

Full Length Research Paper

Business intelligence applications in Taiwan

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Business intelligence (BI) market appears actively as well as becoming a competitive tool. In order to precisely understand why BI has been capturing the attention of many CIOs or IS managers and has also been accepted by them lately. This empirical study has explored the current status of BI applications in the top 500 Taiwanese firms. The participants were given some BI-related questions often mentioned in the IS literature, e.g. BI users, motivation factors in application, using analytical techniques and functions, application for benefits and problems, and critical success factors. The results will provide available insights for researchers and practitioners.

Key words: Business intelligence, motivation factors, analytical techniques, critical success factors.

INTRODUCTION

Recently, business environment has changed so rapidly. Business industries face the challenges in the global competitive market, such as high degree of market volatility, shortened lifecycles, uncertain demand and unreliable supply (Alipour et al., 2010; Seyedhoseini et al., 2010). Organizations in order to obtain more reliable competitive intelligence and avoid loss or bankruptcy, that business intelligence (BI) applications have been dominating the IT priority list of many CIOs (Lawton, 2006; Watson and Wixom, 2007; Shariat and Hightower, 2007; Gartner Research, 2008, 2009, 2010; Yeoh and Koronios, 2010). Some industry analyst reports show that in the coming years, millions of people will use BI daily (Baum, 2006; Turban et al., 2007). From a technical point of view, the stage is set for rapid growth in adoption of BI applications in the coming decades (Petrini and Pozzebon, 2009).

According to Rehan and Akyuz (2010), BI is defined as "consolidating data coming from various sources into reports that allow for intelligent managerial decisions that is vital for business success and this need is taken care of in all of these architectures". Nowadays, BI integrates with a wide range of diversified resources which includes packages, tools and platforms, and various products aimed at satisfying different needs related to the search for, and use of information, e.g. dashboards applications (used to consolidate within a single control panel the information linked to performance factors in a largely

summarized level), sophisticated mining applications (used to build predictive business models) and OLAP (used to continuously and interactively, with dynamic and flexible data presentation for various dimensions and cross-sections). The large variety of tools may help explain why an extensive range of apparently dissimilar applications is commonly called BI (Petrini and Pozzebon, 2009). Thus, it plays a key role in achieving and maintaining competitive advantage (Phan and Vogel, 2010). As a result, BI has gained much attention from IS researchers and practitioners. However, there are many "perceptual" writings about BI, in contrast, very few academic studies of BI applications (Bergeron, 2000; Negash, 2004; Elbashir et al., 2008; Jourdan et al., 2008). In order to know whether BI can, in fact, generate competitive advantages, investigation of their actual uses is necessary. For example, Watson et al. (2006) and Wixom et al. (2008) discussed actual uses of BI in the Continental Airlines. Phan and Vogel (2010) identified strategies and the successes and failures of customer relationship management (CRM) and BI at Fingerhut. However, these studies are primarily based on American firms. Few references of how Asian firms use these systems are available. Thus, the purpose of this study is to explore the current situation of BI applications in Taiwanese firms. Most firms are globally competitive, such as Foxconn, Acer, Quanta Computer, Wistron, and Taiwan Semiconductor Manufacturing Company (TSMC),

etc. Particularly, Foxconn had an annual sales of over 1,959 billion NT dollars (1 US\$ = 31 NT\$) in 2009 and so far they have more than 25,000 worldwide patents.

A better understanding of how BI is perceived and used in Taiwan can give us a better sense of IT/IS applications. The study investigated the following research problems:

1. What level of understanding of BI?
2. What is the importance of BI for company?
3. What is the extent of actual use BI?
4. What are the reasons for not using BI (If the firm did not use BI)?
5. What are the motivations for applying BI (If the firm have used BI or under development)?
6. What developmental approaches, tools were incurred in developing BI?
7. What BI analytical techniques are commonly used by the company?
8. Who are the major BI users?
9. What kinds of BI functions are often used?
10. What are the major domains for applying BI?
11. What problems need to be resolved when building BI?
12. What are the benefits for applying BI?
13. What are the key factors for successful BI implementation?

Clearly, these issues are interesting and important. The results of this investigation could provide useful insights to researchers and practitioners. The remainder of this paper is organized as follows: research methodology; summary of major findings from the surveys and the discussion of the results, their implications, and future research issues.

