

Constraints into IS strategic planning and IS development in the banking sector

Suresh Pakshaweera¹, Nandana Pathirage² and Sajith Peiris³

^{1&2} Department of IT and Mathematics, General Sir John Kotelawala Defence University, Sri Lanka

³ University of Sri Jayewardenepura, Sri Lanka

¹suresh61626@yahoo.com, ²nandana_pat@yahoo.com, ³sajithruk@yahoo.com

Abstract— The term Information System Strategy (ISS) encompasses a wide array of information and it brings together the business aims of a company, an understanding of the information needed to support those aims, and the implementation of computer systems to provide that information. It is a plan for the development of systems towards some future vision of the role of information systems in the organization. Strategic Information System Planning (SISP) is the process of identifying a portfolio of computer based applications that can provide assistance to an organization in terms of the execution of a business plan and realization of business goals.

Furthermore, the expected outcome of this process will be an increased understanding of SIS opportunities and constraints together with a shared view of SIS utilization. SISP constitutes a powerful contribution to enhance managerial understanding and decision making concerning the organizational development and business successes. It is a comprehensive process by which a company could generate viable cooperate strategies and develop futuristic plans to enhance its competitiveness. The banking sector which is a part of a cutthroat market segment and highly depends on IS strategic planning for its success is the main focus of this research which examines the need to integrate the real world pressures in IS strategic planning in banking sector. The impact of real world pressures on the banking sector is viewed through multiple perspectives such as; economic, social, technological, legal, and security.

This research entirely depended on a qualitative approach where published literatures and interview sessions with industry experts were used as data sources. A close analysis of published literatures identified the nature of real world pressures and constraints of IS Strategic Planning and Development in the banking sector and their degree of influence. Interview sessions brought focused to the Sri Lankan situation and its similarities and differences to the global context. The research plan was developed using Multiple Realities Enquiry System and all the data was theorized using multiple critical perspectives derived through the said Enquiry System.

It was revealed that the economic pressure and constraints need to be greatly considered in IS planning and IS development of banking sector. Impact of technological pressure and constraints of IS planning and IS development

on the banking sector is also of high significance. Impact of social pressure and constraints of IS planning and IS development on the banking sector is comparatively less in significance.

Finally, it can be said that the unbounded nature of the banking sector results in the need to use messy strategic planning in handling this problem domain. Therefore, the need to integrate real-world pressure and constraints into IS strategic planning and IS development on banking sector is high.

Keywords— Information System Strategy, IS Strategic Planning, Banking Sector

I. INTRODUCTION

SISP is an important activity for helping information executives and top management identify strategic applications and align IT with business needs. The expected outcome of this process will be an increased understanding of SIS opportunities and constraints together with a shared view of SIS utilization. SISP constitutes a powerful contribution to enhance managerial understanding and decision making concerning the organizational development and business successes. Creating valid cooperate strategies and formulating plans for futuristic enhancement is expected by a company in using this comprehensive process.

The banking sector is a part of a cutthroat market segment and it highly depends on IS strategic planning for its success. The nature of the banking sector can be illustrated using Porter and Miller (1985) which identifies differences in the role and intensity of information among various industries.

	INFORMATION CONTAINED IN THE PRODUCT	
	LOW	HIGH
HIGH	Ex: OIL REFINERY	Ex: BANKS, PRESS, AIRLINE COMPANIES, TELECOM
LOW	Ex: CEMENT	
INFORMATION INTENSITY IN THE VALUE CHAIN (PROCESS)		
LOW		

Fig 1. Information Intensity Matrix

Source: Porter and Miller (1985)

According to the above matrix, banking industry is classified as industry having high information intensity of the value chain and high information content of the product.

Another characteristic of the banking sector is its unbounded nature. According to Ackoff (2004), problem situations are the results of social interactions and language interactions and can be put in a continuum according to their degree of boundedness.

