

Article

Effect of Applying Business Intelligence on Export Development and Brand Internationalization in Large Industrial Firms

Mahboobeh Golestanizadeh ¹, Hadi Sarvari ^{2,3,*}, Matteo Cristofaro ^{4,*} and Daniel W. M. Chan ²¹ Department of Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan 8195-39998, Iran² Department of Building and Real Estate, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, China³ Department of Civil Engineering, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan 81595-39998, Iran⁴ Department of Management and Law, University of Rome 'Tor Vergata', 00133 Rome, Italy

* Correspondence: h.sarvari@khuisf.ac.ir (H.S.); matteo.cristofaro@uniroma2.it (M.C.)

Abstract: Possessing an international brand in an exclusive field can play a critical role in developing exports. On the other hand, monitoring market conditions and predicting the changes caused by the physical separation and distance between the upstream and downstream markets and asymmetric information is challenging in export markets. Accordingly, it is necessary to manage this issue by adopting business intelligence tools. To this end, using a descriptive–correlation method, the present study investigated the effect of applying business intelligence on export development and brand internationalization in large industrial firms. To collect the data, three questionnaires were distributed among 161 employees at the headquarters of Isfahan’s Mobarakeh Steel Company. The validity and reliability of the research questionnaires were confirmed. Data analysis was performed with SmartPLS and SPSS software. The findings indicated the effect of applying business intelligence on export development and brand internationalization in large industrial firms. We also performed additional analyses to deepen the results of the verified hypotheses to identify the best business intelligence dimensions for the prediction of export development and brand internationalization. The conclusion that can be drawn from our findings is that business intelligence and its tools can provide companies with an optimal understanding of organizational processes, appropriate responses to the behavior of competitors, and the ability to identify the needs of global customers by developing the best value chain.

Keywords: brand internationalization; business intelligence; export development



Citation: Golestanizadeh, Mahboobeh, Hadi Sarvari, Matteo Cristofaro, and Daniel W. M. Chan. 2023. Effect of Applying Business Intelligence on Export Development and Brand Internationalization in Large Industrial Firms. *Administrative Sciences* 13: 27. <https://doi.org/10.3390/admsci13020027>

Received: 7 December 2022

Revised: 10 January 2023

Accepted: 13 January 2023

Published: 18 January 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

The ability to obtain useful information in real time has become of paramount importance to making quick and smart decisions and has sometimes been considered a way to reduce the limits of managers’ rationality (Newell and Simon 1972; Cristofaro 2016, 2017). Hence, managers need sufficient information at the right time and place (Malekzadeh 2014), and, undoubtedly, managers need to transform data into useful and effective communication. However, this information must be correct, valuable, timely, and practical; this is what business intelligence (BI) does (Patil 2016). BI is defined as the organization’s ability to take advantage of all capabilities and convert them into a vast collection of information and knowledge, which leads to the development of new opportunities. The following are some of the strengths of BI: delivering quick and correct reports, leading to improved decisions; time-saving; improving customer services; promoting solutions and programs; increasing revenues; and enhancing efficiency of processes (Acheampong and Moyaid 2016). It can also integrate diverse types of data from various sources and extract new knowledge from

data for prediction and decision making (Yan et al. 2012; Brichni et al. 2017; Lasi 2013). Thus, data elaborated using BI can be effective in helping managers make strategic decisions.

Moreover, in today's era, the significant role of exports and their expansion is highlighted, and the long- and short-term growth in goods exchange with destination countries to make their trade balances positive is one of the primary goals of most countries seeking to improve and develop their economic status (Rahmany Youshanlouei et al. 2013).

In general, a brand's reputation, growth, and entry into international markets present prospects for investing in economic savings, establishing worldwide marketplaces, and pursuing diverse market sectors. Therefore, as an intangible organizational resource, brands play a significant role in worldwide marketplaces and provide organizations with a competitive advantage over rivals. In addition to the benefits they bring, the characteristics mentioned above have also posed obstacles for businesses. To acquire a competitive advantage in export development, organizations must understand the peculiarities of global markets and clients and their brand's compatibility with diverse cultures and ability to flourish in foreign markets (Tajuddin 2019). Understanding the connections between business intelligence, export development, and brand internationalization enables businesses to achieve greater success.

Additionally, since the borders of countries have opened to other nations, giving customers more choices than in the past, it is always necessary for companies to consider the requirements of global markets in order to achieve customer satisfaction and maximize profit (Özdemira et al. 2017). They should consider brand internationalization and export development because export companies worldwide are the drivers of export development and the symbol and brand of a country in export markets (Pyper and Doherty 2022; Pyper et al. 2022). They can bring a wide range of downstream companies into a market by entering a market. In addition, export is of paramount importance in the current economic climate since it provides reliable and stable sources of foreign exchange to prevent currency crises. From another perspective, it leads to stimulation of demand and prosperity of production in the country. It can have a direct effect on employment and the regulation of the domestic market. Furthermore, an organizational brand manager who can make timely and relevant decisions by applying BI tools guarantees the success of his business in an internationally competitive environment.

