Leadership styles and sustainable organizational energy in family business: modeling non-compensatory and nonlinear relationships

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Abstract

Purpose – This study aims to understand the impact of leadership styles on the sustainability of organizational energy, using the mediator role of organizational ambidexterity in family firms in Malaysia. To this end, dual-stage Structural Equation Modeling (SEM) and Artificial Neural Networks (ANN) were adopted to determine the leadership style of family firms in Malaysia.

Design/methodology/approach – An exploratory design (i.e. questionnaire) was used to collect data from 528 workers in the family firms in Malaysia.

Findings – According to the results, leadership styles and long-term organizational energy have a positive and significant relationship. Furthermore, organizational ambidexterity mediates the relationship between leadership styles and organizational energy sustainability. On the other hand, based on nonlinear and compensatory relationships, the ANN method predicted a bureaucratic leadership style typical in Malaysian family businesses. The results of this study indicate transformational, transactional and bureaucratic leadership styles affect sustainable organizational energy. Besides, organizational ambidexterity fully mediates the relationship between leadership styles and sustainable organizational energy. On the other hand, the results of non-compensatory relationships revealed organizational ambidexterity is the most determinant of sustainable organizational energy, followed by bureaucratic leadership. As a result, leadership styles encourage human resources to perform tasks with energy and vitality. In family businesses, bureaucratic leadership increases job immersion and positive motivations toward work challenges.

Research limitations/implications – From a practitioner's perspective, leaders and practitioners must encourage creativity and idea generation to give members sufficient strength to work and focus on goals that support building sustainable organizational energy. A family business is a type of capitalism that significantly impacts employees. The family-owned businesses surveyed by first-generation families lack subsidiaries and are ingrained in a paternalistic culture that offers employees greater security at a lower wage. Although there are few details, the study sample size is small and has limitations. This study suggests that understanding the leadership styles on sustainable organizational energy and using the mediator role of organizational ambidexterity in the family business has immense value. Characteristics such as transformational,

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transactional and bureaucratic leadership styles have a significant role in sustainable organizational energy. Also, organizational ambidexterity is the mediator for the relationship between leadership styles and sustainable organizational energy.

Originality/value – This study sheds light on the effect of leadership styles on sustainable organizational energy through organizational ambidexterity in family firms. In this context, the novelty of this study includes two perceptions. The first explored the impact of exploration and exploitation on sustainable organizational energy. The second investigates linear and nonlinear relationships to predict sustainable organizational energy determinants.

Keywords Sustainable organizational energy, Leadership styles, Bureaucratic leadership, Organizational ambidexterity

Paper type Research paper

Introduction

Leadership is vital to organizations because it drives their actions (Keegan and Den Hartog, 2004). Firms can achieve superiority by developing leaders who can interact effectively with employees and influence their perspectives by instilling leadership skills (Hadi *et al.*, 2018). Leaders identify suitable leadership styles to encourage commitment and passion for jobs (Thuijsman, 2015; Bjugstad *et al.*, 2006). Leaders adapt techniques and strategies to external and internal pressures faced in the business world (Chapman and Giri, 2017; Korkmaz, 2007). Therefore, leaders can develop organizational work by mastering ambidexterity (Yu *et al.*, 2018). Consequently, the leader seeks to influence employees toward the firm's goals. New ways of working must be sought because changes occur more frequently in the global environment than ever before (Blarr, 2012). Therefore, organizational ambidexterity is the core competence of contemporary organizations (O'Reilly and Tushman, 2013; Blarr, 2012). Moreover, ambidexterity can enhance the ability to understand and adjust to change in tricky situations (Stokes *et al.*, 2019).

March (1991) states that organizational ambidexterity consists of two dimensions, namely, exploration) and exploitation subdimensions/strategies. It emphasizes that organizations should research innovative ideas and processes to adapt to environmental change while using their existing products and services. Therefore, businesses that constantly renew themselves by using their existing resources effectively and efficiently and can be successful in the market can be considered ambidexterity organizations that implement both exploitation strategies and exploratory strategies. The exploitation dimensions include the use of existing knowledge, technologies, marketing methods, capabilities in a stable manner and the use of previous experience. This strategy contains mechanical structures, closely interconnected systems, routinization, process dependence, control and bureaucracy associated with the market and technologies. In a centralized organizational structure that encourages activity, cooperation and increasing production, the formation of a mechanical system under stationary conditions prepares an "exploitation" environment, because of which authority descends from top to bottom and is distributed to very few points. The exploration strategy involves using new ideas and processes in production. It includes developing services and marketing ways, using core elements such as diversity, risk-taking, flexibility and innovation. Developing exploration strategies for managers to cope with confusion, chaos, or uncertainty and live by targeting the future is required. In this dimension, employees are supported in taking risks, being flexible, experimenting, being autonomous and developing creative ideas within the organization through discovery (Raisch *et al.*, 2009, p. 686).

Academics have indicated organizations within ambidexterity will be able to motivate employees to explore and exploit creative ideas (Siero *et al.*, 1996). In this context, the enthusiasm and flexibility of human resources are increased to worker motivations (Ludema and Di Virgilio, 2007). The more vital organizational energy toward improvement leads to

greater organizational effectiveness (Dhawan *et al.*, 2002). Sustainable energy and leadership style increase human resources efforts toward achieving goals and facing challenges (Alexou *et al.*, 2019). In addition, exploration must be activated alongside exploitation to increase innovation in the long term. Therefore, exploiting and exploring are intrinsic factors linked with organizational ambidexterity (Bui *et al.*, 2021). According to Fries *et al.* (2021), which conducted a systematic review of leadership styles in family firms, there are over ninety-nine relevant articles. However, organizational ambidexterity has yet to be studied as a mediating variable between leadership style and sustainable corporate energy in family firms (Al Khajeh, 2018; Alnoor *et al.*, 2022c; Dhawan and Jeske, 2008).

Theoretically, several of the previous literature has examined leadership styles in family firms (e.g. Schenkel *et al.*, 2016; Arnold, 2017; Gonzalez *et al.*, 2017; Calabrò *et al.*, 2018; Richards *et al.*, 2019). Such studies and others have explored the impact of leadership styles on family business performance. However, there is a shortage of literature examining the effects of leadership styles on sustainable organizational energy in family firms by adopting organizational ambidexterity. In addition, leadership in family businesses differs from other businesses due to the compassionate considerations of such businesses (Mussolino and Calabrò, 2014).

There is a considerable study on leadership style adopted in family businesses (Cunningham *et al.*, 2016; Fries *et al.*, 2021). Leadership styles affect organizational success in family firms in less developed countries. CEOs in family firms have autocratic leadership and a value-laden leadership style affects the success of family firms. Leadership styles have been transformed by emotional intelligence and a vision for a sustainable family business (Effendy and Onong, 1993; Gregory and Keil, 2014).

The literature argues transformational and paternalistic leadership style is the leadership style to be applied in family businesses (Mussolino and Calabrò, 2014; Hauck and Prügl, 2015). However, to date, theoretically, there is insufficient understanding of the relationship between leadership styles and sustainable organizational energy in family firms (Hew *et al.*, 2019; Leong *et al.*, 2020; Raut *et al.*, 2018; Zikmund, 2016).

