





## Article

# Smart Sustainable Marketing and Emerging Technologies: Evidence from the Greek Business Market

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**Abstract:** In the market-shaping literature, markets are viewed as the results of intentional and planned acts. Market shapers do not often create technology themselves despite the fact that technical advancements can hasten changes in smart sustainable marketing. This study assessed the development of emerging technologies in business informatics with a focus on smart sustainable marketing and its relevant emerging technologies. Data were collected using an online questionnaire from 320 marketing professionals in Greece. The study revealed that emerging technologies have a significant relationship with smart sustainable marketing. Drivers of smart sustainable marketing positively enhance the effectiveness of smart sustainable marketing, and innovations in business informatics have a positive effect on smart sustainable marketing. It is clear from our results that the area of emerging technologies and smart sustainable marketing has not received much attention since such developments depend on complementary technologies that make it possible for emerging methods or technologies to integrate resources and co-create value. This study conceptually distinguishes between technology as a market offering and technology as a business platform for market shaping and innovation. Managers in the business industry and elsewhere are urged by this research to more closely examine the development of ancillary technologies, which could serve as platforms for market innovation and market shaping. Discovering and taking advantage of these opportunities is crucial for success in smart sustainable marketing. This study also presents a significant addition to the academic community because of the empirical evidence on the relationships between business informatics, smart sustainable marketing, and new technology. In terms of technology, it expands the theoretical framework of market dynamics and offers a novel perspective on the ways in which technology influences the structure and sustainability of markets.

**Keywords:** smart sustainable marketing; emerging technologies; business informatics; artificial intelligence; 5G technology



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## 1. Introduction

Initially, the idea that markets currently exist and that enterprises must integrate into an established ecosystem in order to locate opportunities has been connected to mainstream marketing [1]. According to this perspective, a firm has no control over the market and must respond to the demands of its new commercial environment [2,3]. However, the neoclassical view of markets has recently come under scrutiny, and marketing scholars have begun to question it [4]. Scholars now see markets as systems that are performed and represented by numerous market participants rather than as pre-existing entities with predetermined settings [1,5]. This change in how markets are conceptualized has underlined the significance of corporations actively authoring markets with market

proposals. These developments have led to market shaping, which now presents markets as the results of intentional and planned activities, allowing businesses and other players to participate in influencing markets and creating market innovation [6,7]. Ekman et al. [8] noted that market innovations represent new, institutionalized solutions that occur mainly as a result of the deliberate efforts, rather than accidental outcomes, of important actors who perform within and, consequently, transform markets. If there are substantial changes to the market structure or practices, the outcome of the smart sustainable marketing process is deemed to be a market innovation [1,9–11]. Nosratabadi et al. [12] denied smart sustainable marketing as a marketing model that involves creation and marketing of goods and services that meet customers' wants in terms of quality, effectiveness, cost, and ease of use while also being good for society, the economy, and the environment. It uses high-tech tools to spread the deal and encourage environmentally friendly ways of living and doing business. Service-dominant (S-D) logic theory contends that markets develop as a result of the interaction between technical advancements and institutional frameworks [4,6,13]. Markets are purposefully shaped by actors with agency, and these changes may be related to more granular factors such as products and price [9,14,15]. Therefore, markets are institutionalized approaches where certain categories of (market) participants generally engage in trade. Additionally, Kaartemo and Nyström [1] noted that "peripheral" or "nontraditional" market actors may also play a role in the market's evolution. As a result, it is critical to shift the focus from traditional market players and activities to unorthodox market actors and actions that may affect or produce traditional market practices [14,16].

According to Dallas et al. [17], markets develop as a result of actions taken by numerous participants and are partially dependent on unexpected emergence. Saeid [18] demonstrated that although not all emergence is caused by established players in an institutionalized market, this phenomenon is, nevertheless, relatively predictable, provided the technological advancements of ancillary actors are closely scrutinized. This measure promotes the use of both causal and effectual logic when forming markets [2].

One process that might quicken changes in the industry is technological progress [19]. It was observed by Kaartemo and Nyström [1] that market shapers seldom develop technologies themselves. Using the notion of a platform company structure, previous studies [20,21] identified instances in which focal enterprises do not have full control of the service system. Consequently, market actors' cooperation is influenced by the technical environment [22]. However, not much research has been done on the use of technology to promote innovation and create smart markets. Stated differently, while existing research contributes to our knowledge of the complicated abstraction-level relationship between technological and market changes, it is imperative that we focus on the ways in which advances in business informatics drive intelligent, sustainable marketing [22,23]. On the other hand, limited research has been done on new technology's impact on intelligent, sustainable marketing. Only a small part of the market shift driven by developing technologies is captured by current research. Although technological advances may induce market shifts, the direct and indirect implications of technology on market standards, representations, and other factors are seldom recognized. Research occasionally takes this into account but very infrequently [1,9–11]. In particular, we look at how the S-D paradigm might be applied to research the predicted shifts in the smart market caused by business informatics powered by various developing technologies. This study fills the aforementioned research gaps on technology-induced market change.

The purpose of this study is to examine how emerging technologies in business informatics can be used as platforms for smart market structuring. This report offers numerous expert perspectives on what businesses may look like in the near future as upcoming technologies such as 5G networks are adopted. As a result, we are able to illustrate the model's application in an empirical environment, give constructive criticism that assists in the framework's advancement, and present reasonable perspectives on market shaping.

The major objective of this study is to assess how to enable emerging technologies in business informatics with a focus on smart sustainable marketing and its relevant emerging technologies. This study was also based on the following specific objectives:

- Establishing the different emerging technologies and their effects on smart sustainable marketing;
- Determining the effects of the drivers of smart sustainable marketing on the effectiveness of smart sustainable marketing;
- Exploring the different innovations in business informatics and their effects on smart sustainable marketing.

The research questions of this study were the following:

1. What are the different emerging technologies and their effects on smart sustainable marketing?
2. What is the effect of drivers of smart sustainable marketing on the effectiveness of smart sustainable marketing?
3. What are the different innovations in business informatics and their effects on smart sustainable marketing?

The research hypotheses of this study were the following:

**Hypothesis One (H1):** *Emerging technologies have a positive effect on smart sustainable marketing.*

**Hypothesis Two (H2):** *Drivers of smart sustainable marketing positively enhance the effectiveness of smart sustainable marketing.*

**Hypothesis Three (H3):** *Innovations in business informatics have a positive effect on smart sustainable marketing.*

This research makes a significant contribution to the development of a framework for analyzing market change in line with different emerging technologies. We explain how business informatics in relation to emerging technologies can help predict smart sustainable marketing changes. This work offers a criticism that urges a wide range of players to be included for a more comprehensive understanding of market changes. This research also contributes to the literature on business informatics, emerging technologies, and smart sustainable marketing by expanding awareness of the larger market changes that new technologies cause as well as how tech acts as a platform for the introduction of market innovations.