RESEARCH METHODOLOGY

In this study, a mail survey was conducted. The questionnaire design mainly referred to the past researchers (Hsieh et al., 1992; Watson et al., 1995; Liang and Hung, 1997; Turban et al., 2007). The first part of the questionnaire concerned the demographics of the firm. Next, the current status of BI applications in the organization was assessed through items pertaining to the perceived understanding and important of BI, extent of BI actual use, major motivations for applying BI, BI developmental approaches and tools, analytical techniques usage, major BI users, major functions of BI, domains for BI application, major difficulties in BI development, major benefits for using BI, and key success factors for the implementation of a BI project. Alternatively, when the company was currently not using BI, reasons for BI non-use were examined. Basically, the questionnaire was pre-tested carefully by two professors and twelve doctoral students in this area, including translation, wording, structure, and content. Content validity of the scale should be acceptable.

A study sample, including Top 500 firms ranked by the Common Wealth Magazine (a popular commercial magazine in Taiwan) was selected. Based on this sample, CIOs or IS managers were selected as the respondents. This is because this study focuses on the understanding of BI application. Therefore, CIOs or IS managers are more likely to be the managerial personnel who have best knowledge regarding all these topics. Their experiences should be properly reflected on the responses of the questionnaire. In

addition, in order to improve survey return, a follow-up procedure by phone or letter is carried out for the non-respondents after 2 to 3 weeks.

After the questionnaire was finalized, 171 replied, with 3 incomplete responses deleted, resulting in a total sample of 168 respondents for a 33.6% response rate. The seemingly low response rate raises the concern about non-response bias. To check non-response error, the responding sample was divided into two subsamples, that is, early and late with 70 and 98 respondents, respectively. The two groups were compared on various demographic characteristics for their correlation with *t*-test, including annual revenue, IS department budget, number of IS employees, and history of IS department. All of them reveal no significant differences at the 0.05 level. This indicates no systematic non-response bias for the responding sample. All statistics were computed using SPSS 15.0 for Windows.

The sample demographic is depicted in Table 1. Approximately 70% of the responding firms had annual sales of more than 10 billion NT dollars. 20% of the firms had an annual IS budget of over 100 million NT dollars. 40% of the respondents employed fewer than 20 IS persons and 50% of them had there is departments installed for more than 20 years .

RESEARCH FINDINGS

Results from this survey are discussed as follows:

Level of understanding of BI

Basically, respondents' understanding of BI is presented in Table 2. Approximately 70% of the respondents understand BI. As mentioned earlier, publicity and education of BI concept has reached a certain level, after that we can rely on related information units and academics continued to promote BI.

The importance of BI for company

Importance of the system to business competitiveness, a large portion of the respondents indicated that BI did play a significance role in their companies. As Table 3 shows, over 80% of them identified the BI to be very important. It should be pointed out that most respondents have agreed that the BI is becoming a powerful tool for firms.

Extent of actual use BI

In order to know whether firms use BI or not, Table 4 show that 105 firms (62.50%) were found using or developing BI systems and only 63 firms (37.50%) were yet to use it. Half of the companies are using BI. This implies that applications of BI have high potential and then the non-users will sooner or later, become users of BI systems. For those 63 firms, non-BI users, respondents were further asked to indicate why they did not use BI. Table 5 summarizes their responses. It turns out that the lack of top management support was the

Table 1. Profile of the sample firms.

Characteristics	Frequency	Percentage (%)
Annual revenue (NT \$ Billion)		
≤ 9.9	41	24.40
10 - 19	62	36.90
20 - 29	17	10.12
30 - 39	13	7.74
40 - 49	4	2.38
≥ 50	31	18.45
IS department budget (NT \$ Million)		
≤ 19	71	42.26
20 - 39	28	16.67
40 - 59	15	8.93
60 - 79	6	3.57
80 - 99	6	3.57
≥ 100	34	20.24
Number of IS employees		
≤ 19	75	44.46
20 - 39	40	23.81
40 - 59	13	7.74
60 - 79	10	5.95
80 - 99	2	1.19
≥ 100	25	14.88
History of IS department (Year)		
≤ 9	15	8.93
10 - 19	60	35.71
20 - 29	51	30.36
30 - 39	23	13.69
≥ 40	15	8.93

Table 2. Level of understanding of BI.