Practically, the lack of predictability of optimal leadership style for family businesses reduces sustainable organizational energy (Vandekerkhof *et al.*, 2015). Lack of conclusive evidence about the leadership style of family business due to the neglect of the literature conducting and adopting nonlinear approaches with PLS-SEM. Albahri *et al.* (2021a) conducted a systematic review of studies that used ANN with SEM. It was concluded there were 60 studies about the original approach and there needs to be such an approach to predict the leadership style used in family businesses. Basco *et al.* (2021) investigated using PLS-SEM as a suitable method for estimating nonlinear interactions. However, the ANN approach should have explained and explored nonlinear interactions between families and businesses. Therefore, it is possible to express that there is a limited paper on adopting dual-stage hybrid SEM and ANN approach in family business research. The main benefit of the ANN method is in predicting the leadership style of family businesses. In addition, such a method validates the SEM results (Khaw *et al.*, 2021). Hence, we ask: What leadership style is in Malaysian family businesses?

This study adopted the PLS-SEM method using SmartPLS 3.0 software to explore the causal relationships between the constructs. The methodology of the leadership style prediction framework in family businesses can be divided into two phases. The first stage discusses sample size and measurement. The second stage proposes the use of a dual-stage hybrid SEM-ANN approach. The PLS-SEM method includes the measurement model (outer model) and the inner model (structural model). A survey of family businesses in Malaysia was conducted to determine causal relationships and shed light on the antecedents of sustainable organizational energy in family firms. The ANN method was adopted to determine the leadership style used in Malaysian family businesses through non-compensatory relationships. Such arguments are supported by previous literature (e.g. Lee *et al.*, 2020; Albahri *et al.*, 2021a).

Also, despite extensive studies of leadership styles, challenges, development, opportunities and importance in the family business and organizational ambidexterity role on family businesses (Raish and Birkinshaw, 2008; Gibson and Birkinshaw, 2004; March, 1991; Jansen *et al.*, 2008) there is minimal research on the impact of leadership styles on the sustainability of organizational energy, using the mediator role of organizational ambidexterity in family firms.

Another research done by Nwuke (2017) has experimented with leadership strategies for a family business with medium sizes with the context of sustainability. The paper is limited to three family businesses in Lagos destination. The paper is based on transformational leadership theory and the theory of planned behavior. One of the quantitative studies, semi-structured face-to-face interviews, has been done in research. According to the results, there is positive social change by the middle-sized family business on leadership styles to sustain operations and future implications. Another conclusion of the paper is that the effects of leadership styles on sustainable job performance have close relations with increasing employment, income and well-being. Onyeukwu and Jekelle (2019) researched leadership styles' effects on success and sustainability in small family-owned businesses in Nigeria. The research is a case study using simple random sampling techniques. According to the conclusions, mentoring on human resources significantly affects sustainability management. Akinniyi *et al.* (2018) researched leadership requirements in successful small and medium-family businesses in Nigeria. According to the results, there are different ways for successful family owners in the northern part of Nigeria. Also, successful leadership styles should strengthen to prolong the lifespan of the small family business. Finally, some recommendations for industry owners for leadership succession in northern Nigeria.

Family firm manager/owner's organizational ambidexterity affected the decision-making process. Another study by Cao *et al.* (2009) has revealed that CEOs' or Owners' attitudes in family firms are involved in positive strategic decisions, leading to organizational ambidexterity. Finally, Richards *et al.* (2019) have studied organizational ambidexterity in family firms. They used multisource data on 109 family businesses and according to the results, organization ambidexterity in family businesses affects innovative decision-making. They also argued about the relationship between organizational ambidexterity, exploration and exploitation.

This study identifies the leadership style that most contributes to achieving sustainable organizational energy in family businesses. Thus, we develop research for leadership in family businesses by conducting linear and non-compensatory relationships. The paper also has challenges (Khaw *et al.*, 2021, 2022a; Alnoor *et al.*, 2022a). Since a family is a typical firm run by an owner, which has an essential effect on worker leadership and organizational energy and a family business composed of first-generation families, workers lack encouragement when participating in research. The antecedents of sustainable organizational energy in family firms were evaluated. The conceptual framework of this study explores the role of the organizational ambidexterity between leadership styles and sustainable organizational energy (Hadi *et al.*, 2018; Eneizan *et al.*, 2019; Fadhil *et al.*, 2021; Alnoor *et al.*, 2022d; Aymen *et al.*, 2019). Therefore, the gap in the previous literature is filled and opens exciting avenues for further research. The results of this study serve as guidelines and instructions for practitioners regarding the leadership style of family businesses (Albahri *et al.*, 2021a, b; Alhamdi *et al.*, 2019; Alharbi and Alnoor, 2022; Alnoor, 2020).

Literature review and hypotheses development

This section discusses the variables of this study leadership styles, organizational ambidexterity and sustainable organizational energy. Besides, the following section describes the hypotheses development in-depth.

Sustainable organizational energy

To increase and maintain efficiency, organizations use organizational energy to develop and assess job satisfaction since workers' psychological energy levels are reflected in various activities at work. In addition, the organizational energy comes from personal communication with individuals within the organizational boundary that is jointly created by all members of the organization (Stigter and Cooper, 2015). Consequently, most leaders recognize the importance of gauging organizational energy to ensure the success of creativity in organizations since active workers are more productive and creative in pushing their passion and enthusiasm into the depths of their work as compared to others who lack enthusiasm (Cross and Parker, 2004; Laumann *et al.*, 1985). The constancy of organizational energy depends on three aspects: the emotional element emphasizes positive emotions and the excitement associated with work, the cognitive aspect represents the exchange of intelligence that leads to sound thinking and the behavioral feature refers to the execution of joint efforts by members who contribute to organizational success (Alexiou *et al.*, 2019; Vine, 2019; Alnoor *et al.*, 2018; Wah *et al.*, 2022; Khaw *et al.*, 2022b). Energy refers to the willingness to contribute to work efficiently and effectively and thus increase productivity (Kim *et al.*, 2020; Preskar and Zizek, 2020). Organizational energy is the basis for compelling workplace motivation and employee involvement (Butt *et al.*, 2020). Thus, organizational energy drives economic and social development (Islam and Hassanuzzaman, 2020). However, executives are concerned about activating organizational capabilities to achieve strategic goals (Vine, 2019). As a result, most firms struggle to maintain basic levels of organizational productivity (Bossink, 2017). As a result, managers adopt leadership styles that enable conserving sustainable organizational energy (Bruch and Vogel, 2011). Therefore, the manager must understand that mobilizing and sustaining energy is a fundamental challenge influenced by leadership style (Fellmann *et al.*, 2020). To this end, the following section highlights the relationship between leadership styles and sustainable organizational energy (Alnoor *et al.*, 2020, 2022b; Atshan *et al.*, 2022; Al-Abrrow *et al.*, 2022; Abdullah *et al.*, 2022).

Leadership styles and sustainable organizational energy

Leadership influences and controls members to achieve organizational goals (Mussolino and Calabrò, 2014). Leaders are people who apply such influence and control. Therefore, the achievement of organizational goals is through the presence of an effective leader (Shen, 2003). An effective leader seeks direction by controlling and steering other individuals' feelings and behaviors in ways that help achieve a specific objective (Uchenwamgbe, 2013). A leader categorizes tasks to get employees to work together more efficiently as a method of influence (Hasibuan, 2005). Each leadership style depends on the skills and experience of the leader, team members and the task they want to accomplish (Kaleem *et al.*, 2013). The right leadership style must be chosen because leadership is one of the main determinants of success and failure in an organization by enhancing capabilities and skills (Al Khajeh, 2018). As a result, leaders may use a transactional leadership style that relies on expectations (Ojokuku *et al.*, 2012). The leader can also lead in an autocratic style, which means all organization members follow orders (Obiwuru *et al.*, 2011). Leadership can focus on values, ethics, skills, or motivation by embracing transformational leadership. Leaders focus on increasing human resources involvement in jobs to maintain an elevated level of organizational energy. Previous studies have shown a significant relationship between leadership and organizational energy (Bruch *et al.*, 2006). In addition, leaders motivate all members of the organization to participate in producing energy by providing independence, competence and commitment (Ludema and Di Virgilio, 2007).