To this end, using a descriptive–correlation method, the present study investigated the effect of applying BI on export development and brand internationalization in large industrial firms. To collect the data, three questionnaires were distributed among 161 employees at the headquarters of Isfahan's Mobarakeh Steel Company. The validity and reliability of the research questionnaires were confirmed. Data analysis was performed with SmartPLS and SPSS software. The findings indicated the effect of applying business intelligence on export development and brand internationalization in large industrial firms. We also performed additional analyses to deepen the results of the verified hypotheses to identify the best business intelligence dimensions for the prediction of export development and brand internationalization. The conclusion that can be drawn from our findings is that business intelligence and its tools can provide companies with an optimal understanding of organizational processes, appropriate responses to the behavior of competitors, and the ability to identify the needs of global customers by developing the best value chain.

2. Literature Background and Hypotheses Development

2.1. Applying Business Intelligence and Export Development

Exporting is a growth strategy companies use when moving toward internationalization, enhancing their competence, expertise, and knowledge (Kotabe and Czinkota 1992) and contributing to economic performance on an international scale (Morgan and Katsikeas 1997). The participation of companies in exporting is stimulated by internal and external factors (Bilkey 1978). The former emerge from within the companies (e.g., resources and capabilities), while the latter includes factors such as export promotion programs organized by governments (Wilkinson 2006). Trade growth has caused companies to face increased

competition in domestic markets due to rising imports, and it has also opened up opportunities to sell products and services in foreign markets (Catanzaro and Teyssier 2021). To this end, companies active in this field should decide how to adapt their marketing plans to the local conditions of the foreign markets. This can be done by adopting BI systems, making effective decisions in the best way possible, and paying attention to influential factors in this field to reach an appropriate competitive advantage at the international level (Pranjić 2018). There are abundant data on businesses, especially export-oriented companies. These data come from various sources, such as orders, inventory, accounting information, point-of-sale transactions, customer information, and statistical information. They are converted into information by means of analytical processes and tools, with the help of experts. Under these conditions, and given the extent of collected information, BI is a new way to combine and organize data for better decision making, which provides the company with better performance and more competitive advantages (Aruldoss et al. 2014).

In this vein, Eshtehardi and Movahedzadeh (2018) used a path-analysis model in a study. They concluded that the path coefficients for the effects of data integration, information-content quality, and using the information in the business process for export development were 0.26, 0.30, and 0.28, respectively. Moreover, the path coefficients for the effects of analytical capabilities on export development, quality of access to information on export development, and analytical decision-making culture on export development revealed no significant relationship. In a study, Neubert and Van der Krogt (2018) showed that only a few Paraguayan software companies are now using intelligence solutions to analyze and forecast data, support international strategic decision-making processes, and evaluate and select foreign markets. Furthermore, they found that most founders, shareholders, and CEOs are willing to use business-intelligence solutions for analysis and forecasting since they expect business intelligence to have a significant positive impact on their export performance and competitiveness in the development of international markets. Their findings also showed that the main determinants for selecting business intelligence by managers are cost transparency, excellent customer service, and an attractive pricing model. Accordingly, the first hypothesis of the research is formulated as follows:

Hypothesis 1. *Applying business intelligence positively affects export development.*

2.2. *Applying Business Intelligence and Brand Internationalization*

A brand, as one of the pillars of today's competitive game, is an element to be carefully defined, created, and managed so that companies can achieve profitability by relying on the strategic and critical role brands play in companies' strategic decisions and in creating differentiation in products and activities (Lee 2009). Moreover, the international brand is a concept encompassing a wide range of activities of a nation, including export, foreign investment, culture, cultural heritage, individuals, governance, and tourism. The international brand is a concrete and new example of soft power (Anholt 2005). A country's brand affects many sectors. It should deal with various aspects, such as attracting businesses and capital, improving public diplomacy, supporting the interests of export industries, strengthening national identity, promoting self-respect (Moilanen and Rainisto 2009), and creating a favorable image in the mind of the customer by affecting their perception of the received service (Tong and Hawley 2009).

Based on what has been said up to this point, it is possible to conclude that for brands to be competitive in the global environment, while increasing customer satisfaction and loyalty, they need to develop and implement the most recent business-intelligence capabilities, including business intelligence, to understand their customers better. By doing so, businesses can make informed choices (Yalcin et al. 2022), allowing them to boost their productivity across various dimensions, including costs, growth and learning, and customer satisfaction and loyalty (Gauzelin and Bentz 2017). As a result, one can reach the following conclusion: using business intelligence and being concerned about branding are

two fundamental components that are likely to help bring recognition to large industrial businesses in the international community (Aghaei and Aghaei 2018).

In this vein, Rashidi Chaghakhor and Rezaian (2022) concluded that business intelligence affects the financial performance of private banks. Moreover, business intelligence has a positive and significant effect on the financial performance of private banks in Khuzestan province as regards the mediating role of brand equity and creativity. In a study, Hu et al. (2019) concluded that consumers use brands to communicate their identity symbolically. Moreover, brand personality tends to reflect a company's internal environment, from which the brand originates. Furthermore, in today's business environment, companies need to collect data from inside and outside the country, using business intelligence tools, to obtain competitive information and consequently make strategic decisions on issues such as improving product positioning, new product development, and customer relationship management. Shafiei et al. (2017), in a study, reported that business intelligence had a significant effect on private sports clubs' innovation and financial performance; however, its effect on brand success was not significant. On the other hand, the impact of innovation on brand success and financial performance was substantial. Brand success also affects financial performance. Accordingly, although business intelligence can significantly predict financial performance, understanding this mechanism and achieving financial success requires attention to the efficiency of the innovation system and the effectiveness of brand management. Tamiminia et al. (2016) showed that the decision-making process in data mining, the decision-making process in information processing, the decision-making process in knowledge processing and analysis, and the decision-making process in improving competition all affect brand promotion. As a consequence, the following is the formulation of the second hypothesis for the research:

Hypothesis 2. *Applying business intelligence positively affects brand internationalization.*

3. Research Methodology

This study was descriptive and correlational regarding its practical objectives and method. The study's statistical population consisted of 277 employees of the headquarters of Isfahan's Mobarakeh Steel Company, a significant industrial firm. From this population, 161 individuals were picked using Cochran's sample-size calculation and a simple random-sampling technique.

In simple random sampling, each element of the population has an equal chance of being chosen, and one method used for picking a sample is the lottery method. In our study, the 277 members of the statistical community were each assigned a card bearing a code (ranging from 1 to 277). Then, 161 cards were drawn at random from the deck of cards to determine who would participate in the study. As regards the questionnaires, given that the current research includes three variables, namely business intelligence as an independent variable and export development and internationalization of brand as dependent variables, the researchers needed to examine the effect of the independent variable on each of the dependent variables of the model based on the questionnaire responses. Therefore, the research included three questionnaires. The business-intelligence and export-development questionnaire was used to measure the first hypothesis, while the business-intelligence and brand-internationalization questionnaire was used to measure the second hypothesis.

The following are the specifications of the questionnaires used. The researcher-made business intelligence questionnaire comprised 25 items and four dimensions (data management, data analysis, knowledge management, and target-market development). This questionnaire was designed and compiled by interviewing five experts. The export development scale was localized and developed according to Da Silva and Rocha's (2001) export barriers questionnaire. This questionnaire consisted of 27 items and five dimensions (financial, political, managerial, cultural, and technological). The brand internationalization questionnaire was based on Wong and Merrilees (2008) international branding questionnaire. This questionnaire consisted of 12 items and two dimensions (brand repositioning

and brand orientation). In this questionnaire, six items developed by Wong and Merrilees (2008) were used to measure the brand repositioning variable, and six items created by Wong and Merrilees (2008) were used to measure brand orientation, which was extracted from Wong and Merrilees (2006) study. The questionnaires were scored on a five-point Likert scale. It is important to note that before the distribution of the questionnaires, all three questionnaires were generated as a questionnaire containing 64 questions and distributed to members of the statistical community.

Several experts and respondents confirmed the research instruments' content and face validity. Since the researchers developed the business intelligence questionnaire, its construct validity was checked using confirmatory factor analysis provided by SmartPLS software. As presented in Figure 1, the factor loading of all questions was >0.3; hence, the model was well fitted. The results of other fit criteria (Tables 1 and 2) show that the values of Cronbach's alpha and composite reliability for all dimensions of the business intelligence questionnaire were >0.7; the values of convergent validity for all dimensions were >0.5; the values of convergent validity for all dimensions were >0.5; and other fit indices (common values, R², Q², F², GOF) were acceptable. According to the values reported by Fornell and Larcker, the square root of average variance extracted (AVE) on the main diameter of the matrix is greater than the underlying values of each cell. Hence, the researcher-made business intelligence questionnaire was valid and acceptable, and the construct validity of this questionnaire was confirmed. The instrument's reliability was also estimated using Cronbach's alpha coefficient with SPSS software, and the obtained values were 0.936 for the business intelligence questionnaire, 0.956 for the export development scale, and 0.893 for the brand internationalization questionnaire. SmartPLS software was used for the structural equation model for the data analysis to evaluate the primary hypothesis. SPSS software was used for the correlation coefficient and multiple regression using a stepwise method to test the secondary hypotheses.

Apart from the hypotheses testing, we performed some additional analyses to deepen the results of the verified hypotheses. In particular, we investigated (a) the best business intelligence dimensions for the prediction of export development, and (b) the best business intelligence dimensions for the prediction of brand internationalization.

