

THE EFFECTIVE UTILIZATION OF INTERNET BANDWIDTH IN ORGANIZATIONAL DEMAND SERVICES AND APPLICATIONS

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ABSTRACT

This research evaluates the sustainable utilization of Internet bandwidth usage and proposes a framework for organizational Internet Bandwidth demand service. The study highlighted the lack of an understanding of how much internet bandwidth is required for business and individual use and to what extent individual users must be familiar with it. This is crucial because it will enable a smooth data transmission flow back and forward in an organizational network. That is why this study seeks to (1) measure the relationship between organizational learning and effective utilization of internet bandwidth; (2) assess the relationship between organizational learning and organizational performance, and (3) investigate the mediating impact of effective utilization of internet bandwidth in influencing the relationship between organizational learning and organizational performance. We adopted the quantitative research methodology, and a reasonable sample population (n=318) was selected from those Malaysian business firms that use Internet bandwidth. Structural equation modeling (SEM) was utilized to test the relationship among study variables. The finding indicates that; organizational learning is of critical importance in the effective utilization of Internet bandwidth. However, effective bandwidth utilization does not mediate the relationship between organizational learning and performance. This result is interpreted that learning how to use Internet bandwidth improves individual usage and better decision-making in choosing an organization's Internet bandwidth-demand services and applications. Still, it does not significantly increase operational and financial performance.

Keywords: Effective Utilization, Internet Bandwidth, Internet Bandwidth use, Internet Bandwidth requirement

INTRODUCTION

The advancement and complexity of computer programs and hardware devices that require Internet bandwidth has forced users to familiarize themselves with the complexities of those applications and their effective utilization. Individuals and organizations need expertise when managing applications or subscribed services that use Internet bandwidth. Businesses must look closely into Internet bandwidth seriously to assess their performance. Learning is defined as permanent changes in behavior because of experience (Boud et al., 2013; Mitchell and Larry, 2021). Specific skills are acquired to modify the behavior (Sullivan, 2000; Santori et al., 2021). The acquisition of a skill or specific know-how involves what is learned (knowledge) and the way how it is learned (learning process), which are primarily influenced by cognitive dynamics that lead to dynamically robust outcomes of learning (Koponen et al., 2016; Kaso et al., 2021). Therefore, learning positively influences the use of Internet bandwidth which an individual or organization gathers relevant facts related to the management of Internet bandwidth.

The organizational learning of managing Internet bandwidth for the Internet-bandwidth-demand services does not differ substantially from the general organizational learning process.

Organizational learning is more about acquiring knowledge by individuals. Organizations belonging to the same activity sector may apply different learning practices (Silva et al., 2017). Despite the existing Internet policies and monitoring of the employees' use of Internet bandwidth, the employees may still abuse it (Stanto, 2002) out of ignorance and thus negatively affect their decision-making process and performance. Therefore, organizational learning in services and applications requiring Internet bandwidth is crucial. Any organization's responsibility is to ensure that its employees are adequately trained and, in return, achieve their objectives (Roughton and Crutchfield, 2011; Amrutha and Geetha, 2021). Learning in an organization is part of adding skills that can enhance performance (Jones, 2007; Burhan et al., 2021). Especially when it comes to Internet bandwidth, individuals and organizations are expected to be familiar with the Internet bandwidth requirements for Internet bandwidth-demand services and applications. The amount of Internet bandwidth an organization or individual needs is based on the tasks it is required to perform. In other words, the more online transactions are required as part of the organizational tasks, the more Internet bandwidth is needed. However, different organizations may have different priorities regarding their Internet bandwidth usage.

Previous studies identified several factors that influence organizational learning and assessed and evaluated the impact on various business constructs (Salarian et al., 2015; Jiménez-Jiménez and Sanz-Valle, 2011). Details on the features of Internet bandwidth, round trip time, and its variants were described by Zhang et al. (2021). Some studies investigated the extent to which learning more about Internet bandwidth usage impacts business and individual use and allows for more informed decision-making regarding Internet bandwidth-demand services and applications (Zheng et al., 2016; Chen et al., 2017; Idika et al., 2021). Crucial in this context is the conceptualization of the variables "innovation" and "performance" that are found to be positively interrelated with organizational learning (Jiménez-Jiménez and Sanz-Valle, 2011; Sasikala and Sakthivel, 2021). Whenever a new feasible idea (Innovation) is established in an organization, the organizational performance tends to increase (Saadat and Saadat, 2016). Organizational learning also positively impacts organizational commitment (Salarian et al., 2015). An analysis of the relation between managerial ties on firm performance is given by Peng and Luo (2000), who argue that firms perform better if there exists "a better understanding of the relationship among managerial ties, strategic initiatives, and firm performance". Calontone et al. (2002) use the four items of "commitment to learning", "shared vision", "open-mindedness", and "intra-organizational knowledge sharing" to measure the learning orientation. Lee et al. (2008) find that The Internet policy influences internet bandwidth. Dhinnesh et al. (2021) highlight the importance of efficient bandwidth allocation, whereas Patel et al. (2021) revealed the need for effective Internet bandwidth utilization. The use of Internet bandwidth and several other issues associated with it are addressed in many studies (Lenhart et al., 2010; Zheng et al., 2016; Chen et al., 2017; Ganapathy, 2021; Daase et al., 2021).