High productivity is achieved by optimally challenging the members' energy (Bruch and Vogel, 2011). Therefore, two potential explanations exist for the superior levels of

organizational energy: firstly, the organization's ability to attract and retain human resources to work sustainably. Secondly, the leadership style used might be vital to sustainable organizational energy (Hannah *et al.*, 2010). Leaders develop positive energy among employees through flexibility, optimism and effectiveness (Yammarino *et al.*, 2008). In this regard, studies indicate the transformational leadership style is an effective method for overcoming negative trends in group work and enhancing energy. Furthermore, the leadership style motivates the organization's members to put in extra effort and develop ways to inspire more exploration and exploitation of the ideas discovered (Purwanto *et al.*, 2020). Leadership style improves employee satisfaction, enhances work energy and develops capabilities (Nguni *et al.*, 2006; Al-Abrrow *et al.*, 2019, 2021; Krishnan *et al.*, 2021). On the other hand, previous literature showed a negative relationship between leadership style and performance because leaders adopt arbitrary techniques that reduce motivation to make more effort (Fiaz *et al.*, 2017). Arbitrary leadership styles lead to failure in business and drain the workers' energy (Desveaux *et al.*, 1994). On the other hand, some studies show that transformational leadership has a relationship between organizational energy, innovation and development.

H1a. Transformational Leadership styles are positively related to sustainable organizational energy.

Transformational leadership comprises creative and innovative characters. Transformational leadership styles come from crucial elements such as empathy, relationship building, responsibility and innovation. These elements lead to positive outputs such as a trustworthy atmosphere, supporting employees' self-confidence and organizational energy. Transformational leaders have unique visions, such as sharing ideas with workers and giving some powers, including decision-making, to workers in family firms. As a result, family firms have good sustainable organizational energy and positive organizational culture with the help of the owner/CEO, who has a transformational leadership style (Krishnan *et al.*, 2021). Thus, the following hypothesis is developed:

H1b. Transactional leadership styles are positively related to sustainable organizational energy.

The bureaucratic leadership style needs to obey all rules and regulations according to the owner or CEO. Rules and regulations determine any time required by the bureaucratic leader. Also, a bureaucratic leader seems to be a supervisor or guide that obeys all the rules and procedures. According to Swarup (2013), a bureaucratic leadership style can be effective if employees need to work in a routine and understand the rules and vision of the business. But bureaucratic leaders ignore workers' motivation, development and organizational commitment and this leadership style can de-motivate employees and decrease job performance and corporate energy. According to previous studies, the following hypothesis has been developed:

H1c. Bureaucratic leadership styles are negatively related to sustainable organizational energy.

Leadership styles and organizational ambidexterity

Leadership style is an essential component with stable attributes to facilitate discipline and trust and support companies in achieving ambidexterity (Nemanich and Vera, 2009). Increasing ambidexterity encourages human resources to innovate, embrace change, recognize risks and participate in strategy development. Increasing such factors requires a suitable leadership style. Leadership style supports reducing stress and anxiety due to stressful work and home tasks. Therefore, leadership style increases or decreases the

processes of exploration and exploitation that lead to ambidexterity (Gibson and Birkinshaw, 2004). An effective leadership style is a dynamic way of dealing with complexity and change in competitive environments.

Organizational ambidexterity requires a basic level of exploration and exploitation. Firms cannot focus on exploration and neglect exploitation or vice versa. Many firms employ an effective leader that follows a critical leadership style to strike a balance between exploration and exploitation. Scholars argue exploration and exploitation are opposing when it comes to scarcity of resources or lack of experience. Many leaders make critical decisions and actions that encourage organizations to strike a balance between exploration and exploitation. Leadership styles include multiple roles that allow for the effective handling of complex and challenging situations. Exploiting creative ideas by adopting the concept of ambidexterity requires a leadership style that increases human resources empowerment and gives more confidence to achieve efficiency and learning (Nemanich and Vera, 2009).

Consequently, leaders provide a suitable combination of exploration and exploitation processes essential to organizational ambidexterity through bureaucratic, transactional and transformational leadership styles (Baškarada *et al.*, 2016). By adopting a transformational leadership style, human resources can participate in activities addressing conflict and stress (Gibson and Birkinshaw, 2004). Transformational leadership affects learning culture, openness and the decision-making process. These variables lead to organizational ambidexterity (Nemanich and Vera, 2009).

Besides, transactional leaders can achieve high levels of success by exploiting creative ideas and focusing on business development. It also means task-oriented leadership styles. Leaders with this leadership type can behave according to processes and actions and make decisions with different approaches for a sustainable organization. Transactional leadership is positively related to organizational ambidexterity and some issues related to job performance. On the other hand, bureaucratic leadership discourages employee participation and creates a sense of mistrust toward the business. Therefore, such a leadership style leads to a negative relationship between employees and the organization. According to previous studies, the following hypothesis has been developed:

H2a. Transformational leadership styles are positively related to organizational ambidexterity.

H2b. Transactional leadership styles are positively related to organizational ambidexterity.

H2c. Bureaucratic leadership styles are negatively related to organizational ambidexterity.

Mediator role of organizational ambidexterity

Organic structures are characterized by decentralization and learning to start creating ideas. On the other hand, mechanical systems contribute to a high centralization and control, which leads to disregarding innovation (Duncan, 1976). The ambidextrous approach represents a fundamental treatment that integrates exploration and exploitation through the combination of organizational practices for innovation generation and implementation. In recent years, an organization's ability to reconcile and efficiently manage business requirements in changing environments has gained increasing attention (Raisch and Birkinshaw, 2008).

Leadership styles (e.g. Transformational and transactional leadership) clearly define the organization's tasks, motivate members and increase their involvement in decision-making processes (Kaleem *et al.*, 2013). Consequently, many studies have proven that firms with ambidexterity can exploit existing competencies and explore new opportunities, increasing the organization's performance. As a result, prominent organizations attract more job

applicants (Cao *et al.*, 2009; Raisch *et al.*, 2009). Organizational ambidexterity has involved exploitation and exploration. The literature has argued that managers' decisions toward task completion positively relate to the exploitation process. However, employee experiences are linked to exploration processes with organizational energy (Attar and Kalfaoğlu, 2020).

The participation of human resources in decision-making enhances sustainable organizational energy and adaptability (Gibson and Birkinshaw, 2004). Furthermore, ambidexterity increases sustainable organizational energy by focusing on learning and control and encourages members to complete tasks and respond to changes (Simsek, 2009). In this context, the ambidextrous approach provides the members of the organization with an opportunity to take responsibility at work and infuse them with maximum organizational energy (Schudy and Bruch, 2010; Gibson and Birkinshaw, 2004). To improve sustainable organizational energy, members' intrinsic resources and emotional and cognitive aspects must be stimulated to increase and maintain organizational power (Schuby and Bruch, 2010). Research in organizational studies and family firms shows that managers who practice transformational leadership enhance organizational ambidexterity (Jansen *et al.*, 2008). In addition, leadership styles can be used to improve the exploration of beneficial activities (Qammar and Abidin, 2020). According to previous studies, the following hypothesis is proposed:

H3. Organizational ambidexterity is positively related to sustainable organizational energy.

H4a. The relationship between transformational leadership styles and organizational energy is mediated by organizational ambidexterity.

