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Path Analysis of People's Thinking and Its Influence on Industrial Revolution 4.0 Adoption: Case of Vietnam

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Abstract: This study delves into the intricate relationship between social factors and the successful implementation of the Industrial Revolution 4.0 in the context of Vietnam's developing economy. By focusing on the influences of people's thinking, behaviors, social lives, and societal norms, the research sheds light on key determinants that shape the efficiency of adopting Industry 4.0. The findings reveal a positive correlation between people's thinking towards manufacturing, industrial activities, and the quality of work with the effective implementation of the Fourth Industrial Revolution. Moreover, the study uncovers how people's behavior, both within organizations and in broader societal contexts, plays a pivotal role in driving the adoption of Industry 4.0, especially in response to technological shifts and market dynamics. Additionally, the research highlights the significance of people's social lives in facilitating the adoption of Industry 4.0, emphasizing the impact of interactions, communication, and education levels on the application of advanced technologies in various economic sectors. The study underscores the mediating role of social norms in bridging the gap between people's thinking, behaviors, and the successful implementation of the Industrial Revolution 4.0. By exploring how social norms are influenced by individuals' thinking and behaviors, the research elucidates the crucial link between societal norms and the effectiveness of Industry 4.0 adoption. The study not only contributes theoretically to the understanding of Industry 4.0 but also offers practical insights for policymakers, economists, and industrialists in Vietnam. By addressing the limitations of previous research and emphasizing the need for a comprehensive analysis of social and economic factors, this study aims to guide future studies and initiatives aimed at fostering a conducive environment for the successful integration of Industry 4.0 practices in Vietnam's manufacturing sector.

Keywords: Industry 4.0, Vietnam, Social factors, Technology adoption, Manufacturing sector, Social norms, Economic development, Technological integration.

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1. Introduction

The industrial sector and the global economy have evolved significantly in recent years due to the constant technological advancement that brought about the Industrial Revolution. The Industrial Revolution first appeared in 2011 on the part of the German government as an initiative for its high-tech policy (Vaidya, Ambad, & Bhosle, 2018). The fourth industrial revolution is the link between autonomous and independent devices, able to communicate in real time and coordinate in the smart environment through smart devices, thus facilitating decision-making and applying actions based on the collected information. This industrial revolution is classified into vertical, horizontal, and end-to-end integration. With the significant elements

of Industrial Revolution 4.0, like big data, robots, cyber-physical systems, virtual reality, the Internet of things, and cloud computing, the collaboration between people and people, people and machines, and machines and machines facilitates manufacturing more productivity, and thus, improves the efficiency of business activities and quality of life (Bortolini, Ferrari, Gamberi, Pilati, & Faccio, 2017).

Along with many benefits that past literary articles have shown, the fourth industrial revolution brought more benefits, like improved product quality, collaboration between stakeholders, and reduced time (Cetrulo & Nuvolari, 2019). Implementing the Industrial Revolution 4.0 overcomes many serious challenges like high costs, new procedure requirements, instant organizational changes, and uncertainty of laws. The highly experienced scholars Bibby and Dehe (2018) have stated that awareness and understanding of business organizations and people about the change is one of the most critical challenges of the Industry 4.0 revolution. This awareness and knowledge of change help organizations to apply the Industry 4.0 revolution in operations and production. This awareness and understanding are improved by the social interaction of people within or outside the business organizations and that is the reason of increasing level of Industry 4.0 revolution adoption and shown in Figure 1. The main focus of our study is to analyses the contribution of people's thinking, people's behaviors, and their social life into the application of the Industrial Revolution 4.0.

