User Acceptance of Internet Banking Service in Malaysia

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Abstract. The study is the first research in Malaysia that investigates user acceptance of Internet banking service (IBS) based on Unified Theory of Acceptance and Use of Technology model (Venkatesh, Morris, Davis and Davis, 2003). Two hundred and eighty questionnaires were distributed and collected from two major cities, Kuala Lumpur and Melaka. Descriptive statistics was used to analyse the data. The results show that Malaysians have intentions of using IBS (mean rating of close to 4.00). Moreover, Malaysians recognize the benefits of IBS by giving a high mean rating (close to 4.00) to performance expectancy. However, they give relative low mean ratings (close to 3.00) on other indicators of Behavioural Intention to Use IBS such as effort expectancy, social influence, facilitating conditions and perceived credibility. Recommendations were given to promote a safe, efficient and conducive environment for user adoption of Internet banking.

Keywords: User acceptance, Internet banking, performance expectancy, perceived credibility.

1 Introduction

Internet banking service [IBS] was introduced in Malaysia about six years ago (The Star, 2005). Although it is new, it has become one of the most popular services in Malaysia with 51% out of the total respondent base of 8,000 using Internet banking service (IBS) once a month (The Star, 2005). With 12 domestic banks offering IBS to 4.5 million subscribers currently (Bank Negara Malaysia, 2007), IBS is an alternative (to physical banking) and new medium to reach more potential customers as it allows bankers to deliver banking products and services to a wider segment of customers through electronic and interactive communication channels, particularly the Internet (Goi, 2005). However, if a bank offers IBS without a clear understanding of factors affecting customer adoption, the investment may be wasted due to the absence of vital business understanding to support customer adoption (Goi, 2005; Pires and Aisbett, 2002). Domestic banking institutions must therefore seek to better understand their customers in this area to prevent loss and maintain competitive advantage (Goi, 2005). Thus, the aim of the present study is to conduct a thorough research on the user acceptance and discover the factors that encourage and discourage the adoption of IBS. To our knowledge, this research is the first in Malaysia, which applied

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Unified Theory of Acceptance and Use of Technology (UTAUT) model, a new, robust and powerful model, to measure the consumer adoption of IBS. Although numerous studies such as AlAwadhi and Morris (2008), Chen, Wu, and Yang (2008), Michael and Uzoka (2008) and Siracuse, Sowell, and Musselman (2006) have applied UTAUT model in predicting individual adoption of e-government services, Weblogs, E-commerce, and Personal Digital Assistants (PDA) in daily life, none has examined the IBS adoption in Malaysia.

This research will provide domestic bankers with an improved understanding of end-users' concerns and thus assist them in their efforts to offer better IBS that provides a more satisfactory response to consumers' needs. It also helps the government and Bank Negara Malaysia (central bank) to create a conducive and user-friendly environment that will promote full adoption of IBS.

1.1 Selection of UTAUT Model

Nowadays, researchers are confronted with a choice among a multitude of models to examine the user acceptance of a new technology where they always have to choose a "favoured model" and largely ignore the contributions from alternative models. The UTAUT model captures the essential elements of eight previously established models (i.e. Theory of Reasoned Action (TRA), Theory of Acceptance Model (TAM/TAM2), Theory of Planned Behaviour (TPB), Innovation Diffusion Theory (IDT), Motivational Model (MM), Model of Personal Computer Utilization (MPCU), Technology Acceptance Model (CTAM), Theory of Planned Behaviour (TPB) and Social Cognitive Theory (SCT)) (Venkatesh, Morris, Davis and Davis, 2003). The UTAUT model has been tested, cross-validated and confirmed to outperform the eight above-mentioned theoretical frameworks (which can only explain 17% to 53% of the variance in user acceptance) by being able to account up to 70% of the variance (adjusted R^2) in technology acceptance. This is a substantial improvement over the original eight models. By encompassing the combined explanatory power of the many above-mentioned models, the UTAUT model advances cumulative theory while retaining a