Bounded	Unbounded
Limited time scale	Longer uncertain time scale
Clear priorities	Priorities called into questions
Limited applications	Uncertain, but greater implications; worrying
Can be treated as a separate matter	Can't be disentangle from its context
Limited number of people are involved	More people involved
Know what needs to be known	Don't know what needs to be known
Know what the problem is	Not sure what the problem is
Know what would be a solution	No "Solution"

Table 1. Nature of the Boundedness and Unboundedness

Source: Ackoff (2004)

These characteristics of the banking sector make it highly dependent on real world pressures and constraints. Therefore, integration of such real world pressures and constraints into there IS development and IS planning is a must if they are to maintain their competitive edge. Hence, the focus of this study is to determine the extent to which Sri Lankan Banking Sector should incorporate real world pressures and constraints into there IS Strategies considering the global context.

A. Research Question

The research question around which this research is based is presented below:

To what extent real world pressure and constraints need to be incorporated into IS Strategic Planning and IS Development in the Sri Lankan Banking Sector?

II. LITERATURE REVIEW

The research work to identify the need to integrate real-world pressure and constraints into IS strategic planning and IS development in the banking sector is conducted using Multiple Realities IS. According to Multiple Realities IS, the need to integrate real-world pressure and

constraints into IS strategic planning and IS development in the banking sector is viewed from different viewpoints such as; technological, economic and social and degree of boundedness in the banking sector.

A. Economic Perspective

Hong Kong's governmental website (2013) indicates that economic growth and development over the past two decades has been a key driver of the development of banking sector. However, more recently, the Asian crisis and the contagion effect on other emerging markets are having a profound effect on the banking sector. Over the next three to five years, addressing the Asian crisis (and potentially emerging global economic crisis) will dominate the global economic landscape and will continue to have a profound impact on Hong Kong's banking sector. Therefore, in IS strategic planning for banking sector current economic traits and their future implications should be considered as if the intended IS becomes incompatible or unfeasible the whole process will turn out to be a failure.

Partnov and Estier (2008) show that non banking financial institutions in the financial market are much flexible than traditional banks in adopting new financial IS solutions that cater to continuously changing requirements of the customers. The traditional banks need to endow their Information System with the ability to cater to the changing market requirements if they are to be successful in the financial market. Similarly, novel economic dimensions including concepts like globalization, economic unions like BRIC that have entered and changed the global economic landscape and the banking sector need to take into account these dimensions in planning and developing their IS strategies (Broadbent and Weill, 2007).

When considering these findings, it is evident that in IS strategic planning and IS development, current and possible future economic tendencies need to be considered. Economic pressure needs to be taken into account in planning and developing feasible and durable IS for banks. The banking sector is highly competitive and overtly sensitive to financial fluctuations.

Therefore, a sound understanding and anticipation of global and local economic trends and economic landscape is vital. Unless an information system considers these economic traits and integrates itself to face current and future economic realities it would lose its competitive edge.

B. Technological Perspective

According to Broadbent and Weill (2007), in incorporating technological developments and their future advancements when strategically planning of information systems is vital as the adoption of an appropriate technological architecture and IT to suit the new generation of required information products and services will ultimately decide the

success or failure of the IS in the banking sector. Therefore, alignment of appropriate technology with IS planning and IS development in the banking sector is crucial.

Further, as shown by Ahamed and Jamal (2005), banks, because they cover a large geographical area through their branches, need to have a strong network with sound architecture. Under current circumstances, there are issues such as; unavailability of the network and bandwidth issues that hinder the quality service of the banking system. In planning IS, banks need to consider whether the network architecture is compatible with new the new IS features.

Technological innovations such as more powerful software, broader and wider access to communications and advances in databases produce changes like the development of new products, improvements in the efficiency of operations, improvements in risk management which function as major challenges in IS planning. The skilled employees such as; statisticians, marketers, sales technicians, decision science experts and other non-traditional bankers replace traditional bank officers to drive the pace of change in financial services (Hong Kong's Governmental Website, 2013).

The researchers came to the conclusion following the above findings that a sound futuristic IS that adopts appropriate technological architecture and IT to suit the generation of required information products and services and which has the ability to cater to each and every requirement of banking procedures is the need of the hour.

An IS needs to have the flexibility to integrate new technologies into its folds as ever changing demands of banking customers requests inclusion of novel facilities and financial products and services to the existing banking services. In adhering to the changing demands of banking sector, an IS needs to have a futuristic outlook with inclination to welcome new technologies.