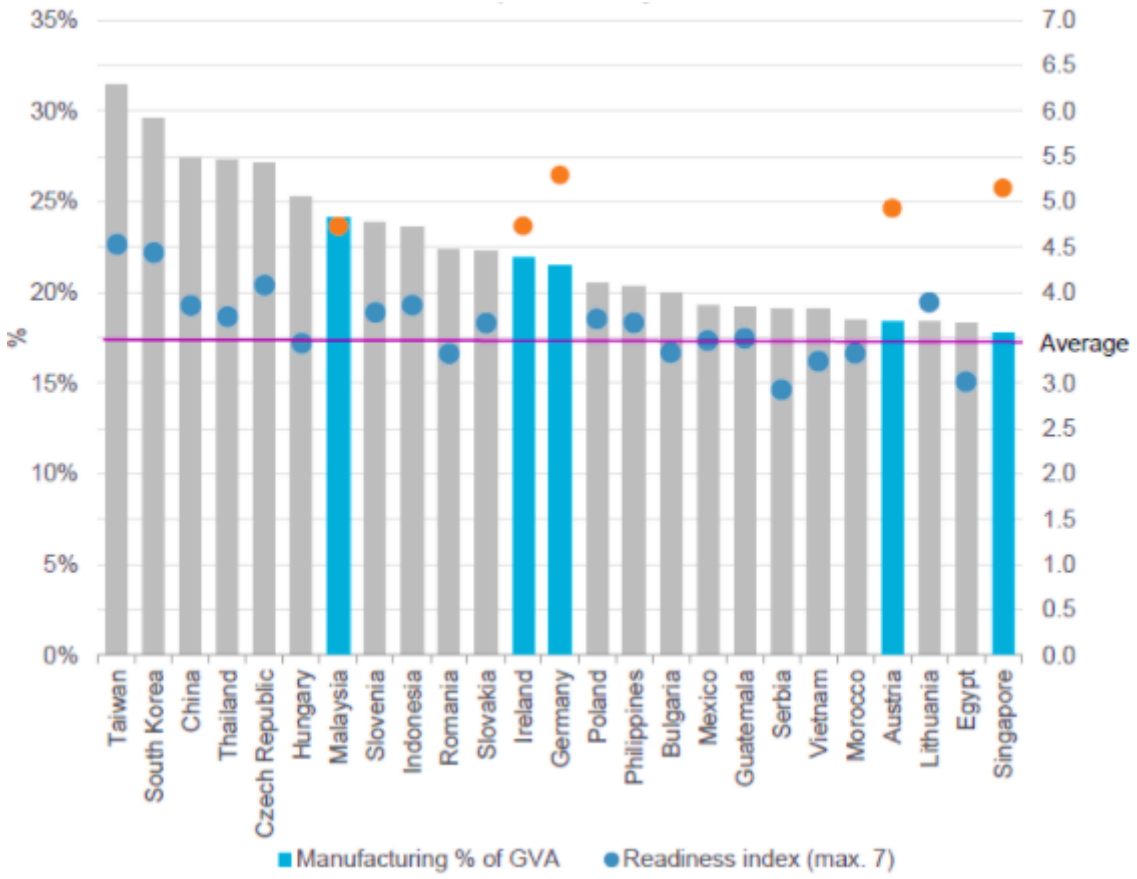

Figure 1: Readiness of Top 25 Countries to Adopt Industry 4.0

Source: United Nations Industrial Development Organization (UNIDO) (2019)

Our study examines the influences of some social factors like people's thinking, behaviors, social life, and social norms on the application of the Industrial Revolution 4.0 in the economy of Vietnam. Vietnam is a developing, lower-middle-income country. The economy of Vietnam is a socialist-oriented market economy. Regarding the nominal gross domestic product, Vietnam is the 36th largest economy in the world, while in purchasing power parity, it is the 23rd largest economy (NGUYEN & LUU, 2020). The government of Vietnam plans to implement policies that assist the economy with active participation in the Industry 4.0 revolution. The government has promoted technology, creative innovation, and science to contribute to the

fourth industrial revolution. The level of active contribution in this regard is still shallow. That is why resolution no. 52 focuses on using Industry 4.0 to have a position in the top three ASEAN countries by 2025. Thus, it wants to raise the share of the digital economy in GDP to 20%. It also plans to increase productivity by over 7% (Bigliardi, Bottani, & Casella, 2020).

The nature of Industrial Revolution 4.0 is the digital campaign aiming to digitize society, enterprises, and state management. The release said that the state of Vietnam would support the digital transformation in businesses, social areas, and current manufacturing sectors to enhance resource use efficiency, competitiveness, and innovation in new industries and products. The research by NGUYEN and NGUYEN (2020) has stated that in Vietnam, the level of implementation of Industrial Revolution 4.0 is still low. However, compared to the beginning of the application of the Industrial Revolution 4.0 in Vietnam, automation and data exchange in production and other business organizations have increased to some extent. This research has proved that the thinking of people within the business organizations, their social-economic behaviors, their social life, and favorable changes in social norms have also significantly contributed to the efficiency and effectiveness of the Industrial Revolution 4.0 implemented in all the sectors of the country. Primi and Toselli (2020) on the Industrial Revolution 4.0 in different areas of the economy of Vietnam suggests that as there is still a strong need to implement all the elements of the fourth industrial revolution, positive change should be brought into the thinking of people within the business organizations, their social-economic behaviors, their social life, and favorable changes in the social norms.

2. Theoretical Overview of the Main Concepts

The Industrial Revolution 4.0 has brought about the digital revolution, which has occurred for half of the last century. It is the current trend of data exchange and automation in manufacturing technologies and techniques. It comprises big data, robots, cyber-physical systems, virtual reality, the Internet of Things, and cloud computing. It refers to the combination of smart technologies, smart devices, and intelligent techniques in business organizations to raise productivity, improve the efficiency of business operations and the quality of products and services, reduce waste, and minimize time operation and production. The effective implementation of the Industrial Revolution 4.0 also improves the quality of the product, enhances the quality of customer relationships, and develops the skills and abilities of human resources (Raj, Dwivedi, Sharma, de Sousa Jabbour, & Rajak, 2020). To implement the Industrial Revolution 4.0 within different country areas, proper awareness and understanding of this revolution, better interaction, improved communication, and financial well-being are needed, which is possible if the people's thinking, behaviors, social life, and norms are positive. Many previous studies, like Ghobakhloo (2020), have shown the contribution of these social factors to the application of the Industrial Revolution 4.0 in different economic areas. The current study explores the influences of the aforementioned social factors on applying the Industrial Revolution 4.0 in previous studies.