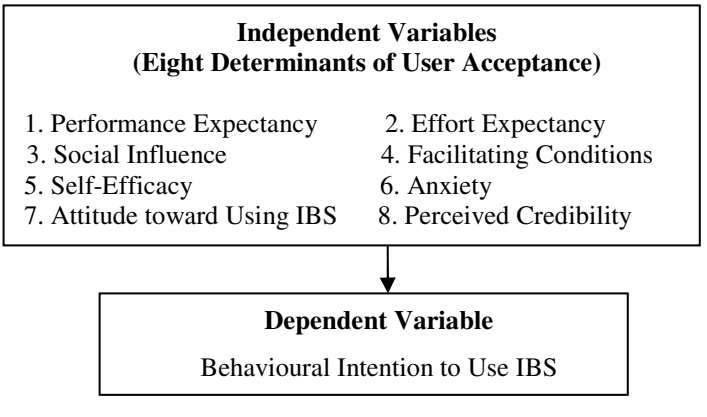

Fig. 1. Research Framework

parsimonious structure. The model encompasses constructs such as performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh, et al., 2003). Four additional factors i.e. perceived credibility, self-efficacy, attitude toward using technology, and anxiety are added to this model to measure issues such as security and privacy, confidence, enjoyment and fear during user interaction with IBS, as these factors are highlighted in many IBS literature. The research model of this study is comprehensive and definitive. It redresses the limitations of existing user acceptance models (e.g. TAM/TAM2) by including barriers that would prevent an individual from using IBS (e.g. lack of expertise, and time or money constraint) into the study.

Figure 1 shows the research framework of the study. There are 8 independent variables and one dependent variable.

1.1.1 Dependent Variable

User acceptance is defined as a person's psychological state with regard to his or her voluntary use and intention to use a technology (Dillon and Morris, 1996). It was discovered that some prior studies used attitude while others used behavioural intention or actual usage as the indicators of user acceptance (Sun and Zhang, 2004; Sun and Xiao, 2006). However, behavioural intention is confirmed to be a highly valid indicator of actual usage (Sun, 2003). Therefore, user acceptance is examined by intention to use (equivalent to behavioural intention) in the present study. The dependent variable in the present study is Behavioural Intention to Use IBS which is measured by three items adapted from Venkatesh, et al. (2003) (refer to Table 2: nos. 9-9.3).

Sustained usage of a new technology could be directly hindered or fostered by the accessibility of vital resources and opportunities (Venkatesh, et. al., 2003). The following independent variables are used to measure factors that will encourage and discourage Behavioural Intention to Use IBS.

1.1.2 Independent Variables

The first independent variable is Performance Expectancy. Better Performance Expectancy will lead to greater intention to use a technology (Agarwal and Prasad, 1998; Davis, 1989; Venkatesh and Davis, 2000; Venkatesh, et. al., 2003). Performance expectancy is defined as the degree to which an individual believes that using a service will help him or her to attain gains in job performance (Venkatesh, et. al., 2003). Being one of the strongest predictor of intention, usefulness and job-fit (Thompson, Higgins and Howard, 1991) are key attributes to measure Performance Expectancy.

Another important indicator for Behavioural Intention to use IBS is Effort Expectancy, which is defined as the degree of ease associated with the use of a technology (Venkatesh and Davis, 2000; Venkatesh and Morris, 2000; Venkatesh, et. al., 2003). This factor is significant only during the early adoption of a technology (e.g. first 3 months of service subscription). Perceived ease of use and complexity are crucial attributes to measure Effort Expectancy (Agarwal and Prasad, 1998; Davis, 1989; Thompson, Higgins and Howard, 1991).

The third indicator, Social Influence, is defined as the degree to which an individual perceives others' belief that they should use a new service (Venkatesh, et. al., 2003).

This factor appears to be important only in the early stages (e.g. during service subscription) of individual experience with the technology. Its influence erodes over time, becomes insignificant during sustained usage (Venkatesh and Morris, 2000; Venkatesh, et. al., 2003). Social Influence alters an individual's belief structure, causing him or her to respond to potential social status gains (e.g. prestige) or potential social pressure (e.g. peer or family pressure) in the adoption of a new technology (Venkatesh, et. al., 2003).

The next indicator which has direct influence on Behavioural Intentions is Facilitating Conditions. It is defined as the degree to which an individual believes that a technical infrastructure exists to support the use of a service (Taylor and Todd, 1995, Venkatesh, et. al., 2003). Perceived behavioural control (perceptions of technical and manpower resource constraints on behaviour), and compatibility (the degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters) are among the attributes of Facilitating Conditions (Venkatesh, et. al., 2003).