C. Social Perspective

Hong Kong's Governmental Website (2013) indicates the tendency of banks being more and more aware of copyright and patent laws making it difficult for adopting novel features illegally. Deregulation of financial, capital and trade markets has also facilitated the development of legal and ethical perceptions in global financial markets. Changes in regulations have been and will remain a dominant force in driving the evolution of banking and all financial markets. These new social traits demand more sensitivity towards the emerging legal and ethical aspects of IS strategic planning.

Further, they also identified customer needs as one of the major forces driving change in financial markets. The key developments influencing customer needs are population growth and ageing, increasing education levels, changing

work patterns and increasing consumer wealth. In planning IS for banks, customer needs and demographic changes are needed to be integrated to the final mechanism so that it can bear the burdens of changing customer traits.

According to Broadbent and Weill (2007), the security implications in IS development process where vital system information is to be handled by a group of people can be severe if not handled by responsible parties. The interaction between IS and business staff is vital to the success of an information system as a proper line of communication between these two parties would result smoothly functioning IS system for a bank as indicated in Figure 2. An unsuccessful information system would bring frustrations and inconveniences to clients.

As pointed out by the above findings in planning and developing IS, social implications manifested by legal and ethical demands need to be adhered. As banking sector is a cutthroat industry that craves for technological and product innovations, the legal rights and ethical obligations towards technological and product innovations need to be honoured. In planning new technological or product innovations, the copyrights of these innovations need to be secured to safeguard the hard earned competitive edge. In adopting new technologies, their authenticity and ownership need to be scrutinized in order to honour others rights.

III. RESEARCH METHODOLOGY

Considering the nature of the problem domain, as the chosen research methodology for the research, a qualitative methodology was used within an overall inductive research paradigm. The unboundedness of the banking sector necessitates a qualitative approach where multiple dynamics present within the domain need to be subjected to an in-depth analysis that transcends numerical quantification.

Therefore, Multiple Reality Enquiry System was used to develop the research plan which employed multiple research techniques to obtain the required data. Interviews with industry experts, observation of ground realities and published literatures on similar cases in global context were used to gather data.

Finally, to theorize and reach conclusions, an inductive reasoning technique was used with multiple perspectives derived from the multiple reality enquiry system.

IV. DISCUSSION OF DATA

Depending on the gathered data, the consequences of failure to integrate real world pressures and constraints at IS Strategic Planning, Feasibility, Analysis and Design were analysed with emphasis on their severity and probability of occurrence. Furthermore, the ethical implications of integrating real world pressures and constraints into IS

Strategic Planning of banking sector is also discussed considering the inherent ethical obligations of banks as service providers.

A. The Potential Negative Consequences of Failure to Integrate Real World Pressures and Constraints

1) *IS Strategic Planning Stage*: The potential negative impact of failure consequences of IS Strategic Planning has been presented below.

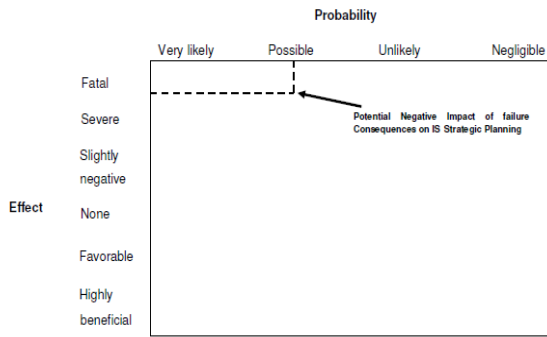


Fig 2. Failure Consequences of IS Strategic Planning

Source: Author

As shown in the above figure, the potential negative impact of consequences on IS Strategic Planning in the banking sector has been identified as having a possible probability of occurrence with a fatal effect.

- Identification of the severity of the effect

As shown in the above figure, the potential negative impact of consequences of IS strategic planning on the banking sector is fatal. According to Porter and Miller (1985), banking sector is a sector with high information intensity where in case of a failure in IS Planning, consequences will be irremediable. Because IS Planning is intended for the entire organization, a failure at this stage affects the entire organization.