Bittencourt, Alves, and Leão (2019) reveal that the thinking of people there affects the implementation of any revolution in any area of life. Industrial Revolution 4.0 is great in the manufacturing sectors in all economies. As this industrial evolution brings a drastic change in the manufacturing organizations and the social lives of people, different people within and outside the manufacturing organizations have different views about it. The thinking of the people affects the degree of implementing the Industrial Revolution 4.0 in manufacturing organizations. The Industrial Revolution 4.0 is a modern age; almost everyone wants innovation in the goods or services they buy, most often to satisfy their sense of social prestige and better use. The people who wish to innovate in products and services and think that the use of smart information technology, smart production technology, techniques, and processes will give products and services that come up to their standard innovation and social prestige, encourage the implementation of Industrial Revolution 4.0 (Oliveira, Liboni, Cezarino, Stefanelli, & Miura, 2020). Under Industrial Revolution 4.0, a cyber-physical system is used in manufacturing organizations during operations or production procedures. These systems monitor the environment and physical processes; if they find any unfavorable change or disturbance, they alert the people there and control the situation. People within the manufacturing organization or those near that organization who want security from sudden accidents, such as breakage

of something, theft, fire spreading, or any disturbance in the production process, may cause health damage to prefer to implement Industrial Revolution 4.0 in the manufacturing organizations. People are becoming aware of environmental issues (Nawaz et al., 2020), which industrial enterprises mainly raise. The people who have somewhat negative thinking about the operations of the current manufacturing organization that it causes environmental pollution (Nawaz et al., 2021) want and force the organization to adopt the Industrial Revolution 4.0 as it assures pollution-free production by applying automatic smart technology (Reischauer, 2018). The people within or outside manufacturing who think that a change in production and operation technology and techniques should occur, which assure reliability and durability and reduce lead time, prefer implementing the Industrial Revolution 4.0. Hence;

H1: People's thinking positively affects the implementation of the Industrial Revolution 4.0.

People's behavior expresses their mentality, emotion, capabilities, or potential through words, actions, interaction, choice, or decision-making. People adopt different types of behavior in various situations, such as optimistic, pessimistic, trusting, envious, supportive, or discouraging. When a revolution occurs in any area of life, people's behaviors affect the implementation of that revolution. The different behaviors of people in society or as a group affect the implementation of the Industrial Revolution 4.0 in the manufacturing sectors. People's positive behaviors toward manufacturing goods or industrial activities support a revolution in manufacturing technology and production and operating techniques, which lead to industrial progress and bring well-being to society (Badri, Boudreau-Trudel, & Souissi, 2018). The people's positive behaviors towards one another in society in the form of good interaction, communication, or positive relations create awareness of the revolution occurring in the technology or business world. It is functioning its utilities or futilities and its effects on the people's social, environmental, or physical well-being. In this way, the exact information about the different aspects of the Industrial Revolution 4.0 affects their thinking and behavior toward implementing the Industrial Revolution 4.0 in manufacturing goods. The people who acquire positive information through interaction with others show supportive behavior toward automation and data exchange in manufacturing activities (Demir, Döven, & Sezen, 2019). As the introduction and implementation of the fourth industrial revolution in the manufacturing or other sectors minimize human intervention and, thus, the employment rate within the country, many people have negative behaviors towards implementing this revolution in their economy and take serious initiatives. These negative behaviors become a hurdle in the way of implications. The people who have optimistic behaviors towards the use of automatic technology, cyber-physical systems, Internet of things, and data exchange in support of the operation and production activities and who have an awareness that if one side decreases the role of human beings, it increases employment opportunities for them at the time in the form of production and management of these technologies, encourage the implementation of Industrial Revolution 4.0 (Chou, 2018).

H2: People's behavior positively affects the implementation of the Industrial Revolution 4.0.

People's social life involves bonds with others like family members, friends, society members, colleagues, seniors, or strangers. These bonds lead to communication, circulation of information, and financial and mental support, which facilitate making decisions and removing problems in the way of implementing the fourth industrial revolution (Kurt, 2019). A good social life consists of solid relations among people, financial well-being, physical well-being (sound health of human beings), and community well-being, leading to the effective implementation of the Industrial Revolution 4.0. Economic evolution can be implemented more effectively in a country where social relationships and interactions between people and others are strong or based on emotional attachment. Strong relations or interactions facilitate communication and sharing of information among people. Economic entities that want to introduce technology or techniques introduced by the Industrial Revolution 4.0 into their economic activities or production use their social contacts to collect information about the technology, techniques, installation, and work (Mohsin, Kamran, Nawaz, Hussain, & Dahri, 2021). This complete and accurate information assists in implementing the Industrial Revolution 4.0 (Farrell, Newman, & Corbel, 2020). Similarly, using their healthy social interaction, the negative impacts of using smart and automatic computer and internet-based technologies in economic activities can be removed, and the way of implementing the Industrial

Revolution 4.0 can be cleared. The thinking of employees that the Industrial Revolution 4.0 will make them jobless can be removed by making it clear that the installation, maintenance, and operation of these technologies will create many other employment opportunities. Under a good social life, people have high financial well-being. People have vital financial resources which can be used to bring a positive change in their economic life to further improve their position both in the market and society. High financial resources allow people to implement heavy technologies like automatic and data exchange devices, the Internet of things, and cyber-physical systems in manufacturing, which is part of the Industrial Revolution 4.0. Similarly, workers with sound mental and physical health can effectively learn and operate smart technologies introduced by the Industrial Revolution 4.0 in operation and manufacturing (Stock, Obenaus, Kunz, & Kohl, 2018). Hence;

H3: People's social life positively affects the implementation of the Industrial Revolution 4.0.