Understanding how much internet bandwidth is required for business and individual use and how it is linked to organizational performance, is crucial. This study attempts to determine how well the individual users in an organization truly understand their own Internet bandwidth demand services and applications. For most organizations, the performance measure constitutes the most critical success criterion. Therefore, both learning and Internet use are conceptualized to be related to each other and organizational performance to determine the relationship between organizational learning and managing Internet bandwidth for Internet bandwidth demand services and applications.

THEORETICAL BACKGROUND

This research is based on the organizational learning theory, organizational performance theory, and resource utilization theory or resource-based view. According to the organizational learning theory, learning is based on Argyris and Schön (1996). They view it as a product of organizational inquiry and as the process of the production, absorption, and dissemination of knowledge within an organization. This implies that if an expected outcome deviates from normal, the organization must investigate this abnormality and devise an appropriate solution. Consequently, the four components of learning orientations proposed by Calontone et al. (2002) ("commitment to learning," "shared vision," "open-mindedness," and "intra-organizational knowledge sharing") are used in this current study to investigate the impact of learning on organizational performance associated with the effective use of Internet bandwidth.

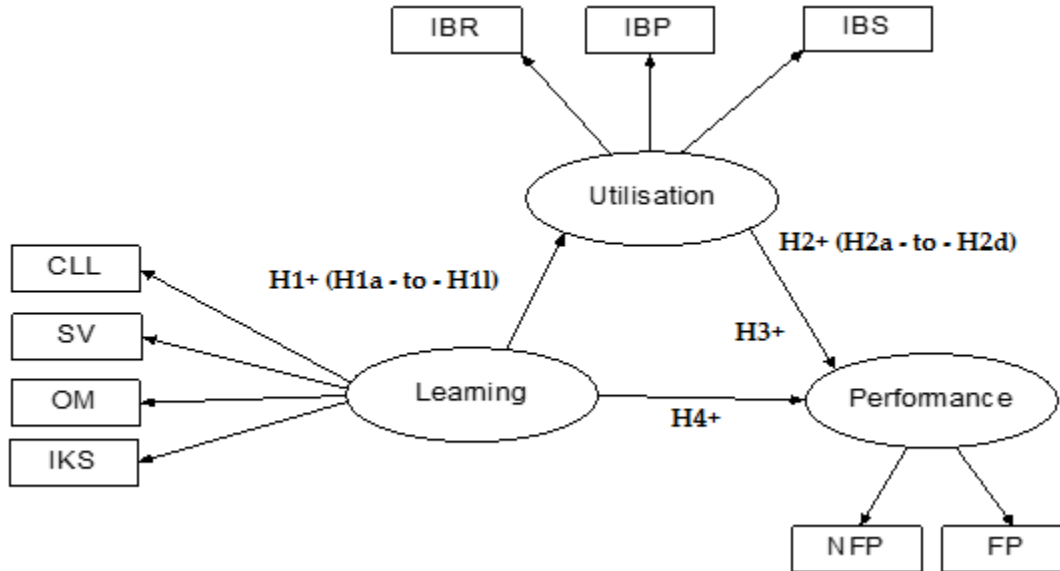
Organizational performance directly underlines an organization's actual output or outcome as measured over a certain period, yet without specific regard to the various facets of the organization's goals and objectives. If some objectives or goals are met and others are not, it is difficult to determine the performance measure. In general, business firms understand the performance measure in terms of "action", that is, the behavioral aspect and an outcome aspect of performance as reflected in the facts and figures (Campbell et al., 1993). Combs et al. (2005) define the operational performance within the organizational performance as the entire non-financial outcomes of organizations. Hamann et al. (2013) view organizational performance based on the four dimensions of profitability, liquidity, growth, and stock market performance. This research adopts the view developed by Mejia et al. (2010) and Salim and Sulaiman (2011) on organizational performance, differentiating between financial and non-financial aspects. Financial performance (FP) is defined as quantitative information expressed as a monetary unit.

In contrast, non-financial performance (NFP) is defined as qualitative information expressed as a non-monetary unit (Mejia et al., 2010). Financial performance is a quantitative measure where information on the financial aspects of the organizational output is accessed as a monetary unit. In contrast, financial performance is a qualitative measure that indicates the result obtained and expressed as a non-monetary unit as described in Combs et al. (2005) as an optional performance. Hence, this research investigates if specific learning (meaning the acquisition of certain skills and know-how) and the effective utilization of Internet bandwidth influence the performance measure.

Resource utilization theory was initially proposed to satisfy all criteria for the theory of productivity by Booty in 1975. Later, a more focused approach to the socio-economic factors was proposed by Maheshvarananda and Branch (2010) in connection with sustainable agriculture and the proper utilization of natural and human resources. In essence, the theory attempts to raise awareness of human society's prospects and goals. The Progressive Utilization Theory promotes the welfare and development of every person by determining the minimum necessities of an individual and by adequately utilizing natural and human resources. Hence, a successful organization was expected to exploit all its available resources and capabilities. The key aspect of the resource-based view theory consists of the organization's use of its resources to exploit the existing opportunities. Such an organization is thus more likely to achieve a competitive advantage over those organizations that fail to do so (Ray et al., 2004). Internet bandwidth constitutes a resource, and thus, the effective utilization of Internet bandwidth is conceptualized into the requirement, use, and priority. The learning impact on utilization and organizational performance is measured within the framework and according to the established precepts of this theory.

