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PRIMARY RESEARCH

Techno-ethical orientation impact on innovation performance: Exploring the mediation moderation role of corporate social responsibility and digital citizenship behaviour

Bachar Kahil *

FacultyProgramming, University, ITPH Academy, Amsterdam, The Netherland

Keywords

Techno-ethical orientation
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Abstract

The nature of social conditions, relationships, citizenship, and information flow has changed from a moral and legal perspective to a digital one in the information and technology age, when the "physical" and "digital" worlds are combined. These days, digital and techno-ethical principles influence how organisations and their members operate, communicate, behave, and govern. The study makes the assumption that corporate social responsibility is predicted by techno-ethical orientation through the regulation of digital citizenship behaviour (DCB), which is based on social cognitive theory. The study also suggests that the proposed association is moderated by each of the DCB dimensions: online civic engagement (OCE) and online respect (OR). The study investigated the relationship between innovation performance and corporate social responsibility and techno-ethical orientation. The study involved 220 call center workers in Amsterdam, Netherlands. Structured and validated questionnaires were used to collect the replies. Longitudinal data was collected and 15 days interval between each time. Robust metrics of correlation, regression, validity (convergent and discriminant validity), and reliability (Cronbach's alpha and composite reliability) were used in the analysis. The software SmartPLS 3.0 used structural equation modelling (SEM) to test and analyse the moderating effect of digital citizenship behaviour. The findings show that techno-ethical orientation positively influenced on corporate social responsibility. R2 values showed 53.2% variation in corporate social responsibility, 59.7% variation in product innovation and 72.7% variation in process innovation. However, mediation analysis by SmartPLS shows corporate social responsibility among techno-ethical orientation and innovation performance. Although, moderation analysis of digital citizenship behaviour on corporate social responsibility and innovation performance. Through digital citizenship behaviour, this study illustrates a novel aspect of technological ethics that encourages the institutionalization of corporate social responsibility. This study is the first to investigate how CSR and techno-ethical orientation interact. Although a number of earlier aspects of ethical behaviour have been studied, the outcomes of employees' techno-ethical behaviour within a business have not yet been investigated.

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INTRODUCTION

Industries are changing quickly due to digital technology and the disruptive innovations that go along with it. This is enabling businesses to take a variety of actions to investigate and take advantage of the advantages that these technologies offer (Ardito, Raby, Albino, & Bertoldi, 2021; Benitez, Arenas, Castillo, & Esteves, 2022; Usai et al., 2021). Businesses have worked to maintain and enhance their innovation performance in response to mounting pressure to create new goods and services fast and ef-

*corresponding author:Bachar Kahil
†email: bashar.kaheel@gmail.com

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fectively (Anzola-Román, Garcia-Marco, & Zouaghi, 2024; Awan, Arnold, & Gölgeci, 2021; Setini, Yasa, Supartha, Giantari, & Rajiani, 2020; Wang, Li, Li, & Wang, 2021). The development of technology and the Internet has completely changed human life. Technology development and early acceptance have made it feasible for people and organisations to communicate, disseminate, function, and survive. The globe gradually shifted to using technology as a tool to fight lockdown, isolation, inaccessibility, and limitations connected to work during the start of the COVID-19 pandemic. In 2023, there were around 876.0 million active Internet users in Netherland, and for the first time, the percentage of non-active Internet users is a minority, accounting for 81% of the country's total population (Anzola-Román et al., 2024; Benitez et al., 2022). These numbers demonstrate how pervasive technology and the Internet are in many facets of our lives.

Businesses and researchers are paying more and more attention to corporate social responsibility (CSR) initiatives. According to reports, more than 7,800 businesses from more than 180 nations have invested more than $4 trillion in corporate social responsibility (Jia, 2020; Singh & Misra, 2021; Verma & Garg, 2024). Several studies have investigated how businesses "do well by doing well" (Li, Al-Sulaiti, Dongling, Abbas, & Al-Sulaiti, 2022; Zhao, Wu, Chen, & Zhou, 2022), however the empirical results regarding the connection between CSR and innovative performance results are complex. Some studies indicate that they have a good relationship that gives them a competitive edge (Dakhli, 2021; Orazalin & Baydauletov, 2020; Singh & Misra, 2021), while others contend that innovation performance may suffer as a result of the agency and financial expenses associated with CSR (Zhao et al., 2022).

Technology has surpassed both our globe and civilization in recent times. Scholars have contended that a technologically mediated self of techno sapiens exists in the world's techno sphere (Setini et al., 2020; Usai et al., 2021). The state of affairs now indicates that technology has assimilated into human civilization and that the world is on the verge of technological civilization due to its mandatory use and adoption. In contrast to science, technology alters the world through interaction (Verma & Garg, 2024). In order for different societal nodes and segments to find their place in the world, technology has impacted and changed them. In addition to modifying or impacting the current norms and structures, technologies have also brought forth new aspects of decision-making and values. Evidently, a viable field of ethics known as "techno-ethics" has been revived by technology (Usai et al., 2021).