Level of understanding	Frequency	Percentage
Very high	26	15.48
High	94	55.95
Medium	42	25.00
Low	3	1.79
Very low	0	0.00

Table 3. The importance of BI for company.

Importance of BI	Frequency	Percentage
Very high	29	17.26
High	116	69.05
Medium	20	11.90
Low	0	0.00
Very low	0	0.00

Table 4. Extent of actual use BI.

BI systems use	Number of firms	Percentage
Use	83	49.40
Under development	22	13.10
Do not use	63	37.50

Table 5. Reasons for not using BI.

Reason	Frequency	Percentage
Lack of top management support	22	40.00
Hard to find proper domains	20	36.36
Lack of system builders	20	36.36
No proper development tools	15	27.27
MIS not mature	12	21.82
No need for BI	10	18.1
Do not understand BI	9	16.36
Others	4	7.27

Note: Owing to multiple answers, the percentages do not sum to 100.

most frequently cited reason (40.00%). This is understandable because this cause is a common and critical factor when a company plans to invest in large project or system. Karimi et al. (2007) indicated that in order to successfully promote projects that require a concerted effort at top managers, even good project managers can contribute to buy-in. In addition, it maybe because some top managers deemed some problems facing organization that it is not needed for BI, even it can use others simple analysis tools (e.g Excel) in problem solving. Other major reasons like as hard to find proper domains (36.36%). Maybe the IS managers do not have adequate know-how of BI to apply the systems properly. However, Lack of system builders (36.36%); caused by BI possess strong capability, and therefore could need to consolidate many technologies (such as data warehouse, OLAP, Data mining, etc.) to develop a complete BI infrastructure. However, system builders must be owner of professional skills and experience to finish the work. Thus, training and education are important for eliminating the problems.

For those 105 firms who use and are under development, respondents were given a list of 28 motivating factors often mentioned in the IS literature and asked to identify them. Table 6 presents the top 10 factors rank ordered. For most firms, "need for timely information" (58.82%), "reduce the load of making report" (56.86%), and "need to help achieve business goals" (53.92%) are the leading factors. Due to rapid change business environment, business industries face challenges in operation, funds, labors, technologies, and furthermore they also confront with increasing global competition. Timely information is needed by managers

for their decision-making. However, managers like to see the timely information already processed (such as performance reports). In general, the report format and content are various. In order to produce report in the shortest time possible, effective to reduce the loading of make report is a key point. When executives want to know about whether business has achieved an objective or not, a suit of tools (e.g. BI) that could assist them in monitor their current situation and further to reach their goals.

BI development approaches and tools

BI have strong functions, thus it often requires support by considerable technology, hardware and software, to build a BI framework. This survey revealed that most organizations' BI development approach was conducted with buying package (61.17%) or self-development (58.25%) method. It is an interesting contrast to outsourcing approach (32.04%). This implied that BI holds features with strategic, confidential, and custom, thus numerous firms prefer to buy package or self-development rather than outsourcing as shown in Table 7.

BI has become a very popular globally among enterprise managers, IT professionals, and IS vendors (Shariat and Hightower, 2007). BI vendors are continually producing many BI development tools; moreover, they have a great diversity of options for companies. Thus, respondents were given a list of 27 common BI development tools and asked to choose them. Table 8 presents a rank ordered listing of the top 5 BI development tools based on their popularity. Heading

Table 6. Motivating factors in the application of BI.

Motivation	Frequency	Percentage
Need for timely information	60	58.82
Reduce the load of making report	58	56.86
Need to help achieve business goals	55	53.92
Need for increased efficiency	54	52.94
Need for direct access to information	51	50.00
Need for access to operational data	50	49.02
Need for more accurate information	48	47.06
Executives to promote	45	44.12
Increasingly competitive environment	42	41.18
Need for increased effectiveness	36	35.29

Note: Owing to multiple answers, the percentages do not sum to 100.

Table 7. BI development approach.

Approach	Frequency	Percentage
Buy package	63	61.17
Self-development	60	58.25
Outsourcing	33	32.04

Note: Owing to multiple answers, the percentages do not sum to 100.

Table 8. BI development tools.