Organizational ambidexterity addresses the ability of the organization to explore and exploit opportunities to compete in mature technologies and markets. In addition, such an approach mixed control and innovation to maximum flexibility, independence and experimentation (O'Reilly and Tushman, 2013). The ambidexterity approach can be achieved by designing processes and systems that allow and encourage individuals to make decisions (Gibson and Birkinshaw, 2004; Baškarada *et al.*, 2016). Transactional leadership styles will lead to positive feelings such as enjoying the job, feeling freedom and linking to organizational culture. This leadership style is positively related to corporate energy and is affected by organizational ambidexterity (Jansen *et al.*, 2008; Cao *et al.*, 2009). A bureaucratic leadership style can be effective and successful when all workers have the same motivation and have strong feelings to work much more than routine. The hard-working, effort and effective team membership are beneficial when using a bureaucratic leadership style (Swarup, 2013). This affects organizational energy and ambidexterity. According to previous studies, the following hypothesis can be developed:

H4b. The relationship between transactional leadership styles and organizational energy is mediated by organizational ambidexterity.

H4c. The relationship between bureaucratic leadership styles and organizational energy is mediated by organizational ambidexterity.

Based on the proposed hypotheses, the conceptual model of this study was adopted by exploring the relationships between leadership styles (i.e. Transformational leadership, transactional leadership and bureaucratic leadership) and sustainable organizational energy through the mediation of the organizational ambidexterity as simplified in Figure 1.

Method

The methodology of the leadership style prediction framework in family businesses can be divided into two phases. The first stage discusses sample size and measurement. The second

stage proposes the use of a dual-stage hybrid SEM-ANN approach. These stages are discussed thoroughly in detail in the following sections.

Sample

Since Family businesses are linked to innovation and creativity, they create sustainable competitive advantages for companies (Ferreira *et al.*, 2021). Family businesses in Malaysia developed after the Second World War period. The pioneering foundations for such businesses were set after bridging the gaps between oil extraction, agriculture and mining. Moreover, family businesses in Malaysia have dominated organizational structures and forms (Yeoh and Hooy, 2020). Family businesses contribute about 67% of the gross domestic product and make up 70% of the companies listed on Bursa Malaysia (Morck *et al.*, 2005). Family businesses in Malaysia are managed through heredity due to family commitment. Family executives run family businesses in Malaysia and the rest of the family members are chosen as CEOs regardless of professionalism. To predict the leadership style of family businesses in Malaysia, this study investigates the effect of leadership styles on sustainable organizational energy in family firms using a dual-stage hybrid SEM-ANN approach.

A total of 197 listed companies from various sectors: consumer, construction, real estate, services and trading, were listed on Bursa Malaysia from 2015 to 2021. However, this study focuses on family businesses. Hence, 37 firms on the list were family firms. Selected family businesses were based on firms with family ties between shares of stock owned and board members by family members of at least 20% (Ibrahim *et al.*, 2020). On the other hand, Hair *et al.* (2021) confirmed the sample size should be greater than the structural paths in the structural model. Google form was used due to the COVID-19 pandemic and thirty-seven family businesses were targeted in Malaysia. This study used a filter question through the following question, "Do you work at the lower administrative level?" The filter question was used to target workers. If you are the head of a department or manager, please stop to fill out the questionnaire.

Data collection

528 questionnaires were collected, with an overall response rate of 91%. The demographics profile of respondents were 60% male and 20% female, 27% of the respondents were between the ages 20 and 24, 31% between 25 and 30, 21% between 31 and 34, 16% between 35 and 40 and 5% between 41 and 45 years old, respectively. Regarding education, 11% obtained a secondary degree, 29% obtained a diploma, 37% obtained a bachelor's and 23% received a postgraduate.

According to Hair *et al.* (2014), a normal distribution test was performed using SmartPLS software. The normal distribution analysis determined the data were normally distributed due to Skewness and Kurtosis values being less than +1 and −1. On the other hand, two methods were used to address the standard bias method. Firstly, we confirmed there is no

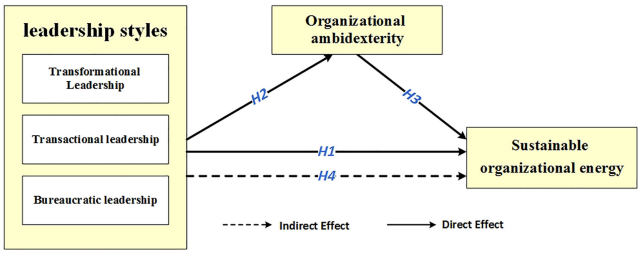

Figure 1.
Conceptual framework

need to mention the respondent's name. Secondly, a Harman single-factor test was adopted. The results showed the variance of the first factor was 25.8%; such a value does not exceed 50% (Podsakoff *et al.*, 2003). Therefore, there are no concerns about the common bias.

Measures

The questionnaires contained 50 items covering the three variables; To analyze the respondents' answers, a five-point Likert scale was used.

(1) *Leadership styles*: A sixteen-item scale developed by Tajasom and Ahmad (2011), Tibagwa *et al.* (2016) was used, which was divided into three dimensions: *Transformational Leadership*: 6 items (e.g. "Helps me to develop my strengths"); *Transactional leadership*: 5 items (e.g. "Provides me with assistance in exchange for my efforts") and *Bureaucratic leadership*: 5 items (e.g. "ensures that leaders follow the rules and procedures accurately and consistently"). The reliability for transformational leadership was 0.80, transactional leadership 0.79 and bureaucratic leadership 0.83.

(2) *Organizational Ambidexterity*: A twelve-item scale developed by Abuzaid (2016) was used, which was divided into two dimensions: Exploration: 6 items (e.g. "We frequently utilized new opportunities in new markets"). Exploitation: 6 items (e.g. "We improve our efficiency of the provision of products and services"). Reliability for the exploration was 0.78 and for the exploitation was 0.82.

(3) *Sustainable Organizational energy*: A twenty-two-item scale developed by Cole *et al.* (2012) was used, which was divided into four dimensions: Innovation: 6 items (e.g. "Members of the organization often bring many different ways to improve their workflow"). Entrepreneurial initiative: 6 things (e.g. "I engage in the project and businesses by providing a new perspective"). Integrity: 5 items (e.g. I recommend the company as an excellent place to build a career"). Focus: 5 things (e.g. "Write down key information needs based on goals"). Reliability for the innovation was 0.88, for the entrepreneurial initiative was 0.80, for the integrity was 0.73 and for the focus factor was 0.83.

Data analysis and operationalization

This section discusses data analysis using a dual-stage hybrid SEM-ANN approach. The SEM method involves the assessment of the measurement model and the evaluation of the structural model. The ANN method discusses sensitivity analysis and prediction of leadership styles used in family businesses. The following sections discuss the SEM-ANN approach in more detail.

PLS-SEM

This study adopted the PLS-SEM method using SmartPLS 3.0 software to explore the causal relationships between the constructs. The PLS-SEM method includes the measurement model (outer model) and the inner model (structural model).

Convergent validity. To evaluate the measurement model, convergent and discriminant validity were tested. Firstly, convergent validity involves the loading factor, which must exceed 0.7; the average variance extracted (AVE), which must exceed 0.5; the composite reliability (CR); and Cronbach's alpha which must exceed 0.7 (Hair *et al.*, 2014). Table 1. shows the loading factor values exceeded 0.7. In addition, EXR2, EXI3, EXI5, INN4, ING3 and FO5 items were deleted because they did not exceed 0.7. On the other hand, AVE, CR and Cronbach's Alpha values were statistically acceptable.

