

**Research Article**

# Technology Adoption in Mediating the Effect of Leadership Succession on Family Business Sustainability in West Sumatra

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**Abstract.** A family business is one that can last forever. These businesses play an important role in the world's economy and are a driving force for the world's industries. This study aimed to investigate the effect of leadership succession on family business sustainability, mediated by technology adoption, in family business industries in the West Sumatra province. Purposive sampling was used to recruit participants with the criteria of family businesses that had been running for more than five years and had been preparing the successor of their companies. The total sample was 231 managers or chief executive officers of family companies. The results showed that leadership succession and technology adoption affected sustainability. Furthermore, technology adoption significantly mediated the relationship between leadership succession and sustainability of family businesses in West Sumatra, Indonesia.

**Keywords:** leadership succession, family business sustainability, technology adoption

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## 1. INTRODUCTION

The family business is one of the most prominent factors for supporting the economy of a country. Moreover, the family business has an important role in the world's economy and as a driving force for modern industry [1]. In general, business people view the company's viability as a long-term indicator and is used to evaluate the company. According to Zehrer and Leiß (2019) [2] factors that need to be considered about the resilience of family companies include success, survival, and sustainability. Furthermore, Zellweger, et al also investigated the sustainability of family businesses by focusing on how families maintain an entrepreneurial approach over several generations. They found that the transgenerational sustainability intention of the family was a key factor [3]. In addition, Le Breton-Miller studied how family firms remain profitable and the long-term investment requirements of governance conditions that enable families to create sustainable capabilities [4].


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Contributions to family's owned companies themselves make a tremendous contribution to economic progress in many countries, but only a few of the family companies are successful after the succession of leadership from the founder generation to the successors of the company. Furthermore, the outcome of the intergenerational successional process is decisive in the early transition. However, from these results, the question still arises why more than 50% of family businesses fail despite the transition and succession period [4], [5]. The same thing happened in the implementation of inappropriate strategies so that many family companies failed after the leadership transition period. There are about 85% of family businesses are not successful, and among those that survive only 30% for the 2nd generation and 15% for 3<sup>rd</sup> generation which are successful [6].

The theory of family business sustainability (FBST) is a general theory with the consideration that this theory provides a common introduction to families and companies. Furthermore, this theory focuses more on the sustainability of the family company than on the company's income [7]. FBST was introduced first time in 1999 by Olson, et.al [8]. Moreover, several changes was done in 2008 to enhance and leading to FBST II, the the family firm's structure was improved such as adding resources and constraints separately [7]. Family companies have contributed significantly to the economy of a country and the sustainability of family companies must be concerned because they have a positive impact on the national economy. The development of family companies is the largest in the world and has dominated the market. [9].

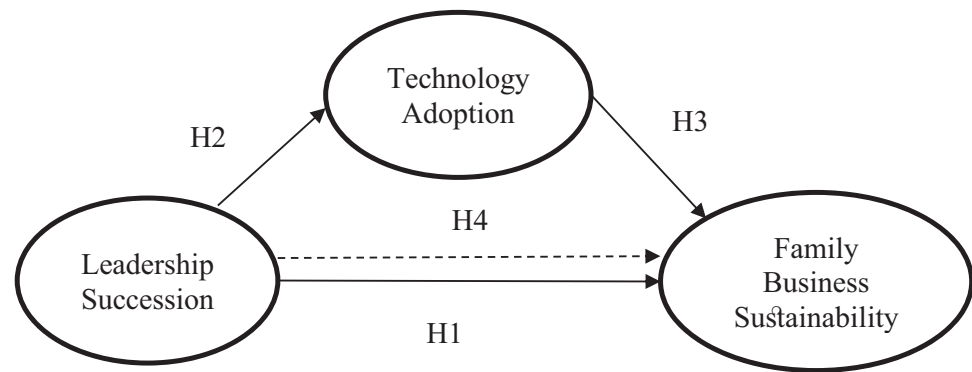
The family business succession issue has been substantially discussed in the literature. Leadership succession can be explained as a procedure in determining the transition from one leader to another and one of the significant challenges for families business (10). Nevertheless, many researchers state that leadership is something that is still under debate in terms of the most critical factors for the success of an organization. It is undeniable that the need for an organization in placing leaders at a certain level is important (11). According to Bozer, Levin, Santora [12] mention that family business succession could influence family business performance, whereas, good performance of the family business can affect the family business sustainability in the long run (13). Besides, succession planning also showed that it can be important to sustain the family business [14]. However, there are still many family companies that still do not have a clear leadership succession [12] especially in West Sumatra and Indonesia in general. For this reason, it is still necessary to develop this research, in the case of family companies in West Sumatra, where there are quite a lot of family companies but it is difficult to