## 2. Literature Review

### 2.1. Theoretical Review

This study utilized the service-dominant (S-D) logic theory, which asserts that markets develop as a result of the interplay or connection between technical advancements and different institutional frameworks [4,6,13]. The core principle of S-D logic is that people engage in a service-for-service exchange wherein they apply their competencies to help others and obtain reciprocal benefits from others' applied competences. Akaka et al. asked other marketing researchers to collaborate in the development of models and theories, with the goal that S-D logic would serve as the basis for a comprehensive theory of marketing. In order to do this, studies were conducted on the application of S-D logic to branding, service science, and other fields. However, despite the fact that S-D reasoning explicitly states that marketing is a social activity, not as much attention has been paid to its ethics [24]. Vargo and Lusch contended that a better example of the general actor-to-actor (A2A) orientation is provided by business-to-business (B2B) marketing as opposed to the conventional business-to-consumer (B2C) orientation of mainstream marketing. This is due to the fact that all participants in a business-to-business transaction are seen as firms that want to further their own survival by advancing the interests of other enterprises; producers and consumers

do not exist in this context [25]. B2B exchanges are all service-for-service transactions whether they happen directly or indirectly. Vargo and Lusch [26] argued that the generic actor designation and the actor-to-actor (A2A) orientation should not be mistaken for the belief that all performers are the same. In fact, the exact opposite is meant to happen since it will free actors from predetermined roles (like customers) and provide the ground for describing them in terms of uniquely constructed identities.

Additionally, from the standpoint of value co-creation, S-D logic zooms out beyond the conventional dyadic emphasis of company and consumer to a larger, more complete configuration of players [26]. Value creation, according to S-D logic, happens when the actions of providers, beneficiaries, and other players converge. It is acknowledged that players constantly combine resources from many sources, such as “private” (e.g., family, friends), “market-facing” (e.g., businesses and other “market” actors), and “public” (e.g., community and governmental actors) sources [27]. Therefore, rather than being produced and subsequently supplied, value is generated via the integration of resources by numerous players in a particular setting. Additionally, according to S-D logic, the beneficiary is always a co-creator of value who is actively involved in the process of creating its own value [25]. Put another way, operant resources of the beneficiary (a client, for example) must also be incorporated in order for value to be seen by the beneficiary and thus for value creation to take place. For instance, think of dining in a restaurant. For value-in-use to be felt, even when the food is produced and delivered by others, the diner must integrate her knowledge of chewing, using cutlery, and other related topics with the meal that is supplied.

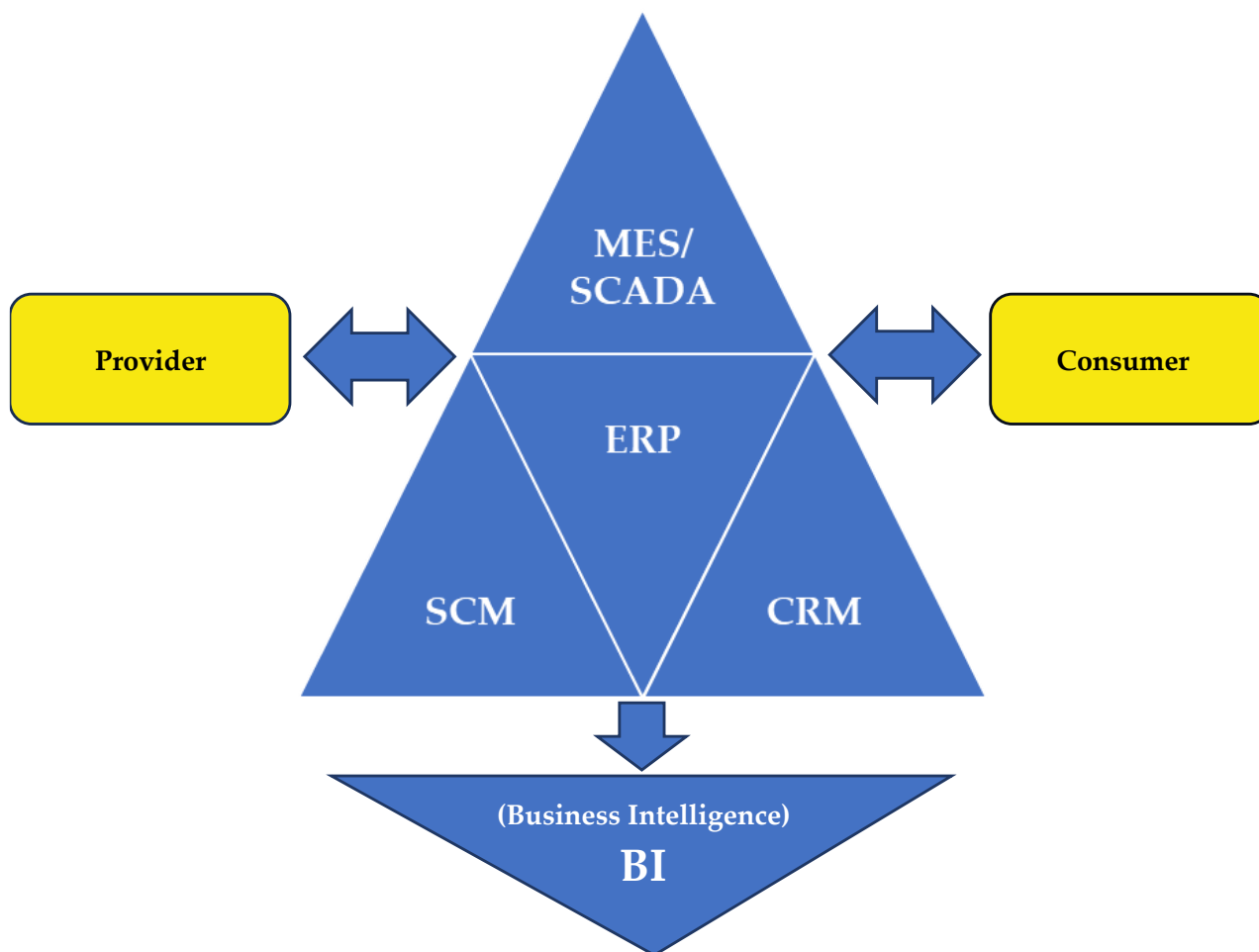
In addition to accommodating institutional structures, the metatheoretical framework of S-D logic plays a coordinating function that is crucial for a fuller understanding of the value co-creating processes [24]. The notion of service ecosystems, which is described as a “relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange”, embodies both the systemic and institutional orientation of S-D logic [26]. According to Vargo and Lusch [25], the word “ecosystem” is employed in the context of the service ecosystems concept since it refers to energy flow and actor–environment interaction. In service ecosystems, this energy transfer is described in the context of reciprocal service provision. One way to think of a society is as a collection of nested and overlapped service ecosystems or, more precisely, as a collection of service ecosystems [24]. In turn, these service ecosystems consist of groups and subgroups of resource-integrating, services-exchanging actors that use institutional frameworks to regulate and synchronize with each other. This theoretical framework is essential in examining smart sustainable marketing and emerging technologies in business.

