

Article

Exploring the employees' behavioral intention towards disruptive technologies: A study in Malaysia

Kiran Kumar Thoti

Faculty of Entrepreneurship and Business (FKP), Universiti Malaysia Kelantan, Kota Bharu 16100, Malaysia; kiran.kt@umk.edu.my

CITATION

Thoti KK. (2024). Exploring the employees' behavioral intention towards disruptive technologies: A study in Malaysia. *Human Resources Management and Services*. 6(1): 3399.
<https://doi.org/10.18282/hrms.v6i1.3399>

ARTICLE INFO

Received: 17 November 2023
Accepted: 19 December 2023
Available online: 17 January 2024

COPYRIGHT



Copyright © 2024 by author(s).
Human Resources Management and Services is published by PiscoMed Publishing Pte. Ltd. This work is licensed under the Creative Commons Attribution (CC BY) license.
<https://creativecommons.org/licenses/by/4.0/>

Abstract: The study focuses on the employees' behavioral intentions towards the usage of disruptive technology in the industry. The digital technology application in consumer, retail, and hospitality, education and training, financial services, the health sector, infrastructure, government, and airports. The study objectives were to explore the possible adoption of innovation and creativity changes and their acceptance by the employees in the organization. To identify the variables impacting behavioral intention and analyze how these variables relate to perceived usefulness, attitude, perceived ease of use, facilitating conditions, and technology optimism. A structured questionnaire was used to collect data from 335 respondents, who were selected based on their relevance to the study objectives. The questionnaires were distributed through the Google Forms application, and the data were collected and analyzed periodically. The findings of the study provide valuable insights into the behavioral intention towards disruptive technologies in Kuala Lumpur and Putrajaya locations in Malaysia and highlight the significance of factors such as perceived usefulness, attitude, perceived ease of use, facilitating conditions, and technology optimism. The research contributes to the existing body of knowledge on Industry 4.0 by providing empirical evidence and practical implications for organizations seeking to leverage disruptive technologies in their operations management.

Keywords: disruptive technologies; operation management; human resource management; employees' welfare; digital transformation

1. Introduction

The advent of the Industry 4.0 era has brought about significant advancements in technology, reshaping industries and business operations worldwide. Disruptive technologies such as artificial intelligence, big data analytics, robotics, and the Internet of Things (IoT) have revolutionized the way businesses operate, presenting both opportunities and challenges. These technologies have the potential to enhance productivity, efficiency, and competitiveness in various sectors, including manufacturing, logistics, and services. However, the successful implementation and adoption of disruptive technologies heavily depends on individuals' behavioral intentions to embrace and utilize these technologies. Understanding the factors that influence individuals' intention to adopt disruptive technologies and integrate them into operations management is crucial for organizations and policymakers in Malaysia as they strive to navigate the Industry 4.0 landscape. There are issues in this research that include behavioral intention. It seeks to understand whether individuals are willing to adopt and use these technologies in their daily operations. Many social, ethical, and environmental considerations should be considered while investigating behavioral intentions toward disruptive technologies in the Industry 4.0 period and

beyond. As disruptive technologies continue to transform sectors and enterprises, it is critical to investigate the larger implications and repercussions of their use.

According to the article published in The Star Newspaper on 12 January 2023 stated problems have arisen in the local construction sector due to several factors, including a lack of available workers, inflationary pressures, increased material costs, and more frequent interruptions in the supply chain. As a result, projects have run behind schedule, teams have been operating in silos, time is being wasted, and the environment has suffered. The construction industry, which has historically been slow to embrace digital technologies, is now leading the way in terms of investment and ambition, which bodes well for future economic development. The government is also actively pursuing digitalization, as shown in **Figure 1**, for better competitiveness, productivity, and sustainable building practices through programmes like the National 4IR Policy and the National Construction Policy 2030. In line with national goals, the Public Works Department (JKR) has been leading the charge to revolutionize Malaysia’s construction sector through the implementation of innovative technology. Roads, buildings, airports, ports, and jetties are just some of the infrastructure that JKR has been developing and maintaining since its founding in 1872 for a wide range of federal and state agencies. Through a partnership with Autodesk, JKR is spearheading the digital transformation of the construction industry on a national scale. Building Information Modelling (BIM) has been utilized in more than 200 projects since 2010 by the department. One of these projects was the Health Ministry’s clinic in Maran, Pahang. In contrast to earlier projects that did not use BIM, the JKR team was able to carry out its end-to-end construction without a hitch, saving money and avoiding the build faults that plagued such endeavors. With an annual increase of 10%, JKR aims to have 50% of projects valued at RM10 million or more using BIM by 2021. The introduction of building information modelling has yielded various benefits, according to JKR deputy director general Amran Mohd Majid. “By using 3D model visualizations during design review and value engineering sessions, stakeholders can better understand the design intent. Comprehensive asset information records can be used for reference by facility managers. And clash detection processes can help minimize the risk of project cost increases.”