Factors	Subfactors	Items	Factor loading	AVE	CR	Cronbach's α
Leadership styles (First-order)	Transformational leadership	TFL1	0.838	0.587	0.833	0.793
		TFL2	0.828			
		TFL3	0.768			
		TFL4	0.715			
		TFL5	0.716			
		TFL6	0.720			
	Transactional leadership	TCL1	0.801	0.541	0.761	0.706
		TCL2	0.707			
		TCL3	0.673			
		TCL4	0.758			
		TCL5	0.731			
	Bureaucratic leadership	BL1	0.801	0.614	0.830	0.788
		BL2	0.795			
		BL3	0.805			
		BL4	0.782			
		BL5	0.734			
Organizational ambidexterity (Second-order)	Exploration	EXR1	0.685	0.610	0.827	0.893
		EXR3	0.818			
		EXR4	0.780			
		EXR5	0.853			
		EXR6	0.758			
	Exploitation	EXI1	0.697	0.627	0.809	0.906
		EXI2	0.837			
		EXI4	0.812			
		EXI6	0.815			
Sustainable organizational energy (Second-order)	Innovation	INN1	0.624	0.590	0.809	0.893
		INN2	0.788			
		INN3	0.812			
		INN5	0.864			
		INN6	0.730			
	Entrepreneurial initiative	EIN1	0.750	0.578	0.826	0.906
		EIN2	0.752			
		EIN3	0.805			
		EIN4	0.697			
		EIN5	0.750			
		EIN6	0.801			
	Integrity	ING1	0.893	0.620	0.802	0.893
		ING2	0.711			
		ING4	0.710			
		ING5	0.820			
	Focus	FO1	0.698	0.547	0.726	0.906
		FO2	0.699			
		FO3	0.665			
		FO4	0.878			

Note(s): EXR2, EXI3, EXI5, INN4, ING3 and FO5 items were deleted

Table 1.
Convergent validity

Discriminant validity. The PLS-SEM will be used to establish causal relationships between constructs. To this end, Hair *et al.* (2014) recommends using confirmatory factor analysis (CFA) to test measuring instruments' structural validity. A complete model was built for the variables and dimensions of the study. As illustrated in Table 2. the X^2/df = 2.91; CFI = 0.97; IFI = 0.95; NFI = 0.90; RMSEA = 0.70 SRMR = 0.81. The obtained values were acceptable for the structure of the current model according to the indicators of CFA as following simply:

Acceptable Matching Index,

(1) The ratio between X^2 (Chi-square) and df (degree of freedom) = X^2/df (1–3) (Chan *et al.*, 2007).

(2) Root means a square error of approximation= (RMSEA) 0.05 to 0.08.

(3) Square residual (SRMR), both must be less than 0.08 (Hooper *et al.*, 2008).

(4) Normed Fit Index (NFI) = Greater than 0.90 (Fidell and Tabachnick, 2003).

(5) Comparative Fit Index (CFI) = Greater than 0.95 (Chan *et al.*, 2007).

(6) Incremental fit indices (IFI) = Greater than 0.90 (Bentler and Bonnet, 1980)

The second test for the assessment of the measurement model is the discrimination test. Discriminant validity is the extent to which the constructs in a conceptual framework are unrelated. Besides, discriminant validity assesses the amount of relationship among the variables (Hair *et al.*, 2014). There are three types of such methods (i.e. Fornell and Larcker, the heterotrait-monotrait ratio of correlations and cross-loadings). This study adopted the Fornell and Larcker method to measure the discriminant validity. According to the Fornell and Larcker way, the square roots of the AVE should be greater than the correlations among the latent constructs (Hair *et al.*, 2014). Table 3 shows the square roots of the AVE for all constructs were more significant than the correlations among the latent constructs. Therefore, there is no concern regarding discriminant validity, indicating that the variables' measurements are differentiated.

Multicollinearity test. For hypothesis testing, the multicollinearity of the study variables should be examined. According to Hair *et al.* (2014), multicollinearity is the opacity variable that can be highly correlated. Furthermore, multicollinearity affects the results of the path model. Therefore, the correlations should be at most 0.9. Table 4 shows the correlations between the variables were less than 0.9. Thus, there is no concern about multicollinearity. Consequently, such results support the study's hypotheses because there is a positive

Table 2.
Assessing the models fit and acceptable matching index

Model	X^2/df	NFI	IFI	CFI	SRMR	RMSEA
Model 1	2.91	0.90	0.95	0.97	0.81	0.70

Variables	TFL	TCL	BL	EXR	EXI	INN	EIN	ING	FO
TFL	*0.766*								
TCL	0.584	*0.735*							
BL	0.452	0.521	*0.783*						
EXR	0.398	0.412	0.621	*0.781*					
EXI	0.556	0.452	0.354	0.511	*0.791*				
INN	0.425	0.336	0.452	0.421	0.632	*0.768*			
EIN	0.525	0.458	0.521	0.365	0.425	0.321	*0.760*		
ING	0.514	0.241	0.558	0.298	0.412	0.412	0.531	*0.787*	
FO	0.412	0.522	0.412	0.321	0.422	0.501	0.412	0.321	*0.739*

Table 3.
Fornell-Larcker criterion

Note(s): TFL = Transformational leadership; TCL = Transactional leadership; BL = Bureaucratic leadership; EXR = Exploration; EXI = Exploitation; INN = Innovation; EIN = Entrepreneurial initiative; ING = Integrity; FO = Focus

correlation between leadership styles and sustainable organizational energy and a significant correlation with organizational ambidexterity ($p < 0.01$).

Table 4 indicates that sustainable organizational energy got the highest mean (3.18) because of the importance of sustainable organizational energy at work. Attention should be paid to human resource energy because it is a vital factor for success. However, the mean for leadership styles and organizational agility is 2.91–2.50, respectively. According to the standard deviations, there was a decrease in the dispersion of the answer in the respondents' opinions.

Inspecting the structural model. Table 5 shows a bootstrapping method was adopted to obtain the inferential statistics. Hence, SmartPLS software was used to test hypotheses based on second-order analysis to explore linear relationships between variables (Hair *et al.*, 2014). Based on the assessment of the significance of the structural model, the impact of transformational leadership style on sustainable organizational energy (H1a) is statistically significant ($\beta = 0.204$ and $p < 0.05$). Thus, hypothesis H1a is supported. Accordingly, the (H1b), which represents the effect of the transactional leadership style on sustainable regulatory energy, was supported ($\beta = 0.164$ and $p < 0.05$). In addition (H1c), showed the effect of the bureaucratic leadership style on sustainable organizational energy was statistically significant and supported ($\beta = 0.211$ and $p < 0.05$). The hypothesis (H2a) includes the effect of transformational leadership style on organizational ambidexterity is statistically positive and significant at 5% ($\beta = 0.333$ and $p < 0.05$).