Integrating ethics into technology emerged as a result of the study of techno-ethics, an interdisciplinary discipline that examines how ethical frameworks and technological features interact for the benefit of society (Amrute, 2019). Both moral and immoral human behaviour influence how ethical or unethical technology performs. Since technology is governed and controlled by the moral standards of its users, it is abstract. Therefore, un-techno-ethical practices by employees are increasing despite corporates' good attempts to assure ethical business conduct (Amrute, 2019). However, increased efficiency, improved services, and expanded reach have resulted from the organization's ongoing investments in technology (Verma & Garg, 2023). Nevertheless, companies face a difficult task in making the most ethical and efficient use of technology, even with all of its many advantages (Anzola-Román et al., 2024; Verma & Garg, 2023)). When technology is used to its full potential, unethical behaviour by a product.

In addition, the nature of social conditions, relationships, citizenship, and information flow has changed from a moral and legal perspective to a digital one in the information and technology age, when the "physical" and "digital" worlds are combined (Hernández, Yañez-Araque, & Moreno-García, 2020; Usai et al., 2021). These days, digital principles govern how organisations and their members operate, disseminate information, behave, and govern. According to Verma and Garg (2023), organisations have acknowledged the ability of digital technologies to influence their organisational environment and culture. To guarantee moral behaviour when using technology, organisations are educating their staff on netiquette and digital ethics. When working digitally, employees are urged to exhibit online respect (OR) and morally righteous conduct. Digital citizenship behaviour is the ability to engage in society online in a responsible manner (Verma & Garg, 2024). Digital citizenship behaviour describes to the set of rules and regulations that govern the digital world (Verma & Garg, 2024). Digital citizenship behaviour refers to Internet users' responsible, moral, and safe online conduct (Tapingkae, Panjaburee, Hwang, & Srisawasdi, 2020; Wang et al., 2021).

A new era of work arrangements has been brought about by the advent of digitalization, which has given rise to creative ideas like "digitalization of work" (Ardito et al., 2021; Jones & Mitchell, 2016; Tapingkae et al., 2020)). The current landscape of work arrangements has made hybrid work, remote work, virtual work setup, and other related concepts the focal point of these new trends (Nah, Lee, & Liu, 2022). Employee interactions, behaviour, and ethical considerations at work are impacted by the nature of various digital work

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arrangements (Wang et al., 2021). The way that techno-ethics and digital citizenship conduct are viewed and applied has changed dramatically as a result of the many types of digital work (Benitez et al., 2022). Digital citizenship behaviour is essential for encouraging inclusive cooperation, polite communication, and productive teamwork. Exhibiting OR, being aware of digital etiquette, and actively participating in constructive digital interactions are all components of being a responsible digital citizen. In conclusion, employees frequently rely significantly on digital tools and platforms for communication and cooperation when working in virtual and hybrid environments. Understanding the ethical implications of data privacy, information security, and responsible use of digital resources has become more crucial due to our growing reliance on technology (Usai et al., 2021). Businesses and employees must pay closer attention to their digital interactions, online behaviour, and adherence to ethical standards in a digital setting (Ardito et al., 2021).

Purpose of the Study

Numerous research have developed the concept of innovation performance in detailed with dimensions of product innovation and process innovation; however, it is unknown how it is generated and influenced. Furthermore, the current study has been conceptualized the conduct of ethical orientation related to technology. The prior studies on digital citizenship behaviour are limited investigations, but in present study techno-ethical orientation moderating by digital citizenship behaviour with online respect and online civic engagement (Verma & Garg, 2024, 2023). The present study investigated techno-ethical orientation with corporate social responsibility, digital citizenship behaviour and innovation performance.

THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

Innovation Performance (Product and Process Innovation)

For a persistent competitive edge, innovation is essential (Awan et al., 2021). According to Wang et al. (2021), innovation is frequently pursued in reaction to unforeseen, strange, or non-routine issues. Since innovation necessitates altering a firm's current cognitive paradigms Usai et al. (2021) and resources Ardito et al. (2021), it entails organisational intelligence and learning. The technical design, research and development, production, management, and commercial activities involved in the marketing of a new (or improved) product are all included in the process of product innovation, according to Setini et al. (2020). Awan et al. (2021) conceptualized product innovation performance in this study as a construct with two distinct dimensions: efficiency and efficacy. An innovation's level of success is reflected in its efficacy. However, the work made to reach that level of achievement is reflected in innovation efficiency. Prior studies have examined two reasons for process innovation: the necessity to generate a profit Ghasemaghaei and Calic (2020) and the desire to seem respectable to outside stakeholders (Awan et al., 2021). One incentive that is quite well recognised is obtaining a financial reward. Companies use open innovation to identify more effective methods to accomplish things by acquiring new process technologies in an effort to cut costs (Anzola-Román et al., 2024; Usai et al., 2021).