Social norms are the unwritten rules of behavior generally acceptable in society or a group. These social norms may change with the environment, culture, and situation in which they are found. The relationship between people's thinking, behavior, social life, and norms is reciprocal. As the social norms of a society determine people's thinking, behavior, and social life, social norms are also affected by changes in people's thinking, behavior, and social behavior, but the social norms change with time. Moreover, the values, traditions, and social rules affect the implementation of the Industrial Revolution 4.0. The change in people's ideas and concepts about anything, any situation, or issue affects the area's traditions, values, and social rules (Pereira & Romero, 2017). When a group of persons has similar social thoughts like liberalism or individualism, which are against the social tradition, the tradition that does not allow individuals to express their views freely and act according to their wishes influences the traditions as time passes (Sun et al., 2020). The change in traditions due to changes in people's thinking affects the implementation of the Industrial Revolution 4.0. Similarly, behaviors that positively express thinking, ideas, or emotions in actions or interaction with others add to social norms (Saucedo-Martínez, Pérez-Lara, Marmolejo-Saucedo, Salais-Fierro, & Vasant, 2018). The people's fair and sincere dealings with others add to the social aspect. The people's behavior of valuing environmental health makes it a tradition as time passes and encourages a revolution like that of Industrial Revolution 4.0. The change in the social life of the people affects the social norms, the circulation of information as a result of positive interaction, and financial well-being contributes to the traditions and social rules, which also allow using the change in technology and manufacturing process (Kovacs, 2018). Thus, the following hypotheses have been shaped:

H4: Social norms mediate between people's thinking and the implementation of the Industrial Revolution 4.0.

H5: Social norms mediate between people's behavior and the implementation of the Industrial Revolution 4.0.

H6: Social norms mediate between people's social life and the implementation of the Industrial Revolution 4.0.

3. Methodology

This study investigates the impact of people's thinking, behavior, and social life on implementing the Industrial Revolution 4.0. Also, it examines the mediating role of social norms among the nexus of people's thinking, behavior, social life, and implementation of the Industrial Revolution 4.0 in Vietnam. The researchers chose the quantitative methods, and questionnaires came from data collection. The study adopted the five-point Likert scale: "5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree, and 1 for strongly disagree". The respondents were selected by simple random sampling, and the surveys were forwarded by email. In addition, 1050 surveys were sent to the respondents, and 757 were received and used for the analysis. These collected surveys represent about 72.09 percent response rate.

Moreover, the current research has also executed the smart-PLS for analysis purposes and the testing of discriminant and convergent validity because the complex model has been used. The study aims to test hypotheses (Hair Jr, Babin, & Krey, 2017). In addition, this research has also used the implementation of

the Industrial Revolution 4.0 (IIR) as a dependent variable with six items, and social norms (SN) have been used as the mediating variable with four items. Finally, three predictors were used by the researchers, namely, people thinking (PT) with four items, people behavior (PB) with four items, and people social life (PSL) with five items. These variables and their relationships are mentioned in Figure 2.