Furthermore, banking sector, being a competitive industry is prone to future changes manifested by technological, social and financial innovations. If in information system planning stage, an information system is not endowed with the strengths to cope with these possible changes, the entire information system would become a failure. As an information system is endowing the bank with novel capabilities to introduce and enhance new services, an information system needs to be capable of warding off any ways or means of abusing these new services. Another possibility is to having been compelled to witness a total system failure as a result of internal or external forces. Therefore, all these negative possibilities would be fatal.

- Identification of the probability of occurrence

Banking industry, being a competitive industry has attained much ICT maturity in almost all countries when compared

with other industries. Thus, it's a well-known factor that banking employees are endowed with high ICT maturity level. The senior management who involves in IS Strategic Planning have much more ICT maturity than average banking employees. Furthermore, because banking sector is being supervised by local and international bodies such as; local governments, central banks, and international monitoring fund. Though, the banks have the necessary ICT expertise at their disposal, there still exists probable possibility of failure.

2) *IS Feasibility Stage*: The potential negative impact of failure consequences of IS Feasibility has been presented

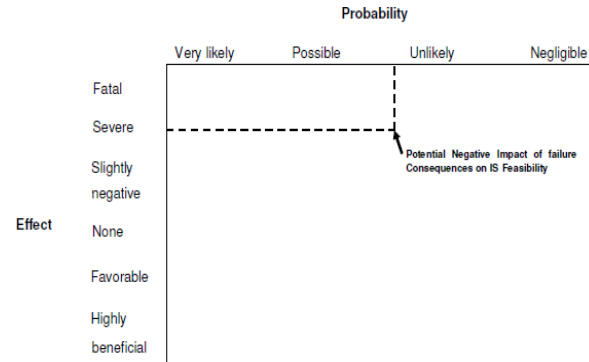


Fig 3. Failure Consequences of IS Feasibility

Source: Author

As shown in the above figure, the potential negative impact of consequences on IS feasibility on the banking sector has been identified as having a possible probability of occurrence with a severe effect.

- Identification of the severity of the effect

As shown in the above figure, the potential negative impact of failure consequences of IS Feasibility on the banking sector is severe. As the negative impact of failure consequences of IS Feasibility affects project wise, it has no holistic impact on the entire organization. Further, the information system in a bank should be feasible with its technical, security, economic and social requirements. It is important that the information system should cater to these requirements if a bank to be successful in a cutthroat industry. Furthermore, because an information system is endowing the bank with novel capabilities to introduce and enhance new services, an information system needs to be feasible with security options that prohibit misuse of those capabilities. Therefore, failure consequences of IS Feasibility in the banking sector is severe.

- Identification of the probability of occurrence

Banking industry, being a competitive industry has attained much ICT maturity in almost all countries when compared with other industries. In this stage, IS Feasibility is concerned project wise and industry experts like financial experts regulation experts are employed to

verify the feasibility of a project. In addition, the higher management is also involved in this process of verifying feasibility. Therefore, probability of failure in this stage is more towards unlikely.

3) *IS Strategic Analysis and Design Stage*: The potential negative impact of failure consequences of IS Analysis and Design has been presented below.

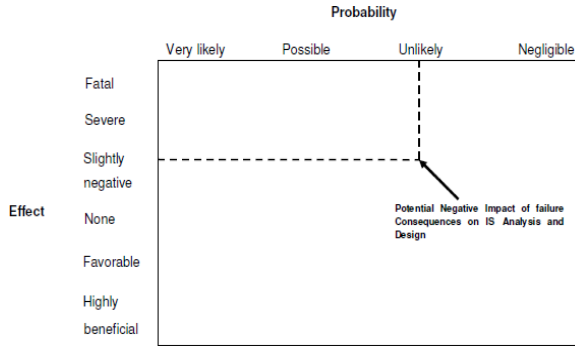


Fig 4. Failure Consequences of IS Analysis and Design
Source: Author

As shown in the above figure, the potential negative impact of consequences on IS Analysis and Design on the banking sector has been identified as having a possible probability of occurrence with a slightly negative effect.