## 2.2. Business Informatics

Business informatics is composed of two essential subfields that develop separately but are related to and, to some degree, integrated with an organization’s information system architecture [28,29]. Business solutions such as customer relationship management (CRM) and enterprise resource planning (ERP) comprise the first sector and are very important in the success of smart sustainable marketing. Basic information systems that assist business operations are known as business solutions and are also closely related to business intelligence (BI), which is the second aspect of business informatics [30–32].

Kaur et al. [33] noted that it is possible to divide business information systems into two groups of management-support enterprise information systems: one that concentrates on management support and one focused on operational support (Figure 1). The manufacturing resource planning (MRP), ERP, and CRM used to record the majority of enterprise events related to economic and financial issues as well as business processes (supply, production, and sale) are very important in enhancing smart sustainable marketing [34]. Enterprise information systems that assist management are usually referred to as business intelligence (BI) systems and help to analyze the company’s financial status and

facilitate more advanced informational tasks that support smart sustainable marketing [35]. Existing specialized information systems provide a variety of additional specialized capabilities [18,36]. Geographic information systems (GIS) are among the most important in this category since they give the geographical position of current infrastructure and other data [37–39]. Depending on the sector, businesses can combine these technologies in different ways, often resulting in the businesses merging information systems [2,33].



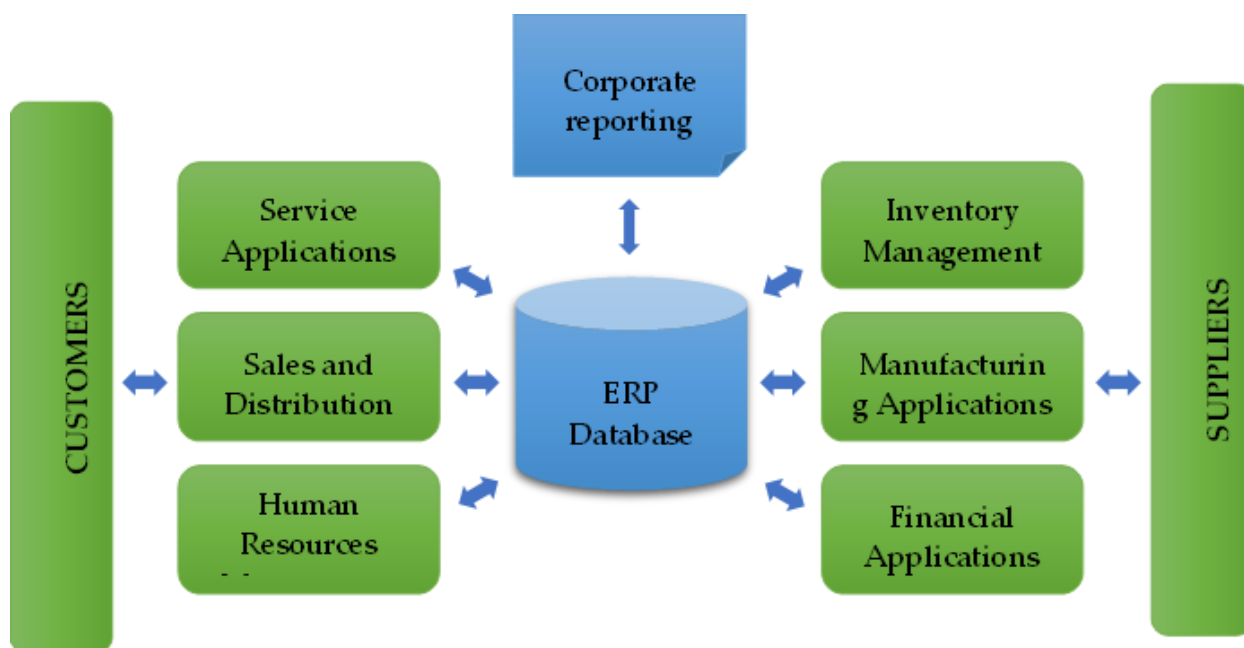
**Figure 1.** Business information systems.

### 2.3. Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) Technologies

Business management-support software is often referred to as enterprise resource planning (ERP) solutions [40,41]. This software is often a bundled program that a firm may use to collect, organize, store, and evaluate data from ongoing business processes. ERP systems, which use a common database, give an integrated and regularly updated view of core corporate processes [42,43]. ERP systems monitor the status of company commitments such as orders, purchase orders, and pay rolls as well as resources such as cash, raw materials, and manufacturing capacity [44,45]. Data gleaned from different departments (manufacturing, buying, sales, accounting, etc.) are shared throughout the programs that comprise the system [46]. ERP handles links to external stakeholders and streamlines information flow across all corporate units [47]. Demand and supply are forecasted and balanced by ERP, which provides a set of forecasting, planning, and scheduling tools used across the entire organization. This system integrates customers and suppliers into the supply chain, uses tried-and-true methods for making decisions, and unifies various business divisions such as sales, marketing, operations, logistics, purchasing, and finances [48].

Most ERP systems follow best practices, indicating that the software represents the vendor's perspective of the most efficient method to carry out each function of the firm [49,50]. The most widely used integrated business solutions across almost all industries are ERP systems. Workers often utilize ERP systems at work, and as a consequence, the number of ERP installations and users within organizations is rising significantly [51–53]. Although front-office chores, e-business, and supplier relationship management (SRM) are becoming increasingly linked as a consequence of the Internet's facilitation of simplified external communication, ERP systems first focused on automating back-office operations that did not immediately affect customers [54]. An ERP system handles several common functional areas (Figure 2):

- Aspects of management accounting, including activity-based costing, costing, cost management, and budgeting;
- Human resources, including recruiting, hiring, training, allocating work assignments, paying workers, offering benefits, pension and retirement plans, managing diversity, retirements, and dismissing staff;
- The manufacturing sector, including engineering, work orders, scheduling, capacity, workflow administration, quality control, manufacturing techniques, manufacturing projects, production flow, and product life-cycle management;
- Order input and processing, which includes credit checks, price, ability to promise, inventory, shipping, revenue analysis and reporting, and commissioning of sales.



**Figure 2.** ERP system.

#### 2.4. Enterprise Information Systems and GIS Integration in Business

Enterprise information systems and GIS are frequently divided by current software architectures, and as a result, business processes and spatial processes are often seen as separate processes [41]. Geographic information systems (GIS) provide a framework that makes it possible to produce, edit, manage, process, and store geographical data. Business applications of GIS include customer profiling, risk assessment and financing, capacity planning and management, and market segmentation or distribution [55]. As previously stated, business management-support software is typically referred to as ERP solutions [41,56]. This software is often an integrated program that a company may use to gather, handle, store, and evaluate data from its regular business operations [2,57,58].