Techno-Ethical Orientation

There are special problems with ethics presented by modern technology that did not exist in earlier generations. A variety of factors, including variations in values, beliefs, and attitudes towards technology, as well as variations in the ways in which technology has developed, can cause generations to differ in their technological-ethical orientation (Anzola-Román et al., 2024). In contrast to previous generations that did not have access to the same technologies during their childhood, newer generations who have grown up with technology may hold different opinions on what ethical behaviour in technology use looks like (Verma & Garg, 2024). The distinction between right and wrong is hazy, necessitating evaluation from a variety of angles. For example, youthful workers frequently use social media sites and messaging applications while at work. According to a conventional perspective, such an act would be categorically unethical. However, because technology has made it harder to distinguish between work and home, younger employees do not view this kind of involvement as unethical (Amrute, 2019). Additionally, contemporary workers frequently find themselves working at the workplace, even on the weekends or after hours. As a result, technology has eliminated the separation between home and work. Consequently, it is unethical and requires a thorough review to use organisational time and resources for personal purposes. Thus, the internet and digital technologies' broad accessibility and acceptance have completely changed how people use technology. However, regrettably, it has also provided a great deal of opportunity for moral transgressions and moral conundrums (Verma & Garg, 2024).

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Techno-Ethical Orientation and Corporate Social Responsibility

The impact of ethics on technology, technological change, technical advancements, and their applications are all related to techno-ethics. Assuming that technological advancement is unavoidable, techno-ethics addresses the pursuit of procedural and technical remedies for the detrimental societal effects of technology (Amrute, 2019). Rapid technological advancements bring with them techno-ethical issues that demand careful consideration in order to be resolved and prevent unethical behaviour in the future. Techno-ethics is defined for this study as the application of technology while taking morality and ethical principles into consideration. Additionally, it is thought that a person with a techno-ethical mindset maintains and uses technology in an ethical and thoughtful manner. When ingrained in a user, this mindset encourages moral technology use that advances society (Anzola-Román et al., 2024). The social cognitive theory (SCT) has been used to explain the theoretical foundation of the current study, which is the connection between corporate social responsibility and techno-ethical orientation (Luszczynska & Schwarzer, 2015). The foundation of SCT is triadic reciprocity, which is the interplay of behavioural, environmental, and personal elements that collectively shape human behaviour. The theory makes the assumption that an action's result is determined by a person's personal elements, including moral thinking, ethical orientation, values, and behavioural components including attitude, beliefs, affective reactions, and all other contextual circumstances (Schunk, 2012). The current study's the idea is based on the assumption that a corporate responsibility will be framed by the collection of individual ethical orientations by technology. Thus, the following is the research hypothesis:

H1: There is significant relationship between techno-ethical orientation and corporate social responsibility.

Corporate Social Responsibility and Innovation Performance Numerous research have examined the impact of corporate social responsibility (CSR) on innovation performance; however, the majority of these studies concentrate on overall economic performance, but there are numerous other specific benefits that merit consideration (Buertey, Sun, Lee, & Hwang, 2020), including the one discussed here. In any event, it is also true that earlier research has attempted to explain how corporate social responsibility and innovation phenomena are related. This beneficial effect of corporate social responsibility on innovation is confirmed by empirical works published subsequent to the literature study (Dakhli, 2021; Orazalin & Baydauletov, 2020; Jia, 2020). According to Singh and Misra (2021), future research should concentrate on both establishing a credible theory that addresses the implications of this relationship and offering empirical data on the presumed beneficial effect of corporate social responsibility on innovation that reveals the comprehension of these elements. Furthermore, when analysing corporate social responsibility impact on innovation, the authors stress the importance of viewing it as a multifaceted, comprehensive notion that breaks down the construct. Similarly, Li et al. (2022) assert that each of the social and environmental facets of corporate social responsibility influences innovation in a different way.

Furthermore, according to certain authors, studies ought to consider the various results obtained via CSR tactics (Setini et al., 2020). More specifically, (Wang et al., 2021) discuss the significance of differentiating between the two primary categories of technical innovation results (i.e., process and product innovations), since each reflects unique ways that CSR initiatives might impact performance. For example, process innovation resulting from CSR concerns increases the efficiency of the firm, whereas product innovation may be generated from specific social or ecologically responsible practices followed by the firm and generally impacts earnings (Benitez et al., 2022; Usai et al., 2021). The possible peculiarities of the effects of CSR orientation on the results of process and product innovation are thus specifically addressed in this work. As previously said, it accomplishes this by taking into account the multifaceted character of CSR. By concentrating on the fundamental elements of causation, the study also seeks to provide a thorough understanding of the connection between CSR and innovation (Anzola-Román et al., 2024; Chu, Bai, & Li, 2024; Benitez et al., 2022; Wang et al., 2021). Organisational innovation practices are specifically introduced in the theoretical framework as a moderator of the impact of CSR orientation on innovation performance. Thus, the following is the research hypothesis:

H2a: There is significant relationship between corporate social responsibility and product innovation.