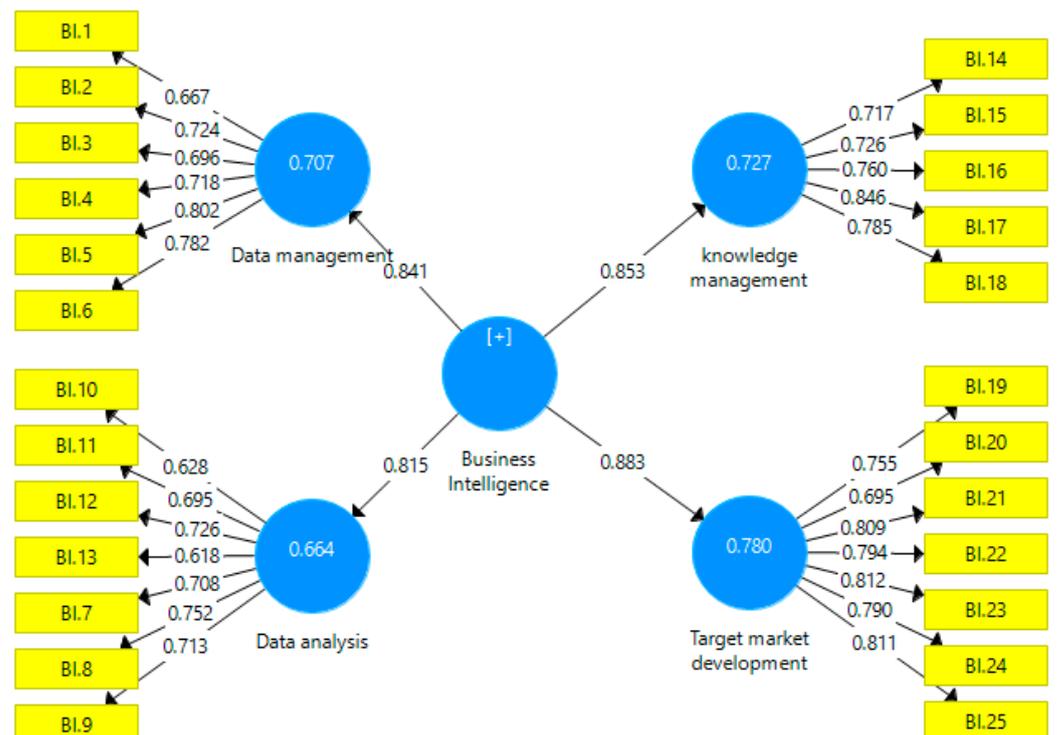


Figure 1. Coefficients of factor loadings for business intelligence questionnaire.

Table 1. Fit values of business intelligence questionnaire.

Dimensions	Cronbach's Alpha	Composite Reliability	Convergent Validity of AVE	Common Values	R ²	Q ²	F ²	GOF
Data analysis	0.819	0.866	0.500	0.250	0.664	0.299	1.972	0.634
Data management	0.827	0.874	0.537	0.288	0.707	0.354	2.416	
Target market development	0.893	0.916	0.611	0.373	0.780	0.444	3.549	
Knowledge management	0.826	0.878	0.590	0.348	0.727	0.402	2.667	

Table 2. Fornell and Larcker's values of variables of the business intelligence questionnaire.

		1	2	3	4
1	Data analysis	0.707			
2	Data management	0.697	0.733		
3	Target market development	0.528	0.631	0.782	
4	Knowledge management	0.594	0.554	0.762	0.768

4. Findings

Table 3 and Figures 2 and 3 show the positive effect of applying business intelligence on export development (0.767) (T = 21.573) as well as the positive effect of applying business intelligence on brand internationalization (0.701) (T = 13.854). From these results, H1 and H2 are confirmed.

Table 3. Effect factor of applying business intelligence on export development and brand internationalization in large industrial firms.

Predictor Variable	Criterion Variable	Effect Factor	T	Sig.
Business intelligence	Export development	0.767	21.573	0.000
Business intelligence	Brand internationalization	0.701	13.854	0.000

p < 0.05.

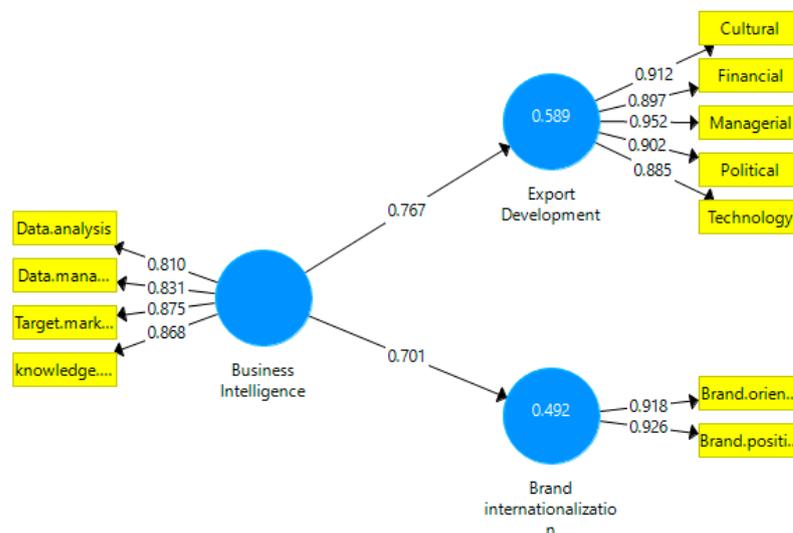


Figure 2. Coefficients for the effect of applying business intelligence on export development and brand internationalization in large industrial firms.