Variables		Mean	SD	1	2	3	4	5
1	Transformational leadership	2.91	0.86	1				
2	Transactional leadership	2.98	0.83	0.728**	1			
3	Bureaucratic leadership	2.95	0.89	0.568**	0.613**	1		
4	Organizational ambidexterity	2.50	0.81	0.609**	0.613**	0.728**	1	
5	Sustainable organizational energy	3.18	0.93	0.780**	0.713**	0.440**	0.610**	1

Note(s): $^{**}p < 0.01$

Table 4.
Descriptive statistics and correlations

Path direct effect		Estimate	S.E	C.R	*P*	Label
H1a	TFLS → SOE	0.204	0.230	0.886	0.003	Supported
H1b	TSLS → SOE	0.164	0.150	1.093	0.002	Supported
H1c	BLS → SOE	0.211	0.180	1.172	0.004	Supported
H2a	TFLS → OA	0.333	0.253	1.316	0	Supported
H2b	TSLS → OA	0.240	0.261	0.919	0.001	Supported
H2c	BLS → OA	0.183	0.209	0.875	0.003	Supported
H3	OA → SOE	0.264	0.191	1.382	0.001	Supported
Path indirect effect by organizational ambidexterity						
H4a	TFLS → SOE	0.190	0.098	1.938	0.002	Supported
H4b	TSLS → SOE	0.170	0.167	1.017	0.001	Supported
H4c	BLS → SOE	0.200	0.178	1.123	0.003	Supported
Total effect						
	LS → SOE	0.363	0.389	0.933	0.001	Supported

Note(s): TFLS = Transformational Leadership Styles; TSLS = Transactional Leadership Styles; BLS = Bureaucratic Leadership Styles; OA = Organizational Ambidexterity; SOE = Sustainable Organizational Energy
$^{***}p < 0.001$

Table 5.
Assessment of structural model

The (H2b) represents the effect of the transactional leadership style on organizational ambidexterity is positive and significant ($\beta = 0.240$ and $p < 0.05$). While the (H2c) showed the effect of bureaucratic leadership style on organizational ambidexterity was supported ($\beta = 0.333$ and $p < 0.05$). Finally, the impact of organizational ambidexterity on sustainable organizational energy (H3) is statistically positive and significant ($\beta = 0.183$ and $p < 0.05$). On the other hand, the indirect effect of hypothesis (H4a, H4b and H4c) involves the influence of transformational, transactional and bureaucratic leadership styles on sustainable organizational energy through the mediator variable (organizational ambidexterity). Using bootstrapping, the results showed organizational ambidexterity mediates the relationships between transformational leadership, transactional leadership, bureaucratic leadership styles and sustainable organizational energy ($\beta = 0.190$, 0.170, 0.200 and $p < 0.05$), respectively.

ANN approach

As shown in Table 6, the mean values of the RMSE for training and testing are 0.265 and 0.364, respectively. Small and similar mean RMSE values show that the ANN model can provide high prediction accuracy and fit the data well, as illustrated in Figure 2. The fit of the predictors was verified by the amount of non-zero synaptic weights associated with hidden neurons (Ferasso and Alnoor, 2022; Wah *et al.*, 2022; Alnoor *et al.*, 2022e).

Sensitivity analysis was performed to predict the contribution of leadership styles to the sustainability of organizational energy. We calculated normalized significance in terms of percentage based on the proportional significance fraction of each input neuron divided by the most significant relative importance (Table 7). The result reveals that organizational ambidexterity is the most critical predictor of sustainable organizational energy, followed by bureaucratic, transactional and transformational leadership styles. In terms of the overall contribution of input neurons (Table 8), organizational ambidexterity is the most contributing predictor, followed by bureaucratic leadership style.

Table 8 shows the hidden neuron of H (1:2) is the most contributing. In contrast, H (1:3) is the most inhibited cryptic neuron, followed by H (1:1). The result shows that the ANN model predicted 99.7% of sustainable organizational energy.

Table 6.
The RMSE for training and testing processes in a ten-fold ANN

	Input neurons: TFLS, TSLS, BLS, OA Output nodes: SOE						
	Training			Testing			
Neural network	N	SSE	RMSE	N	SSE	RMSE	Total
1	406	281.638	0.281	122	45.849	0.395	528
2	411	215.998	0.235	117	24.329	0.273	528
3	411	149.586	0.138	117	18.044	0.121	528
4	406	274.446	0.278	122	41.393	0.351	528
5	401	262.852	0.306	127	43.298	0.349	528
6	413	231.143	0.300	115	40.482	0.355	528
7	404	199.306	0.201	124	49.843	0.359	528
8	410	287.616	0.268	118	46.493	0.364	528
9	404	229.372	0.247	124	46.332	0.425	528
10	407	345.764	0.401	121	76.624	0.649	528
Mean		247.772	0.265		43.269	0.364	
SD		54.660	0.069		15.594	0.131	

Note(s): TFLS = Transformational Leadership Styles; TSLS = Transactional Leadership Styles; BLS = Bureaucratic Leadership Styles; OA = Organizational Ambidexterity; SOE = Sustainable Organizational Energy; *N* = number of data; SSE = sum square of error, RMSE = Root Mean Square of Error

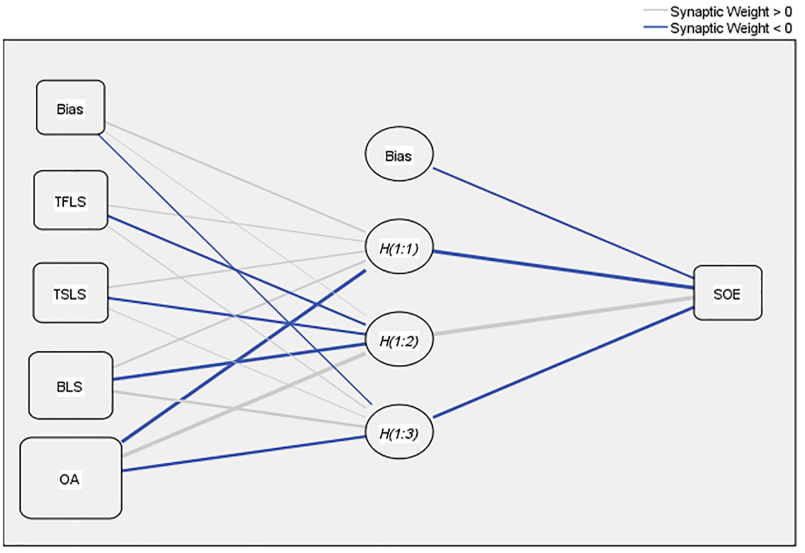

Figure 2.
ANN model

Neural network	Relative importance TFLS	TSLS	BLS	OA
1	0.189	0.168	0.266	0.377
2	0.192	0.224	0.272	0.312
3	0.210	0.179	0.261	0.350
4	0.180	0.220	0.250	0.350
5	0.183	0.215	0.230	0.372
6	0.185	0.207	0.274	0.334
7	0.171	0.208	0.271	0.350
8	0.180	0.202	0.234	0.384
9	0.156	0.182	0.280	0.382
10	0.180	0.167	0.270	0.384
Mean relative importance	0.200	0.206	0.251	0.343
Normalized importance (%)	58.4%	60.1%	73.4%	100.0%

Note(s): TFLS = Transformational Leadership Styles; TSLS = Transactional Leadership Styles; BLS = Bureaucratic Leadership Styles; OA = Organizational Ambidexterity; SOE = Sustainable Organizational Energy

Table 7.
Sensitivity analysis

Discussion

The current study aimed to explore and understand how sustainable organizational energy responds to leadership styles in family firms. Hence, this study also attempted to discover the role of organizational ambidexterity in explaining the relationship between leadership styles and sustainable organizational energy using a dual-stage hybrid SEM-ANN approach.

According to the results, the variables had correlations that were less than 0.9. The findings are consistent with the study's hypotheses since there is a significant association (p 0.01) between organizational ambidexterity and sustainable organizational energy, as well

Table 8.
Average weights of the input and hidden neurons in the ten-fold ANN

Predictor		Predicted Hidden layer 1 H(1:1)	H(1:2)	H(1:3)	Output layer SOE
Input layer	(Bias)	0.524	0.060	−0.398	
	TFLS	0.359	−0.763	0.234	
	TSLS	0.474	−0.809	0.181	
	BLS	0.551	−1.612	0.811	
	OA	−1.644	2.946	−1.389	
Hidden layer 1	(Bias)				−0.682
	H(1:1)				−1.805
	H(1:2)				3.645
	H(1:3)				−1.504

Note(s): TFLS = Transformational Leadership Styles; TSLS = Transactional Leadership Styles; BLS = Bureaucratic Leadership Styles; OA = Organizational Ambidexterity; SOE = Sustainable Organizational Energy

as a positive correlation between leadership styles and both. Similar findings indicate that leadership style positively links to sustainable corporate energy (Nwuke, 2017; Onyeukwu and Jekelle, 2019).