CONCEPTUALIZATION AND HYPOTHESES FORMULATIONS

The application of algorithmic techniques in the utilization of Internet Bandwidth has been revealed by Abel et al. (2021). This research investigates the impact of organizational learning on organizational performance and the mediating role of the effective utilization of Internet bandwidth. The influence of organizational learning on the effective utilization of Internet bandwidth is also examined. The dependent variable for this research is organizational performance, while organizational learning and effective utilization of Internet bandwidth are the independent variables. The hypothesized conceptual model of 'Effective utilization of internet bandwidth' is presented in Figure 1.



IBR = Internet Bandwidth Requirement, IBP = Internet Bandwidth Priority, IBS = Internet Bandwidth Demand Services, CLL = Commitment to Learning, SVV = Shared Vision, OMM = Open-mindedness, IKS = Intra-Organizational Knowledge Sharing, NFP = Non-Financial Performance, FPP = Financial Performance

FIGURE 1. Proposed model of 'Effective utilization of internet bandwidth (referring to OL and RBV theories)

INDEPENDENT VARIABLES

INTRA-ORGANIZATIONAL KNOWLEDGE SHARING

Intra-organizational knowledge sharing involves intra-organizational advice relations (Agneessens and Wittek, 2012) and intra-organizational networks (Lee and Lee, 2015). It consists of combining beliefs or behavioral routines with contingencies of inter-organizational knowledge sharing (Loebbecke et al., 2016). Regarding working with Internet-bandwidth demand services and applications, the construct "intra-organizational knowledge sharing" reflects the real-life scenario in which an organization obtains the required know-how and information from different sources. Critical to this is the knowledge that the individuals already possess since an organization's knowledge consists of the knowledge of the people running the organization (Nonaka, 1994). Therefore, the perception of the shared know-how related to working with Internet-bandwidth demand services and applications within the organization can be measured and evaluated based on the details obtained from those individuals. Such an approach is taken in Calontone et al. (2002),

where intra-organizational knowledge sharing is used as a variable measuring learning orientation. The analysis of the relationships indicates a significant positive impact of intra-organizational knowledge sharing on learning orientation. The studies that evaluate firm innovations (Gunday et al. 2011; García-Morales et al. 2012) also use intra-organizational performance as a key variable for measuring the impact of innovation in an organization. In line with this approach, this study adopted "intra-organizational knowledge sharing" from Calontone et al. (2002) to measure the effective utilization of Internet bandwidth and its impact on organizational performance. Hence, the following hypotheses are formulated:

H_{1a} Intra-organizational knowledge sharing is positively related to the effective utilization of Internet bandwidth.

H_{1b} Intra-organizational knowledge sharing is positively related to the Internet bandwidth requirement.

H_{1c} Intra-organizational knowledge sharing is positively related to the Internet bandwidth priority.

SHARED VISION

Shared vision constitutes one of the four components of learning orientations proposed by Calontone et al. (2002), previously used in Hurley and Hult (1996), Hult and Ferrell (1997), and Hult (1998). Calontone et al. (2002) justify their use of the construct with the words that "learning cannot occur unless an organization has an effective and efficient system of information sharing". Thus, for the individuals working in an organization to recognize the effective use of Internet bandwidth to complete their work-related tasks, constructive relationships need to be established to exchange relevant information (Akgun et al., 2007). For instance, completing multiple transactions with fluctuating Internet bandwidth demand simultaneously relies on bandwidth and not mere Internet service subscriptions (Hilbert, 2016). Sharing and exchanging this kind of knowledge among the organization's employees can give a competitive edge and sustainability in highly competitive markets (Salim and Sulaiman, 2011). This research adopted the variable "shared vision" to measure how individuals engage in teamwork when handling services and applications requiring Internet bandwidth. This behavior supports the development of a group problem-solving culture and reduces reliance on the organization's technical team for taking Internet bandwidth-demand services and applications. Other studies use "shared vision" as a construct and find that shared vision contributes positively toward effective organizational commitment and job satisfaction (West and Bocârnea, 2009). Also, developing a shared vision enhances the innovativeness of the firm (Expósito-Langa et al., 2015). A shared vision is also positively related to competency (Gagné, 2009). For this reason, the present research is proposed to focus on the skill to effectively utilize the Internet bandwidth for the Internet bandwidth-demand services and applications to measure the influence of shared vision. The following hypotheses are formulated.

H_{1d}: Shared vision is positively related to the effective utilization of Internet bandwidth.

H_{1e}: Shared vision is positively related to the Internet bandwidth requirement.

H_{1f}: Shared vision is positively related to the Internet bandwidth priority.