Forming trust or perceived credibility prior to service subscription has a significant impact on customer acceptance since customers generally stay away from a service provider whom they do not trust (Gefen and Silver, 1999; Reichheld and Schefter, 2000). Perceived Credibility is "the belief that the promise of another can be relied upon even under unforeseen circumstances" (Suh and Han, 2002). Distrust (low perceived credibility) of service providers make consumers afraid of providing sensitive information such as financial details on the Internet (Suh and Han 2002).

The following variables, i.e. Attitude toward Using Technology, Self-Efficacy and Anxiety, are other vital determinants of user acceptance in UTAUT model (Venkatesh, et. al., 2003). Attitude toward Using Technology is defined as an individual's overall affective reaction (liking, enjoyment, joy, and pleasure) to using a technology (Davis, 1989; Taylor and Todd, 1995; Thompson, Higgins and Howard, 1991). An individual's positive or negative feelings (e.g. it is good/bad to use a service) and feelings of joy or displeasure (e.g. the innovation makes tasks more interesting / difficult) significantly affect his / her tendency to adopt a new technology in the near future (Venkatesh, et. al., 2003). Self-Efficacy is the judgment of one's ability to use a technology (e.g. computer) to accomplish particular jobs or tasks (Compueau and Higgins, 1995). Since new innovations are often viewed as complex by inexperienced users, confidence in one's ability to handle them can exert an important influence on consumer acceptance (Venkatesh, et. al., 2003). Anxiety is "evoking anxiety or emotional reactions when it comes to using a new technology" (Taylor and Todd, 1995). Unpleasant, strong and negative emotional states (e.g. frustration, confusion, anger) which arise during interaction with a new technology may affect productivity, learning, social relationships, and overall well-being (Compueau and Higgins, 1995, Taylor and Todd, 1995; Venkatesh and Morris, 2000).

2 Methodology

A survey questionnaire was distributed to a sample of 300 IBS users with Information-Technology and business background from two major cities in Malaysia, i.e. Malacca and Kuala Lumpur by using intercepts and snowball sampling methods. Since IBS is new (about six years in operation), it would be apt to first focus on urban

areas before rural areas. Therefore, cities were selected in this research on the prospect that there would be more IBS users in urban areas. The response rate was 93.33% (280 respondents). All respondents managed to answer the questionnaire within 30 minutes. They expressed high enthusiasm in commenting on the attributes which deserve modification, clarification or removal. They were also willing to recommend other IBS users to answer the questionnaire. Results of the pilot study were analysed and presented in this paper. The measurement instrument comprised 58 questions on the eight determinants of user acceptance. Of these, 12 questions examined Performance Expectancy, 12 questions related to Effort Expectancy, six questions related to Social Influence, four questions related to Facilitating Conditions, nine questions related to Perceived Credibility, seven questions related to Anxiety, four questions related to Self-Efficacy, and four questions related to Attitude toward Using IBS. In addition, three questions on Behavioural Intention to Use IBS were also included in this measurement instrument. All the questions were rated using a 5-point Likert's scale anchored by 1- Strongly Disagree, 2 – Disagree, 3 – Neutral/Unsure, 4 – Agree, 5 – Strongly Agree. The research data was analysed using descriptive statistics.

About half of the respondents in the present study are male (51.8%) while the remaining (48.2%) are female as indicated in Table 1. Among the respondents, 10.4% are Malays, 77.9% are Chinese and 11.8% are Indians. Sixty-two per cent of the respondents are in the 20 to 29 age-bracket while 31.1% of the respondents are 30 years of age and above. Nearly half of the respondents (48.2%) have 1 to 5 years' experience in using IBS.

Table 1. Respondents' Profile

		Number of cases	%
Gender	Male	145	51.8
	Female	135	48.2
Race	Malay	29	10.4
	Chinese	218	77.9
	Indian	33	11.8
Age	Below 20	19	6.8
	20-29	174	62.1
	30 and above	87	31.1
Number of Years of IBS Use	<1 year	119	42.5
	1-<5 years	135	48.2
	5 years and above	26	9.3

3 Results

Mean and Standard Deviation for attributes measuring each independent and dependent variable in this study are shown in Table 2.