H2b: There is significant relationship between corporate social responsibility and process innovation.

Corporate Social Responsibility as Mediator

Chu et al. (2024), stated that the growth of corporate social responsibility is governed and encouraged by one's techno-ethical attitude. The ethical orientation of every employee in an organisation will function as an interacting determinant that influences and shapes the foundation for corporate values since employees only behave in a way that is

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consistent with the values they encounter while working (Awan et al., 2021; Usai et al., 2021). Their ethical stance will be represented in the organization's corporate values, or ethical framework. When its members support ethical orientation, a company will act ethically. Compared to older generations, they therefore have a different relationship with technology and are probably going to have different techno-ethical orientations(Wang et al., 2021). Furthermore, future managers can create pertinent moral training and institutionalize an ethical organisational culture by investigating the techno-ethical orientation of post-millennial students who are about to enter the workforce (Chu et al., 2024; Usai et al., 2021; Verma & Garg, 2023). This highlights the need for businesses to maximise stakeholder welfare in addition to economic profit (Setini et al., 2020). The complexity of the external institutional environment and the existence of many institutional pressures cause variations in the CSR practices of businesses (Verma & Garg, 2024, 2023). Three typical CSR tactics that organisations use to address legitimacy issues were evaluated by Hernández et al. (2020). These tactics include communicating with stakeholders that question the organization's legitimacy, adjusting to external expectations, and influencing stakeholder perceptions. All three strategies share the goal of achieving social legitimacy, which is made more difficult by increasingly complex and diverse institutional systems (Chu et al., 2024; Verma & Garg, 2024)). When businesses engage in actions that support several institutional logics at once, this becomes particularly troublesome. This is due to the fact that these logics are difficult to integrate, which compromises the effectiveness of CSR tactics (Hernández et al., 2020, 2020). But our understanding of the issues that result from this process is somewhat limited.

But we also recognise that corporate social responsibility (CSR) is a multifaceted concept that encompasses a variety of business practices meant to satisfy the demands of many stakeholders (Ghasemaghaei & Calic, 2020; Setini et al., 2020). Whether or not CSR practices have an impact on businesses' financial returns is one major research question. The vast body of research offers conflicting and erratic proof of the relationship between corporate social responsibility (CSR) and business performance (see the excellent assessment. Four categories of correlations between CSR firm performance were compiled by Tsinopoulos et al. (2018): positive, negative, curvilinear, and no link. Thus, the instrumental benefit of CSR has been confirmed by adopting a contingency viewpoint (Anzola-Román et al., 2024; Chu et al., 2024). Researchers have taken into account both internal organisational capabilities and managerial traits (Benitez et al., 2022; Usai et al., 2021; Wang et al., 2021) as well as external contingent factors (such as stakeholder saliences and the institutional and industrial environment) (Ardito et al., 2021; (Wang et al., 2021). Although there is evidence supporting the mediating relationship of corporate social responsibility between ethical-techno orientation and innovation performance, the impact of firms' value creation and appropriation on this relationship has not been thoroughly investigated.

H3a: There is mediating role of corporate social responsibility between techno-ethical orientation and product innovation.

H3b: There is mediating role of corporate social responsibility between techno-ethical orientation and process innovation.

Digital Citizenship Behaviour as Moderator

Technology is viewed as having two sides. It might be viewed as a tool-specific paradox (Verma & Garg, 2024). Technology can either be utilised to improve society or the system, or it can be used to further unethical behaviour and influence it (Wang et al., 2021). Nonetheless, two viewpoints on technologies have been recognised in the body of existing work. According to researchers, the human-controlled perspective determines whether technological practices are morally right or wrong based on individual beliefs and choices. Technology is not to blame because it is neutral, and people's choices about how to utilize it are more likely to be shaped by society or culture (Nah et al., 2022). Because the new information and communication spaces brought about by the Internet and technology have altered the roles of technology and those in control of it, scholars should talk more about the alternative viewpoint of viewing technology as an independent entity that propels human activity (Usai et al., 2021). With the constant development of newer and smarter technologies, people are unable to understand the true nature of these tools (Benitez et al., 2022). People frequently use the same technology in various ways. Thus, it is accurate to say that people use their cognitive schemas and choices to govern technology. It is the duty of users in this digital age to make sure that the Internet and technology are used effectively in a way that makes the community's cyberspace safer, more responsible, and more respectable (Ardito et al., 2021). The idea of "digital citizenship behaviour" (DCB) develops in an effort to maintain control over malevolent activity and facilitate legal compliance with the shifting ethical considerations in technology development (Tapingkae et al., 2020; Wang et al., 2021).