develop. The sustainability and resilience of family enterprises are priority factors for better economic growth [15].

To prepare for the succession of a family business, several actions are needed, such as how the successor is prepared, which is important to have implied that how ready the successor is to take the leadership role in a family company. The development of successor readiness requires the transfer of knowledge from predecessors which is very important in the succession process of family companies and is an essential asset to produce a successful succession [1],[16]. The process of family business interaction between predecessor and successor was still unclear. The research on this field is still a small number, especially in West Sumatra. The contributions of this study are focusing on research addresses which to understand the process in the middle of the processor and successor to be developed the capability and support the process of leadership succession. By transferring knowledge to the successor is one of a dynamic process to continue the relationship over a lifetime. The owner/founders and successors have to build a relationship based on open communication [17],[18].

Higginson, (2010) did some cases of studies to develop the relationship factors that affect knowledge transfer proses from predecessors to successors in the family business. The study found that the elements of cognition, reflection, constitute elements that have synergy with each other. It is such cognition concern about the understanding of shared between predecessor and successor; reflection relate to openness and introspection of the individual, and affection refers to emotional feeling.

Technology adoption (TA) is one of the factors that can affect competition in the company's sustainability efforts in the future. TA in the use of information technology and communication has become a method nowadays in increasing business competition in the world [19]. Adopting information and communication technology is important for family companies, which are generally still small and medium-sized to capitalize on the economy of scale. Furthermore, one of the theoretical frameworks that can support technology adoption is the Technology Acceptance Model (TAM) in which TAM is a theoretical framework that is widely used to assess how individuals or organizations make decisions regarding adopting new technologies. TAM has been used for information systems and other fields related to technology [20]. The TAM model explains the basic theory for the dissemination and acquiring of technological innovations like the use of computers technology and the internet network which very much needed by companies. It is from this perspective that there are several things are useful in understanding how new ideas, processes, and technologies are used across organizations [21].



**Figure 1:** Conceptual Framework Design.

. Technology adoption in the business world shows a perception of the benefits and value of using technology by all generations in family businesses. The leadership role in family businesses is to motivate and encourage them to use new technologies such as the internet and computers to reduce costs, gain value in the long term and subsequently adapt to disruptive technologies that are booming to improve performance in family businesses. Moreover, TA will eliminate traditional conditions and switch to technology to increase competitive advantages [23]

From several problems based on literature from previous research and related theories that strengthen this research, several hypotheses formulated as follows:

H<sub>1</sub>: Leadership succession has a positive effect on family business sustainability.

H<sub>2</sub>: Leadership succession has a positive effect on technology adoption.

H<sub>3</sub>: Technology adoption has a positive effect on family business sustainability.

H<sub>4</sub>: Technology adoption mediates the effect between leadership succession and family business sustainability.