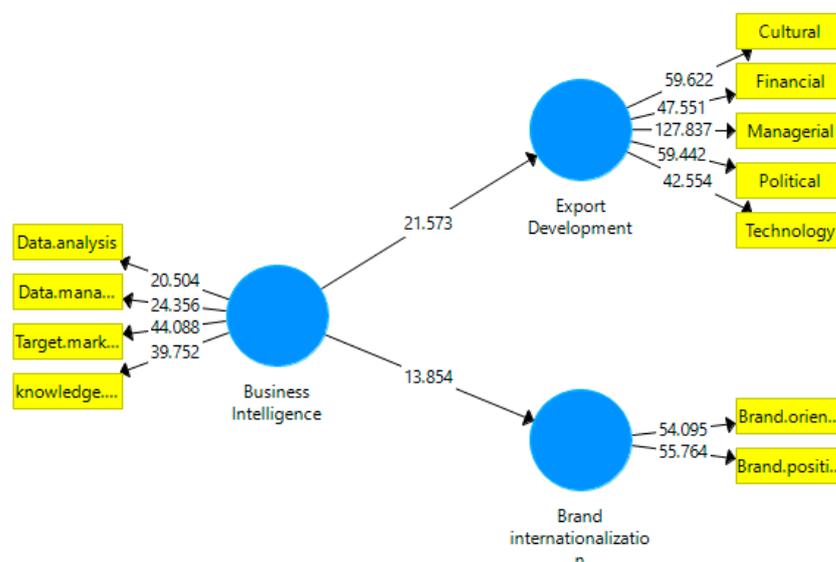


Figure 3. T-values for the effect of applying business intelligence on export development and brand internationalization in large industrial firms.

5. Additional Analyses

In this section, we show additional analyses that we conducted to deepen the results of the verified hypotheses. In particular, we investigated (a) the best business intelligence dimensions for the prediction of export development and (b) the best business intelligence dimensions for the prediction of brand internationalization.

Regarding point (a), Table 4 shows that the correlation between applying business intelligence and its dimensions (namely knowledge management, data analysis, knowledge management, and target market development) and export development is significant at $p < 0.01$. This implies a meaningful relationship between applying business intelligence and export development ($r = 0.775$). Regarding the coefficient of determination (r^2), 60.1% of the variance of applying business intelligence is shared with export development.

Table 4. Coefficient of correlation between applying business intelligence and its dimensions and export development.

Predictor Variable	Correlation Coefficient	Square of the Correlation Coefficient	Sig.
Business intelligence	0.775 **	0.601	0.000
Data management	0.629 **	0.396	0.000
Data analysis	0.597 **	0.356	0.000
Knowledge management	0.655 **	0.429	0.000
Target market development	0.725 **	0.526	0.000

Criterion variable: export development. ** Correlation is significant at 0.01 level.

Table 5 reveals that, among the applying business intelligence dimensions in the regression, target market development is the best predictor of export development in the first step, data analysis the best predictor in the second step, and data management the best predictor in the third step. According to the stepwise regression analysis, the relationship between target market development, data analysis, and data management and export development is significant. Accordingly, in the first step, the coefficient of target market development explains 52.3% of the variance of export development. The coefficient of target market development and data analysis in the second step explains 58.6% of the

variance of export development. Finally, in the third step, the coefficient of target market development, data analysis, and data management explains 59.4% of the variance of export development. The observed F was significant at $p < 0.01$; hence, the regression can be generalized to the statistical population.

Table 5. Multiple coefficients of correlation between applying business intelligence dimensions and export development.

Dependent Variable	Step	Predictor Variable	Multiple Correlation Coefficient	Squared Multiple Correlation Coefficient	Squared Adjusted Multiple Correlation Coefficient	F	Sig.
Export development	Step 1	Target market development	0.725	0.526	0.523	176.527	0.000
	Step 2	Target market development Data analysis	0.769	0.591	0.586	114.291	0.000
	Step 3	Target market development Data analysis Data management	0.776	0.602	0.594	79.123	0.000

$p < 0.01$.

Table 6 indicates that the beta coefficient increases export development by 0.512 units per unit increase in target market development, by 0.221 units per unit increase in data analysis, and by 0.157 units per unit increase in data management. The prediction equation is presented as follows:

Export development = constant coefficient (0.349) + target market development (0.464) + data analysis (0.265) + data management (0.166)

Table 6. The beta coefficient in forecasting export development by applying business intelligence dimensions.

Dependent Variable	Step	Predictor Variable	Non-Standard Beta Coefficients		Standard Beta Coefficients	t	Sig.	
			Beta	Std. Error				
Export development	Step 1	Constant	1.398	0.210	0.725	6.646	0.000	
		Target market development	0.658	0.050		13.286	0.000	
	Step 2	Constant	0.442	0.273	0.569	1.618	0.108	
		Target market development	0.516	0.054		9.525	0.000	
		Data analysis	0.359	0.072		5.019	0.000	
	Step 3	Constant	0.349	0.274	0.512	1.273	0.205	
		Target market development	0.464	0.059		7.829	0.000	
		Data analysis	0.265	0.085		0.221	3.134	0.002
		Data management	0.166	0.081		0.157	2.045	0.043

$p < 0.01$.

According to Table 7, the relationship between knowledge management and export development was not significant at $p < 0.05$.

Table 7. Variables outside the regression equation to predict export development by applying business intelligence dimensions.

Step	Scale	Beta	t	Sig.
Step 3	Knowledge management	0.137	1.675	0.096

$p < 0.05$.

Regarding point (b), Table 8 shows that the correlation between applying business intelligence and its dimensions (data management, data analysis, knowledge management, and target market development) and brand internationalization is significant ($p < 0.01$). This implies a meaningful relationship between applying business intelligence and brand internationalization in large industrial firms ($r = 0.698$). Regarding the coefficient of determination (r^2), 48.7% of the variance of applying business intelligence is shared with brand internationalization.

Table 8. Coefficient of correlation between applying business intelligence and its dimensions and brand internationalization in large industrial firms.