- Identification of the severity of the effect

As claimed in the above figure, the potential negative impact of failure consequences of IS Analysis and Design on the banking sector is slightly negative. Because failure consequences of IS Analysis and Design affect modules in a IS project, unlike the failure consequence of planning or feasibility impact of which affect the entire organization or a particular project, its impact is relatively low. Further, a module in a IS caters to or fulfils a particular option, requirement or product which might have social, economic, security or technological significance. In case of a failure of a module, it can be remedied without having overall implications to the entire IS. Therefore, failure consequences of IS Analysis and Design are considered slightly negative.

- Identification of the probability of occurrence

Banking industry, being a competitive industry has attained much ICT maturity in almost all countries when compared with other industries. In this stage, analysis and design are mostly conducted module wise and expertise of programmers, system architects, system designers are employed to conduct these processes. Because these individuals are well experienced and specializes particular functions, probability for failure in this stage is unlikely.

B. Ethical Implications

Ethical implications of IS Planning and Development is discussed in terms of; failure consequences, professional

codes of conduct and data accessibility with regard to the banking sector

1) *Discussion of Failure Consequences in the Banking Sector*: The data revealed following failure consequences in banking sector.

(a) *Identity theft due to poor development practices* – the probability of occurrence for this is more towards very likely and effect of this is slightly negative.

(b) *Faulty hardware causing excessive wasteful expenses* - the probability of faulty hardware causing excessive wasteful expense is more towards very likely its effect will be severe.

(c) *Data vulnerability due to lack of security measures*- the probability of this occurring is more towards unlikely and effect of this will be slightly negative.

(d) *Virus and malicious software attacks causing system to malfunction* – virus resulting system malfunction has a very likely possibility and its effect would be severe.

(e) *Power failure causing hardware damages* – hardware damages due to power failures are unlikely to happen and if happened result would be slightly negative.

(f) *Data loss due to inadequacies in backup systems* – the probability of data loss is unlikely but effect would be severe.

(g) *IT infrastructure damages due to natural disasters such as; floods, fire, earthquake* – the probability of occurrence for this is more towards negligible but its effect is severe.

(h) *Hardware damages due to implementation errors* – hardware damages due to this are possible and its effect is slightly negative.

Based on the above findings, the impact of failure consequences on the banking sector has been depicted by using effect/probability/action grid as illustrated Figure 5.

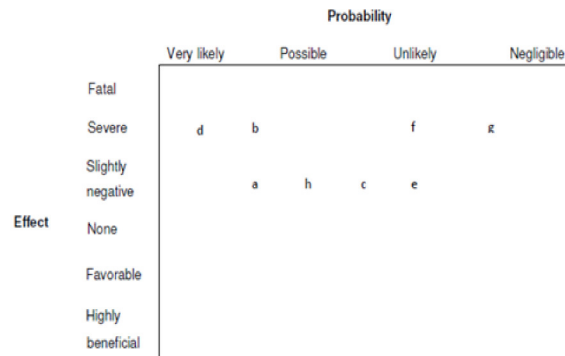


Fig 5. Failure Consequences on the Banking Sector
Source: Author

As shown in the above figure, the net effect of occurring a system malfunction due to virus or malicious software attack is high and therefore, immediate and efficient measures to prevent these threats are needed. The net

impact of IT infrastructure damage due to natural disasters is low and therefore, these factors do not demand immediate attention.

2) *Discussion of Professional Codes of Conduct in the Banking Sector:* The data revealed following *professional codes of conduct* in banking sector.

(a) *Identification and authorization* – disregard for authorization and identification processes has the probability of being more towards very likely and its effect is slightly negative.

(b) *Copyright and intellectual property* – violation of these rights has possible probability occurrence while its effect is severe.

(c) *Obscenity and harassment* – occurrence of harassment and obscenity is very likely and its effect is slightly negative.

(d) *Interference of excessive application usage* – occurrence of this is possible and its effect is slightly negative.

(e) *Enforcement of ethical laws and obligations* – negligence of this is unlikely but if happened the effect is severe.

(f) *Violation of purpose of an IS* – occurrence of this is more towards negligible and its effect is severe.

(g) *Honouring the privacy concerns of others* – violation of this has probability of occurrence being very likely and its effect is slightly negative.