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Verma and Garg (2024b) defines digital citizenship as "the norms of appropriate, responsible behaviour with regard to technology use." Digital citizenship behaviour is the capacity to use technology "safely, responsibly, critically, productively, and civilly," according to Wang et al. (2021). Digital citizenship behaviour is a new code of civil rights for today's digital learners due to shifting norms and the creation of new venues (Tapingkae et al., 2020). Researchers are working tirelessly to develop safer, more responsible, and more respectable technology. For nations like Netherlands, which are at a pivotal point in technology development, the idea of digital citizenship is very important. Online misconduct is becoming a more serious problem as India gradually enters the digital age, where technology is influencing every part of people's life. According to Jones and Mitchell (2016), teaching digital citizenship will lessen the possibility of unethical activity committed online and using digital devices. They found that a lack of training in digital literacy and civic engagement has a direct impact on the rise in instances of cyberbullying, sexting, harassment, and other unethical online behaviours. In order to gauge digital citizenship behaviour, they created a two-dimensional scale. The two dimensions online respect and online civic engagement are in good agreement with how digital citizenship activity is generally conceptualized (Deng & Fei, 2023). Digital engagement and e-participation have been used interchangeably with the term "online civic engagement." It conceptualizes activities including the use of online platforms, like online discourse and expression to address social and community challenges (Deng & Fei, 2023; Nah et al., 2022). This study employs a concept of online civic engagement that relates to interactions between the government and citizens mediated by the use of ICT devices, drawing on earlier research on online civic behaviour (Tapingkae et al., 2020; Wang et al., 2021) and e-participation (Wang et al., 2021). According to Usai et al. (2021), online civic engagement can take many different forms, such as information gathering and posting, government-citizen communication, e-voting, activity coordination, lobbying, and advocacy (Benitez et al., 2022; Usai et al., 2021; Nah et al., 2022). In light this study concentrates on a behavioural component of online civic engagement, specifically participating in online civic activities to exchange skills or promote community well-being (Tapingkae et al., 2020; Verma & Garg, 2024). To put it briefly, the researchers' hypothesis is:

H4a: There is moderating role of online respect on corporate social responsibility and product innovation.

H4b: There is moderating role of online respect on corporate social responsibility and process innovation.

H4c: There is moderating role of online civic engagement on corporate social responsibility and product innovation.

H4d: There is moderating role of online civic engagement on corporate social responsibility and process innovation.

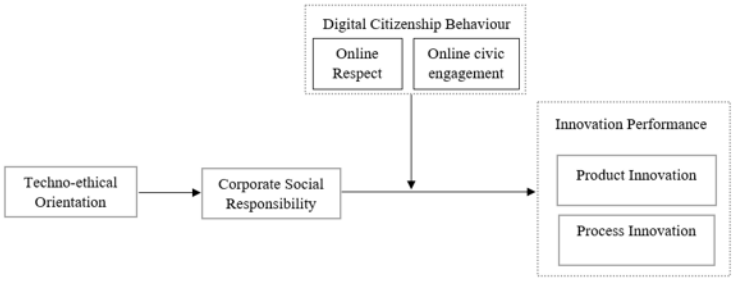

FIGURE 1. Conceptual Model Source: Primary Data

Figure 1 below shows the study framework outlined from the previously discussed hypothesis.

METHODOLOGY

Sampling and Data Collection Procedure

A structured Questionnaire were used in online survey for data collection and longitudinal sampling method used with 15 days interval between each time. First Time variables include for data collection are techno-ethical orientation, second Time interval data collection variables include mediator (corporate social responsibility) and moderator (digital citizenship behaviour), and lastly Time 3 having innovation performance (product and process innovation). Professionals and policy makers with using their expertise and technology to make a questionnaire. The survey were transformed into Google Forms having recorded participant's emails, the study variables and demographics for data collection used. Total 350 email were sending to Call Center

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employees working in Amsterdam, Netherlands. The final sample including 220 call center employees.

Table 1, shows demographic characteristics of employees, having 60% were male employees and 40% were female employees. Most of the participants were married 38.6%, unmarried were 35.9% and divorced were 25.5% employees. Furthermore, master level employees were 38.1%, college level were 26.4%, PhD level were 20% and primary level were 15.1% participants. Regarding job tenure, 2-3 years participants 41.3%, 7-12 months were 25.0%, more than 4 years were 20.5% and less than 6 months were 13.2% participants.