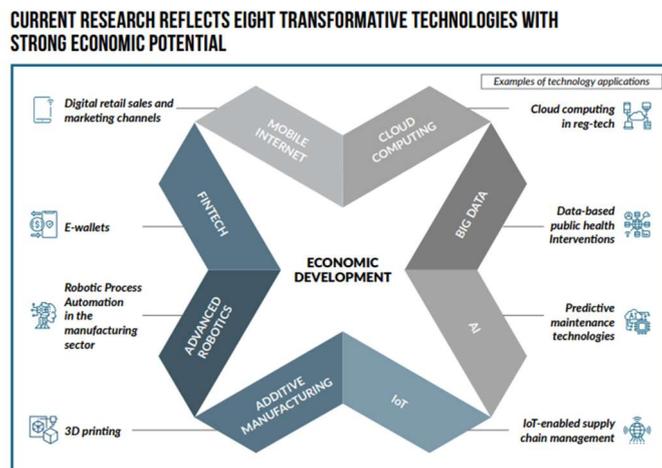


Figure 1. Transformative technologies with economic potential. Source: accesspartnershop.com- alpha beta strategy x economics (2021).

Building: A sector perfect for going digital— The digitization of information and processes represents a giant leap forward in lowering rework, increasing productivity, and boosting bottom lines, all of which are crucial in meeting the fast-growing building and infrastructure demands of Malaysia. Globally and locally, construction companies have been collaborating with Autodesk to optimize resources, achieve economic and productivity savings, and promote sustainable impact via the use of sophisticated technologies including building information modelling (BIM), generative design (GD), and digital twins (DT). The national construction sector is about to undergo digital transformation, and the JKR and Autodesk MoU is going to make that happen by strengthening strategic partnerships. A thriving national construction sector that embraces innovation will be born out of this partnership between building information modelling (BIM) and new technologies like the internet of things (IoT) and artificial intelligence.

Employees' advancement towards disruptive technology for activities happening in healthcare organizations' HR information systems can be categorized as either operational or strategic, depending on their impact on HR management. Technologies pertaining to human resources administration, tracking of time and absence, scheduling and rostering, employee benefits, and expenditure management make up the first group. The second group focuses on enhancing the department's top-notch HR practices, such as hiring, performance evaluation, L&D management, and workforce and succession planning. As an example, applicant tracking technologies have revolutionized the way healthcare HR recruits' new employees. By automating the process of collecting, sorting, and evaluating job applications, these technologies greatly alleviate the workload of HR workers. Taleo and Greenhouse are just two examples of software that streamlines the hiring process for human resources departments. Human resources experts are free to concentrate on other important duties thanks to this technology, which swiftly identifies the most suitable individuals. Additionally, we might think about how VR is becoming an effective tool for teaching healthcare workers, especially HR personnel. Human resources workers may learn essential skills in a risk-free setting with the help of virtual reality (VR) simulations, which offer realistic and immersive settings. One use case for virtual reality is in emergency response training; HR teams may also use it to practice having tough discussions and resolving conflicts. When it comes to healthcare HR, employee engagement systems have completely changed the game when it comes to communicating with staff, creating a more pleasant workplace, and increasing happiness on the job. These systems allow HR staff to interact with workers successfully by providing a centralized location for communication, recognition, and feedback. Big data analytics may be used to study HRH from the perspective of the phases and effects on people management. Planning, organizing, staffing, directing, regulating, recruiting, placement, salesforce size, performance evaluation, assessment, remuneration, and training are the components of HRH that comprise the phases. People management, on the other hand, is primarily concerned with HR planning, business strategy development, management information systems, talent analysis and management, information management, knowledge management, retention attrition, and workforce analysis. New academic publications containing HRIS that might be