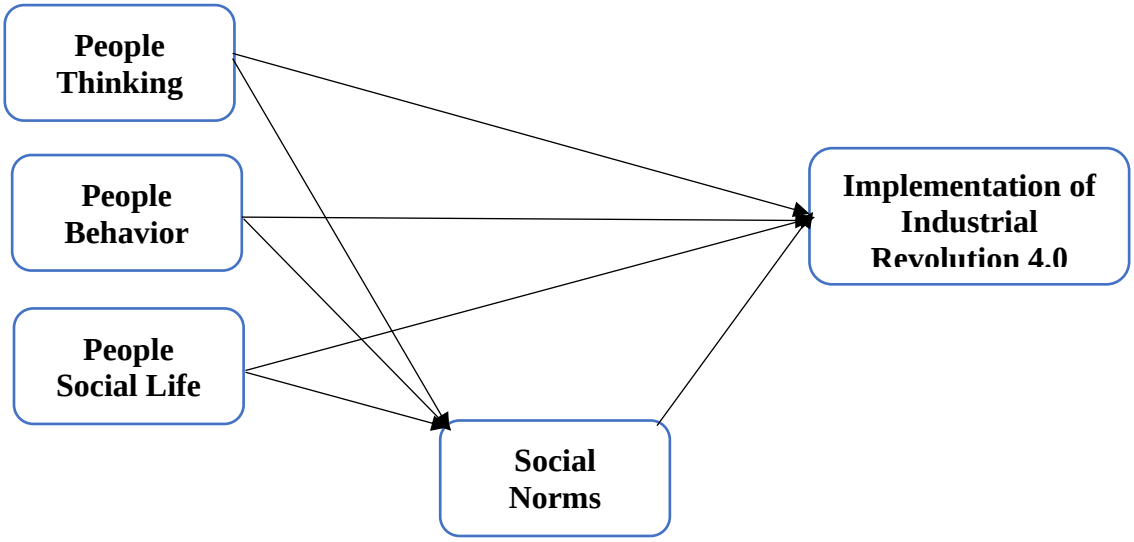

Figure 2: Theoretical Framework

4. Findings

The present research has investigated the relationships among the items named convergent validity. The statistics have highlighted that the composite reliability (CR) and Alpha values are higher than 0.70, and loadings and average variance extracted (AVE) values are more than 0.50. These values show a high relationship between the items and valid convergent validity, and these values are highlighted in Table 1.

Table 1: Convergent Validity

Constructs	Items	Loadings	Alpha	CR	AVE
Implementation of Industrial Revolution 4.0	IIR2	0.835	0.849	0.898	0.689
	IIR4	0.851			
	IIR5	0.836			
	IIR6	0.796			
People Behavior	PB1	0.800	0.840	0.893	0.676
	PB2	0.837			
	PB3	0.835			
	PB4	0.816			
People Social Life	PSL1	0.882	0.890	0.925	0.754
	PSL2	0.792			
	PSL3	0.911			
	PSL5	0.885			
People Thinking	PT1	0.857	0.832	0.880	0.595
	PT2	0.762			

	PT3	0.758			
	PT4	0.753			
	PT5	0.721			
Societal Norms	SN1	0.789	0.773	0.803	0.511
	SN2	0.511			
	SN3	0.749			
	SN4	0.773			

Note: Alpha: Cronbach's alpha; CR: composite reliability; AVE: average variance extracted. IIR: Implementation of Industrial Revolution 4.0; PB: People Behavior; PSL: People Social Life; PT: People Thinking; SN: Societal Norms.

The present research has also investigated the discriminant validity relationships among the variables. This study used cross-loading and Fornell Larcker to test the validity of the discriminant. The statistics have highlighted that the values that exposed the nexus with variables by themselves are larger than those that exposed the links with other constructs (Figure 3). These values show a low relationship between the variables and valid discriminant validity, highlighted in Tables 2 and 3.

Table 2: Fornell Larcker

	IIR	**PB**	**PSL**	**PT**	**SN**
IIR	0.830				
PB	0.623	0.822			
PSL	0.564	0.730	0.869		
PT	0.722	0.627	0.580	0.771	
SN	0.550	0.555	0.546	0.558	0.715

Note: IIR: Implementation of Industrial Revolution 4.0; PB: People Behavior; PSL: People Social Life; PT: People Thinking; SN: Societal Norms.

Table 3: Cross-loadings

	IIR	**PB**	**PSL**	**PT**	**SN**
IIR2	**0.835**	0.553	0.5	0.578	0.424
IIR4	**0.851**	0.495	0.432	0.632	0.485
IIR5	**0.836**	0.502	0.454	0.614	0.47
IIR6	**0.796**	0.52	0.489	0.57	0.446
PB1	0.521	**0.8**	0.562	0.502	0.452
PB2	0.552	**0.837**	0.579	0.548	0.441
PB3	0.486	**0.835**	0.65	0.493	0.477
PB4	0.486	**0.816**	0.614	0.519	0.456
PSL1	0.44	0.599	**0.882**	0.428	0.482
PSL2	0.563	0.594	**0.792**	0.59	0.416
PSL3	0.478	0.667	**0.911**	0.511	0.493
PSL5	0.472	0.672	**0.885**	0.478	0.503
PT1	0.668	0.507	0.453	**0.857**	0.548
PT2	0.629	0.576	0.555	**0.762**	0.414

PT3	0.558	0.369	0.359	**0.758**	0.444
PT4	0.449	0.492	0.444	**0.753**	0.354
PT5	0.416	0.483	0.428	**0.721**	0.348
SN1	0.417	0.418	0.402	0.408	**0.789**
SN2	0.273	0.308	0.254	0.284	**0.511**
SN3	0.486	0.482	0.478	0.491	**0.749**
SN4	0.352	0.345	0.381	0.371	**0.773**

Note: IIR: Implementation of Industrial Revolution 4.0; PB: People Behavior; PSL: People Social Life; PT: People Thinking; SN: Societal Norms.

This study has also used the Heterotrait Monotrait (HTMT) ratios to test the discriminant validity. The statistics have highlighted that the HTMT ratios' values are below 0.85. These values show a low relationship between the variables and valid discriminant validity, highlighted in Table 4.

Table 4: Heterotrait Monotrait Ratio

	IIR	**PB**	**PSL**	**PT**	**SN**
IIR					
PB	0.737				
PSL	0.648	0.844			
PT	0.837	0.751	0.672		
SN	0.711	0.727	0.689	0.715	

Note: IIR: Implementation of Industrial Revolution 4.0; PB: People Behavior; PSL: People Social Life; PT: People Thinking; SN: Societal Norms.