## 2. METHODOLOGY

. The data used in this study is empirical data with the unit of analysis is a family industrial company in West Sumatera. Questionnaire design based on Likert with 5 scales. Each variable is based on measurement indicators with a total of 40 items consisting of 12 items of leadership succession, 12 items of technology adoption, and 16 items of family business sustainability. The items of questioners were adapted from past research [26], [27], [18], [28]. The data was taken from a survey based on face-to-face and using google forms which are distributed via email and WashApp which were conducted in March and April 2019. Respondents are managers or CEOs of family companies with a total of 231 respondents. The sampling technique used purposive sampling with the respondents'

criteria were family companies that had been running for more than five years who had been managed by a member of the family. Family companies that were preparing for leadership succession and/or in the 2nd or more generation.

The analysis technique in this study uses SEM-PLS version 3.3.2 which data information obtained through questionnaires is tabulated and processed to obtain results about validity, reliability, and test hypotheses for each exogenous construct (22). The list of questions was made using the Likert method with 5 scales. then each dimension is measured by 3 questions adapted from Kahalas (23), [24]. Furthermore, the leadership succession variable has 2 dimensions, 6 statements were assigned that adapted from Higginson [17], [25], [26]. The technology adoption consist of 1 dimension with 3 statements adapted from Pojasek [27].

The data is said to be valid and reliable if the Cronbach alpha, composite reliability, and cross-loading values are above 0.7 and the AVE value  $> 0.500$ . However, for social research, there are exceptions for the AVE value which are allowed with a value of 0.4 and above. Furthermore, the validity of the research data can be seen from the discriminant validity (Fornel Larckel and cross-loading. Moreover, a structural assessment model is used to see that the exogenous variable affects the endogenous variable [22].

### 3. RESULT AND DISCUSSION

#### 3.1. Respondents Characteristic

In this study, there was 231 respondents to be analyzed with the characterized as family business in West Sumatera. The results of survey showed that the companies in 1st generation with a total percentage is 20.8% and the companies' age is five years and over, however, the family companies have planning to prepare for the successor for their family. In addition, The status of family companies in West Sumatra are mostly individual proprietorship, namely around 80,5%, only 7,8% as a limited company and 11,3% as commanditaire Vennootschap (CV) and 11 percent is publicly. The total employees of the company are between  $< 30$  to  $> 120$  employees with income of the company is over 500 million. Furthermore, most companies prevail the foods and printing industries with the percentages of 43,7. Family own business management dominated by male gender as much as 59.3% and only 40.7% are managed by female. The highest education of the managers are master degree with the percentage of 35%, then bachelor degree with the percentage of 47.6 and senior high school with the percentage of 29%.

TABLE 1: Internal Consistency Reliability

Item	Construct/ Dimension	Dimension	Outer Loading	Cronbach Alpha	Composite Reliability	AVE
1	FBS-Sistem Thinking	ST1	0,680	0.499	0.749	0.500
		ST3	0,684			
		ST4	0,755			
2	LS-Cognition	CN1	0,725	0.679	0.805	0.509
		CN2	0,659			
	LS-Reflection	RF2	0,782			
		RF3	0,682			
3	TA-Disruptive Technology	DT1	0,770	0.740	0.836	0.560
		DT2	0,756			
		DT3	0,731			
		DT4	0,736			

Sources: Author's Own Finding

### 3.2. Measurement Assessment Model

The validity and reliability were appraise by using SEM-PLS 3.3.2 v to get the information result. The study is exploratory research which is intended to examine the effects of leadership succession on family business sustainability with technology adoption as mediating construct. To measure validity and reliability, Hair et al. (2017)[22] mentioned that to evaluate the constructs that should be measured. Table 1 shows that the values of Cronbach Alpha, Composite Reliability, and Average Variance Extract was used as indicators of construct validity. As a result, the Cronbach's alpha (CA) is 0,499 (FBS), 0,679 (LS), 0,740 (TA). The composite reliability (CR) value is greater than 0,7, and the average variance extract (AVE) is over 0,5 which complies with threshold value < 0.5. Therefore, according to Hair et al., (2017) [22], such results can be indicated sufficient.