developed and used to aid HRM surfaced during the COVID-19 epidemic. The human resources and personnel management communities are also more invested in HRIS for HRM. To limit the dangers of infection that might decimate healthcare practitioners or raise their turnover due to fear of infections, veterans and some co-researchers advocated a robot-assisted HRM system that integrates robots in workforce management. However, Vahdat emphasized that HRM must maintain a human-centered approach even as it embraces HRIS such as teleworking, cloud computing, and information and communications technologies (ICT). According to Yao and Azma, HR productivity is still an important part of HRM for healthcare organizations, even during the epidemic. For that reason, they doubt that ERP software hosted in the cloud can boost HR efficiency during COVID-19. In the end, they concluded that HRH's HRIS will rely on ERP in the cloud for HR administration in the future. Based on their findings, Wu, Pi, and Chen recommend that HRM invest in innovative technologies like blockchain and AI to better safeguard consumers' personal information when they utilize healthcare products. By bringing in medical device builders from HR, the author alludes to HR's involvement in the blockchain application. Creative and Innovative Health Information Systems in Healthcare Organizations, Discussions revolve around the ethical and legal aspects of utilizing HRIS in HRH. Some academics would rather debate the pros and cons of different HRIS systems, considering factors like production feasibility and the effects on HRM responsibilities. Some healthcare providers may still wonder if it's worthwhile to invest in HRIS for HRH because of the benefits and drawbacks of using them. Some scholars focus on theoretical concerns, while others examine how healthcare organizations use HRIS systems within intricate HRM frameworks. Innovation, efficiency, productivity, respect for ethical, legal, and compliance concerns, and HR happiness and well-being are hotly debated topics. Other scholars addressed the difficulties HR professionals have when trying to determine which large data sets are the most useful for making informed judgments. Concerns about building accessibility and their interactions with healthcare professionals and patients arise when considering the integration of robot-assisted staff in staffing management. Staffing and human resource managers' responsibilities within a healthcare organization may be altered or diminished because of changes brought about by HRIS. This is because technology has the potential to take over their everyday activities. Given the current situation, it is a good time to weigh the pros and cons of HRIS for HRM in HO, paying special attention to the issues of acquisition cost and the training of HR managers about these technologies. Additionally, due to the necessity of reducing implementation costs with an excessive number of stakeholders, privacy protection remains a top priority, even with the ideal combination of blockchain and AI. Most of the industries in Malaysia are transforming to the digital economy and disruptive technology. For example, AirAsia Airlines is adopting FACE technology for check-in and processing security checks at KLIA1 Airport.

2. Literature review

Behavioral intention towards disruptive technologies in Industry 4.0 in Malaysia:

The dependent variables in this context are influenced by various independent variables. Specifically, the behavioral intention to adopt disruptive technologies represents an individual's behavioral inclination towards Industry 4.0 (Hubert et al., 2019). Behavioral intention is a manifestation of an individual's attraction and motivation to engage in specific behaviors. The stronger the determination to adopt a particular behavior and the greater the influence of motivating factors, the higher the likelihood of actual implementation. Moreover, the perception of social norms and the support of the broader population play a role in shaping behavioral intentions. This includes considering the opinions and expectations of others, such as close relationships, regarding the individual's engagement in certain behaviors. Gupta et al. (2020) offered another way to Industry 4.0 adoption, using institutional theory to examine coercive, mimetic, and normative pressure. Yu and Schweisfurth (2020) investigated crucial elements influencing the obstacles and potential of Industry 4.0 adoption. Srivastava et al. (2022) employed a technology-organizational-Environmental (TOE) paradigm to study Industry 4.0 adoption since sophisticated digital technologies are exceedingly complicated. While extensive research has explored users' preferences and desires regarding the utilization of technology in Industry 4.0, this work makes a unique contribution by focusing on specific behavioral intentions and investigating the independent variables influencing them in the context of Industry 4.0. To facilitate a realistic and comprehensive discussion, this paper conducts an exploratory study on the purposeful utilization of Industry 4.0 technologies.

Relationship between perceived usefulness and behavioral intention towards disruptive technologies in Industry 4.0

The perceived usefulness of a system is related to its productivity and efficacy, as well as its overall benefits for improving user performance (Haron et al., 2022). Exploring factors influencing the perceived usefulness and ease of use of virtual reality in education. Conducted a study that focused on exploring the factors that influence the perceived usefulness and perceived ease of use of virtual reality (VR) in the field of education. The researchers aimed to identify the key factors that affect users' perceptions of the usefulness and ease of use of VR technology in an educational context. The study employed a quantitative research approach and collected data from participants (Akgün et al., 2021). Investigating the factors influencing perceived usefulness and user satisfaction in technology acceptance. The research aimed to explore how various factors impact users' perceptions of the usefulness of technology and their satisfaction with its usage. The study employed a quantitative approach and collected data from a sample of participants. The authors utilized structural equation modeling (SEM) to analyze the collected data and identify the significant factors. It emphasizes the importance of understanding the relationship between perceived usefulness and behavioral intention in the adoption and implementation of disruptive technologies in operations management, particularly in the Malaysian industrial sector. It examines research conducted in Malaysia or similar industrial settings to understand how perceived usefulness influences the intention to adopt and implement disruptive technologies in operations management. When individuals perceive Industry 4.0 technologies as more useful in improving their operations and processes,

they are more likely to have a stronger intention to adopt and implement disruptive technologies.

3. Hypothesis statements

Hypotheses 1: The higher perceived usefulness of Industry 4.0 will lead to a greater influence on behavioral intention towards disruptive technologies in the Industry 4.0 era.