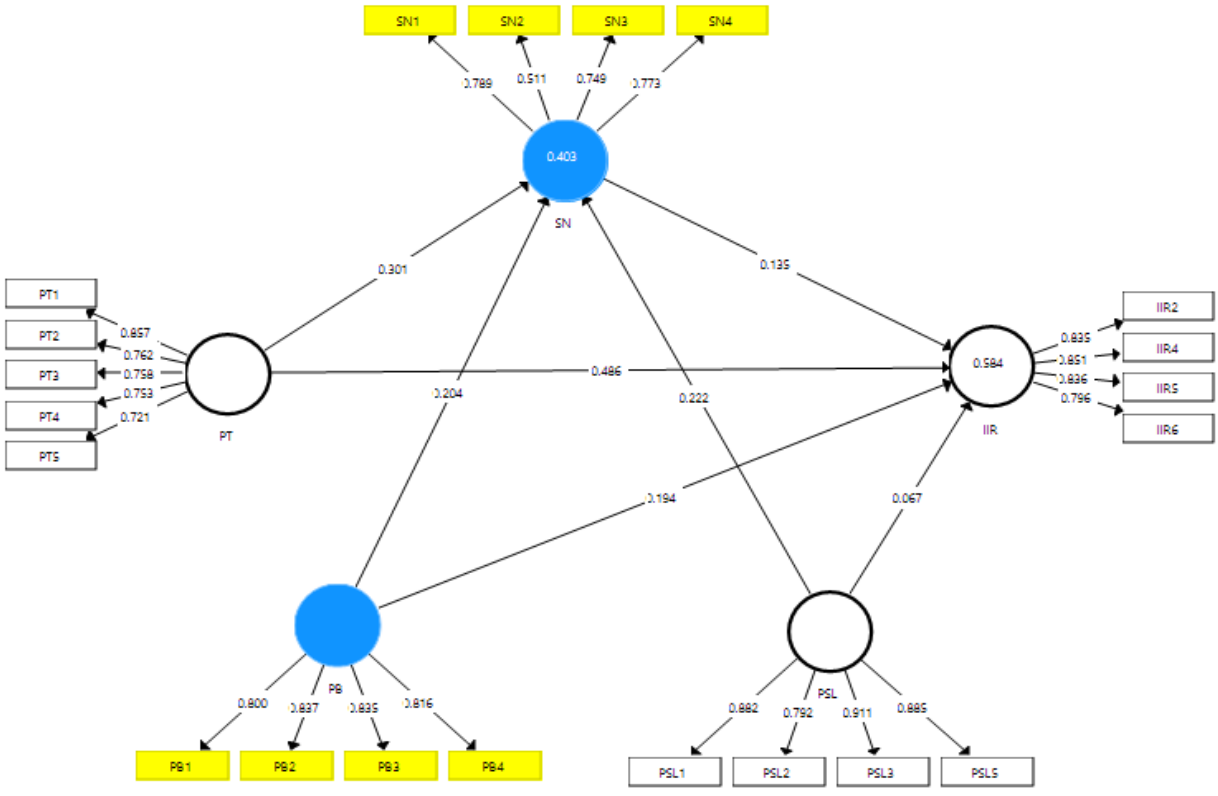

Figure 3: Measurement Model Assessment

Note: IIR: Implementation of Industrial Revolution 4.0; PB: People Behavior; PSL: People Social Life; PT: People Thinking; SN: Societal Norms.

The path analysis has shown the nexus among the constructs, and the findings indicated that people's thinking, behavior, and social life have positive relationships with the implementation of the Industrial Revolution 4.0 in Vietnam and accept H1, H2, and H3 (Figure 4). The outcomes also revealed that social norm positively mediates the nexus among people's thinking, behavior, social life, and the implementation of the Industrial Revolution 4.0 in Vietnam and accepts H4, H5, and H6. These values are highlighted in Table 5.

Table 5: Path Analysis

Relationships	Beta	S.D.	T Statistics	P Values	L.L.	U.L.
PB -> IIR	0.194	0.036	5.437	0.000	0.122	0.256
PB -> SN	0.204	0.046	4.394	0.000	0.096	0.274
PSL -> IIR	0.067	0.033	2.000	0.048	0.004	0.123
PSL -> SN	0.222	0.046	4.793	0.000	0.127	0.308
PT -> IIR	0.486	0.037	13.030	0.000	0.408	0.555
PT -> SN	0.301	0.043	6.959	0.000	0.219	0.379
SN -> IIR	0.135	0.031	4.331	0.000	0.078	0.201
PB -> SN -> IIR	0.027	0.009	3.000	0.003	0.012	0.045
PSL -> SN -> IIR	0.030	0.009	3.463	0.001	0.016	0.048
PT -> SN -> IIR	0.040	0.012	3.317	0.001	0.018	0.064

Note: S.D.: Standard Deviation; L.L.: Lower-Limit Confidence Interval; U.L.: Upper-Limit Confidence Interval. IIR: Implementation of Industrial Revolution 4.0; PB: People Behavior; PSL: People Social Life; PT: People Thinking; SN: Societal Norms.