Tool	Frequency	Percentage
Microsoft SQL server: Reporting service	37	36.63
Microsoft office system	27	26.73
IBM Cognos BI	22	21.78
SAP business objects	20	19.80
Microsoft performance point server	10	9.90

Note: Owing to multiple answers, the percentages do not sum to 100.

the list, is Microsoft SQL Server: Reporting Service (36.63%), the second is Microsoft office system (26.73%), the third is IBM Cognos BI, the fourth is SAP business objects (19.80%), and next is Microsoft performance point server (9.90%). Although there are various BI development suits in the market, most firms prefer the famous BI vendors (e.g. Microsoft, IBM, and SAP).

BI analytical techniques used by the company

Analytical applications are the major advantage of using BI. As we know the kernel BI analytical techniques mainly encompass OLAP and data mining (Zeng et al., 2006; Saha, 2007; Zhou et al., 2008), both of which run off a data warehouse or a data mart (Kim, 1998). BI analytical techniques used by the Taiwanese companies as shown in Table 9. OLAP (96.88%) and data mining (78.13%) are

both really used frequency. Firms are increasingly required to use data mining coupled with OLAP technology to make sense of and to gain competitive insight into this vast volume of data (Heinrichs and Lim, 2003).

In order to understand application circumstances of each analytical technique, we survey OLAP, data mining, and other analytical techniques, respectively. The detailed results are as follows: OLAP as the sets of front-end analyzing tools, can continuously and interactively be used with dynamic and flexible data presentation for various dimensions and cross-sections (Xu et al., 2007; Lagumdžija and Kačapor, 2008). A number of techniques may be applied to OLAP, such as drill-down, roll-up, slice, dice, etc. The survey that more than seven analytical techniques have been used for analyze in Taiwanese firms. Among them, for the most part, drill-down, and roll-up/ drill-up are constantly utilized by respondents. Table 10

Table 9. BI analytical techniques used by the company.

Technique	Frequency	Percentage
OLAP	93	96.88
Data mining	75	78.13
others	47	48.96

Note: Owing to multiple answers, the percentages do not sum to 100.

Table 10. Analytical techniques in OLAP.

Technique	Frequency	Percentage
Drill-down	84	90.32
Roll-up/ drill-up	53	56.99
Pivot/ rotate	29	31.18
Dice	28	30.11
Slice	23	24.73
Drill-through	21	22.58
Drill-across	9	9.68
Others	1	1.08

Note: Owing to multiple answers, the percentages do not sum to 100.

Table 11. Analytical techniques in data mining.

Technique	Frequency	Percentage
Classification	54	72.00
Time series analysis	40	53.33
Cluster analysis	34	45.33
Association analysis	33	44.00
Link analysis	14	18.67
Sequential pattern analysis	13	17.33
Others	1	1.33

Note: Owing to multiple answers, the percentages do not sum to 100.

lists these techniques and their application frequency.

Data mining applications allow users to detect trends identify interesting data patterns and relations (Xu et al., 2007; Lagumdžija and Kačapor, 2008). Table 11 presents a rank ordered listing of the techniques based on their application frequency. Classification, time series analysis, cluster analysis, and association analysis are commonly applied by respondents.

Moreover, respondents were asked to check other analytical techniques that they have used. As shown in Table 12, the most often used techniques were frequency analysis and decision rule. It may be due to frequency analysis and decision rule are owned simple to comprehend and easy to use, thus they turn out to be very popular.

BI users

BI solution provides appropriate interfaces and tools for

users at different levels of organization, which have different demands (Bogza and Zaharie, 2008). As Table 13 shows, BI major users are primarily middle and upper-level managers. The purpose of BI is to assist in processing the business information into condensed and useful managerial knowledge/ intelligence (Lönnqvist and Pirttimäki, 2006), and then to support decision-makers for their actions (Frishammar, 2002) such as performance management, and further to enhance an enterprise's business competence (Liu and Zhao, 2008). As aforementioned, BI has strong capability of supporting especially business managers.

BI Functions

In general, BI Functions are quite diverse. As shown in Table 14, the most popular functions of BI are information search and browse (72.73%) and security access control (60.61%). For example, the executives can use the

Table 12. Other analytical techniques.

Technique	Frequency	Percentage
Frequency analysis	22	46.81
Decision rule	22	46.81
Scenario analysis	14	29.79
Regression	14	29.79
Others	1	2.13

Note: Owing to multiple answers, the percentages do not sum to 100.

Table 13. BI users.