Relationship between attitude towards using and behavioral intention towards disruptive technologies of Industry 4.0 in Malaysia: Attitude towards using refers to an individual's overall evaluation, perception, or disposition towards the act of using a particular technology, product, or service. This influential paper presents the Unified Theory of Acceptance and Use of Technology (UTAUT), which includes the construct of "attitude towards using" as a key determinant of technology acceptance and usage. It provides a comprehensive overview of the theory and its components, including attitude, and offers insights into understanding and predicting users' acceptance and usage of technology (Venkatesh et al., 2019). This recent study develops an integrated framework to understand the antecedents and consequences of attitudes towards using disruptive technologies. It examines the impact of various factors, including perceived usefulness, perceived ease of use, and subjective norms, on users' attitudes towards using disruptive technologies. Additionally, social factors, including social norms and social influence, also play a significant role in shaping managers' behavioral intentions to use Industry 4.0. (Liaw and Ting, 2019). When individuals have a favorable perception and positive beliefs about the benefits and advantages of Industry 4.0, they are more inclined to have a stronger intention to engage with disruptive technologies in their operations management.

Hypotheses 2: The more positive attitude towards using Industry 4.0 will have a significant effect on behavioral intention towards disruptive technologies in the Industry 4.0 era.

Relationship between perceived ease of use and behavioral intention towards disruptive technologies in Industry 4.0: Perceived ease of use refers to the subjective perception or belief held by an individual regarding the level of effort required to use a particular technology and the degree of complexity associated with its use. It represents the individual's assessment of how easy or difficult it would be to learn and operate the technology effectively. A higher perceived ease of use implies that the technology is perceived as intuitive, user-friendly, and requires minimal cognitive and physical effort to use. The paper provides a theoretical framework for understanding the factors influencing users' perceptions of ease of use and its impact on technology acceptance (Nayanajith et al., 2019). Technology Acceptance Model 3 (TAM3), which extends the original TAM by incorporating additional factors, including perceived ease of use, It examines the role of perceived ease of use in users' acceptance and usage of technology, highlighting its importance as a determinant of users' attitudes and intentions towards using technology (Venkatesh and Bala, 2021). When individuals perceive Industry 4.0 technologies as easy to understand, learn, and use in their operations management, they are more likely to develop a stronger intention to adopt and integrate disruptive technologies.

Hypothesis 3: The higher perceived ease of use of Industry 4.0 will influence behavioral intention towards disruptive technologies in the Industry 4.0 era.

Relationship between facilitating conditions and behavioral intention towards disruptive technologies in Industry 4.0: The Unified Theory of Acceptance and Use of Technology (UTAUT) includes the construct of “facilitating conditions” as one of the key determinants of technology acceptance and usage (Venkatesh et al., 2021). Facilitating conditions refer to the extent to which an individual believes that the necessary resources, support, and infrastructure are available to use a particular technology effectively. The paper provides a comprehensive overview of the UTAUT and its components, including facilitating conditions. The antecedents and consequences of attitude towards using disruptive technologies include facilitating conditions as a relevant construct (Al-Ajlouni et al., 2019). It contributes to the understanding of facilitating conditions and their implications for technology acceptance and adoption. When individuals perceive the availability of necessary resources, support systems, and infrastructure to effectively use Industry 4.0 technologies in their operations management, they are more likely to have a stronger intention to embrace disruptive technologies.

Hypotheses 4: The presence of facilitating conditions in using Industry 4.0 will have a positive impact on behavioral intention towards disruptive technologies in the Industry 4.0 era.

Relationship between technology optimism and behavioral intention towards disruptive technologies in Industry 4.0: Technology optimism refers to an individual’s positive beliefs, attitudes, and expectations towards technology, including their confidence in its benefits, potential, and impact (Vrontis, 2022). Technology optimism is a belief system that assesses individuals’ beliefs about the extent of technical change and the impact of technological developments. It discusses the various dimensions of technology optimism and its influence on individuals’ attitudes and behaviors towards technology adoption and usage (Solberg et al., 2020). This study examines the effects of technology optimism and technology resistance on individuals’ continued intention to use mobile payment services (Shen et al., 2022). When consumers have a sense of optimism and positive expectations about the potential of Industry 4.0 technologies, they are more likely to have a positive attitude towards adopting disruptive technologies in their operations management.

4. Research objectives

The goal of this study is to identify the factors that influence consumers’ evaluations of industry products and services and to examine the interplay between purpose to utilize and attitude towards Industry 4.0.

Examining the connection between perceived usability and future conduct in industrial activity 4.0 and identifying the factors that influence a person’s decision to engage in industrial activity 4.0.

To identify the factors that influence technological optimism and subsequent intent to utilize 4.0.

5. Research problem statement

The issue that is being addressed in this paper is a lack of complete knowledge of employee behavioral intentions toward disruptive technologies and operations management in the Industry 4.0 era and beyond, especially in the context of Malaysia. As industries in Malaysia undergo digital transformation, it is essential to investigate how individuals perceive and intend to engage with disruptive technologies in their daily operations. Artificial intelligence, the Internet of Things, robots, and big data analytics are examples of technology breakthroughs that have the potential to transform existing business structures and operations because of the Industry 4.0 revolution. However, the successful implementation and adoption of these disruptive technologies depend on individuals' willingness to embrace and utilize them effectively. To date, limited research has focused on exploring the behavioral intentions of individuals in Malaysia towards disruptive technologies and their integration into operations management. Understanding the factors influencing behavioral intention, including adoption barriers and enablers, is crucial for organizations and policymakers in Malaysia to formulate effective strategies that promote successful implementation and utilization of disruptive technologies. By addressing this research problem, the study aims to provide valuable insights into the behavioral intention towards disruptive technologies and operations management in Malaysia, facilitating informed decision-making and enabling organizations to navigate the challenges and opportunities of the Industry 4.0 era and beyond.