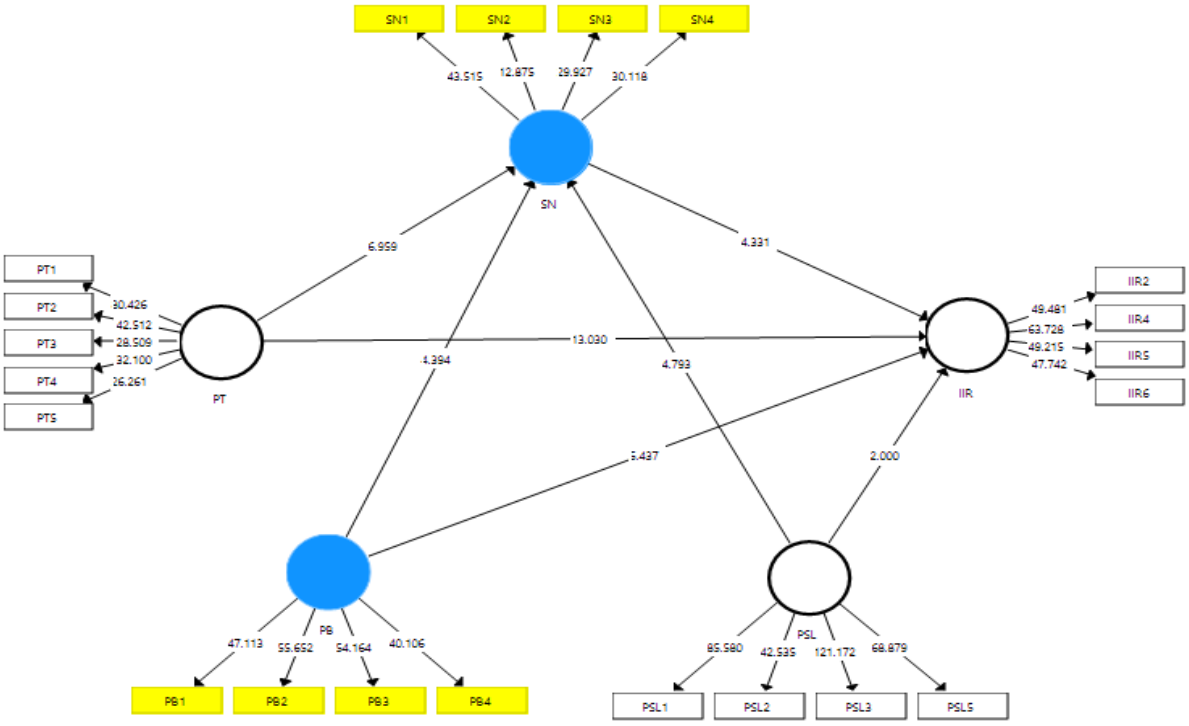

Figure 4: Structural Model Assessment

Note: IIR: Implementation of Industrial Revolution 4.0; PB: People Behavior; PSL: People Social Life; PT: People Thinking; SN: Societal Norms.

5. Discussions and Implications

The study results revealed that people's thinking in a country has a positive relationship with implementing the Industrial Revolution 4.0. The study implies that people's thinking towards manufacturing and industrial activities and the quality of work and production determines the efficiency of the fourth industrial revolution in the country. These results align with Li (2020). This study sheds light on the revolution that has appeared and is still occurring in the industrial world. This study highlights that the thinking and ideas of people within a business organization or general people in the country affect the implementation of the Industrial Revolution 4.0. These results also align with the past study of Oztemel and Gursev (2020), whose objective is to examine how people's thinking influences the implementation of any revolution, whether it appears in social life or the world. This study states that the diversity of thinking in people from the economic or social world determines the effectiveness of the Industrial Revolution 4.0. The study results have revealed that people's behavior positively relates to implementing the Industrial Revolution 4.0. Specifically, people's behavior within or outside the organization and their behavior towards the shift in technology, the business world, and the market affect the implementation of the Industrial Revolution 4.0. These results are supported by the past study of Valentini, Saponieri, and Damiani (2017), which reveals that whenever a new idea, concept, technique, or revolution is brought into any field, it is difficult for people to accept it instantly. In this regard, people's behavior counts. The positive behavior of people towards the Industrial Revolution 4.0 affects its implementation. Over time, people's behavior towards the Industrial Revolution 4.0 has become positive and is getting more popular. These results also reflect the previous study of Vaidya et al. (2018), which suggests that the implementation of the Industrial Revolution 4.0 is more likely under the positive behavior of general people towards the market requirements and shifts in technology and the positive behavior of organization personnel among themselves.

