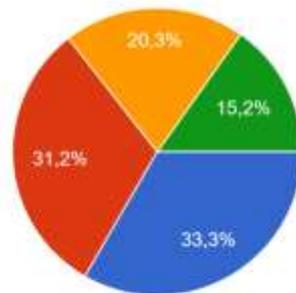
Milyen időtávon készül a vállalkozás átadására?

141 válasz



Tudatosan készíti utódját a vállalkozás átvételére?

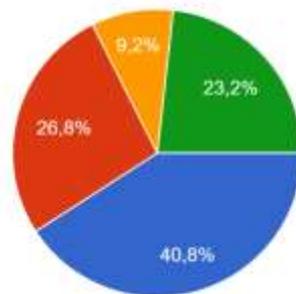
138 válasz



- Határozott igen
- Inkább igen
- Inkább nem
- Határozott nem

A generációváltás során hogyan tervezi a cégből való kiszállását?

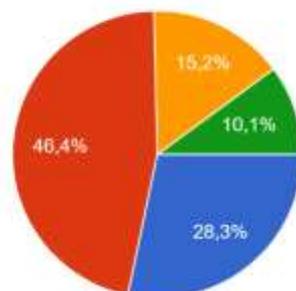
142 válasz



- Átadom a tulajdonjogot és az ügyvezetést is
- Csak az ügyvezetést adom át
- Csak a tulajdonjogot adom át
- Nem készülök az átadásra valamilyen okból kifolyólag (nincs megfelelő utód/értékesíteni kívánom cégemet)

Ön szerint saját vállalkozása tekintetében problémamentesen lezajlik a generációváltás?

138 válasz



- Határozott igen
- Inkább igen
- Inkább nem
- Határozott nem

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