TABLE 1. Demographic characteristics of respondents (N = 220)

Variables	Categories	Frequency	%	Cumulative %
Gender	Male	132	60.0	60.0
	Female	88	40.0	100
Marital Status	Un-Married	79	35.9	35.9
	Married	85	38.6	74.5
	Divorced	56	25.5	100
Education Level	Primary Level	34	15.5	15.5
	College Level	58	26.4	41.9
	Master Level	84	38.1	80.0
	PhD Level	44	20.0	100
Job Tenure	< 6 months	29	13.2	13.2
	7-12 months	55	25.0	38.2
	2-3 years	91	41.3	79.5
	>4 years	45	20.5	100

Techno-Ethical Orientation

Techno-ethical orientation having 6-item scale adopted by (Verma & Garg, 2024). The items include" Reading and forwarding emails of others without their consent", "Sending files with virus intentionally", "Not giving due credits to someone for providing assignment-related material", "Making a personal copy of a rented movie", "Copying software from the organization for personal use and using workplace organizations to play games online" and "Loafing, i.e. using instant messaging apps during work hours, is evident in this factor extraction". Five-point Likert scale used for survey collection rang include "1=strongly disagree and 5=strongly agree".

Corporate Social Responsibility

Corporate social responsibility having 6-item scale adopted by Okura (2008). The items include "donation and volunteer activities are carried out as acts outside business domain", "Making internal check system and internal control work in production", "Making internal check system and internal control work on sales" , "Making internal check system and internal control work on purchases" , "Making internal check system and internal control work on appropriateness of sales to people under age and elderly people" and "Making internal check system and internal control work on the appropriateness of officers 'bonuses and distribution to shareholders". Five-point Likert scale used for survey collection rang include "1=strongly disagree and 5=strongly agree".

Digital Citizenship Behaviour

Digital citizenship behaviour having two dimensions online respect and online civic engagement. Online respect having 6-item scale and online civic engagement having 4-item scale adopted by Jones and Mitchell (2016). Five-point Likert scale used for survey collection rang include "1=strongly disagree and 5=strongly agree". A sample include "I think about making sure that things I say and post online will not be something I regret later", "I do not add to arguments and insulting interactions that happen on the Internet" and " I have used the Internet to share something that I am good at".

Innovation Performance

Innovation performance having two dimensions product innovation and process innovation. Product innovation having 8-item scale and process innovation having 4-item scale adopted by Alegre et al. (2006); Tsinopoulos et al. (2018). Five-point Likert scale used for survey collection rang include "1=strongly disagree and 5=strongly agree". A sample statements "Opening of new markets abroad", "Opening of new domestic target groups and "The percentage of the

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firm's total annual turnover from goods and services that were unchanged or only marginally modified".

Common Method Bias

In order to give the impression that techno-ethical orientation and innovation performance are distinct, which are already informed in literature. The participant's demographics are confidential. Biases was reduced by statistical and procedural techniques. Research findings may be significantly impacted by common covariance or socially desired replies since the independent and dependent variables (DVs) were measured by the same respondents. In addition, a marker variable was added to the model as a statistical fix. The study included a marker variable, resilience, which had no relationship to any of the other characteristics.

Descriptive Statistics, Reliability and Validity Testing

The findings of the descriptive statistics, correlation analysis, reliability, and validity values are displayed in Table 2. The findings indicate that respondents were more inclined to exhibit online respect when using technology, with the construct with the highest mean (4.47) being online respect. According to the appropriate degree of dependability, the reliability metrics Cronbach's alpha (CA) values between 0.789 to 0.913 and composite reliability (CR) displayed very acceptable values between 0.864 and 0.932 (Hair et al., 2024). All of the constructs' convergent and discriminant validity were examined using average variance extracted (AVE) in accordance with Fornell and Larcker's criteria. The model's convergent validity was supported by the AVE values, which were high enough above the 0.50 threshold value (Fornell & Larcker, 1981). Likewise, the AVE values' square root was higher than its correlation with the other components. Consequently, discriminant validity was verified.

TABLE 2. Descriptive analysis, correlation analysis, reliability and average variance extracted

Variables	Mean	SD	CA	CR	AVE	1	2	3	4	5	6
CSR	3.35	0.591	0.863	0.898	0.596	0.772					
OCE	2.98	0.654	0.789	0.864	0.615	0.620	0.784				
OR	4.47	0.781	0.912	0.932	0.696	0.657	0.537	0.834			
PI	3.22	0.613	0.913	0.930	0.624	0.596	0.478	0.761	0.790		
PoI	3.78	0.512	0.872	0.913	0.725	0.624	0.557	0.712	0.669	0.851	
TEO	4.12	0.719	0.849	0.888	0.573	0.629	0.726	0.680	0.622	0.700	0.757

RESULTS

Three sections present the findings. First, the direct analysis which shows techno-ethical orientation has direct impact on corporate social responsibility and corporate social responsibility has significantly influence on innovation performance (product and process innovation). Second, the mediation effect of corporate social responsibility among techno-ethical orientation and innovation performance (product and process innovation). Third, moderation effect of digital citizenship behaviour (online respect and online civic engagement) on corporate social responsibility and innovation performance (product and process innovation).