COMMITMENT TO LEARNING

In any organization, the commitment to learning is considered an asset. If it is maintained, it leads to various favorable organizational outcomes (Hanaysha, 2016). It is generally perceived as an avenue for the organization to promote learning. Calontone et al. (2002) use "commitment to

learning" as one of the four components of learning orientations. It is linked directly to the amount of learning that an organization can achieve. In general, organizational commitment is significantly related to job satisfaction, and both are directly associated with organizational profitability and superior competitiveness (Abdullah and Ramay, 2012). Therefore, commitment to learning can improve understanding the organization's business goals (Ussahawanitchakit, 2008). Previous research uses "commitment", the most important aspect being the relationship between the organization's commitment and the work environment. Both variables are positively related to the organization's commitment to learning. Hanaysha (2016) argues that the more individuals are engaged with their work environment, the higher their commitment to the organization (Danish et al., 2013); similarly, Billon et al. (2021) reveal those educational disparities have an impact on Internet use. Thus, engaged individuals are generally more committed to their organization (Schaufeli and Bakker, 2004). This concept can be applied to Internet bandwidth whereby the variable "commitment to learning" is proposed to measure how the organizational learning culture towards Internet bandwidth-demand service can be considered a key factor in predicting the overall employee commitment toward the organization. The commitment to learning may also influence the effective individual utilization of Internet bandwidth. Hence the following hypotheses are formulated:

H1g. Commitment to learning is positively related to the effective utilization of Internet bandwidth.

H1h. Commitment to learning is positively related to the Internet bandwidth requirement.

H1i. Commitment to learning is positively related to the Internet bandwidth priority.

OPEN-MINDEDNESS

Open-mindedness has directly to do with individuals' attitudes and behavior. This construct is used in Calontone et al. (2002) as part of the four components of the learning orientations. It reflects the willingness and the ability of individuals within an organization to accept new ideas. Usually, it is placed on the top of any list of intellectual or "epistemic" virtues (Riggs, 2010). Open-mindedness has been used in this study to examine the individual perceptions of the need to effectively utilize Internet bandwidth and measure each internet bandwidth-demand service and application used in an organization. For this to happen, individuals must have some level of openness to the organizational needs and recognize the need for removing functional barriers. They have to be willing to cope with and adapt to the rapid rate of changing technology. Previous research studies use the variable "open-mindedness" to generate several valuable findings. Spiro et al. (2007) confirm that "an open-minded organization promotes new and innovative ideas and procedures, which contributes to the achievement of competitive advantage". Barak and Levenberg (2016) establish that flexibility is a "higher-order thinking skill essential for learning in technology-enhanced environments" and "flexible thinking in learning is the ability to be open-minded and adapt to new learning methods". Open-mindedness in learning refers to "an individual with a high inclination to be open to new ideas and experiences will most likely try new learning technologies and easily adapt to new ways of learning" (Barak and Levenberg, 2016). To build on this finding and investigate if this matter also applies to working with Internet bandwidth-demand services and applications, the following hypotheses are formulated:

H1j. Open-mindedness is positively related to the effective utilization of Internet bandwidth.

H1k. Open-mindedness is positively related to the Internet bandwidth requirement.

H1l. Open-mindedness is positively related to the Internet bandwidth priority.

ORGANIZATIONAL INTERNET BANDWIDTH REQUIREMENT AND PRIORITY

The Internet bandwidth requirement may not be the same for two or more companies offering the same services and using the same Internet bandwidth demand application. This is because the amount of Internet bandwidth an organization needs determined by its online activities. The ratio of an organization's online activities and the Internet bandwidth requirement must be stable. If organizational tasks require too many online transactions and the organization has too little internet bandwidth, it may cause the day-to-day activities to come to a complete halt at their highest point. Although different organizations may have different usage priorities regarding Internet bandwidth, the rule is that the more the speed, the better the services that depend on Internet bandwidth (Lawrence, 2008). In many cities and rural areas, high-speed internet bandwidth is being deployed. It requires that individual users and organizations rely on measuring bandwidth and not merely subscription count (Hilbert, 2016).

In many cases, internet bandwidth needs for rural areas are different from urban areas, and urban consumers are willing to pay higher rates because they make more intensive use of the Internet (Savage and Waldman, 2009). This has raised how much internet bandwidth is necessary and appropriate for business and individual usage. Individuals can base their decision on their capability, whereas organizations base their decision on their actual business requirements. Organizations need to have a proper mechanism in place to respond to the ever-increasing demand for internet bandwidth to counter the competition effectively. The organizational output is directly developed based on the input made by its members or anybody who wishes to contribute (Hill, 2014). Previous studies show that heavy Internet bandwidth-consuming connections are significantly related to usage-sensitive pricing (Sarkar, 1997). However,, any Internet connection may lose its integrity if the most important nodes are destroyed (Tu, 2000). To fully understand the Internet bandwidth requirement for an organization's Internet bandwidth demand services and applications, this research uses this construct of Internet bandwidth requirement as the barrier within the intrinsic requirement, availability, and effective utilization. This can be justified by Lee et al. (2008), which reveals that organizational use of Internet bandwidth is influenced by the Internet policy necessity, market forecasting, policy purpose, budget, and deliverables. To measure the influence of learning and organizational performance on the Internet bandwidth requirement, the following hypotheses are proposed:

H2a: Internet Bandwidth Requirement is positively related to the financial performance of an organization.