Predictor Variable	Correlation Coefficient	Square of the Correlation Coefficient	Sig.
Business Intelligence	0.698 **	0.487	0.000
Data management	0.517 **	0.267	0.000
Data analysis	0.496 **	0.246	0.000
Knowledge management	0.656 **	0.430	0.000
Target market development	0.679 **	0.461	0.000

Criterion variable: brand internationalization. ** Correlation is significant at 0.01 level.

Table 9 shows that, among the applying business intelligence dimensions in the regression, the best predictor of brand internationalization was target market development in the first step and knowledge management in the second step. According to the stepwise regression analysis, the relationships between target market development and knowledge management and brand internationalization were significant. Accordingly, in the first step, the coefficient of target market development explains 45.8% of the variance of brand internationalization, and in the second step, the coefficient of target market development and knowledge management explains 50.3% of the variance of brand internationalization. The observed F was significant at $p < 0.01$; hence, the regression can be generalized to the statistical population.

Table 9. Multiple coefficients of correlation between applying business intelligence dimensions and brand internationalization in large industrial firms.

Dependent Variable	Step	Predictor Variable	Multiple Correlation Coefficient	Squared Multiple Correlation Coefficient	Squared Adjusted Multiple Correlation Coefficient	F	Sig.
Brand internationalization	Step 1	Target market development	0.679	0.462	0.458	136.269	0.000
	Step 2	Target market development Knowledge management	0.714	0.509	0.503	82.053	0.000

$p < 0.01$.

Table 10 indicates that the beta coefficient increases brand internationalization by 0.428 units per one-unit increase in the target market development and by 0.334 units per one-unit increase in knowledge management. The prediction equation is presented as follows:

$$\text{Brand internationalization} = \text{constant coefficient (1.200)} + \text{target market development (0.375)} + \text{knowledge management (0.325)}.$$

Table 10. The beta coefficient in predicting brand internationalization by applying business intelligence dimensions.

Dependent Variable	Step	Predictor Variable	Non-Standard Beta Coefficients		Standard Beta Coefficients	t	Sig.
			Beta	Std. Error			
Brand internationalization	Step 1	Constant	1.675	0.217	0.679	7.729	0.000
		Target market development	0.596	0.051		11.673	0.000
	Step 2	Constant	1.200	0.240	0.428 0.334	5.000	0.000
		Target market development	0.375	0.074		5.043	0.000
		Knowledge management	0.325	0.083		3.931	0.000

$p < 0.01$.

As presented in Table 11, the relationship between data management and data analysis and brand internationalization was not significant at $p < 0.05$.

Table 11. Variables outside the regression equation to predict brand internationalization by applying business intelligence dimensions.

Step	Scale	Beta	t	Sig.
Step 2	Data management	0.113	1.573	0.118
	Data analysis	0.116	1.659	0.099

$p < 0.05$.

6. Discussion

Results of hypotheses testing using SmartPLS software indicated the effect of applying business intelligence on export development (0.767) ($T = 21.573$) and the effect of applying business intelligence on brand internationalization (0.701) ($T = 13.854$), suggesting that applying business intelligence affects export development and brand internationalization in large industrial firms. Meanwhile, the results of the additional analyses show the correlation coefficients for the relationship between applying business intelligence and its dimensions (data management, data analysis, knowledge management, and target market development) and export development and brand internationalization to be significant at $p < 0.01$. This implies a significant effect between applying business intelligence and export development ($r = 0.775$) and brand internationalization ($r = 0.698$). Regarding the coefficient of determination (r^2), 60.1% of the variance of applying business intelligence was shared with export development and 48.7% of the variance of applying business intelligence was shared with brand internationalization. Moreover, among the applying business intelligence dimensions in the regression, the best predictors of export development were target market development, followed by data analysis, then data management. Furthermore, the best predictor of brand internationalization was target market development, followed by knowledge management. Accordingly, all secondary hypotheses of the research were confirmed.

The findings for the first hypothesis are directly in line with the research findings of [Eshtehardi and Movahedzadeh \(2018\)](#), regarding the effect of business intelligence

components on export development, and those of [Neubert and Van der Krogt \(2018\)](#) regarding the effect of business intelligence solutions on a company's export performance. Those research findings are also indirectly consistent with the first secondary hypothesis. On the other hand, this study's findings for the second hypothesis are directly in line with the research findings of [Rashidi Chaghakhor and Rezaiyan \(2022\)](#) regarding the effect of business intelligence on brand value, [Hu et al. \(2019\)](#) regarding the relationship between business intelligence and brand personality, [Shafiei et al. \(2017\)](#) regarding the effect of business intelligence on brand success, and [Tamiminia et al. \(2016\)](#) regarding the effect of business intelligence on brand promotion.

Relevant to the study findings is the fact that social and economic reality has made contemporary organizations search for tools to facilitate the process of effective data acquisition and processing and the extensive analysis of data from different and scattered sources to provide the grounds for discovering knowledge. Accordingly, adopting tools such as business intelligence has become incredibly important nowadays due to their role in organizational decision making and improving productivity in different industries. In successful organizations, comprehensive planning, supply-chain management, and customer-relationship management are attributed to business intelligence. Business intelligence is an effective method for purposive analysis of the business and analysis of the organization's competitors in order to make strategic decisions and even instant turnarounds. Identifying opportunities using business intelligence and implementing effective strategies to exploit them can allow companies to gain a competitive advantage and long-term stability, including export development.