Table 2. Mean and Standard Deviation

Variables	Mean	Standard Deviation
1. Performance Expectancy	**3.81**	**0.981**
1.1 I can manage my money Internet at anytime	3.83	1.057
1.2 I can keep a record of my finances	3.83	0.946
1.3 I need not visit traditional banks regularly	3.89	1.013
1.4 I can transfer money anytime and anywhere	3.94	0.886
1.5 I can save time paying essential bills at the post office	3.95	0.977
1.6 IBS is convenient and easy to access	3.86	1.044
1.7 IBS is efficient	3.87	0.928
1.8 IBS is effective	3.75	0.948
1.9 IBS improves productivity	3.76	1.063
1.10 IBS increases quality of output	3.64	0.959
1.11 IBS is useful	3.90	0.986
1.12 IBS fits into my lifestyle	3.55	0.964
2. Effort Expectancy	**3.41**	**0.896**
2.1 IBS is easy to learn	3.66	1.010
2.2 It is easy to do what I want to do by using IBS	3.50	0.950
2.3 IBS is easy to use	3.61	0.864
2.4 It is easy to become skilful in using IBS	3.55	0.866
2.5 Using IBS does not take too much time	3.61	0.893
2.6 Authentication code is easy to use	3.36	0.905
2.7 There is sufficient time for information entry	3.39	0.905
2.8 Fast information download	3.32	0.897
2.9 Easy web navigation	3.45	0.854
2.10 Detailed answers referring to Frequently Asked Questions (FAQs)	3.16	0.864
2.11 Comprehensive site map	3.16	0.845
2.12 Useful search engine	3.17	0.898
3. Social Influence	**3.13**	**0.923**
3.1 People who influence my behavior use IBS	3.01	0.900
3.2 Coworkers/classmates use IBS	3.40	0.990
3.3 Friends use IBS	3.14	1.031
3.4 People using IBS have high profile	3.15	0.825
3.5 People using IBS have more prestige	3.14	0.848
3.6 Most Malaysians like to use IBS	2.92	0.941
4. Facilitating Conditions	**3.46**	**0.898**
4.1 Basic system requirements for using IBS are met	3.60	0.967
4.2 All contents of IBS are easy to read and understand	3.38	0.872

Table 2. *(continued)*

4.3 Specific person (or group) is always available for assistance	3.38	0.879
4.4 The language in which the document is written is easily understood	3.46	0.875
5. Perceived Credibility	**3.27**	**0.958**
5.1 I trust in the ability of an Internet bank to protect my privacy and personal information	3.27	1.032
5.2 I believe no money will be lost in unauthorized electronic fund transfers	3.27	.942
5.3 I believe Internet bank would not sell my personal information to third parties	3.37	.949
5.4 Other people cannot view my bank account information	3.44	1.004
5.5 Internet bank has enough specialists to detect fraud and information theft	3.27	.960
5.6 I am not worried about being deceived into a fake website	2.90	1.029
5.7 Current password generation is secure	3.17	.910
5.8 Sufficient guidance on password selection	3.23	.930
5.9 Customers are automatically locked out after failed login attempts	3.52	.867
6. Anxiety	**3.13**	**1.048**
6.1 I am afraid of high Internet connection cost	3.57	0.932
6.2 I am afraid of being charged for IBS	3.09	1.097
6.3 I am worried about the inaccessibility of IBS web pages	2.80	1.078
6.4 I don't know how to use IBS	3.40	1.032
6.5 I am afraid of losing information by hitting the wrong key	3.03	1.064
6.6 I am afraid of making mistakes that I cannot correct	2.81	1.152
6.7 IBS is intimidating to me	3.23	0.984
7. Self-Efficacy	**2.98**	**1.033**
7.1 I use IBS only if there is no one around me	3.00	1.137
7.2 I use IBS only if there is built-in help facility for assistance	2.99	0.939
7.3 I use IBS only if I could call someone for help	2.89	0.951
7.4 I use IBS only if I have a lot of time to learn and deal with the service	3.05	1.105
8. Attitude toward Using IBS	**3.50**	**0.879**
8.1 IBS makes banking tasks more interesting	3.50	0.855
8.2 I like working with IBS	3.44	0.857
8.3 It is a good idea to use IBS in daily life	3.64	0.878
8.4 IBS is enjoyable	3.40	0.926
9. Behavioural Intention to Use IBS	**3.83**	**0.893**
9.1 I intend to use IBS in the near future	3.83	.919
9.2 I predict I would use IBS in the near future	3.81	.882
9.3 I plan to use IBS in the near future	3.84	.877