H2b: Internet Bandwidth Requirement is positively related to the non-financial performance of an organization.

H2c: Internet Bandwidth Priority is positively related to the financial performance of an organization.

H2d: Internet Bandwidth Priority is positively related to the non-financial performance of an organization.

EFFECTIVE UTILIZATION OF ORGANIZATIONAL INTERNET BANDWIDTH

The effective utilization of the organizational Internet bandwidth in the context of this study consists of a multi-dimensional construct with the following multiple indicators: "Organizational Internet Bandwidth Requirement", "Organizational Internet Bandwidth use", and "Organizational Internet Bandwidth priority". The reason for this combination is that "effective utilization" is conceptualized as the tradeoff between "requirement", "use", and "priority". Any organization can

only use the internet bandwidth it has access to, which either meet its requirements or not. However, the use of the Internet bandwidth is directly related to the services the organization has identified as its priority. Given the fact that there is an immense demand for Internet bandwidth on a global scale, the problem of congestion can never be avoided. However, deregulation and prudent usage of the web point might be the way forward (Butler, 1996; Mahato et al., 2021). It means an organization uses the Internet bandwidth that matters and uses it effectively by prioritizing certain services for Internet bandwidth as part of its effective utilization strategy. Another crucial aspect of Internet bandwidth usage is the problems that may arise, such as user awareness of the problems associated with the use of the Internet and how Internet usage may impact the performance of an organization (Hassan et al., 2021; Bindhorob et al., 2021). In terms of the problems commonly associated with Internet usage, Davis et al. (2002) identify the four social dimensions of diminished impulse control, loneliness or depression, social comfort, and distraction. These problems can be either prevented or solved through learning and the organization's flexibility in using the services and applications which require Internet bandwidth. Various studies on Internet bandwidth usage have discussed the most likely occurring problems and proposed the steps to achieve a successful implementation (Chen et al., 2017; Zheng et al., 2016; Lenhart et al., 2010; Pathak et al., 2021). To build on the studies mentioned earlier, the following hypothesis is formulated.

H3: Effective Utilization of Organizational Internet Bandwidth is positively related to organizational performance.

DEPENDENT VARIABLE

ORGANIZATIONAL PERFORMANCE

Organizational performance is measurable. In this research, the measure is through the impact of learning and effective utilization of Internet bandwidth. Therefore, it constitutes the dependent variable of this research. The key indicator of organizational performance centers on the financial (monetary unit) and non-financial (non-monetary unit) nature of the organizational output. The same variables are used in Mejia et al. (2010) and Salim and Sulaiman (2011) and serve to express the effects on controlling variables. These studies consider the financial measures as the return on assets (ROA), sales growth, and profitability. In contrast, non-financial measures are considered employee satisfaction, customer growth, and quality of products and services. This study adopts the same variables to determine the impact of learning of Internet bandwidth demand services and applications on organizational performance and its relationship with the effective utilization of Internet bandwidth. No statistically significant effect of broadband has been found on the performance of firms (De Stefano et al., 2014). This research intends to explore the impact of the two independent variables on the organizational performance. Hence, the following hypotheses are formulated:

H4: Organizational learning of Internet bandwidth demand services and applications is positively related to the organization performance.

RESEARCH METHODOLOGY

This study applies a quantitative research methodology where hypothesis testing research is intended to generalize the study's outcome. Three main constructs were used to investigate the

relationships among them. Statistic evaluation was used for the research to produce a statistically valid quantitative result. Reasonable samples were obtained, and the details of the data collection were given in the subsequent sections. Two statistical application packages, SPSS and Structural Equation Modelling (SEM) with AMOS were utilized to analyze the data particularly in testing the relationships among study variables.

SAMPLING AND DATA COLLECTION

The population of interest in this study was defined as Malaysian organizations that utilized Internet bandwidth demand services and applications in their day-to-day activities. The sample for the study was drawn from the available population of individuals working in organizations that use Internet bandwidth. A simple random sampling was selected to ensure equal opportunity for all the employees using Internet bandwidth who participated. Thus, the respondents were selected randomly, and their responses were collected for data analysis. The instrument for the data collection consisted of a questionnaire. The items were designed based on the conceptualization for each construct. The questions were modified from previous related research to suit the present study. The questionnaire was designed using the Likert scale type, with responses ranging from (0) to (4) (see Appendix 1). The targeted 350 to 500 responses were gathered randomly within metropolitan Kuala Lumpur and in other parts of Malaysia. The data collection was performed online, and face-to-face, and 318 responses were collected.

PRELIMINARY ANALYSIS

This dataset consisted of 318 cases ($n = 318$), and no missing data were found. Exploratory Data Analysis (EDA) was performed at this stage, and the result showed that the dataset met the assumptions of normality and linearity. No violation was observed. Before testing the structural model of Internet Bandwidth Utilization, the measurement model and reliability analysis for each construct (organizational performance, organizational learning, and utilization of internet bandwidth) were evaluated using confirmatory factor analysis (CFA). The obtained result showed a good fit for each measurement model. However, for the Utilization of the Internet Bandwidth construct, two dimensions (IBR and IBP) were merged as suggested by the CFA results. The reliability coefficients for each factor or construct are presented in Table 1. All Cronbach's alpha coefficients were satisfactory (Cronbach's $\alpha > .70$) as the values ranged from .738 to .909 for each subscale, thus indicating that the measured items were good and internally consistent (Field, 2009; Pallant, 2007).