(h) *Accountability for the actions* – the probability of occurrence of this is unlikely but effect of it is slightly negative.

(i) *Protecting trade secrets* – breach of this code is more towards unlikely but if occurred it has a severe effect.

Based on the above findings, the impact of negligence of professional codes of conduct in the banking sector is depicted by using effect/probability/action grid as illustrated Figure 6.

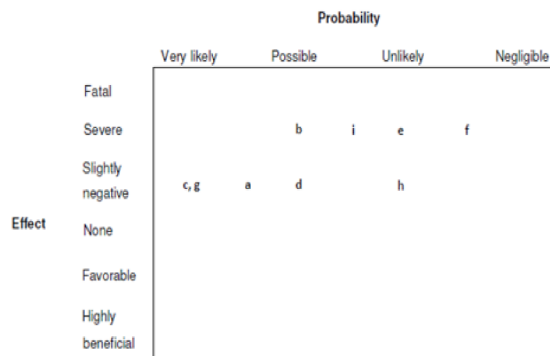


Fig 6. Professional Codes of Conduct in the Banking Sector
Source: Author

As shown in the above figure, the net effect of violation of copyright and intellectual property rights is high and therefore, robust and efficient measures to prevent these violations are needed. The net impact of violation of purpose of an Information System is low and therefore, these factors do not require robust remedies.

3) *Discussion on Data Accessibility Issues in the Banking Sector:* The data revealed following *data accessibility issues* in banking sector.

(a) *Privacy concerns of banking networks* – negligence of this right has the probability of being more towards very likely and its effect is slightly negative.

(b) *Data quality issues* – lapses in data quality has the probability of being very likely and its effect is slightly negative.

(c) *Proper maintenance of access points* – negligence of access points has unlikely probability of occurrence and its effect is slightly negative.

(d) *Honouring individual property rights* – violation of this is possible and its effect is slightly negative.

(e) *Existence of security level for data access* – negligence of this is unlikely and its effect is severe.

(f) *Unauthorized intrusion into personal data using cookies technology* – possibility of occurrence for this type of intrusion is very likely and its effect is slightly negative.

(g) *Unauthorized intrusion into personal data using web bugs* - possibility of occurrence for this type of intrusion is very likely and its effect is slightly negative.

Based on the above findings, the impact of data accessibility issues in the banking sector is depicted by using effect/probability/action grid as illustrated Figure 7.

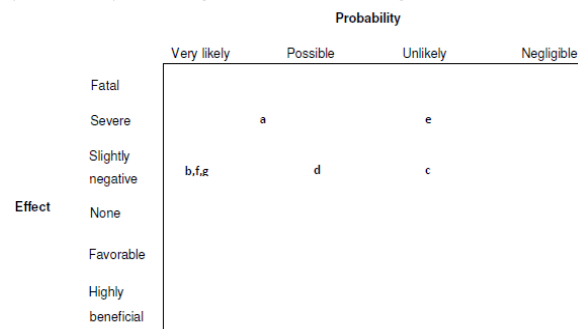


Fig 7. Data Accessibility issues in the Banking Sector

Source: Author

As shown in the above figure, the net effect of privacy concerns of banking networks is high and therefore, robust and efficient measures to prevent these violations are needed. The negligence in maintaining access points has a

low net effect as there is less probability of any responsible organization not maintaining their access portals properly.

V. CONCLUSIONS AND GENERALIZATION

Based on the findings the ways in which real world pressures and constraints need to be incorporated into IS Planning and Development in the banking sector have been identified. Since the Multiple Realities Enquiry System was used to theorize the findings, main IS Planning and Development issues have been presented using economic, technological, security and Legal perspectives. The main IS planning issues that a bank should consider are as follows:

A) Economic Issues

1) *Strategic Agility*: flexibility to wield the resources to produce a viable Information System is denoted by the term strategic agility; the probability of losing strategic agility is possible and its consequent effect is fatal

2) *Ability to provide a cost effective solution*: the probability of the solutions being ineffective cost wise is possible and its effect would be slightly negative