GIS, on the other hand, are information systems for gathering, archiving, verifying, and presenting position-related data [55].

In landscapes of information systems, GIS are often left out [55]. Nevertheless, integrated workflows that include both business and geographical operations are needed for decision support [59]. Understanding and interpreting business data via a spreadsheet or table is impossible since the majority of business data include a geographic or spatial component that must be geo-referenced on a GIS map to visualize [60–62]. Due to the difficulty of managing each system, the GIS often do not contain data on regular company operations such as existing and future clients on a map for market research. This integration may provide various benefits to both areas by combining ERP systems, thereby helping to manage the workflow and GIS for location-based information management [63]. This measure could prevent the use of the geographical analytic capabilities of GIS and the business transaction-management tools of ERP systems. As a result, there has been a noticeable increase in interest in recent years surrounding the integration of GIS with legacy systems and ERP [33]. GIS could help companies make informed decisions and boost effectiveness by visualizing connections, relationships, and patterns in their business data. For this reason, ERP and GIS solutions are a crucial component of a successful IT strategy.

Sternad et al. [63] noted that with business integration, a user can directly access the GIS from inside the ERP system and visualize data from the ERP system within the GIS. The ability to make decisions by viewing the results from both platforms on a screen in a plain visible manner, without the need to move between systems and correlate data across many systems, enables a user to accomplish more [64].

## 2.5. Business Intelligence Systems

The notion of moving company data from an information system in which operational data for business transactions are gathered into a database utilized for management assistance is known as business intelligence (BI). This concept first appeared in the middle of the 1990s [65,66]. Business intelligence (BI) refers to the tools and technology that organizations employ to analyze business data for management reporting [30,67].

Organizations can utilize business information to assist in a variety of tactical and strategic business tasks. For businesses looking to acquire a competitive edge, BI is a top priority [68]. By using company data, BI equips managers with the knowledge they need to make wise business choices. BI tools provide company perspectives that are predictive, historical, and present. In order to provide business reports for managers, BI systems can handle vast volumes of organized and sometimes unstructured data [69]. BI is most successful when it integrates data from internal corporate data sources, such as financial and operational data, with data obtained from other external and internal data sources [70–72]. When internal and external data are merged, they can provide a comprehensive picture that, in turn, produces an “intelligence” that cannot be obtained from any partial collection of facts. BI technologies provide the organization with the capacity to gauge demand for goods and services and acquire insights into new markets [73–75].

The terms business intelligence (BI) and business analytics (BA) are commonly used interchangeably, although they vary in some ways. Business intelligence is often used to describe business data collecting, online analytical processing, and business reporting [66,76,77]. Business analytics, on the other hand, correspond to mathematical and statistical methods for explanatory and predictive modelling [33,78]. BI/BA systems use ETL (extraction, transformation, and loading) operations to operationally access data from information systems. Spreadsheets, plain text files, office programs, CRM software, and other systems and programs can all provide data [79]. Data transformation modifies the data’s structure to satisfy the specifications outlined in the architecture of the data warehouse and ensures the consistency of all information. During the loading process, the data are localized in an information repository (such as a data warehouse or data mart) [80,81].

## 2.6. Emerging Technologies and Smart Sustainable Marketing

Smart sustainable marketing is fueled by the development and institutionalization of novel solutions as well as the combinatorial evolution of value propositions [1]. According to Talwar et al. [76], if academics wish to examine markets in a sociopolitical–technological–material framework, they must include the influence of technology on market dynamics. Technology, as stated by Sjödin et al. [79], is a critical instrument for value co-creation, innovation in services, and system (re)formation. Technology is seen as an operant resource, meaning that it may produce value by operating on other resources. Importantly, technology may be seen as a market offering or value proposition in addition to being a tool for value co-creation and innovation.

Market players can shape markets in ways that are advantageous to them, so the corresponding literature focuses on market shaping, rather than accepting the market's borders as set, and competing with current rivals for the best possible position within those borders [81,82]. Markets are social constructs co-created by market players as they engage in market behaviors rather than predefined institutions where participants compete for fixed spots.

According to Kaartemo and Nyström [1], market innovation is a process whereby players assist in the formation of markets and, more precisely, mold new market devices and the current framework, change market behavior, and reassemble market agents. One approach to thinking about market shaping is via the lens of market invention, motivating markets, market programming, and market plasticity [9]. Astute sustainable marketing places more emphasis on gradually reshaping the market to actively alter its present behavior than it does on creating whole new markets. Thus, the use of emerging technology to innovate markets goes beyond just opening up new markets. Market innovation, as defined by Hofmann and Jaeger-Erben [83], is the process of modifying the way that business is normally performed via a range of strategies and actions from sales to rewriting the laws of the market.

The intentional and unintentional actions of market players change how markets are created [84]. Lately, there has been a significant focus on the issue of actively creating markets, with the contention being that these are dynamic processes that are always changing and reshaping instead of being static entities. Kindström et al. [85] suggested that an examination of market scientific, exchange-related, and institutional actions might provide insight into this malleability. Technology is in the vanguard of astute market-shaping, as Kaartemo and Nyström [1] said, providing a useful basis for the development of noteworthy market items as well as the shaping of individual as well as collective endeavors.

## 2.7. Summary of the Literature

Businesses' perceptions of their own capabilities, the accessibility of market resources, and the roles that players, resources, and market processes play are all influenced by the state of technology today. Recent studies on market shaping suggest that “emerging alternatives”—the actions of outlier, peripheral players—have an impact on how market members think, which in turn affects how they behave. This article introduces the idea of non-traditional market participants providing novel spaces for value co-creation and resource integration. For example, the Android platform from the Open Handheld Partnership and the Marketplace on Amazon act as platforms for novel items and business ideas that are made available to customers. Hofmann and Jaeger-Erben [83] suggested that platforms may also be seen as technical ecosystems that facilitate widespread participation in innovative service-sharing activities. Therefore, rather than being an exchange item in and of itself, developing technology may be seen as an intermediary that coordinates and expedites the exchange of resources. Consequently, a platform may be described as “a set of shared core technologies and technology standards [that] supports value co-creation through specialization and complementary offerings” through mediating interactions between customers and service providers. According to earlier studies by Talwar et al. [76]



and Kaur et al. [33], technology can serve as platforms for market transformation. According to these literary streams, platforms are often purposefully introduced to the market by the primary players [44,45]. One exception is the discussion of linked autonomous cars' influence in the market for motor insurance in Kaartemo and Nyström's examination of the effects of an emergent peripheral technology [1]. However, the literature on smart sustainable marketing as influenced by the different emerging technologies in business informatics is still limited.

### 3. Materials and Methods

This study used a cross-sectional survey design based on a quantitative research methodology, which helped collect data in a very short time. A cross-sectional survey design based on quantitative research helped make statistical inferences using the collected data and consequently establish statistical relationships between the study variables.