The study results also indicated that people's social lives were positively linked to implementing the Industrial Revolution 4.0. The interaction of people with one another and their interaction with their environment, communication among people, and people's mentality and education level affect the application of the Industrial Revolution 4.0 in different economies and some social sectors. These results are approved by the past study of Santos, Mehrsai, Barros, Araújo, and Ares (2017), which indicates that the social life of the people, like the communication within the society, the living standard of people, social needs, and social activities, show the need for industrial 4.0 revolution in their lives and affect its implementation. These results are also favored by the past study of Kamble, Gunasekaran, and Gawankar (2018), which indicates a society where people have a strong and effective relationship with one another, enjoy good health, and where people can manage their money, automation in the smart technology for several purposes can better be implemented. The study results also indicated that social norms significantly mediate between people's thinking and the implementation of Industrial Revolution 4.0. How does the thinking of the members of a group or society affect the norms of that society or group? These norms, whether focusing on some actions or prohibiting some actions or things, affect the implementation of the Industrial Revolution 4.0. These results align with the past study of Lucato, Pacchini, Facchini, and Mummolo (2019), which states that the social norms affected by people's thinking build a link between people's thinking and the implementation of the Industrial Revolution 4.0. These results also align with the work of Müller and Voigt (2018), which sheds light on the role of different social norms in applying a concept or approach in the business world. This study suggests that the social norms affected by people's thinking influence the effectiveness with which the Industrial Revolution 4.0 can be carried out.

The results have also shown that social norms play an appropriate mediating role in people's behavior and the implementation of the Fourth Industrial Revolution. These results match the results of the work of Raj et al. (2020), which shows that people's conduct and actions affect the norms of a social group. The positive and effective behaviors of people among themselves bring positive change in the social norms, and the

positive social norms help to implement the Industrial Revolution 4.0. The study results have also indicated that social norms mediate between people's social lives and the implementation of the Industrial Revolution 4.0. These results are in accord with the study of Martin, Nolte, and Vitolo (2016), which indicates that people's social life formulates social norms (taboos, laws, more, and folkways) and further affects the application of smart technology, which can acquire, process or share up-to-date minute data, and works as human beings like sensing, understanding, and response.

The present investigation has theoretical implications and a significant contribution to economic-based literature. The study explores the Industrial Revolution 4.0 in an economy. It sheds light on the influences of social factors like people's thinking, behaviors, and social life on implementing the Industrial Revolution 4.0. The study shows the positive contribution of people's thinking, behaviors, social lifestyle, and living standards to effectively implementing the Industrial Revolution 4.0. Past researchers and authors have given little attention to social norms as a link between people's thinking, behaviors, and social life and the implementation of the Industrial Revolution 4.0. The current study fills this gap by introducing the social norms of a group or community as a mediator between the above-mentioned social variables and the implementation of the fourth industrial revolution. This academic article has great empirical significance in an emerging economy like Vietnam. It guides economists or industrialists on effectively implementing the fourth industrial revolution. This research is helpful for the regulators while formulating the policies related to the Industrial Revolution 4.0. This study suggests that the Industrial Revolution 4.0 can effectively implement people's positive thinking, behavior, and good social life. This study also describes how to effectively implement Industrial Revolution 4.0 into the manufacturing sector in areas where social norms are favorable.

6. Conclusions

This study examines the introduction and implementation of the Industrial Revolution 4.0 in the developing economy of Vietnam. Specifically, the study focuses on the influences of social factors, such as the thinking of people, the behaviours of people, and the social life of human beings, on the implementation of the Industrial Revolution 4.0. The study states that people thinking in society and the economy influences the Industrial Revolution 4.0. In a country where the thinking of people towards a change in the society or economy, manufacturing or industrial activities, and quality of operations and products is positive, the Industrial Revolution 4.0 can be efficiently implemented. The study throws light on the significant contribution of the conduct and behaviours of people to the implementation of the Industrial Revolution 4.0. A country where the people have optimistic behaviour towards one another within a community or business organizations and shifts in technology and market prefer to implement the Industrial Revolution 4.0.

Similarly, people's social lives determine the efficiency with which the Industrial Revolution 4.0 can be adopted in manufacturing organizations. In the areas where people have a good social life (social, physical, financial, and community well-being), manufacturing organizations are found to implement the Industrial Revolution 4.0. Moreover, the study makes it clear that the areas where the social norms are affected by the thinking of people, their conduct and behaviors, and people's social life positively; these norms help apply the Industrial Revolution 4.0 in the manufacturing sector.

7. Limitations, Implications, and Further Directions of Research

Though the current study has theoretical and empirical significance, it has several limitations, too. The upcoming authors recommend that these limitations be removed when replicating this study. First of all, this literary analysis encompasses only some social factors like the thinking of people, the behaviors of people, and the social life of human beings as the contributors to the effective implementation of the Industrial Revolution 4.0. The study is limited in that various economic factors also affect the implementation of the Industrial Revolution 4.0, but this literary analysis does not cover these. Future scholars must pay attention to removing this limitation. The author collects quantitative data from the manufacturing sector through a single source, like the issuance of questionnaires. Adopting a single source

to acquire data supporting this study limits the study's completeness and reliability. Hence, the data must be collected from multiple sources for a more comprehensive and reliable study. This current study analyzes the application of Industrial Revolution 4.0 in Vietnam on account of the change in the above-mentioned social factors. Vietnam is a developing country with specific social norms and social life. Thus, the study conducted in Vietnam may not be equally applied in the case of a developed country. The upcoming authors should conduct empirical analyses in diverse countries and conduct a more generalizable study.

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