TABLE 1. Descriptive statistics and reliability analysis of the study variables

Constructs	Factors	N of items	Cronbach's alpha
Organizational performance	NFP	3	.769
	FPP	2	.831
Organizational learning	CLL	2	.860
	SVV	2	.909
	OMM	2	.841
	IKS	2	.738
Utilization of internet bandwidth	IBR and IBP	5	.857
	IBS	3	.899

PRESENTATIONS OF THE RESULTS

THE STRUCTURAL MODEL OF INTERNET BANDWIDTH UTILIZATION

Figure 2 illustrates the hypothesized model of the mediating role of Internet Bandwidth Utilization influencing organizational performance. This model consisted of organizational learning, utilization of Internet bandwidth, and organizational performance of Malaysian organizations. Organizational learning was an exogenous variable and consisted of four dimensions. The dimensions of organizational learning were commitment to learning (CLL), shared vision (SVV), open-mindedness (OMM), and intra-organizational knowledge sharing (IKS). The utilization of Internet Bandwidth functioned as a mediator and was made up of internet bandwidth requirement and priority (IBR and IBP) and internet bandwidth problem resolution (IBS). The organizational performance served as an outcome variable and consisted of two dimensions, non-financial performance (NFP) and financial performance (FPP). This model was analyzed through Structural Equation Modelling (AMOS) with Maximum Likelihood Estimation (MLE).

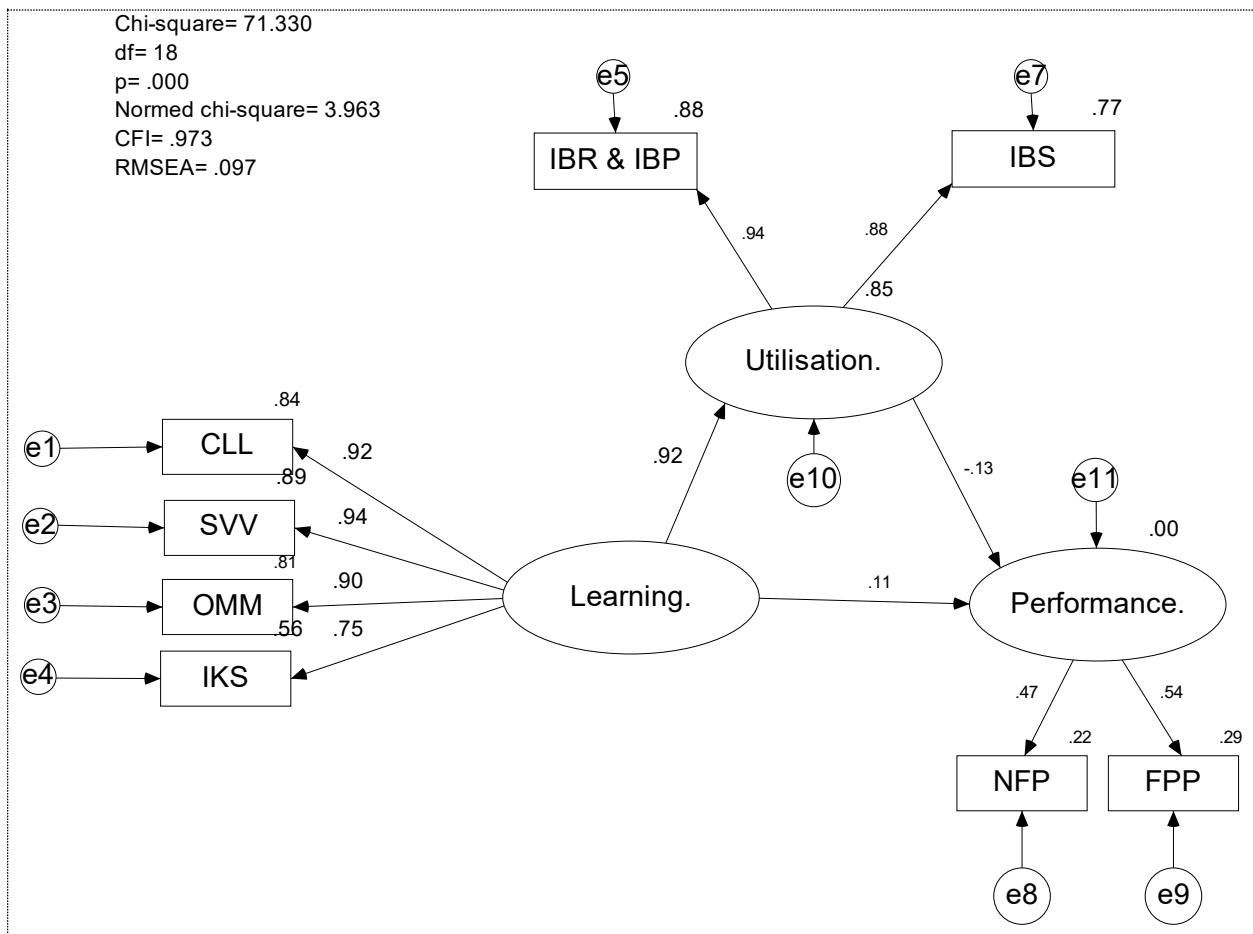


FIGURE 2. The standardized coefficient results for the hypothesized structural model on Internet bandwidth utilization