4 Discussion and Recommendations

Malaysians have high expectations on the performance of IBS (Table 2: No. 1) as shown by the average of 3.81 (close to 4.0). This finding is in line with earlier literature worldwide (Chau, 1996; Hsu and Chiu, 2004; Lederer, Maupin, Sena, and Zhuang, 2000), which revealed that the most important criterion in adopting IBS is the ability to enhance job performance without the inconvenience of having to travel, wait and worry about their personal safety while transacting money. Performance expectancy of IBS can be improved by offering more new and unique online banking products and services to tailor the needs of Malaysian communities. For instance, besides allowing customers to check account balances, transfer funds and make online bill payments, domestic banks, in collaboration with other government agencies, could consider allowing consumers to renew car road taxes, settle study loans, and pay for car summons via the Internet. These will help banks to attract new customers, retain old customers and increase profits from online payment and collection of loans.

Standard deviation for the attribute "I need not visit traditional banks regularly" is higher than 1. This indicates that while some respondents think that IBS saves their troubles of visiting physical banks, others still prefer to visit the banks routinely. Perhaps security concerns discourage them from fully relying on IBS to transfer money and pay bills. As indicated by the attributes measuring Perceived Credibility in Table 2, some respondents think that Internet banks cannot protect their privacy and personal information from being stolen by hackers (No. 5.1: standard deviation =1.032 > 1.0). Some even suspect that unauthorized persons may be able to access and view their bank account information (No. 5.4: standard deviation =1.004 > 1.0). Inadequate knowledge of Internet banking security will probably reduce their intentions to use the technology and drive them to either visit traditional banks or maintain low amounts in Internet accounts. One of the main causes of consumers' unfamiliarity with Internet banking security measures is possibly due to the incomprehensible and lengthy security and privacy policies in the official websites of domestic banks. Customers may not have the time, patience and computer literacy to read and understand the policies. They may not understand some of the technical terms in the security policies, such as, firewalls, secure socket level, encryption, P3P policy, etc. Fake IBS website concern is another reason that deters some respondents from fully adopting IBS (No. 5.6: mean =2.90, standard deviation =1.029 > 1.0). Wide news coverage on the particular issue may have raised their awareness and sensitivity toward the authenticity of an IBS website. Therefore, domestic bankers should conduct consumer education programmes (e.g. seminars, exhibitions, etc.) to reveal their security policies to customers in layman's terms and educate them about ways to identify a fake website. The effectiveness of these consumer education programmes should be periodically evaluated. Instead of solely relying on banks to tackle phishing, fraudulent websites, and identity theft, consumers should be encouraged to report on fraudulent attempts to obtain their authentication credentials (e.g., attempts to steal username, password, etc.). As revealed by Unisys (2007), Malaysians have nominated Internet identity theft as one of the top three security concerns, similar to those in developed countries such as Australia. Ninety-two per cent of them look forward to having extra security techniques to protect their identity while using IBS (Unisys, 2007). Therefore, Bank Negara Malaysia (central bank) should develop industry-wide best security standards

such as two-factor authentication technique which uses transaction authorization code (TAC), digital certificate, smart card or fingerprints in authentication besides username and passwords. Regular report supervision and on-site examinations should be in place to make it mandatory for all domestic banks to comply with the standards issued. In addition, new law such as the Privacy Act or Freedom of Information Act should be enacted to protect consumers' personal information from being misused by unauthorized parties. One important point to consider is security is inversely related to effort expectancy (Lawson, 1998). There should be a balance between these two factors, i.e. the security features implemented should not make IBS too difficult for the users, thus discouraging them from using it.