6. Research method

The systematic processes and techniques used to collect, analyze, and interpret data in a research project are referred to as research methodologies. These approaches provide a framework for performing rigorous and organized research that ensures the findings are trustworthy, valid, and relevant to the study objectives. Researchers use research methodologies to collect information and answer research questions in a methodical and structured manner.

6.1. Research design

The study aimed to explore the most suitable research methods and procedures for investigation, with a focus on generating research ideas and selecting appropriate techniques. Quantitative research was chosen for its objectivity and its ability to investigate and comprehend the correlation between the independent variables (perceived usefulness, attitude towards using, perceived ease of use, facilitating condition, and technology optimism) and the dependent variable (behavioral intention). To ensure comprehensive data collection, both primary and secondary sources were utilized. In addition, secondary data was gathered from various sources, such as websites and relevant journal articles, to support the main research findings. The questionnaire was thoughtfully designed to facilitate the collection of respondents' observations. Section A of the questionnaire includes essential information about the respondents, such as age, gender, employment status, education level, and income. Section B of the questionnaire is the dependent variable. Section C

of the questionnaire assesses users' perspectives on perceived usefulness, attitude towards using, perceived ease of use, facilitating conditions, and technology optimism. To score all attitude items, a five-point Likert scale ranging from "strongly disagree" to "strongly agree" was employed.

6.2. Scale of measurement

a) Nominal scale

In this research, the use of a nominal scale provides a means for categorizing and organizing specific topics, allowing researchers to group responses into distinct classes or categories. To capture demographic information, five questions were included in the study, focusing on variables such as age, gender, race (Silva et al., 2019), faculty, and program. These variables are measured on a nominal scale, enabling respondents to select their responses from predefined groups or categories.

b) Ordinal scale

Section A of the study questionnaire collects data using a five-item ordinal scale. This scale allows respondents' data to be placed in a hierarchical order, reflecting the relative differences or positions of individuals in relation to others. By utilizing an ordinal scale, the research captures the varying degrees or levels of agreement, satisfaction, or preferences among respondents.

c) Interval scale

To assess respondents' perspectives, a five-point Likert scale ranging from 1 to 5 is employed in the questionnaire. This interval scale provides respondents with the opportunity to express their degree of agreement or disagreement, ranging from "strongly disagree" to "strongly agree". The use of this scale ensures that respondents can effectively answer the questions, as it offers a balanced range of response options while minimizing ambiguity and respondent burden.

6.3. Data collection

In this research, the primary data collection tool utilized was structured questionnaires, which were distributed to 335 respondents who were relevant to the study's objectives. The target group of people are employees' working in advanced technology industries like health care, airports, banking's, and many more located in Malaysia. To streamline the data collection process, the questionnaires were administered through the Google Forms application. It is worth noting that gathering information through this method necessitates a significant investment of time and effort. As respondents completed the questionnaires, the researcher regularly collected and analysed the data to ensure a timely and comprehensive analysis.

Sampling

- **Population of the study:** In this research, the population of the study is people who are practically using Industry 4.0 in their behavioural intentions.
- **Sample size:** The sample consisted of 335 respondents, which is considered a statistically significant representation of the entire population in Malaysia. According to **Table 1** and Krejcie and Morgan's (1970) calculations, a sample size of 335 is adequate and can be considered equivalent to the estimated population of 2600.

Table 1. Krejcie and Morgan table.

N	S	N	S	N	S	N	S	N	S
10	10	100	50	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	26	140	103	340	181	1000	276	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	202	1500	306	9000	368
60	52	210	132	460	210	1600	310	10,000	373
65	56	220	136	480	214	1700	313	15,000	375
70	59	230	140	500	217	1800	317	20,000	377
75	63	240	144	550	225	1900	320	30,000	379
80	66	250	148	600	234	2000	322	40,000	380
85	70	260	152	650	242	2200	327	50,000	381
90	73	270	155	700	248	2400	331	75,000	382
95	76	270	159	750	256	2600	335	100,000	384

N = Population size, S = Sample size.