The goodness-of-fit (GOF) indices results indicated that the hypothesized model was adequate to represent the data; $\chi^2 (18) = 71.33$, $p = .000$, $\chi^2/df = 3.963$, $CFI = .973$ and $RMSEA = .097$. Furthermore, its normed chi-square (< 5.0) and CFI ($\geq .95$) suggested that the model showed a good model fit (Bentler, 1990; Hair et al., 2010; Tabachnick and Fidell, 2007). The RMSEA value

of .097 indicated a mediocre fit (RMSEA = .08 to .10) (MacCallum, Browne, and Sugawara, 1996). These statistics suggested that the hypothesized model of Internet Bandwidth Utilization was consistent with the data. Thus, there was evidence to support the validity of the inter-relationship of organizational learning, Internet bandwidth utilization, and organizational performance. The result for the Internet Bandwidth Utilization structural model and its parameter estimates is provided in Figure 2.

THE RELATIONSHIP BETWEEN ORGANIZATIONAL LEARNING AND EFFECTIVE INTERNET BANDWIDTH UTILIZATION

The result indicated a significant positive relationship between organizational learning and effective Internet bandwidth utilization, the degree of the relationship being strong (path coefficient = .92, CR > ±1.96). Hence, organizational learning had a significant direct impact on enhancing effective Internet bandwidth utilization. Further investigation into the relationship between each indicator of organizational learning (commitment to learning, shared vision, openness, and intra-organizational knowledge sharing) and Internet bandwidth utilization was examined. The result suggested a significant positive relationship between the organizational learning dimensions and Internet bandwidth utilization. It was found that the main contributor for Internet bandwidth utilization was shared vision (regression weight = .342, CR > ±1.96), followed by intra-organizational knowledge sharing (regression weight = .284, CR > ±1.96), commitment to learning (regression weight = .172, CR > ±1.96), and openness (regression weight = .159, CR > ±1.96). Table 1 below summarizes the relationship between these dimensions and Internet bandwidth utilization. Therefore, H_1 was supported.

TABLE 2. Results of the relationship between effective Internet bandwidth utilization and its predictors

Relationship	Regression weight
Commitment to learning ---> Utilization of Internet Bandwidth	.172*
Shared vision ---> Utilization of Internet Bandwidth	.342*
Openness ---> Utilization of Internet Bandwidth	.159*
Intra-organizational knowledge sharing ---> Utilization of Internet Bandwidth	.284*

* The relationship was significant at the .05 alpha level.

THE RELATIONSHIP BETWEEN EFFECTIVE INTERNET BANDWIDTH UTILIZATION AND ORGANIZATIONAL PERFORMANCE

There was no significant relationship between Internet bandwidth utilization and organizational performance (path coefficient = -.13, CR < ±1.96). The relationship between each factor of Internet bandwidth utilization was also investigated. The findings revealed no significant relationships between each predictor and the Internet bandwidth utilization. The relationship between Internet bandwidth requirement and priority and Internet bandwidth utilization was positive and non-significant (regression weight = .10, CR < ±1.96). The relationship between internet bandwidth problem resolution and Internet bandwidth utilization was also non-significant (regression weight = -.11, CR < ±1.96). Thus, the Internet bandwidth utilization had no significant direct impact on the organizational performance, and therefore, H_2 was not supported. H_{2a} , H_{2b} , and H_{2c} were also not supported. Table 2 summarizes the results of the relationship between these factors and the performance of organizations.

TABLE 3. Results on the relationship between organizational performance and its predictors

Relationship	Regression weight
Internet bandwidth requirement and priority ---> organizational performance	.104
Internet bandwidth problem resolution ---> organizational performance	-.106

THE RELATIONSHIP BETWEEN ORGANIZATIONAL LEARNING AND ORGANIZATIONAL PERFORMANCE

The findings revealed a positive relationship between these two variables for the relationship between organizational learning and organizational performance. However, the relationship was not significant (path coefficient = .11, $CR < \pm 1.96$). Hence, organizational learning had no significant direct impact on enhancing organizational performance. H_3 was not supported. Further investigation was scrutinized on the relationship between each indicator of organizational learning (commitment to learning, shared vision, openness, and intra-organizational knowledge sharing) and organizational performance. The result revealed no significant relationship between organizational learning dimensions and organizational performance. The path coefficient between commitment to learning and organizational performance was insignificant (regression weight = .076, $CR < \pm 1.96$). There were also no significant relationships between shared vision and organizational performance (regression weight = .076, $CR < \pm 1.96$), openness and organizational performance (regression weight = .076, $CR < \pm 1.96$), also between intra-organizational knowledge sharing and organizational performance (regression weight = .076, $CR < \pm 1.96$). Therefore, H_{3a} , H_{3b} , H_{3c} , and H_{3d} were not supported. See Table 3 for the standardized coefficient result of the relationship between these organizational learning factors and the performance of the organizations.