The target population included different marketing professionals from Greece. We assumed that targeted marketing would offer the best knowledge concerning enabling emerging technologies in business informatics, including smart sustainable marketing and its relevant emerging technologies.

A sample refers to a group or subgroup generated from the available total population. The total number of key players in the digital marketing business in Greece is approximately 10,000, which contains over 1000 key players in the business marketing sector of Greece. Sample size determination was based on the portion of key players in the education sector operating in Greece, particularly marketers. The sample size was determined using the following formula (Equation (1)) derived from Krejcie and Morgan [86]:

$$n = \frac{T^2 \times K \times P \times (1 - P)}{M^2 \times (K - 1) + T^2 \times P \times (1 - P)} \quad (1)$$

where  $n$  is the desired sample size for this study, and  $T^2$  is the chi-square table value determined at the level of 1 degree of freedom and a confidence level of 3.8416. The confidence level's value is generated by squaring the chi-square table value for one degree of freedom (3.8416). In addition,  $K$  is the size of the population, and  $P$  is the proportion of the population, which helps to calculate or determine the maximum sample size. In this study, the value of  $P$  is 0.5. Lastly,  $m$  is the accuracy degree, which is expressed as a proportion and defined as 0.05 for this study.

The sample size ( $n$ ) is as follows:

$$n = \frac{1.96^2 \times 1000 \times 0.5 \times (1 - 0.5)}{0.05^2 \times (1000 - 1) + 1.96^2 \times 0.5 \times (1 - 0.5)} \approx 320.$$

Stratified random sampling was used to select the most desirable sample of the study. Another method exists for determining the sample, which gives a smaller sample, but this method was not used since the response from the respondents in this research was large [87–89].

An online survey questionnaire was utilized to collect data from the selected 320 study participants. For this purpose, a questionnaire was created online and emailed to the different selected participants to collect data concerning enabling emerging technologies in business informatics with a focus on smart sustainable marketing and its relevant emerging technologies in Greece. The participants were given 2 weeks to respond to the online questionnaire, and this time period was deemed sufficient for the respondents to respond. A high level of confidentiality and privacy was maintained when collecting data from the selected marketing professionals.

Analysis of the data was performed using IBM SPSS Statistics Version 23 (Statistical Package for the Social Sciences) for univariate, bivariate, and multivariate levels of analysis. The data collected were subjected to normality tests to check for skewness and kurtosis. The results showed that normality was within normal bounds, suggesting that

no transformation attempts were used. The gathered data were further tested for outliers, multicollinearity, and homoscedasticity; all results showed that the data were within acceptable bounds. Regression analysis was also utilized to establish how enabling emerging technologies in business informatics could predict the level of smart sustainable marketing. In this scenario, a multiple regression model was used (Equation (2)) to determine the various predicted values:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \quad (2)$$

where Y represents smart sustainable marketing,  $\beta_0$  is a constant (coefficient of intercept),  $X_1$  represents emerging technologies,  $X_2$  represents the drivers of smart sustainable marketing,  $X_3$  represents innovation in business informatics, and  $\varepsilon$  represents the error term in the multiple regression model.

The hypothesis of the study was tested at a 5% (0.05) level of significance.

#### 4. Results

The results for the characteristics of the study participants are presented in Table 1.

**Table 1.** Background characteristics of the study participants.

Item	Categories	Frequency	Percent
Respondent Gender	Male	181	56.6%
	Female	139	43.4%
	Total	320	100%
Respondent Age	Below 30 years	21	6.6%
	31–40 years	171	53.4%
	41–50 years	99	30.9%
	Above 50 years	29	9.1%
	Total	320	100%
Respondent Position	Director	4	1.3%
	Manager	13	4.3%
	Employee	187	62.3%
	Others	96	32.0%
	Total	320	100%
Experience in smart sustainable marketing	Less than 1 year	39	12.2%
	1–4 years	98	30.6%
	5–10 years	126	39.4%
	Above 10 years	57	17.8%
	Total	320	100%

Source: Authors' elaboration.

The results of the study as shown in Table 1 revealed that slightly more than half of the participants were male (181, 56.6%), and the rest were female (139, 43.4%). The study findings also revealed that most of the respondents were aged between 31 and 40 years (171, 53.4%), while the least amount were aged below 30 years (21, 6.6%). More than half of the respondents worked as employees (187, 62.3%), while the least of them were directors (4, 1.3%). The largest portion of respondents had smart sustainable marketing experience of 5–10 years (126, 39.4%), while the smallest portion had less than 1 year of experience (39, 12.2%). The results presented in Table 1 clearly show that the data were obtained from participants of sound mind and age, as the largest percentage was from an older age bracket. This result indicates that the information provided was highly reliable alongside the fact that the largest percentage of respondents had a significant work experience of 5–10 years.

Descriptive results for each aspect of the independent variables are presented independently.

The effects of emerging technologies on smart sustainable marketing were studied using four items, and the results are presented in Table 2.

**Table 2.** Results on the effects of emerging technologies on smart sustainable marketing.

Statement	%	SD	D	NS	A	SA
I think that proper digital ideology is the core factor in responding to abrupt market changes.	%	4.7	4.2	1.7	51.5	38.0
I know this business is embracing artificial intelligence to take on changes in the smart marketplace.	%	8.3	6.7	27.5	40.3	17.2
I think this company's innovation is at its best when it adapts emerging marketing technologies.	%	9.3	4.7	16.1	39.7	30.2
Utilizing 5G networks is important for improving smart sustainable marketing.	%	8.1	5.3	12.7	40.6	32.4

Key: SD, strongly disagree; D, disagree; NS, not sure; A, agree; SA, strongly agree. Source: Authors' elaboration.

As shown in Table 2, slightly more than half of the respondents (51.5%) believed that proper digital ideology is the core factor needed to respond to abrupt market changes. Additionally, 40.3% knew that their business is embracing artificial intelligence to take on changes in the smart marketplace. Furthermore, 39.7% believed that their company's innovation is at its best when it adapts emerging marketing technologies. Finally, the largest number of participants (12.7%) noted that utilizing a 5G network is important for improving smart sustainable marketing. Results on the drivers of smart sustainable marketing are presented in Table 3.

**Table 3.** Results on the drivers of smart sustainable marketing.

Statement	%	SD	D	NS	A	SA
Digital market strategies are key to the growth of smart sustainable marketing.	%	4.2	9.9	10.7	48.7	23.1
Targeting and positioning is important for driving smart sustainable marketing.	%	9.2	13.3	18.3	39.5	19.7
Routine monitoring devices have become the new normal in marketing.	%	8.1	12.7	10.8	47.1	21.3
Digital marketing experts are more flexible for remote consultations in smart sustainable marketing.	%	3.0	10.9	12.5	59.4	14.3
Proper segmentation enhances profitability in smart sustainable marketing.	%	6.5	9.4	13.7	65.2	1.6
Digital promotional tactics are key in driving the level of smart sustainable marketing.	%	9.0	9.1	8.0	50.2	20.3

Key: SD, strongly disagree; D, disagree; NS, not sure; A, agree; SA, strongly agree. Source: Authors' elaboration.