The next measurement that needs to be done is to count the discriminant validity (Fornell-Larcker Criterion and cross-loading) which is to see whether the construct is truly distinct from other constructs. In this case, there are two measures of discriminant validity which, first is cross-loading that is needed to be assessed for each indicator and second is the Fornell-Larcker Criterion which is by comparing square root of the AVE values with the latent variable correlation which means that the square root of each construct's AVE should be greater than its highest correlation with other constructs. The result shows that the outer loading greater than any of its cross-loadings on other constructs. The result of cross-loading can be seen on table 2.

Furthermore, evaluation was done to see the construct exist among other construct. Based on Fornell-Larcker Criterion valuing the square root of Ave should be higher than

TABLE 2: Cross Loading

Construct	FBS	LS	TA
FBS-ST1	<b>0,680</b>	0,282	0,227
FBS-ST3	<b>0,684</b>	0,247	0,304
FBS-ST4	<b>0,755</b>	0,181	0,315
LS-CN1	0,271	<b>0,725</b>	0,190
LS-CN2	0,194	<b>0,659</b>	0,194
LS-RF2	0,269	<b>0,782</b>	0,285
LS-RF3	0,215	<b>0,682</b>	0,247
TA-DT1	0,296	0,337	<b>0,770</b>
TA-DT2	0,304	0,253	<b>0,756</b>
TA-DT3	0,327	0,131	<b>0,731</b>
TA-DT4	0,280	0,223	<b>0,736</b>

Sources: Author's Own Finding.

TABLE 3: Fornell-Larcker Criterion

No	Items Construct	Family Business Sustainability	Leadership Succession	Technology Adoption
1	FamilyBusiness Sustainability	0.707		
2	Leadership Succession	0.335	0.714	
3	Technology Adoption	0.401	0.325	0.748

Sources: Author's Own Finding

its highest correlation of other constructs [22]. Table 3 show the result of discriminant validity (Fornell Larcker Criterion) which showed that the value of family business sustainability constructs 0.707 is greater than the value of other constructs, the value of leadership succession 0.714 is greater than the value of other construct and same to value of technology adoption 0.748 is greater than the value of other constructs of each column and rows.

Moreover, the validity of the constructs also can be assessed by calculating the Heterotrait-Monotrait (HTMT) [28]. The HTMT ratio measured the ratio between trait correlation to the within trait correlation. The threshold value of 0.90 is not recommended which lacks discriminant validity. Henseler [28] suggested that the value of 0.85 and below is recommended. Table 4 shows the value of HTMT of each construct which is below 0.85.

TABLE 4: Heterotrait-Monotrait Ratio

	FBS	LS	TA
FBS			
LS	0.571		
TA	0.659	0.439	

TABLE 5: Results of Direct Effect Model

Direction	Original Sample	Sample Mean	Standard Deviation	T-Statistic	P-Value	Significance (P < 0.05)
LS -> FBS	0.228	0.233	0.077	2.959	0.003	Yes
LS -> TA	0.325	0.334	0.071	4.560	0.000	Yes
TA -> FBS	0.327	0.335	0.074	4.421	0.010	Yes

Sources: Author's Own Finding

### 3.3. Structural Assessment Model (Hypothesized Testing)

The assessment of the structural model ( inner model) and their causal relationship [29] was done. The purposed of the assessment is to test the model's predictive capabilities and the correlation between the constructs and the relationships (paths) between constructs [22]. The bootstrapping technique was done to gauge the paths for each construct [22]. This technique gives the testing of the statistical significance of various PLS-SEM results, such as the path coefficients, Cronbach's Alpha, HTMT, and R<sup>2</sup> [22], [30]. Nevertheless, PLS-SEM is not contemplate as a global goodness-of-fit measure [22]. Instead, the structural model assessment in PLS-SEM mostly scrutinize its capacity to prognosticate the endogenous construct [22]. Therefore, some quantify were count to describe the predictive power, such as the original sample (Beta), coefficient of determination (R<sup>2</sup>), effect size (f<sup>2</sup>), and predictive relevance (Q<sup>2</sup>).