7. Conclusions

This study aimed to examine the effect of applying business intelligence on export development and brand internationalization using a descriptive–correlation method and by distributing a questionnaire to 161 randomly selected employees at the Mobarake Steel Company's headquarters in Isfahan. The study revealed that the usage of business intelligence impacts the expansion of exports and a brand's internationalization. Based on the data, it can be stated that the development of exports paves a new path for international trade and can play a significant role in the international awareness of brands. In addition, carrying out the aforementioned operations necessitates understanding the needs of consumers, controlling, planning, evaluating, and confirming those demands, and offering suitable and timely answers.

Managers of large firms and policymakers should be aware of the fact that applying business intelligence has a positive effect on export development and brand internationalization in large industrial firms. In addition, target market development is the best BI predictor for export development and brand internationalization. This suggests that developing a target market, i.e., a segment of consumers most likely to want or need a business's products or services, is the first lever that companies should move to benefit from BI tools. Governments should support investment in this direction.

According to the theoretical foundations and existing results, future research is needed. Scholars should investigate, for example, the existing obstacles and limitations in the use of effective business intelligence in export development. The research suggests that it would be useful to conduct comparative study of the role of cultural differences in the application of business intelligence and other new technologies and the different methods used in the development of exports and the internationalization of brands in different societies. Moreover, industrial companies' lived experiences of accepting and using business intelligence should be examined. In this regard, designing a model to evaluate companies' business-intelligence maturity level in relation to their brand success could also be useful.

In addition, the current research has faced the following limitations. First, the researchers faced limitations in choosing experts and competent people to conduct interviews in order to develop a researcher-made questionnaire.

Second, this research was conducted in a large industrial company in Iran. Therefore, due to the unique conditions present, including organizational culture, organizational facilities, management structure, location, and geography, it is necessary to be cautious about generalizing the results to other countries or even to other industries in Iran. Third, the results of the current research have only investigated the effect between research variables, and it is not possible to derive a causal inference from the findings.

Author Contributions: Conceptualization, M.G.; methodology, H.S. and M.G.; formal analysis, M.G.; investigation, D.W.M.C. and M.C.; data curation, H.S. and M.G.; writing—original draft preparation, H.S. and M.G.; writing—review and editing, D.W.M.C. and M.C.; visualization, M.G.; supervision, H.S.; project administration, M.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The authors confirm that the data supporting the findings of this study are available within the article. Row data supporting this study's findings are available from the corresponding author, upon reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Acheampong, Owusu, and Said Aiman Moyaid. 2016. An integrated model for determining business intelligence systems adoption and post-adoption benefits in the banking sector. *Journal of Administrative and Business Studies* 2: 84–100.
- Aghaei, Reza, and Milad Aghaei. 2018. The Impacts of Business Intelligence, Customer and Loyalty Satisfaction and Brand Value in Iran Hygienic and Cellulose Industry. *Roshd-e-Fanavari* 14: 33–40.
- Anholt, Simon. 2005. *Brand New Justice: How Branding Places and Products Can Help the Developing World*, 2nd ed. Oxford: Elsevier Butterworth-Heinemann. 192p.
- Aruldoss, Martin, Miranda Lakshmi Travis, and V. Prasanna Venkatesan. 2014. A survey on recent research in business intelligence. *Journal of Enterprise Information Management* 6: 831–66. [CrossRef]
- Bilkey, Warren J. 1978. An Attempted Integration of the Literature on the Export Behavior of Firms. *Journal of International Business Studies* 1: 33–46. [CrossRef]
- Brichni, Manel, Sophie Dupuy-Chessa, Lillia Gzara, Nadine Mandran, and Corinne Jeannet. 2017. BI4BI: A continuous evaluation system for Business Intelligence systems. *Expert Systems with Applications* 76: 97–112. [CrossRef]
- Catanzaro, Alexis, and Christine Teyssier. 2021. Export promotion programs, export capabilities, and risk management practices of internationalized SMEs. *Small Business Economics* 3: 1479–503. [CrossRef]
- Cristofaro, Matteo. 2016. Cognitive styles in dynamic decision making: A laboratory experiment. *International Journal of Management and Decision Making* 15: 53–82.
- Cristofaro, Matteo. 2017. Herbert Simon's bounded rationality: Its historical evolution in management and cross-fertilizing contribution. *Journal of Management History* 23: 170–90. [CrossRef]
- Da Silva, Paulo Azzi, and Angela Da Rocha. 2001. Perception of export barriers to Mercosur by Brazilian firms. *International Marketing Review* 6: 589–611. [CrossRef]
- Eshtehardi, F., and A. Movahedzadeh. 2018. Effect of business intelligence components on ED in Barkat Poultry Company. Paper presented at 4th International Conference on Management, Entrepreneurship and Economic Development, Takestan, Iran.
- Gauzelin, Sophian, and Hugo Bentz. 2017. An examination of the impact of business intelligence systems on organizational decision making and performance: The case of France. *Journal of Intelligence Studies in Business* 7: 2. [CrossRef]
- Hu, Yuheng, Anbang Xu, Yili Hong, David Gal, Vibha Sinha, and Rama Akkiraju. 2019. Generating business intelligence through social media analytics: Measuring brand personality with consumer, employee, and firm-generated content. *Journal of Management Information Systems* 3: 893–930. [CrossRef]
- Kotabe, Misaaki, and Michael R. Czinkota. 1992. State government promotion of manufacturing exports: A gap analysis. *Journal of International Business Studies* 4: 637–58. [CrossRef]
- Lasi, Heiner. 2013. Industrial intelligence—A business intelligence-based approach to enhance manufacturing engineering in industrial companies. *Procedia CIRP* 12: 384–89. [CrossRef]
- Lee, J. W. 2009. Relationship between consumer personality and brand personality as self-concept: From the case of Korean automobile brands. *Academy of Marketing Studies Journal* 1: 25–44.
- Malekzadeh, Gholamreza. 2014. *An Introduction to Organizational Intelligence and Intelligent organizations*, 1st ed. Mashhad: Ferdowsi University of Mashhad.