7. Analysis

Analysis in research refers to the systematic examination, interpretation, and evaluation of data or information collected during a research study. It involves organizing, categorizing, and making sense of the data to identify patterns, relationships, and trends. The purpose of analysis is to derive meaningful insights and draw conclusions that address the research objectives or research questions. Before conducting the analysis, researchers typically organize and prepare the data for analysis. This may involve cleaning and validating the data, transforming variables, and ensuring data quality and integrity. In this stage, researchers examine the data to gain a preliminary understanding of its characteristics and distribution. They may use descriptive statistics, data visualization techniques, or exploratory data analysis methods to explore patterns, trends, and outliers in the data. Researchers employ specific data analysis techniques depending on the research design and research questions. These techniques can include statistical analysis, qualitative analysis, content analysis, thematic analysis, regression analysis, factor analysis, or other relevant methods. The choice of analysis technique depends on the type of data, the research objectives, and the research field. After conducting the analysis, researchers interpret the findings in the context of the research objectives and relevant theoretical frameworks.

Table 2 shows the age groups of the respondents who participated in completing and answering the questionnaire. In this questionnaire, the ages of the respondents were divided into three age groups: the first group was 18–21 years old, the second

group was 22–25 years old, and the third group was 26–29 years old. The second age group was the largest, with 195 respondents, accounting for 58.2% of the total 335 respondents. The age group of 26–29 is the second most respondents, with 68 respondents and 20.3% of the total 335 respondents. The age group 18–21 years was the third most likely to respond, with 65 respondents, accounting for 19.4% of the total 335 respondents. The option for those over 29 years old is the less-responding option, which is only 7 respondents, or 2.1% of the total 335 respondents.

Table 2. Age.

Age	Respondents	Percent
18–21	65	19.4
22–25	195	58.2
26–29	68	20.3
Above 29	7	2.1
Total	335	100

Table 3 shows the gender of the respondents who participated in completing and answering the questionnaire. 194 of the respondents who participated in this study were female with 57.9% of the total 335 respondents. Otherwise, there were only 141 of the respondents who participated in this study were male with 42.1% of the total 335.

Table 3. Gender.

Gender	Respondents	Percentage
Male	141	42.1
Female	194	57.9
Total	335	100

Table 4 shows the current education level of all the respondents. The highest education level for completing the questionnaire was a degree, with 192 respondents (57.3%), followed by a STPM, a Matric, and a Diploma, with 88 respondents (26.3%). Next is Spm with 23 respondents (6.9%), Master with 22 respondents (6.6%), and the other with 6 respondents (1.8%). The fewest respondents by education level are PhDs, with 4 respondents (1.2%) of 335 respondents.

Table 4. Current education level.

Education	Respondents	Percentage
SPM	23	6.9
STPM	88	26.3
Degree	192	57.3
Masters	22	6.6
PhD	4	1.2
Other	6	1.6
Total	335	100

Table 5 shows that in the research, people who had their income below RM1500 were the highest respondents, with 239 respondents (71.3%), followed by group incomes of RM1500–RM3000 with 61 respondents (18.2%), and group incomes of RM3000–RM7000 with 28 respondents (8.4%). The fewer respondents are the above 7000 with 7 respondents (2.1%) of 335 respondents.

Table 5. Income.

Income	Respondents	Percentage
<RM1500	239	71.3
RM1500–RM3000	61	18.2
RM3000–RM7000	28	8.4
Above 7000	7	2.1
Total	335	100

In **Table 6**, the mean age of the respondents was 2.05. The mean gender of the respondents was 1.58. The mean employment status of the respondents was 1.43. The mean education level of the respondents was 2.74. The mean income of respondents is 1.41.

Table 6. Mean of variables.

Variables	Mean
Age	2.05
Gender	1.58
Employment status	1.43
Current education level	2.74
Income	1.41

In **Table 7**, the mean age of the respondents was 2.05. The mean gender of the respondents was 1.58. The mean employment status of the respondents was 1.43. The mean education level of the respondents was 2.74. The mean income of respondents is 1.41. The median age of the respondents was 2. The median gender of the respondents was 2. The median employment status of the respondents was 1. The median education level of the respondents was 3. The median income of respondents is 1. The mode age of the respondents was 2. The mode gender of the respondents was 2. The mode of employment status of the respondents was 1. The mode education level of the respondents was 3. The median income of respondents is 1.

Table 7. Statistics.

Statistics	Age	Gender	Employment status	Education level	Income
Mean	2.05	1.58	1.43	2.74	1.41
Median	2.00	2.00	1.00	3.00	1.00
Mode	2	2	1	3	1
Std. deviation	0.692	0.494	0.629	0.865	0.732
Sum	687	529	479	919	473

Table 8 shows that the independent variables are statistically significant predictors of the dependent variable, $F(5, 1670) = 6.412, p < 0.05$. In this case, the H_0 is rejected because the p -value $< \alpha$.

Table 8. ANOVA between dependent variable and independent variable.

	Sum of squares	df	Mean square	<i>F</i>	Sig
Between people	418	334	1.252		
Within people-between items	1.872	5	0.374	6.412	0.000

Hypothesis: There is a significant positive relationship between perceived ease of use, perceived usefulness, attitude towards using, technology optimism, and facilitating conditions in Industry 4.0.