Table 5 reveal that the original sample's value for leadership succession (LS) affect family business sustainability (FBS) is positive with  $\beta$  0.228, t-statistic (2.959  $\geq$  1.96), P-Value (0.003 < 0.005). The hypothesizes (H1) is supported. It described that LS with dimensions of cognition and reflection shows 22.8% of these latent variables can improve the family business sustainability, the remaining value will affect by others. Furthermore, LS has a positive affected on strategic competitiveness (SC). It showed the original sample value 0.325, t-statistic 2.959 > 1.96, and p-value 0.003 < 0.005. It shows that the hypothesizes (H2) was supported. FBS with system thinking as a dimension increased by 32.5% by applying leadership succession in the family business system. Moreover, technology adoption has a positive affected on FBS. It shows that the original sample value of 0.327, t-statistic 4.421 > 1.96, and P-value 0.010 < 0.05. It means the hypothesizes (H3) is supported. It shows that technology adoption with



TABLE 6: Result of Specific Indirect Effect Model

Direction	Original Sample	Sample Mean	Standard Deviation	T-Statistics	P-Value	Significance (P<0.05)
LS ->TA-> FBS	0.106	0.113	0.037	2.882	0.004	Yes

Sources: Author Own Finding

TABLE 7: The value R-Square

	R Square	R Adjusted Square
<b>FBS</b>	0.208	0.201
<b>TA</b>	0.106	0.102

disruption technology as a dimension can increase the family business sustainability by 32.7%.

Furthermore, Table 6 indicate the value of specific indirect effect, which showed the technology adoption mediate positively between LS towards FBS with a value of path coefficient (original sample) 0.106, t-statistic value  $2.882 > 1.96$ , and P-value  $0.004 < 0.05$ . It indicates that technology adoption (TA) mediate between leadership succession and family business sustainability as complementary mediation [22]. It showed that technology adoption with measurement of disruption technology mediates the family business sustainability for 10.6%. Therefore, the hypothesis (H4) is supported.

Table 7 shows the value of R-Square. It is the result of representative of independent variables toward dependent variable. The rule of thumb for the value of  $R^2$  should be  $> 0.2$ . Based on table 6,  $R^2$  can be explained family business sustainability (FBS) which affect by leadership succession (LS), technology adoption (TA) for 20.8% with remaining 79.2% can explain by other variables which not included in this study. Furthermore, the TA explain by LS for 10.6%, and the remaining 89.4% can explain by others.

#### 4. CONCLUSION AND RECOMMENDATION

The research objective is to calculate the effect of leadership succession on family business sustainability and moderate by technology adoption. At first, four hypotheses have been tested in connecting to the family business sustainability in West Sumatera using consistent bootstrapping with multiple regression analysis. The results of this study designated that the fourth of hypothesizes are positively impact on family business sustainability. The leadership succession (cognition and reflection dimensions) positively affects the sustainability of family companies. To sustain the family company in West Sumatra, the family companies need to prepare the successors early, such as