TABLE 4. Result of the relationship between organizational performance and its predictors

Relationship	Regression weight
Commitment to learning ---> organizational performance	.076
Shared vision ---> organizational performance	.064
Openness ---> organizational performance	-.227
Intra-organizational knowledge sharing ---> organizational performance	.114

THE RELATIONSHIP BETWEEN ORGANIZATIONAL LEARNING AND ORGANIZATIONAL PERFORMANCE IS MEDIATED BY EFFECTIVE UTILIZATION OF INTERNET BANDWIDTH

Figure 1 showed that both organizational learning (path coefficient = .11, $CR < \pm 1.96$) and Internet bandwidth utilization (path coefficient = -.13, $CR < \pm 1.96$) had no significant relationship with organizational performance. Since there were no significant relationships between these predictors and organizational performance, Internet bandwidth utilization was not a significant mediator of organizational performance.

DISCUSSION AND IMPLICATIONS

This study presents a framework for studying organizational Internet bandwidth demand services and applications, organizational learning orientation, and organizational performance. The model was tested using data collected from selected Malaysian business firms. It was found that the data adequately represent the hypothesized model by GOF indices, model fit and mediocre fit at RMSEA respectively ($\chi^2 (18) = 71.33$, $p = .000$, $\chi^2/df = 3.963$, $CFI = .973$ and $RMSEA = .097$, normed chi-square (< 5.0), $CFI (\geq .95)$, $RMSEA = (.097)$. Further analysis indicates that the results

support most of the hypotheses and reveal that organizational learning is critical in effectively utilizing Internet bandwidth. Hence, a significant inference can be drawn from these findings. Researchers and stakeholders are advised to follow certain internet bandwidth utilization guidelines as the relationship between organizational learning and effective Internet bandwidth utilization is strong, significant, and positive (path coefficient = .92, $CR > \pm 1.96$).

Thus, an organization committed to learning will benefit from a full understanding of its Internet bandwidth requirement and priority on Internet bandwidth demand services and applications. Furthermore, the findings also suggest that “shared vision” is the main contributor to the effective utilization of Internet bandwidth (regression weight = .342, $CR > \pm 1.96$), whereas openness is the least (regression weight = .159, $CR > \pm 1.96$). Therefore, a positive shared vision environment is beneficial for any organization that wishes to stand out by effectively utilizing its Internet bandwidth. This is crucial for an organization as it encourages its employees to adopt a shared vision of its online usage and any related tasks requiring Internet bandwidth. The analysis aimed to investigate whether or not the effective utilization of Internet bandwidth can increase the organizational performance and was found to be negative. There was no significant relationship between the effective utilization of Internet bandwidth and the performance of organizations (path coefficient = -.13, $CR < \pm 1.96$). In all cases, this result was confirmed by the relationships between each factor of effective utilization of Internet bandwidth and organizational performance. Although the relationship between organizational learning of effective utilization of Internet bandwidth and organizational performance was positive, it was not significant (path coefficient = .11, $CR < \pm 1.96$). Hence, learning effective Internet bandwidth utilisation has no significant direct impact on enhancing organizational performance. Finally, it can be concluded from this study that the effective utilization of Internet bandwidth is not a significant mediator of organizational performance.

This empirical analysis did not reveal a mediating effect of effective bandwidth utilization on the relationship between organizational learning and organizational performance. A good indication may be that learning the use of Internet bandwidth impacts individual use, which leads to better decisions on the Internet bandwidth demand services and applications of an organization. Yet, it does not yield significant operational performance (non-financial) and financial performance. Crucial here is that organizational learning positively impacts organizational commitment (Salarian et al., 2015). Thus, this study reveals that working with Internet bandwidth demands services and applications requires learning and does not necessarily improve organizational performance. The effective utilization of Internet bandwidth should have been tested as moderating the relationships between organizational and organizational performance which is not considered in this research. Future research should explore other dimensions and possibly consider the effective utilization of Internet bandwidth concerning a moderating variable.

LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This research focuses on the use of Internet bandwidth and emphasizes the importance of learning Internet bandwidth demand services and application used by organizations and links its organizational performance. However, it does not address the issue of various Internet bandwidth demand services and applications for organizations. Future research could identify the categories of Internet bandwidth demand services and applications for organizations and investigate whether an organization relies totally on cloud-based services as cloud services may support organizational learning. Furthermore, this study is limited to the effect of learning within Internet bandwidth for

work-related activities by individuals working in business companies. However, there are numerous other concerns of the employees using their organization's Internet bandwidth for non-work-related issues and, in some cases abusing it. Hence, future research should consider categorizing the use of Internet bandwidth for work non-work-related tasks. Cross-national studies covering different locations around the world other than Malaysia should also be conducted. This will validate the strength of the proposed framework and the difference in the findings. Hence, comparability can be established in generalizing the outcome of this kind of work across varying business systems and organizational forms.

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