As shown in Table 3, most participants (48.7%) strongly agreed that digital market strategies are key to the growth of smart sustainable marketing. It was also agreed by 39.5% that targeting and positioning is important in driving smart sustainable marketing. This result clearly indicates the nature of product positioning applied by businesses has a great influence on the level of smart sustainable marketing. In total, 47.1% of study participants agreed that routine monitoring devices have become the new normal in marketing. Furthermore, more than half of the study participants (59.4%) believed that digital marketing experts are more flexible for remote consultations in smart sustainable marketing. Moreover, 65.2% of the study participants revealed that proper segmentation enhances profitability in smart sustainable marketing. Finally, half of the respondents (50.2%) believed that digital promotional tactics are key in driving the level of smart sustainable marketing. The results on innovation in business informatics are presented in Table 4.

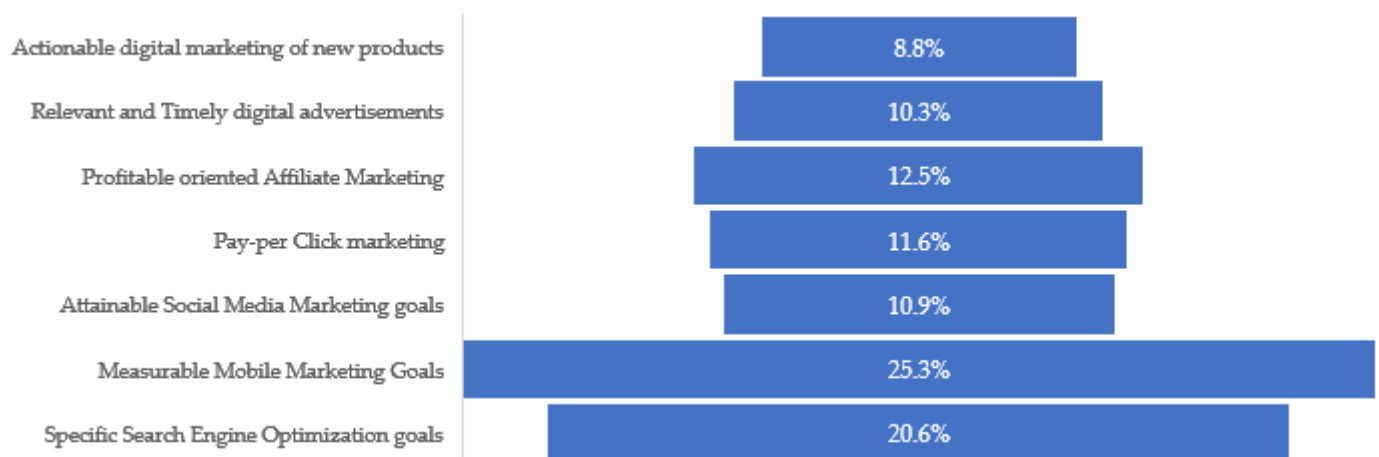
The results in Table 4 indicate whether respondents were confident that new business innovation opportunities for businesses would boost their market share. The majority (59.1%) agreed that current market trends could be strongly influenced by different innovations in business. It was agreed upon by more than half of participants (65.3%) that business informatics such as customer relationship management (CRM) systems help to boost business growth. Furthermore, slightly more than half of the participants (58.3%) agreed that business intelligence systems are important in offering business marketing support. Additionally, the largest portion of participants (49.3%) agreed that enterprise information systems and GIS integration help in the real-time management of business.

Finally, the largest portion of study participants (35.2%) were confident that mobile sensors and IoT help in business monitoring, remote diagnostics, and AI. The results for aspects of smart sustainable marketing are presented in Figure 3.

**Table 4.** Results on innovation in business informatics.

Statement	%	SD	D	NS	A	SA
I am confident that new business innovation opportunities for businesses will boost their market share.	%	15.0	3.7	1.3	59.1	20.2
Business informatics like customer relationship management (CRM) systems help to boost business growth.	%	17.0	5.0	7.0	65.3	5.7
Business intelligence systems are important in offering business marketing support.	%	5.0	7.2	12.0	58.3	17.5
Enterprise information systems and GIS integration help in real-time management of business.	%	8.3	10.7	21.3	49.3	10.3
I am confident that mobile sensors and IoT help in business monitoring, remote diagnostics, and AI.	%	3.3	19.5	18.7	35.2	23.3

Key: SD, strongly disagree; D, disagree; NS, not sure; A, agree; SA, strongly agree. Source: Authors' elaboration.



**Figure 3.** Different aspects of smart sustainable marketing.

The results in Figure 3 show that the majority of participants (25.3%) identified measurable mobile marketing goals as an aspect of smart sustainable marketing, followed by 20.6% who identified specific search engine optimization goals, followed by profitable oriented affiliate marketing (12.5%), while the fewest (8.8%) identified the actionable digital marketing of new products.

To establish whether organizational factors were positive significant determinants of organizational agility and thus test the first three hypotheses in this study, a correlation analysis was conducted. The three influencing variables were as follows: emerging technologies, drivers of smart sustainable marketing, and innovation in business informatics. The results are presented in Table 5.

The results in Table 5 suggest that three independent variables (emerging technologies ( $r = 0.371$ ,  $p = 0.000 < 0.05$ ), drivers of smart sustainable marketing ( $r = 0.533$ ,  $p = 0.000 < 0.05$ ), and innovation in business informatics ( $r = 0.474$ ,  $p = 0.000 < 0.05$ )) had a significant relationship with smart sustainable marketing. Thus, hypotheses one to three are accepted by the current findings of the study.

The heteroscedasticity test in this study helped to determine the error components associated with the data, especially data concerning whether heteroscedasticity was correlated across the different observations in the study. We assumed that heteroscedasticity was not an issue with the data since the  $p$ -value was greater than 5%. This issue was not ruled out at the threshold  $p$ -value of 0.05 according to the reported result of  $0.5421 > 0.05$ .

Consequently, the data were considered not to be heteroscedastic. With a  $p$ -value of 0.5421, the findings in Table 6 show that the constant variance null hypothesis was not disproven.

**Table 5.** Correlation analysis results.

	Smart Sustainable Marketing	Emerging Technologies	Drivers of Smart Sustainable Marketing	Innovation in Business Informatics
Smart sustainable marketing	1	0.180 **	0.533 **	0.474 **
		0.002	0.000	0.000
Emerging technologies		1	0.643 **	0.332 **
			0.000	0.000
Drivers of smart sustainable marketing			1	0.357 **
				0.000
Innovation in business informatics				1

\*\* Correlation is significant at a 0.01 level (2-tailed).