According to the results, the variables had correlations that were less than 0.9. The findings are consistent with the study's hypotheses since there is a significant association (p 0.01) between organizational ambidexterity and sustainable organizational energy, as well as a positive correlation between leadership styles and both. Similar findings indicate that leadership style positively links to sustainable organizational energy (Nwuke, 2017; Onyeukwu and Jekelle, 2019). Due to the significance of sustainable organizational energy at work, sustainable organizational energy received the highest mean (3.18) in the results due to significance at work (Sandberg *et al.*, 2022; Zaidan *et al.*, 2022). The energy of human resources should be taken into consideration because success depends on it. According to Vandekerkhof *et al.* (2015), the inability to forecast the best leadership style for family businesses diminishes the energy the organization can sustain. Additionally, according to Islam and Hasanuzzaman (2020), organizational energy plays a crucial part in the success of human resources. However, the mean for organizational dexterity and leadership styles is 2.91 and 2.51, respectively.

The first hypothesis, sustainable organizational energy and transformational leadership styles are positively correlated. The findings demonstrate that the impact of transformational leadership on sustained organizational energy (H1a) is statistically significant. As a result, hypothesis H1a is supported. Organizational energy and transformational leadership are related. As a result, the hypothesis (H1b), which describes how transactional leadership style affects sustainable regulatory energy, was supported (0.164 and p 0.05). Family businesses benefit from the owner/transformational CEO's leadership style to have intense, sustainable organizational energy and a positive organizational culture. Additionally (H1c), demonstrated that the impact of the bureaucratic leadership style on sustainable organizational energy was statistically significant and supported ($\beta = 0.211$ and $p < 0.05$). We have similar findings to Swarup (2013), who found that a bureaucratic leadership style can be effective if employees follow regulations and clearly understand the company's goals. Additionally, bureaucratic leaders' dismissal of employee commitment, job performance and motivation is supported. This behavior might demotivate workers and lower job performance and organizational energy.

The influence of transformational leadership style on organizational ambidexterity is statistically significant and positive ($\beta = 0.333$ and $p < 0.05$), according to the second

hypothesis (H2a). Nemanich and Vera (2009) assert that transformational leadership impacts decision-making processes, openness and learning culture. Ambidexterity inside organizations is a result of several factors. The (H2b) hypothesis states that the transactional leadership style has a positive and significant effect on organizational ambidexterity ($\beta = 0.240$ and $p < 0.05$). Organizational ambidexterity and various difficulties relating to job performance are positively correlated with transactional leadership (H2c) supported ($\beta = 0.333$ and $p < 0.05$) to the effect of bureaucratic leadership style on organizational ambidexterity.

Bureaucratic leadership has a negative effect on employee readiness and creates a sense of distrust of the company. Thus, such a leadership style leads to a negative relationship between employees and the organization. The third hypothesis states that the effect of organizational ambidexterity on sustainable organizational energy (H3) is statistically positive and significant ($\beta = 0.183$ and $p < 0.05$). Leaders in companies who apply transformational leadership help improve the organization's ambidexterity (Jansen *et al.*, 2008). According to Qammar and Abidin (2020), leadership styles can be used to enhance the exploration of purposeful activities.

The fourth hypothesis (H4a, H4b and H4c) concerns the influence of transformational, transactional and bureaucratic leadership styles on sustainable organizational energy through the mediating variable (organizational ambidexterity). According to the results shown, organizational ambidexterity averages the relationships between transformational leadership, transactional leadership, bureaucratic leadership styles and sustainable organizational energy ($\beta = 0.190$, 0.170, 0.200 and $p < 0.05$). Transactional leadership styles motivate employees and lead to positive feelings such as having fun at work, feeling free and being connected to the organizational culture. This leadership is positively related to organizational energy and is mediated by organizational ambidexterity.

Sensitivity analysis shows that organizational ambidexterity is the most critical predictor of sustainable organizational energy, followed by bureaucratic leadership, transactional leadership and transformational leadership. In terms of the total contribution of input neurons (Table 8), organizational ambidexterity is the most important predictor, followed by bureaucratic leadership style. Organizational ambidexterity refers to the organization's ability to explore and exploit opportunities to compete in mature technologies and markets. Furthermore, such an approach combines control and innovation to maximize flexibility, independence and experimentation (O'Reilly and Tushman, 2013).

The results confirm a positive and significant relationship between leadership styles and sustainable organizational energy. In addition, organizational ambidexterity mediates the relationship between leadership styles and sustainable organizational energy. On the other hand, the ANN method is based on nonlinear and compensatory relationships; such a method predicts bureaucratic leadership style is prevalent in Malaysian family businesses. Therefore, leadership styles encourage human resources to perform high-energy and vitality tasks. Furthermore, the bureaucratic leadership style in family businesses increases job immersion and positive motivations toward challenges facing work. These arguments and findings align with previous literature (Vallejo, 2009). Human energy is a core competency that must be taken into consideration by leaders as it is a critical tool for exploring and exploiting ideas.

The energy of human resources enhances sustainable energy in organizations to achieve goals and plans. Previous literature has confirmed transformational leadership style and paternalistic leadership are the dominant patterns in family businesses (Hauck and Prügl, 2015). However, the results of the current investigation based on linear and non-compensatory relationships open new horizons for future research by exploring that bureaucratic leadership is the best way to achieve sustainable organizational energy in family firms. The bureaucratic leadership style is characterized by maintaining the firm's size

small. Therefore, the small size is beautiful because small companies are distinguished by their flexibility and rapid response to market changes. The bureaucratic leadership style of Malaysian family businesses provides quick answers to changing customer demands. In addition, family businesses in Malaysia have a more outstanding organizational commitment to working on various non-specialized tasks. Nevertheless, the bureaucratic leadership style increases the boredom and withdrawal of human resources working in family businesses, which hinders the strengthening of organizational capacity. Such arguments are in line with the previous studies (Kaleem *et al.*, 2013; Thuijsman, 2015).

Family businesses in Malaysia have a flat and hybrid structure that encourages entrepreneurship and innovation. The mediating role of organizational ambidexterity confirms family businesses in Malaysia can explore and exploit ideas. The world is dramatically changing through technology development or the recruitment of ingenious human minds. Many firms strive to perform tasks with high idealism. Firms focus on developing the capabilities to explore and exploit opportunities and creative ideas. The dominant style of leadership influences companies to break out of the norm by creating and sharing ideas so that employees feel their presence has intrinsic meaning and value in the organization. Organizational ambidexterity stimulates the productive, behavioral and emotional aspects of completing work with high accuracy and proficiency. Thus, the ambidexterity approach is integrated with the leadership style in family businesses to sustain the organizational energy of human resources. These arguments are in line with the findings of previous studies (e.g. Gibson and Birkinshaw, 2004).

Leadership styles influence increasing the level of organizational energy. Organizational ambidexterity increases the positive impact of such a relationship. Ambidexterity contributes to an increase in the sustainable organizational energy of human resources toward work. Future literature should pay more attention to organizational ambidexterity because of the enhanced exploration and exploitation of creative ideas in family businesses. These findings were supported by previous literature (e.g. Vraga *et al.*, 2015). The ambidexterity approach to Malaysian family businesses combines the characteristics of large companies, easy access to resources and the flexibility of small businesses. Therefore, ambidexterity plays a vital role in the sustainability of organizational energy.