Direct Analysis

The table 3 results that techno-ethical orientation has positively influenced on corporate social responsibility (β = 0.729, t = 27.457, p < 0.01). R-square values showed that 53.2% variation in corporate social responsibility by techno-ethical orientation. Thus, H1 supported. The table also shows that corporate social responsibility has negatively influenced on product innovation (β = 0.151, t = 1.927, p < 0.05). R-square values showed that 59.7% variation in product innovation by corporate social responsibility. Thus, H2a supported. Lastly, table shows that corporate social responsibility has positively influenced on process innovation (β = 0.167, t = 1.933, p < 0.05). R-square values showed that 72.7% variation in process innovation by corporate social responsibility. Thus, H2b supported.

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TABLE 3. Direct analysis results

IV	DV	Path Coefficient	T-value	R-Square	*p*-value
H1:TEO	CSR	0.729	27.457	0.532	0.000
H2a:CSR	PI	-0.151	1.972	0.597	0.041
H2b:CSR	PoI	.0167	1.933	0.727	0.048

Mediation Effect

We tested the mediation effects using the bootstrapping approach (repeated bootstrap set to 2000). Table 4 show that corporate social responsibility mediates negatively between techno-ethical orientation and product innovation (β = -0.510, t = 4.110, p < 0.05). Hence, H3a accepted. Furthermore, corporate social responsibility mediates positively influence between techno-ethical orientation and process innovation (β = 0.149, t = 1.968, p < 0.05). Hence, H3a accepted.

TABLE 4. Mediation effect results

Relationship	Path Coefficient	*T*-value	*p*-value
H3a:TEO -> CSR -> PI	-0.510	4.110	0.007
H3b:TEO -> CSR -> PoI	0.149	1.968	0.040

Moderation Effect

We tested the moderation effects using the bootstrapping approach (repeated bootstrap set to 2000) (Hair et al., 2024). Table 5 show that online respect moderates the positive influence on corporate social responsibility and product innovation (β = 0.164, t = 2.379, p < 0.05). Hence, H4a accepted. It emphasises that online respect allows for the growth of corporate social responsibility as well as to a product innovation. Furthermore, online respect moderates the positive influence on corporate social responsibility and process innovation (β = 0.188, t = 3.155, p < 0.05). Hence, H3b accepted. It highlights that online respect fosters process innovation and enhance corporate social responsibility.

However, online civic engagement moderates the negatively influence on corporate social responsibility and product innovation (β = -0.148, t = 2.126, p < 0.05). Hence, H3c accepted. It highlights how exhibiting online civic engagement promotes product innovation and the explosion of corporate social responsibility. Furthermore, online civic engagement moderates the negatively influence on corporate social responsibility and process innovation (β = -0.147, t = 1.916, p < 0.05). Hence, H3d accepted. It illustrates how online civic engagement encourages process innovation and the development of corporate social responsibility.

TABLE 5. Moderation effect results

Relationship	Path Coefficient	T-value	P-value
CSR*OR -> PI	0.164	2.379	.018
CSR*OCE -> PI	0.188	3.155	.017
CSR*OR -> PoI	-0.148	2.126	.021
CSR*OCE -> PoI	-0.147	1.916	.036

DISCUSSION AND CONCLUSION

Over the past fifteen years or more, the world has undergone significant major changes. Because of the constant barrage of techno-ethical orientation, a home that was once thought of as a private space has become much more transparent, open, regulated, and monitored (Ardito et al., 2021). Prior research has indicated that techno-ethical orientation influences manager corporate responsibility, digital citizenship behaviour, and innovation performance (Verma & Garg, 2024; Wang et al., 2021). The development of techno-ethics as an axiomatic element of the techno-sphere is further identified and highlighted in this work. One of the findings of this study is that members' ethical orientations are combined to form corporate social responsibility. People who work with technology in a technology-mediated environment have a techno-ethical attitude, which has been shown to accurately anticipate and support the development of corporate social responsibility. Additionally, by examining the moderating influence of digital citizenship behaviour (online civic engagement and online respect) in enhancing the association between techno-ethical orientation and CSR, this study reaffirms the significance of digi-

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tal citizenship conduct in a fresh environment. The findings showed that the institutionalization of CSR is substantially reinforced by the display of online civic engagement and respect at both low and high levels. The main contribution of this study techno-ethical orientation has significant impact on corporate social responsibility. Furthermore, corporate social responsibility mediates the relationship between techno-ethical orientation and innovation performance. However, digital citizenship behaviour moderates among corporate social responsibility and innovation performance.