**Table 6.** Model Summary.

Breusch–Pagan Test for Heteroscedasticity	
H0: Constant variance	
Variable: Different fitted values of smart sustainable marketing	
chi <sup>2</sup> (1)	0.5301
Prob > chi <sup>2</sup>	0.5421
Predictors: (Constant), emerging technologies, drivers of smart sustainable marketing, and innovation in business informatics.	

It was essential to verify whether the dependent variable was independent. For this purpose, the Durbin–Watson (d) test was used (Table 7). In this test, a value of  $d = 2$  denotes the absence of autocorrelation. The findings of the investigation provided a value of 1.175, suggesting that the residuals are not autocorrelated. Here, the value of (d) always ranges between 0 and 4, where a value of 0 indicates autocorrelation, and a value of above 1 indicates that the residuals are interdependent.

**Table 7.** Durbin–Watson test.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin–Watson
	0.593	0.568	0.581	0.261	1.175

Predictors: (Constant), emerging technologies, drivers of smart sustainable marketing, and innovation in business informatics.

The regression analysis results are presented in Table 8.

**Table 8.** Regression of smart sustainable marketing by influencing or predictive Factors.

Predictive Variables	Standardized Coefficients	Significance
	Beta ( $\beta$ )	$p$
Emerging technologies	0.531	0.000
Drivers of smart sustainable marketing	0.371	0.003
Innovation in business informatics	0.062	0.016
Adjusted R <sup>2</sup> = 0.639		
F = 31.372, $p$ = 0.012		

Dependent variable: Smart sustainable marketing.

Table 8 shows that emerging technologies, drivers of smart sustainable marketing, and innovation in business informatics can explain 63.9% of the variation in smart sustainable



marketing (adjusted  $R^2 = 0.639$ ). This result indicates that 36.1% of the variation in smart sustainable marketing was predicted or accounted for by other factors not considered under this model. It should also be noted that all the independent variables were positive and significant determinants of smart sustainable marketing.

The beta ( $\beta$ ) for emerging technologies was 0.531 and was significant ( $p$ -value = 0.00). This result means that emerging technologies have a significant relationship with smart sustainable marketing, enabling us to accept hypothesis one (H1). Thus, emerging technologies have a positive effect on smart sustainable marketing.

The values for drivers of smart sustainable marketing were  $\beta = 0.371$  and  $p = 0.003 < 0.05$ . Therefore, hypothesis two (H2) is also accepted, meaning that drivers of smart sustainable marketing positively enhance the effectiveness of smart sustainable marketing.

The values for innovation in business informatics can be accepted with  $\beta = 0.062$  and  $p = 0.016 < 0.05$ . Therefore, hypothesis three (H3) is accepted, meaning that innovations in business informatics have a positive effect on smart sustainable marketing.

## 5. Discussion

This study focused on examining enabling emerging technologies in business informatics with a focus on smart sustainable marketing and related emerging technologies. The study confirmed that emerging technologies have a significant relationship with smart sustainable marketing. We established that drivers of smart sustainable marketing positively enhance the effectiveness of smart sustainable marketing and that innovations in business informatics have a positive effect on smart sustainable marketing. Market shapers are not usually considered to be technology developers despite the fact that they often rely on complementary technologies that provide new opportunities for resource integration [6,90,91]. This factor has deterred some market innovation and shaper researchers from researching market shifts introduced by technology. Typical market players, rather than traditional market actors, often use technology as platforms in the market. It is crucial to conceptually separate core technologies from peripheral ones. In order to introduce changes into the market, market shapers have always employed core technologies as their primary tools [1,7]. There is a scarcity of theoretical analyses or experimental instances that demonstrate how market shapers depend on technologies that support them and simultaneously serve as platforms for market reshaping. A technology may be seen either as an innovative and advanced product or a strategic instrument for effective marketing, depending on one's perspective. For example, even when brand-new AI-based tools are available, AI technology can be viewed generally as a very powerful platform for strengthening the marketing sector through smart sustainable marketing [46,92].

The current study's empirical findings focused on the relationship between new market offerings and technology as a platform (5G). For many life-critical applications, mobile networks previously have been too inaccurate and too time-consuming while performing activities remotely. Better data rates and less energy consumption are two benefits of 5G that could be more significant for other industries and help overcome barriers that have delayed the rollout of innovative products [18,93]. Every technology has distinct characteristics of its own. For example, 3D printing enables the production of affordable, pliable items from readily available materials [94]. We do not assert that market-shaping companies have no impact on markets despite the importance of emerging technologies in astute sustainable marketing, even though the transition from market-shaping organizations to technology-induced marketplace can be seen as a criticism of managerial active responsibilities. Entrepreneurs and businesses that shape markets might use these technologies to create business models that impact markets, for example [95].

In addition to being technologically sophisticated, such markets also adhere to the requirements and expectations of organizations. The capabilities of solution providers are constantly improving due to the addition of new modules and features. With other information systems that are more specialized in a particular field, a new generation of solutions can be quickly and easily incorporated. GIS is one such information system; as

the application of GIS in business processes grows, more organizations are increasingly employing this tool [96]. Such tools were formerly utilized as standalone systems, but recently, they have been connected with other information systems in many businesses. In this sense, such technologies play a significant role in providing operational and managerial levels of control over information assistance [51]. These tools are generally employed in businesses that have location-based resources, location-based processes, and location-based business events at the operational level, such as in route planning [97]. Businesses use GIS-enabled reporting and GIS-based dashboards at the management level [96].

Our findings suggest that supply-side networks in business will be more heavily impacted by 5G than other aspects of market transformation. In reality, the supply-side network category represents the bulk of the most significant and probable 5G-dependent market developments. A previous study inspired industry professionals to predict how the marketing and business industries as well as the healthcare and education sectors would change once 5G was introduced. The experts were given the freedom to explain the changes in their own terms rather than being asked if there would be a change. The initial paradigm does not offer deep knowledge of how market practices develop, even though Grewal et al. [98] solely focused on determining whether changes occurred. Rather than presuming that consumers would utilize the product or service differently, the new conceptualization in this study generates more detailed responses, which paints a more accurate picture of the market transition.

Conducting similar research in various market situations allows for a comparison and contrast of the impact of technological advancement as an instrument enabling innovation and market shaping across other markets [44,45]. As per our poll, alterations to the supply-side system are frequently viewed as more consequential, likely, and reliant on 5G than modifications to other constituents of the market. Further study is necessary to see if this reality holds true in the context of other marketplaces. In fact, the effects of emerging technologies on diverse markets can be very different. We understand that patient safety is a top priority in smart sustainable marketing via business informatics, and as such, it is more heavily impacted by technology, which enables information to flow reliably through a range of remote services and tracking systems. In order to provide information to both market players and the creators of ancillary technology, other researchers could adapt our methodology to incorporate questions that indicate the features of the technology required for new market offers. Our professional selection process, through which we emphasized diversity to represent companies engaged in the creation of smart sustainable marketing tools as well as different business groups, is partly responsible for these outcomes. This technique does not provide precise instructions on how to identify or measure plurality within or across sectors, even though it represents good research practice [51–53].