In **Table 9**, the correlation between disruptive technology, perceived usefulness, and behavioral intention has a positive correlation with a value of 0.752. With attitude towards using and behavioral intentions having a positive correlation with the value 0.728, perceived ease of use and behavioral intention have a positive correlation with the value 0.706. With facilitating conditions and behavioral intention, there is a positive correlation of 0.780; with technology optimism and behavioral intention, there is a positive correlation of 0.669. Hence, the hypothesis statement is accepted or significant.

Table 9. Correlations.

DT	DT	PUIV	ATUIV	PEOUIV	FCIV	TOIV
Pearson correlation	1	0.752	0.728	0.706	0.780	0.669
Sig (2-tailed)		0.000	0.000	0.000	0.000	0.000
<i>N</i>	335	335	335	335	335	335

Correlation is significant at the 0.01 level (2-tailed); Note: DT: Disruptive technology, PUIV: Perceived usefulness and behavioural intention, ATUIV: Attitude towards using and behavioural intention, PEOUIV: Perceived ease of use and behavioural intention, FCIV: Facilitating conditions and behavioural intentions, TOIV: Technology optimism and behavioural intentions.

8. Conclusions and recommendation

Based on the research findings, there are several recommendations that can be made, one of which is that organizations should first focus on promoting the perceived usefulness of Industry 4.0 technologies. This can be achieved through effective communication and training programs that highlight the benefits and advantages of adopting disruptive technologies in operations management. Develop a clear and compelling communication strategy to educate employees about the benefits and advantages of Industry 4.0 technologies. Highlight how these technologies can improve operational efficiency, increase productivity, enable data-driven decision-making, and drive innovation. Utilize various communication channels, such as workshops, seminars, newsletters, and intranet platforms, to disseminate this

information effectively. Provide comprehensive training programs to equip employees with the necessary skills and knowledge to utilize Industry 4.0 technologies effectively.

Secondly, efforts should be made to create a positive attitude towards Industry 4.0. Organizations can conduct awareness campaigns, provide incentives, and offer support to employees to foster a positive perception and belief about the potential of disruptive technologies. Provide incentives and rewards to employees who actively engage with Industry 4.0 technologies and showcase innovative uses or successful implementations. Recognize and celebrate individuals or teams that embrace disruptive technologies and contribute to operational improvements. This not only motivates employees but also fosters a positive attitude towards Industry 4.0. Offer training programs that not only focus on technical skills but also emphasize the benefits and potential of Industry 4.0 technologies. Help employees develop a deep understanding of how these technologies can enhance their work and contribute to the organization's success. By enhancing their skills and knowledge, employees are more likely to develop a positive attitude towards Industry 4.0. This positive perception will drive enthusiasm, a willingness to adopt new technologies, and a proactive mindset toward exploring innovative ways to leverage disruptive technologies in operations management.

Next, to enhance behavioral intention, organizations should strive to make Industry 4.0 technologies user-friendly and easy to understand. User training, user-friendly interfaces, and clear documentation can facilitate the adoption and integration of disruptive technologies. Provide clear and concise documentation, user guides, and operating procedures for Industry 4.0 technologies. This documentation should be easily accessible and readily available to users. It should include step-by-step instructions, troubleshooting tips, and frequently asked questions to address common user concerns and facilitate smooth adoption and integration. This, in turn, enhances the behavioral intention of employees to adopt and integrate these technologies in their day-to-day operations. It facilitates a smoother transition and promotes a positive user experience, ultimately leading to higher acceptance and successful implementation of disruptive technologies.

Lastly, providing facilitating conditions is crucial for successful implementation. Organizations should invest in the necessary resources, infrastructure, and support systems to ensure that employees have the means to effectively use Industry 4.0 technologies in their operations management. Develop the required physical and digital infrastructure to support the integration of Industry 4.0 technologies. This may include upgrading manufacturing facilities, implementing IoT-enabled devices, establishing data centers, and ensuring robust network connectivity. The infrastructure should be designed to accommodate the specific requirements of the technologies and provide a stable and secure environment for their implementation. Providing the necessary resources, infrastructure, training, support systems, and leadership support ensures that employees have the means and support to effectively leverage the technologies, leading to enhanced operational efficiency and improved outcomes.

In the context of Industry 4.0, this study examined the link between perceived usefulness and behavioral intention toward disruptive technologies and operations management. The theories claimed that in the Industry 4.0 age, perceived usefulness,

attitude, perceived ease of use, enabling circumstances, and technology optimism have substantial influence on behavioral intention. This study's findings add to a better understanding of the elements that determine behavioral intentions toward disruptive technology. The results suggest that when individuals perceive Industry 4.0 technologies as useful, have a positive attitude, perceive them as easy to use, have access to facilitating conditions, and feel technology optimism, they are more likely to exhibit a stronger intention to adopt and integrate disruptive technologies in their operation management.

Conflict of interest: The author declares no conflict of interest.