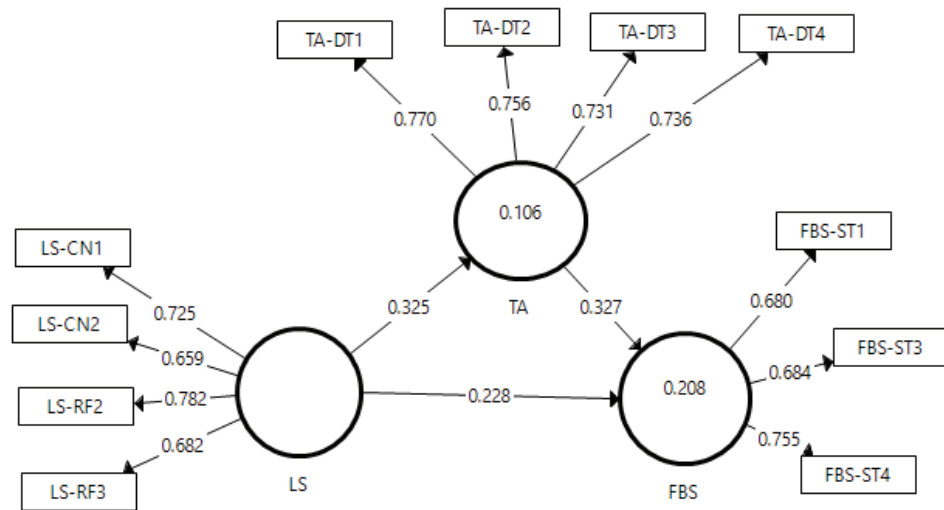


Figure 2: PLS-SEM Result.

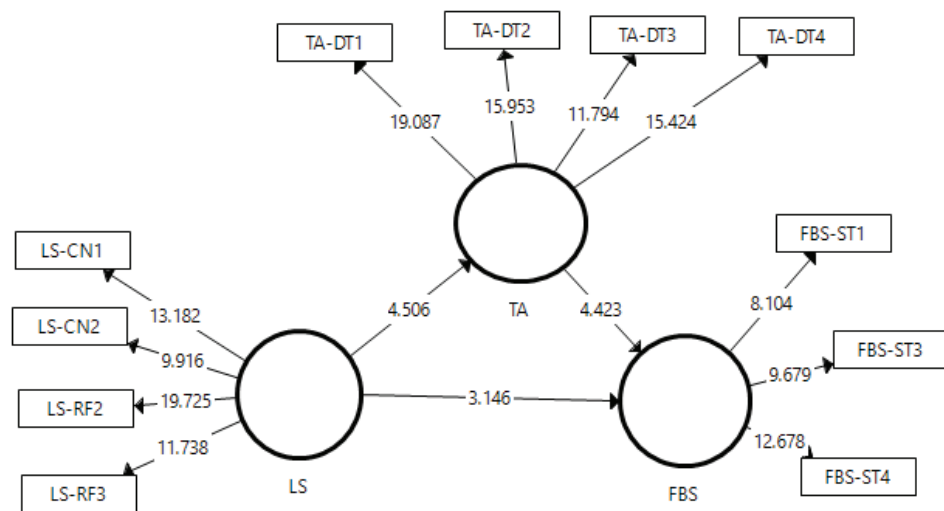


Figure 3: Hypothesized PLS Path Model.

getting involved the successor in the daily operation of the company, initiating good alliance and communication, openness with incumbent by training their leaders and increasing successor creativity [17][31]. Furthermore, leadership succession positively affects technology adoption. Technology adoption positively affects family business sustainability.

The successor involves in daily operation will increase their experiences in managing the family company forward. Therefore, the incumbent as a father or a mother should prepare early successors. As a result, the sustainability of family companies can realize.

Generally, technology is one of the supporting media that can improve the operation of the companies in adopting some related technology in industries operational, such as the use of information system to the company that improved the functionality and quality of the operation process [32]. Moreover, the study showed that technology adoption mediates between leadership succession and family business sustainability. Technology adoption ensured how disruptive technology has been adopted by the family companies in running company operations. However, the companies should apply technology nowadays such as using the internet, Computers, increased knowledge of managers to pull through the higher competitiveness collate to non-family companies [33]. To create innovative products, family companies should paid attention to disruption technology which is booming nowadays that can help the family companies grow better and it can compete in the market. Therefore. technology adoption can mediate toward family business sustainability by improving the technology itself in the family firms and acknowledge the individual who involves in the company especially chief executive officers or managers or successors.

Since the authors limit to the dimension of system thinking for family business sustainability, therefore, further research suggests that family business sustainability can be measured from some other dimension such as stakeholders. information knowledge. continuous improvement. Besides, for future research can be suggested to study specific objects of family businesses, such as corporated in Indonesia.

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