As elucidated by these findings, new technologies like artificial intelligence (AI), 5G networks, and corporate informatics (CRM and ERP) directly affect how markets operate and change. These technologies spur innovation by empowering companies to create new goods and services, which changes the competitive environment [1,27]. Big data analytics and artificial intelligence (AI) are enabling platform-based business models and other new types of competition, which are changing market structures. The methods that companies use to stay relevant and compete in the market are also impacted by these technologies in an indirect way [17]. Additionally, Nosratabadi et al. [12] stated that technology is essential to creating clever, sustainable marketing strategies. This entails developing and promoting goods that are advantageous to the environment and society in addition to being functional and economical. The results show that non-traditional or peripheral market actors are becoming more and more important [16]. These actors are empowered by technology, which gives them the ability to change market practices and patterns. The study shows that although the direct effects of technology on markets are relatively well understood, more research is needed to fully understand the indirect effects, especially those related to norms, representations, and other characteristics of the market [9–11].

We acknowledge that 5G is an uncommon example after vertical market player collaboration. Therefore, our study is limited since we focused on an auxiliary technology that provides an environment for market development and market shaping. We also encourage future research to examine contemporary technology like a market offering in order to wrap up the discussion on how conceptually dissimilar technologies lead to market adjustments. Scholars must take into account technology developed by significant market participants in order to obtain a more thorough grasp of how technology affects innovation and market shaping. Lastly, even though our study highlighted the growing importance for distant marketing services [18,93], further research on the institutional and technological variables that both facilitate and hinder the expansion of these services will be needed in the future. Stated differently, further research is necessary to ascertain the institutional labor required to properly use an emerging technology for a platform for innovation and market shaping as well as the launch of new goods.

## 6. Conclusions

This study focused on enabling emerging technologies in business informatics with a focus on smart sustainable marketing and its relevant emerging technologies. By facilitating comprehension of emerging technologies in marketing, we provide a significant addition to the mainstream theories of smart sustainable marketing. The marketing evaluation of emerging technologies can assist managers and company owners in assessing how innovation may influence relevant markets. We question the conventional understanding in the literature regarding market shape and market innovation by addressing issues related to the “non-intentional design” elements of markets. According to the report, enterprise-wide information systems such as ERP, CRM, and BI are regarded as the core information systems of businesses since they offer important critical help in the day-to-day operations of business activities. These technologies are used by nearly all enterprises and organizations and are generally well established. Third-generation items currently available on the market are offered by vendors and may significantly improve smart sustainable marketing. This research adds to the discussion of how the technological environment influences market value development. Assessing and comparing the effect of evolving technology as a platform for market shaping and innovation across diverse markets is achievable by undertaking analogous research in other market situations. Changes to the supply-side network, according to our study, are often seen as more substantial and likely more 5G-dependent than changes to other market components. Further research is needed to determine if this holds true in other markets. In reality, the implications of emerging technologies such as 5G on various markets may be extremely varied. Businesses could be a unique case, as they prioritize beneficiary safety. As a result, they are more affected by technology that provides a consistent flow of data for a range of online services and monitoring. However, we did not question the experts on how new technologies support sensor-based solutions, remote services, and patient monitoring. In order to provide information to both market participants and peripheral technology developers, other researchers might enhance our methodology by including inquiries that pinpoint the characteristics of the technology needed for new market developments.

This research clarifies the danger of competition for traditional marketers. Newcomers may launch remote services that are better or more affordable. Marketing professionals should consider how the anticipated market changes will affect their organizations’ positions as well as the new business possibilities that will arise, especially on an international scale, for both conventional marketing corporations and technology innovators.

This study shows that the development of market-relevant or ancillary technologies may give rise to new possibilities in marketing. Although managers are often knowledgeable about what occurs in the conventional market, they may be blind to technical advancement in other sectors and lack insight into how these ancillary technologies could lead to market shifts. This study calls on managers in the business sector and elsewhere to pay more attention to the development of auxiliary technologies, which may act as fora for

market creativity and market shaping. Discovering and taking advantage of these chances is crucial to be successful in smart sustainable marketing.

According to the study, there is a direct and positive relationship between the success of smart sustainable marketing and rising technology. AI and 5G network integration have proven essential for improving marketing tactics and responding to shifts in the industry. For companies looking to stay viable and competitive in a market that is changing rapidly due to technology, this conclusion is essential. Scholars may go deeper into the subtleties of these technologies and how they work with different business strategies. In order to increase the efficacy of clever sustainable marketing, the study emphasized the necessity of factors like digital market strategies, targeting and positioning, and the usage of regular monitoring devices. Businesses may efficiently modify their marketing strategy by analyzing market dynamics and client behavior through the use of these drivers. Scholars may investigate how different market tactics might be optimized for different market segments by examining these drivers. Advancements in business informatics, namely in CRM and BI systems, have had a favorable impact on market share and corporate expansion. For improved market research and decision making, this emphasizes how crucial it is to include cutting-edge information technologies into corporate operations. Academic research in this field is highly promising, especially when it comes to optimizing these systems for improved market analytics and customer relationship management.

Our study makes three unique theoretical contributions that expand moderate views on market formation and innovation while also being practically applicable. This is achieved by bringing the S-D logic narrative closer to empirical scrutiny. Above all, our study expands the foundation for changing our perspective on market structure and innovation from one of entrepreneurship to one of human–technology-induced transformation. Market evolution is based in part on unanticipated emergence and involves actions taken by a variety of individuals. Here, we demonstrate that although not all emergence is caused by established players in an institutionalized market; some emergence may still be partially predicted by carefully examining the technological advancements of ancillary actors. This measure promotes the use of both effective and causal logic together when changing the market. The development of a framework to examine market transformation is the second major contribution of our research. We explain how the framework developed by Nenonen et al. [7] can be used in future research that focuses on predicted market changes. This framework also offers a critique that encourages a wide range of players to be included for a more comprehensive understanding of market changes. This study also contributes to the literature on technology and smart sustainable marketing by improving our knowledge of the broader market shifts that new technologies introduce as well as how technology serves as a platform for the introduction of market innovations. The study findings provide practitioners with useful insights on how to use new technology to improve market presence and sustainability. The text offers a guide on how to incorporate business informatics into marketing tactics, highlighting the need for organizations to keep up with technology changes to sustain a competitive advantage. Also, the empirical evidence on the connections between business informatics, smart sustainable marketing, and new technology makes this research a major contribution to academia. With regard to technology, it broadens the theoretical framework of market dynamics and provides a fresh viewpoint on the ways in which technology affects market sustainability and structure. Although this study emphasizes the growing significance of remote business services, additional research is required to understand the institutional and technical factors that support and constrain the growth of remote business services or smart sustainable marketing. Thus, further study is necessary to determine what kind of institutional activity, apart from the introduction of new market products, is required to fully utilize an emerging technology as a platform for a smart sustainable market.

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