3) *Outsourcing/Co-Sourcing*: ability to employ resources in a cost effective manner; the probability of the system being unable to employ resources in a cost effective manner is unlikely and its effect is slightly negative

B) Technological Issues

1) *Demonstrating IT Value*: this refers to ability to showcase utilization of IS to increase profit margins; the probability of not demonstrating IT value is unlikely but if it happens the effect would be severe

2) *Sustainability*: ability to cope with current and future market realities is identified as sustainability; the probability of the IS being unsustainable is more towards negligible but its effect is severe

3) *System Reliability*: endurance of the system to perform under pressure; the probability of the system not being reliable is more towards unlikely but its effect is severe

4) *Data warehousing and backup capabilities*: the probability of lapses in these capabilities is negligible but if happened its effect is severe

5) *Flexibility in adaptation of emerging technologies*: the probability of not having this flexibility is more towards unlikely and its effect is slightly negative

C) Security Issues

1) *Security*: ability to guarantee the safety of information is denoted by the term security; lapses in security are possible and they have a severe effect

2) *Risk Management*: anticipating and remedying abrupt system failures is identified as risk management; the probability of negligence of risk management is unlikely but it has fatal effect

3) *Managing in uncertain environment*: the probability of not having this capability is unlikely but if occurred the effect is severe

D) Legal Issues

1) *Intellectual property, copyrights, patent*: banks need to honour the intellectual property rights, copyrights and patent. Violation of intellectual property rights is unlikely but if happened the effect is severe

Trade secrets need to be protected and disclosure of trade secrets is more towards negligible but its effect is severe.

Based on the above findings, the impact of the main IS planning issues that a bank should consider is depicted by using effect/probability/action grid as illustrated Figure 8.

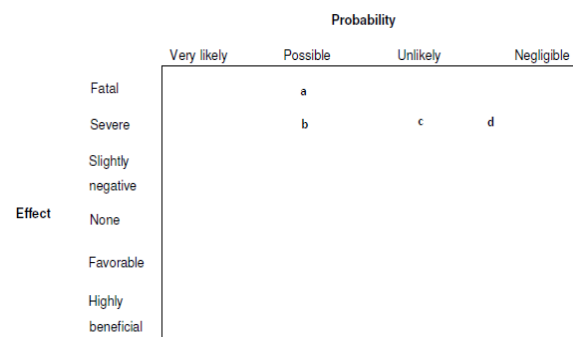


Fig 8. The Main IS Planning Issues that a Bank Should Consider

Source: Author

As shown in the above figure, the net effect of economic issues is high and therefore, robust, immediate and efficient measures to prevent these issues are needed.

According to the above figure, the net effect of technological issues has also a significant impact and therefore, banks need to be vigilant of emerging new technologies while taking necessary steps to prevent technological lapses. The net effect of security, as indicated in the above figure, is comparatively low as there is less probability of any responsible organization not having sufficient security measures and protection.

The legal issues that need to be considered in IS planning have a low net effect as shown in the above figure as the banking sector is being heavily monitored by local and international regulatory bodies significantly reducing the room for negligence of legal issues and rights in the banking sector.

Finally, based on the findings, the banking sector is more towards unboundedness. This unboundedness signals the messy nature of the problem which permits the use of 'messy' strategic planning. Therefore, the need to integrate real-world pressure and constraints into IS strategic planning and IS development on banking sector is high.

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BIOGRAPHY OF AUTHORS



¹Suresh Pakshaweera is Head of the Department of IT and Mathematics, KDU, Sri Lanka. His research interests include Information and Communication Technology, Geographical Information Systems and Remote Sensing. He has more than 20 years' experience in IT infrastructural, product and service development in the Sri Lanka Army.



²Nandana Pathirage is a lecturer in the IT and Mathematics Department, KDU, Sri Lanka. His research interests include Strategic Information System Planning, Management Information Systems and Project Management. He is currently reading for PhD at KDU.



³Sajith Peiris is a lecturer of ELTU, University of Colombo. His research interests include Research Methodologies and their Epistemic Basis, Academic Writing, Discourse Analysis, and Post-Structuralist Literary Criticism. He is currently reading for MA in Linguistics at University of Kelaniya.