- Moilanen, Teemu, and Seppo Rainisto. 2009. *How to Brand Nations, Cities and Destinations: A Planning Book for Place Branding*, 1st ed. London: Palgrave Macmillan, 211p.
- Morgan, Robert E., and Constantine S. Katsikeas. 1997. Obstacles to export initiation and expansion. *Omega* 6: 677–90. [[CrossRef](#)]
- Neubert, Michael, and Augustinus Van der Krogt. 2018. Impact of Business Intelligence Solutions on Export Performance of Software Firms in Emerging Economies. *Technology Innovation Management Review* 9: 39–49. [[CrossRef](#)]
- Newell, Allen, and Herbert A. Simon. 1972. *Human Problem Solving*. Englewood Cliffs: Prentice-hall, vols. 104.
- Özdemira, Erkan, M. Hakan Altıntaşb, and Serkan Kılıçc. 2017. The Effects of the Degree of Internationalization on Export Performance: A Research on Exporters in Turkey. *Business and Economics Research Journal* 3: 611–26. [[CrossRef](#)]
- Patil, Pranav. 2016. Survey of business intelligence system. *International Journal of Research in Computer Applications and Robotics* 9: 13–17.
- Pranjić, Goran. 2018. Decision making process in the business intelligence 3.0 context. *Ekonomiska misao i praksa* 2: 603–19.
- Pyper, Keith, and Anne Marie Doherty. 2022. Employing brand governance mechanisms with export channel partners: What are the performance consequences and contingent effects? *International Business Review* 31: 101991. [[CrossRef](#)]
- Pyper, Keith, Anne Marie Doherty, Spiros Gounaris, and Alan Wilson. 2022. A contingency-based approach to the nexus between international strategic brand management and export performance. *Journal of Business Research* 148: 472–88. [[CrossRef](#)]
- Rahmany Youshanlouei, Hossein, Manoochehr Ansari, Mohammad Mirkazemi, and Mohammad Ebrahimi. 2013. Identifying and Prioritizing the Export Barriers and Proposing Initiatives to Developing Small to Medium Enterprises (SMEs) Export Case Study: Feed Industry in West Azerbaijan. *New Marketing Research Journal* 3: 139–60.
- Rashidi Chaghakhor, H., and A. Rezaian. 2022. Effect of business intelligence on financial performance mediated by brand value and creativity (the case study of private banks in Khuzestan province). *Marketing Management* 56: 101–85.
- Shafiei, Shahram H., Hossein Zareian, and Hosein Berakhas Ghermish. 2017. Effect of business intelligence on financial performance via innovation and brand success (A case study: Private sports clubs in Rasht city). *Sports Management Studies* 41: 146–27.
- Tajuddin, H. 2019. Investigating the role of brand orientation and brand positioning on brand performance in international markets. *Approaches in Business Management* 2: 100–16.
- Tamiminia, H., A. A. Jokar, and M. Mahmoudi Meymand. 2016. Effect of business intelligence on brand promotion: A case study of Sony cellphone products in Asalouye city. *Management and Entrepreneurship Studies* 2: 222–10.
- Tong, Xiao, and Jana M. Hawley. 2009. Measuring customer-based brand equity: Empirical evidence from the sportswear market in China. *Journal of Product & Brand Management* 4: 262–71.
- Wilkinson, Timothy J. 2006. Entrepreneurial climate and US state foreign trade offices as predictors of export success. *Journal of Small Business Management* 1: 99–113. [[CrossRef](#)]
- Wong, Ho Yin, and Bill Merrilees. 2006. Determinants of SME brand adaptation in global marketing. *International Journal of Entrepreneurship and Small Business* 3–4: 477–97. [[CrossRef](#)]
- Wong, Ho Yin, and Bill Merrilees. 2008. Multiple roles for branding in international marketing. *International Marketing Review* 4: 384–408.
- Yalcin, A. S., H. S. Kilic, and D. Delen. 2022. The use of multi-criteria decision-making methods in business analytics: A comprehensive literature review. *Technological Forecasting and Social Change* 174: 121193. [[CrossRef](#)]
- Yan, Suli L., Ying Wang, and Ji Cheng Liu. 2012. Research on the comprehensive evaluation of business intelligence system based on BP neural network. *Systems Engineering Procedia* 4: 275–81. [[CrossRef](#)]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.