References

- Al-Ajlouni, M. I., Nawafleh, S., Alsari, H., et al. (2019). Determinants of user acceptance of electronic-HRM through the extension of UTAUT model via the structural equation modelling approach. *Journal of Information & Knowledge Management*, 18(4), 1950044. <https://doi.org/10.1142/s0219649219500448>
- Bala, H., Venkatesh, V., Ganster, D. C., & Rai, A. (2021). How does an enterprise system implementation change interpersonal relationships in organizations. *Industrial Management & Data Systems*, 121(8), 1824–1847. <https://doi.org/10.1108/imds-06-2020-0380>
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35(8), 982–1003. <https://doi.org/10.1287/mnsc.35.8.982>
- Gupta, K., & Arora, N. (2019). Investigating consumer intention to accept mobile payment systems through unified theory of acceptance model. *South Asian Journal of Business Studies*, 9(1), 88–114. <https://doi.org/10.1108/sajbs-03-2019-0037>
- Hubert, M., Blut, M., Brock, C., et al. (2017). Acceptance of smartphone-based mobile shopping: mobile benefits, customer characteristics, perceived risks, and the impact of application context. *Psychology & Marketing*, 34(2), 175–194. <https://doi.org/10.1002/mar.20982>
- Hubert, M., Blut, M., Brock, C., et al. (2019). The influence of acceptance and adoption drivers on smart home usage. *European Journal of Marketing*, 53(6), 1073–1098. <https://doi.org/10.1108/ejm-12-2016-0794>
- Keskin, H., Ayar Şentürk, H., Tatoglu, E., et al. (2021). The simultaneous effect of firm capabilities and competitive strategies on export performance: The role of competitive advantages and competitive intensity. *International Marketing Review*, 38(6), 1242–1266. <https://doi.org/10.1108/imr-09-2019-0227>
- Liaw, S. Y., Tan, K. K., Wu, L. T., et al. (2019). Finding the right blend of technologically enhanced learning environments: randomized controlled study of the effect of instructional sequences on interprofessional learning. *Journal of Medical Internet Research*, 21(5), e12537. <https://doi.org/10.2196/12537>
- Muzamil, M. F., & Juahir, Y. (2023). Development and perception of the applicability of the Chem's bond game in the topic of covalent and ionic bonds for form 4 students (Malay). In: Salleh, W. M. N. H. W, Yazid, S. N. A. M., Saidin M. I., Jajuli, M. N. (editors). *Final Year Investigation of Chemistry Position*. Volume 2. pp. 36–40.
- Nayanajith, D. A. G., & Damunupola, K. A. (2020). Effects of perceived risk and subjective norms on internet banking adoption amongst the students of University of Kelaniya: A multilevel linear model analysis. *Journal of Business and Technology*, 4(1–2), 42–57. <https://doi.org/10.4038/jbt.v4i1-2.39>
- Silva, S. K., Warnakulasuriya, B. N. F., & Arachchige, B. J. H. (2019). A scale for measuring perceived construction project success—Sri Lankan perspective. *Studies in Business and Economics*, 14(1), 245–258. <https://doi.org/10.2478/sbe-2019-0019>
- Solberg, E., Traavik, L. E. M., & Wong, S. I. (2020). Digital mindsets: Recognizing and leveraging individual beliefs for digital transformation. *California Management Review*, 62(4), 105–124. <https://doi.org/10.1177/0008125620931839>
- Srivastava, D. K., Kumar, V., Ekren, B. Y., et al. (2022). Adopting Industry 4.0 by leveraging organisational factors. *Technological Forecasting and Social Change*, 176, 121439. <https://doi.org/10.1016/j.techfore.2021.121439>

- The Star. (2023). Disruptive technology in construction breaks new ground in Malaysia. Available online: <https://www.thestar.com.my/starpics/2023/01/12/disruptive-technology-in-construction-breaks-new-ground-in-malaysia> (accessed on 20 December 2023).
- Venkatesh, V. (2021). Adoption and use of AI tools: A research agenda grounded in UTAUT. *Annals of Operations Research*, 308(1–2), 641–652. <https://doi.org/10.1007/s10479-020-03918-9>
- Vrontis, D., Christofi, M., Pereira, V., et al. (2021). Artificial intelligence, robotics, advanced technologies and human resource management: A systematic review. *The International Journal of Human Resource Management*, 33(6), 1237–1266. <https://doi.org/10.1080/09585192.2020.1871398>
- Yu, F., & Schweisfurth, T. (2020). Industry 4.0 technology implementation in SMEs – A survey in the Danish-German border region. *International Journal of Innovation Studies*, 4(3), 76–84. <https://doi.org/10.1016/j.ijis.2020.05.001>
- Yue, K., & Shen, Y. (2022). An overview of disruptive technologies for aquaculture. *Aquaculture and Fisheries*, 7(2), 111–120. <https://doi.org/10.1016/j.aaf.2021.04.009>