Theoretical implications

The contribution of social cognitive theory in a technological setup was empirically proven by this study. The findings is consistent with earlier ethical research that found that social cognitive theory was important in assessing a person's moral behaviour (Luszczynska & Schwarzer, 2015). Strong case for incorporating virtue ethics into the discussion of technology ethics. (Anzola-Román et al., 2024) listed a number of techno-moral virtues, including bravery, kindness, flexibility, and techno-moral knowledge. Thus, by incorporating techno-ethics and digital citizenship as a virtue that significantly alters the technological landscape, the results of this study have added to the work of (Verma & Garg, 2024). The broader theoretical discussion on the relationship between ethics and technology can benefit from the use of the techno-ethical orientation scale. It can contribute to our growing knowledge of how ethical standards and values are being shaped by technology and how people are adjusting to these developments. The indicator can be used to gauge people's awareness of technology-related ethical dilemmas as well as their perceptions and reactions to them. One way to conceptualize techno-ethical orientation is as a type of digital citizenship, in which people assume accountability for their online behaviour and work to create a polite and safe online community. Call center employees can become more involved and active citizens in the digital environment by cultivating a techno ethical mindset. Social cognitive theory (SCT) posits that human behaviour and motivation are heavily influenced by premeditation. Expectations that could relate to the results of carrying out a particular activity are part of this anticipatory control system. The theory lists several important variables that affect behaviour. Perceived self-efficacy, the first factor, refers to people's confidence in their ability to carry out a certain activity necessary to achieve a desired result. The other fundamental concept of SCT, outcome expectancies, focusses on people's perceptions of the potential repercussions of their choices. In addition to these two ideas, SCT takes into account objectives, perceived barriers, and opportunity structures (Schunk, 2012).

Practical implications

Techno-ethics is conceptualized and operationalized in the study by extending it to the organisational level in addition to personal factors. The findings demonstrate how a technical-ethical approach relates to corporate social responsibility. Therefore, when creating an organisational value system, managers need to take into account the collective nature of their employees' techno-ethical orientation. Organisations can utilize this knowledge to create and carry out training initiatives that emphasise the advancement of techno-ethical concepts, which will promote moral behaviour and decision-making across the board. Providing employees with tech-ethical training and digital citizenship education is one of the pragmatic strategies that will produce beneficial results like improved and more efficient use of technology for the highest good of people. There will probably be a rise in the need for workers with expertise in technology ethics as businesses come to understand the significance of a techno-ethical approach in forming CSR. For those who specialize in this area, this may open up new career options and employment opportunities. Additionally, prospective employees may have a more positive opinion of businesses that place a high priority on techno-ethical behaviour and significant corporate social responsibility. This might give these companies a competitive edge in the job market by luring top people. Such self-accessed reports may then be readily compared to organisational and social norms, and remedial actions could be implemented in response to streamline a new generation's ethical behaviour. The success of Industry 5.0 may be significantly impacted by the workforce's techno-ethical orientation. Employees with a strong ethical compass and exceptional proficiency with cutting-edge technologies can assist businesses in developing a more environmentally and socially conscious production system. At best, ideas based on the product/industry "maturation" literature are only partially applicable because call center work is neither an industry in and of itself nor limited to a specific economic sector (Loggen & Leukfeldt, 2022). It is preferable to approach call center employment as an ongoing evolution in the application of certain technologies and management approaches to a growingly important segment of the white-collar labour process. As previously said, the closest historical equivalent for comparative purposes may be the way that the use of machines and mechanization in the past impacted numerous manual

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labor-intensive fields.

Limitations and Scope for Future Research

Despite the fact that this study has made a number of contributions, its methodology, sample, and variable inclusion are limited. Because the study was restricted to workers in Amsterdam, the Netherlands, generalizability may be an issue when confirming the results in a different setting. In terms of methodology, the quantitative approach is thought to be inadequate for capturing the entirety of the relationship between variables. Thus, in order to evaluate and validate the aforementioned relationship experimentally, the authors suggest conducting a cross-cultural or intercultural mixed-method study. Due to the removal of numerous outliers, the sample size was not the same for each cohort. A thorough understanding of how technology use has changed often can be obtained from future research examining the effect of additional pertinent aspects through observational studies or interviews. In-person interviews will yield a wealth of information that is essential to our comprehension of the elements affecting the digital divide or the techno-ethical orientation of technology use. Future research could examine how people's techno-ethical orientation is influenced by their social surroundings, experiences, gender, and ethical judgement. Finally, incorporating digital citizenship as a moderator is a smart way to foresee how techno-ethical orientation will develop. The association between techno-ethical attitude and CSR might be further studied to examine the mediating or moderating effects of variables including digital literacy, generational disparities, and technology exposure. Furthermore, the processes and patterns of change are likely to happen unevenly due to its multi-sectoral nature. In contrast to the expanding, aggressive, frequently multi-sectoral outsourcing organisations that are motivated by the need to compete in order to win or retain contracts, in-house call center operations (such as those in the finance, telecommunications, etc.) are likely to be more directly impacted by company or sectoral-specific policies and trends. However, as previously said, the performance and policies of the outsourcing firms will affect their potential clients' general and targeted approaches.

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