One of the attributes measuring Effort Expectancy, i.e. "IBS is easy to learn", in Table 2 (No. 2.1) has high standard deviation (>1.0), indicating that while some respondents enjoy learning IBS, others find it difficult to become skilled at using IBS. Similar result is observed in the rating of an attribute measuring Anxiety, i.e. "I am worried about the inaccessibility of IBS web pages" (No. 6.3: standard deviation = 1.078 > 1.0). The difference in perceptions may arise from different personal experience in using the service. This study consists of 42.5% of respondents with less than 1 year experience in using IBS (Table 1), who may perceive IBS as difficult to learn and access due to the lack of personal experience in dealing with the new service. As discovered by Davis (1989)'s study, the more a service is perceived as easy to learn and access, the more likely the service is used extensively. Therefore, to promote the ease of learning and accessing IBS, domestic banks should consider giving free demonstrations and trials to the public at schools or shopping complexes.

Respondents are unsure about the IBS adoption among their coworkers/ classmates and people who influence their behaviours (Table 2; No. 3; mean = 3.13; standard deviation =0.923). In other words, social circles do not have a strong influence on a person's IBS adoption. This contradicts with Venkatesh and Davis's (2000) research in the United States which claimed that social influence is particularly important in the early stages of technology adoption. Perhaps numerous IBS advertisements in mass media have an influence on consumers' adoptions. Malaysians may be attracted to using IBS by its efficiency and effectiveness as widely advertised. This can be seen in Table 2 where efficiency (No. 1.7) and effectiveness (No. 1.8) have high mean ratings of close to 4.0.

High standard deviations (> 1.0) for most attributes measuring Anxiety factor in Table 2 (Nos. 6.2–6.6) indicate that while some respondents take pleasure in using IBS, others are afraid to use IBS due to cost concern, poor Internet connection, knowledge deficiency, and the apprehension of losing important information by hitting the wrong key and making mistakes that they cannot correct. An IBS acceptance study in Australia (Lichtenstein and Williamson, 2006) highlighted similar consumer anxieties. However, these anxieties could be alleviated by improving the quality of the Internet service, standardizing IBS cost structure and intensifying nationwide education programmes.

Respondents are unsure about the availability of technical infrastructure and comprehensible contents to support the use of IBS (Facilitating Conditions; Nos. 4.2, 4.3 and 4.4). In contrast with Taiwanese who are confident in their capability to use IBS (Hsu and Chiu, 2004), Malaysians are unsure of the existence of a call centre that can assist them with IBS (Nos. 4.3). This concern may lower their interest to use IBS

(note: the attribute "IBS is enjoyable" has a low mean rating of 3.40; see No. 8.4) and hinder them from fully utilizing the benefits and convenience of IBS. Hence, it is recommended that adequate resources (written instructions, specific person (or group) for assistance) should always be ready to support the use of IBS. Domestic banks should guarantee customers with intensive customer service through call centers where customers can easily seek assistance and guidance when in doubt. The government and Bank Negara Malaysia need to closely review business policies and operating practices of domestic banks and ensure the availability of adequate technical support and secure technologies (e.g. firewalls, two-factor authentications, secure socket level, etc.) before approving the launch of a new IBS.

Despite the above-mentioned worries, respondents show high intention of using IBS (Table 2: No. 9). This ascertains Goi (2005) and Nielsen (2005)'s findings that Internet banking industry has high opportunity for growth and user acceptance is the key determinant for the growth. To increase user acceptance, domestic banking institutions should emphasise on providing high level service. To do so, they need to reassess their business practices to be consistent with the needs and demands of consumers. The above-mentioned recommendations are derived from consumers' demands on IBS; thus, if they are implemented, a very conducive environment will be created to provide high level IBS.

5 Limitations and Future Studies

Preliminary results of factor analysis of independent factors and dependent factors show a high construct validity of 60.71% and 78.93%, respectively. In addition, the Cronbach's Alpha coefficients indicate high internal consistency in the respondents' answers (with Alpha coefficients greater than 0.60). Multiple linear regression showed that Performance Expectancy is one of the most important predictors of Behaviour Intention to Use IBS, which concurs with the descriptive statistics results above. Due to the constraint on the length of paper, the full results of the factor analysis, multiple linear regression and the effects of moderating variables such as education level, income, age, etc. will be examined and presented in our future papers. The results of this study are only applicable to Malaysia where all the subjects are from. However, the study can be replicated in other countries using the same model and instrument to identify factors that encourage and discourage the adoption of IBS in those countries.

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