User level	Number of firms	Percentage
Top executives	60	58.82
Middle manager	80	78.43
First-line manager	47	46.08
Others	7	6.86

Note: Owing to multiple answers, the percentages do not sum to 100.

Table 14. BI Functions.

Major function	Frequency	Percentage
Information search and browse	72	72.73
Security access control	60	60.61
Knowledge management	43	43.43
Workflow management	37	37.37
Collaboration	36	36.36
Personal technology	30	30.30
Publishing and subscription information	16	16.16

Note: Owing to multiple answers, the percentages do not sum to 100.

information search and browse to capture correct and real-time business information or related competitive intelligence, and then they can refer to the available information to react rapidly. Moreover, security access control will be able to effectively set by users with distinct permissions to access information and to strengthen information security, and furthermore to protect competitive advantage.

Application domains

Table 15 presents the top 10 BI application domain rank ordered, with their frequency and percentage. It is clear that BI fall into several major application areas: finance, marketing, transport, production, and procurement. These results show that BI application domains are extensively. We believe that there will be more areas through BI applications in the future.

Problems in developing BI

BI applications are successful in Taiwanese companies, some problems still exist (Table 16). The most frequently mentioned were difficulty in determining information requirements (49.46%) and difficulty in building appropriate analytical models (41.94%). Although, BI claim they can support personalized information services, it is still hard to satisfy information needs fully for user at any level. This shows that determined user demand is a complex and thorny problem. Thus, we suggest that system analyst should not only analyze what the user requirements really are, but they also pay attention to these information needs whether they can solve their question or not. Furthermore, it is difficult to build appropriate models that were affected by the foregoing problem. In other words, if user requirements can be caught exactly, it will be easy to build appropriate analytical models. Besides, this problem could also result from rising

Table 15. Application domains.

Application domain	Frequency	Percentage
Finance	62	62.60
Marketing/transport	54	54.50
Production	44	44.40
Procurement	42	42.40
Accounting	39	39.40
Human resource	36	36.40
Project control and management	20	20.20
Quality control and management	17	17.20
Insurance	7	7.10
Investment	7	7.10

Note: Owing to multiple answers, the percentages do not sum to 100.

Table 16. Problems in developing BI.

Problem	Frequency	Percentage
Difficult to determine user requirements	46	49.46
Difficult to build appropriate analytical models	39	41.94
Lack of system builders	20	21.51
Difficult to integrate existing systems	20	21.51
Lack of user commitment	15	16.13
Lack of well-known successful cases	14	15.05
User resistance to the use of computers	13	13.98
Lack of support from other departments	12	12.90
Lack of top management support	11	11.83
Lack of proper development tools	10	10.75

Note: Owing to multiple answers, the percentages do not sum to 100.

complexity in business environments, many phenomena cannot be presented by simple analytical models; hence, it needs to rely on management science, operations research scholars and experts with relevant practical experience to discuss together.

Application for benefits

No business organization can deny the inevitable beneficial result with information technology (Hsu, 2007). Therefore, understanding which benefits are important in applying BI across the corporation. The following list shows the major benefits in BI uses:

1. The BI provides a high level of enterprise wide data integration.
2. BI implementation has improved our efficiency of operations.
3. BI implementation has improved timely access to corporate data.
4. BI implementation has lowered our cost of operations.
5. BI implementation has made us more adaptive to

changing business environment.

6. BI implementation has made our company more agile.
7. BI implementation has improved the flexibility of our operations.
8. Data provided by BI add value to our operations.
9. BI implementation has improved our quality of operations.
10. BI implementation helps us make better sales forecasts than before.

Many of the benefits of BI are intangible. Overall, this finding is consistent with existing literature (Negash, 2004; Watson and Wixom, 2007), and this is why, Hannula and Pirttimaki (2003) found that most companies do not consider cost or time savings as primary benefit when investing in BI systems. For this reason, we suggest that IS managers should not only consider tangible benefits when implement the BI project.

Critical success factors

The implementation of BI is a complex task requiring

Table 17. Critical success factors.