Contributions of study

The contributions section discusses the implications of this study. This section includes the theoretical and practical implications. First, theoretical implications explain the study's contributions to the literature on family businesses. The second section discusses the practical implications that provide guidelines for practitioners to sustain organizational energy.

Theoretical implications

This study identifies a set of theoretical contributions to the family business literature that can be identified as follows. Firstly, the empirical results of the survey indicate leadership style is an essential concept of organizational energy sustainability in family businesses (Yammarino *et al.*, 2008; Stokes *et al.*, 2019). According to the evidence of the current study, family businesses can rely on bureaucratic leadership to increase levels of exploration and exploitation and the sustainability of organizational energy. Moreover, suitable leadership styles contribute to family businesses' societal and economic development (Ojokuku *et al.*, 2012). In addition, adopting a bureaucratic leadership style in family firms does not confuse and keeps the firm size small. However, restrictions and official decisions led to a reduction in issues of corruption and graft, which in turn led to sustainable organizational energy. In line

with Basco *et al.* (2021) recommendations on nonlinear relationships in family businesses, this study adopted the SEM and ANN models to explain and explore nonlinear and causal interactions between families and businesses. Such a method contributed to the literature by describing family businesses' distinct behaviors and outcomes.

There needs to be more testing for linear and nonlinear relationships in family business studies. This study addresses this concern by filling a methodological gap for estimating nonlinear and compensatory relationships. Hence, a dual-stage hybrid SEM-ANN approach provides insight into how organizational energy can be developed and sustained. Family businesses can be generated from an individual or collective perspective based on activating the exploitation and exploration operations to support organizational energy. Applying the SEM and ANN models contributes to developing family business theories. Thus, the business of such firms is the vital artery of many of the world's economies. Exploration and prediction of the leadership style used in family businesses determine the mechanisms of family management through personal relationships with members. Non-compensatory relationships reflect the reality of family businesses.

On the other hand, nonlinear and causal interactions revealed that transformational leaders reduce the likelihood of evading responsibility and blaming members. A transformational leadership style maintains sustainable organizational energy by increasing opportunities to explore ideas. The empirical results confirm a hierarchy of authority and responsibility at the workplace by avoiding mixed and randomly delegating tasks. The results of the current study raise interesting theoretical implications about the use of family businesses in Malaysia's three leadership styles (i.e. Transferrable, transactional and bureaucratic). These findings raise new prospects for future research on developing leadership theories in family businesses. Literature explores patriarchal leadership as a typical pattern in family businesses.

Nevertheless, this study opened new horizons by identifying three leadership styles that can sustain organizational energy. In this context, two critical issues were emphasized, the first is maintaining the firm's success and the second is the process of exploration and exploitation. The mentioned issues are prerequisites for the survival of family businesses in a competitive environment. Deep analysis by integrating two-step SEM and ANN techniques has expanded the scope of sustainability in family businesses. Furthermore, the hybrid model contributed to exploring new directions in organizational studies by clarifying that exploration and exploitation are not only related to hybrid structures. Still, they need leadership styles that increase organizational ambidexterity. The theoretical contributions are supported by previous literature.

Practical implications

From a practitioner's perspective, the dual-stage hybrid SEM-ANN approach develops a more realistic interpretation of the interrelationship between leadership styles and sustainable organizational energy in family firms at the individual, group and organizational levels. This study contributed to improving the management of family businesses by identifying the leadership style that most contributes to the exploration and exploitation of creative ideas. Practitioners can use the current investigation findings as guidelines for developing knowledge for decision-making within family businesses. Family businesses in Malaysia have adopted bureaucratic leadership that reduced corruption and destructive powers. The non-linear approach expanded the practical perspective by predicting the factors contributing to organizational energy sustainability. Moreover, the limited exploration of common leadership patterns in family businesses based on linear and non-linear relationships is an open issue for practitioners and academics. The study of sustainable organizational energy in family businesses contributed to shedding light on how such companies are managed.

The literature on family businesses has answered whether family-oriented goals are good or bad for business success. Adopting a non-compensatory and non-linear approach highlights the factors that lead to positive or negative outcomes for the success of family businesses. Therefore, managers must use the autocratic leadership style because such a style is based on strict rules and laws that undermine cooperation and harmony among human resources. Surviving in a competitive environment requires family businesses to have novel types of leadership, such as transactional and transformational leadership, that motivate action and facilitate change. Increased collaboration and enhanced team culture improves the employee's sense of relevance in the workplace and develops motivation to continue flourishing. Additionally, practitioners should highlight the technical and cognitive capabilities of the employees to enhance sustainable organizational energy. Finally, practitioners should understand the difficulty of identifying the applicable mechanisms for family businesses that can support ambidexterity.

Organizational ambidexterity focuses on creating a balanced system of processes that make human resources part of an efficient system while allowing them to make the ideal decisions (Gibson and Birkinshaw, 2004). However, increased exploration and exploitation require family business practitioners to develop reward systems for winning ideas for development. Practitioners can promote employees based on implementing ideas into actual products and services. Managers are responsible for increasing exploitations for ambidexterity in the workplace (O'Reilly and Tushman, 2013). To maintain sustainable organizational energy, leaders must possess efficiency and learning skills in leadership roles. Leadership should reflect the speed of response to change in the external environment.

Moreover, developing exploration and exploitation of creative ideas in all organizational departments supports human resources in continuing the work and achieving goals with determination (March, 1991). In addition, family firms are the most competitive companies in the business. Therefore, leaders and practitioners must encourage creativity and idea generation to give members sufficient strength to work and focus on goals that support building sustainable organizational energy. Finally, the empirical evidence highlighted improving ambidexterity is achieved through improving the cognitive, behavioral and administrative aspects.

Conclusion

This study aimed to shed light on the influence of leadership styles on the sustainability of organizational energy through the mediating role of organizational ambidexterity. Also, the paper has a research question: Does leadership styles affect the sustainability of organizational energy through the mediating role of organizational ambidexterity in the family business? And it is likely to answer this fundamental question. To this end, a questionnaire was distributed to 528 working in family businesses. This study adopted a dual-stage hybrid SEM-ANN approach to explore linear and non-compensated relationships. The SEM method contributed to identifying the causal relationships between the constructions.

According to the analysis, it is possible to express some meaningful findings. First, the results confirm a positive and significant relationship between leadership styles and sustainable organizational energy. In addition, organizational ambidexterity mediates the relationship between leadership styles and sustainable organizational energy. On the other hand, the ANN method is based on nonlinear and compensatory relationships; such a method predicts bureaucratic leadership style is prevalent in Malaysian family businesses. Therefore, leadership styles encourage human resources to perform high-energy and vitality tasks. Furthermore, the bureaucratic leadership style in family businesses increases job immersion and positive motivations toward challenges facing work.

The results concluded there are direct relationships between leadership styles and organizational ambidexterity. Besides the causal relationships explored, there is a direct

relationship between organizational ambidexterity and sustainable organizational energy. Moreover, organizational ambidexterity mediated the relationship between leadership styles and sustainable corporate energy. However, the results of non-compensatory relationships based on the ANN technique revealed organizational ambidexterity is the most determinant of sustainable organizational energy in family firms, followed by bureaucratic leadership. This study highlights several theoretical contributions, including revealing three basic leadership styles in family businesses. From the practitioner's perspective, the results of this study contributed to guiding practitioners on how to sustain organizational energy. Hence, the exploration and exploitation processes are essential to achieve sustainable organizational energy.

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