Success factors	Frequency	Percentage
Support from chief executives	75	74.26
Credibility of outputs	54	53.47
Experienced system builders	51	50.50
Maturity of IS applications	49	48.51
Maturity of MIS	47	46.53
Friendly user interface	45	44.55
User's experience	43	42.57
Proper user training	41	40.59
Well data management capabilities	38	37.62
Meet business goals	37	36.63

Note: Owing to multiple answers, the percentages do not sum to 100.

considerable resources (Yeoh and Koronios, 2010). For the 105 firms that use and are currently under development BI, respondents were asked to identify the key success factors for implementing BI. According to Table 17, top manager support is by far the most important factor. The top two is credible of outputs, and the top three is experienced BI builders. Other factors include the maturity of IS applications, MIS maturity, and friendly user interface design, etc. These factors are representative and can further help us avoid a failed BI project.

DISCUSSION AND CONCLUSIONS

BI is becoming increasingly important tools in sustaining competitive advantage across industries (Turban et al., 2007). Study results have offered much insight into the application of BI in Taiwanese firms. In general, we found that despite many people thought BI is frequently referred to as a broad term that consist of various methodologies, technologies, and tools for helping decision-making, over 70% of the respondents have high understanding of BI. Besides, this survey showed that only about 62.5% of the companies applied BI in Taiwan, but still have 86.31% of the respondents considered BI to be important to their competitiveness. As aforementioned, the BI has been popular and important within the business realm.

Here, we also explored the motivating factors in the applications of BI for those 105 firms and the reason why 63 of the companies are not using, respectively. Need for timely information, reduce the loading of making report, and need help to achieve business goals are the top three motivating factors. On the contrary, lack of top management support, hard to find proper domains, and lack of system builders are the top three not using reasons. In addition, buying package and self-development are both the familiar method to development BI. The most popular tool for developing BI is Microsoft SQL server: Reporting service. Other tools

include IBM Cognos BI and SAP business objects. However, the major problems for developing BI are difficulty in determining user requirements and to build appropriate analytical models.

Although, BI major user groups to focus on middle and upper-level managers, there are some lower-level managers and general employees have been the users of BI. This finding consists with the forecast of Watson (2009) that BI trends to increased scalability (e.g. more data, users, and complex queries) and pervasive, which gives BI to more employees, suppliers, and customers. Basically, OLAP and data mining are the most frequently BI analytical techniques by Taiwanese firms. Especially, drill-down and roll-up/drill-up are constantly utilized in OLAP; Classification, time series analysis, cluster and association analysis are often used in data mining. The most popular functions of BI are information search, browse, and security access control. Finance, marketing/transport, and production are top three application domains. So far, applications of BI can bring tangible and intangible benefits to Taiwanese firms as it can provide a high level of enterprise data integration, improved efficiency of operations and timely access to corporate data, lowered cost of operations and so on. In order to ensure that BI implement are successful, the top three critical success factors include support from chief executives, credibility of outputs, and experienced system builders.

The implications for researchers are discussed as follows: First, this empirical study has explored the current status of BI applications in Taiwan, and that sampled from a combination of industries, so the conclusions are more general and comprehensive. Future research could be targeted towards the particular industries, for instance, manufacturing, to understand their differences and similarities. Second, researchers can shift through this survey results to extend and build appropriate model to interpret these important BI issues. The implications for practitioners are noted subsequently. BI has been one of the most important tools for business

industries in recent past. In order to apply appropriately for BI and achieve a high rate of return on its BI investment IS managers should initially focus on understanding the current situation of BI applications. As Gangadharan and Swami (2004) concluded, "Understanding what BI is, why one would apply it and the corresponding benefits are important in implementing BI across the enterprise". Thus, these findings will possibly affect BI project outcomes. Clearly, the results can help IS managers direct their attention to most promising actions and provide insights into how to manage their BI project.

Although, this research has produced some useful results, a number of limitations may be inherent in it. First, since the research was conducted in mail surveys, the response rate (33.6%) is slightly lower than desirable, despite the various efforts to improve it. This may be due to the fact that many IS managers currently lack experience in BI implement. However, the sample data indicate no systematic non-response bias in the responding sample and are good representative of the sample frame. In fact, in comparison with many prior survey studies, the response rate is quite acceptable. Second, IS managers from larger firms are primarily the chosen participants in the survey; however, some of the questionnaires may have been completed by subordinates, and as a result the data may be some biases. Third, although some findings are inconsistent with the results from previous research conducted in other countries, deviations suggest that cultural differences do play a role in implementing BI in different countries.

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