Enhancing IT System Integration through the Microsoft BizTalk Server Platform

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Abstract

This paper examines the value of Microsoft BizTalk Server in the process of integrating different IT systems in different industries. A secondary qualitative thematic analysis is conducted with two critical themes. These themes are that BizTalk provides an improvement of system integration and operational effectiveness, and implementation issues like technical complexities and organisational resistance cannot be resolved without a proper strategy. The findings indicate the capacity of BizTalk in automating processes, minimising human attack errors. Also, evaluate the real-time interchange of the data, along with noting the importance of skilled workers and gradual implementation plans. The study addresses the gaps in the literature, as the results of the integration are associated with the practical and organisational level of it.

Keywords: Microsoft BizTalk Server, system integration, middleware, organisational efficiency, IT system integration, Enterprise Application Integration (EAI).

I. INTRODUCTION

The modern IT business is highly networked, and it is essential to ensure seamless communication and integration between various IT systems, allowing operations to become efficient and data to remain up-to-date. Other problems that organisations face regularly are integration of different legacy applications and modern ones that has forced the development of data siloes, slow processes and inconsistency in information movement. This study takes a closer look at the process in that way Microsoft BizTalk Server Platform is used to carry out a successful integration of systems amidst non-homogeneous IT systems. BizTalk Server serves as a scalable and flexible middleware computing that bridges software systems, automates the application processes, and enables the exchange of data in real time [1]. It has its potential, but lacks implementations in many enterprises since the process of integrating architecture is complex, and little is known about the best practices.

The issue that is being investigated in the present research is that there is no mentioned strategy for deploying BizTalk to achieve maximum integration efficiency [2]. The goal of the study will be to analyse the possibilities of BizTalk, outline the main issues of implementation, and provide the optimised procedure of integration between IT infrastructures and modern architectures.

Aim and Objectives of the Research:

The research aims to analyse the effectiveness of Microsoft BizTalk Server in integrating diverse IT systems and improving organisational data flow.

- To assess the core functionalities and integration capabilities of Microsoft BizTalk Server.
- To identify challenges and best practices in implementing BizTalk for system integration.

The study starts with the Introduction section, where the background and the problem are pointed out. The Literature Review investigates literature available on system integration and BizTalk. The Methodology provides the design of the secondary qualitative research and the method of qualitative data collection. Interpretation of the results is given in Data Analysis and Results, and then followed by a Discussion that interprets holiday location and place choice. The conclusion summarises key insights and recommendations.

II. LITERATURE REVIEW

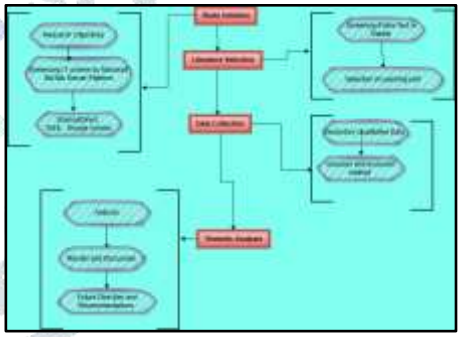

Fig. 1: Research Flow

This section executes the literature review in the following steps:

I. Conducted systematic searches in academic databases using relevant keywords related to BizTalk Server and system integration.
II. Selected peer-reviewed articles and case studies from 2015 to 2018.
III. Identified key themes addressing integration outcomes and implementation challenges.

The literature review articles have been explored from the following databases:

I. **IEEE Xplore** for peer-reviewed technical papers on system integration and middleware solutions.
II. **ScienceDirect** for academic journals on enterprise IT systems.
III. **Google Scholar** for diverse, credible sources and case studies.

A. Searching Study:

The research is conducted with the help of the pre-defined search of the IEEE Xplore, ScienceDirect, and Google Scholar academic databases through the keywords such as BizTalk Server integration, system integration middleware, and enterprise application integration. Peer-reviewed articles that were published during the period 2015-2018 formed the scope of the search to ensure the relevance and up-to-date information.

B. Selection of Journal Articles:

The articles are chosen by the fact that they provide information about Microsoft BizTalk Server, Integration strategies and the performance achieved by middleware under the organisational environment. The research, containing applied cases, practical implementation issues, as well as integration results, provides a saturated qualitative thematic analysis.

C. The Goal of the Review:

The review seeks to find some prevailing themes pertaining to the usage of BizTalk to integrate various IT systems. It tries to determine common benefits, challenges, and patterns of implementation that can be used as references in best practices. The utilisation of this secondary qualitative thematic analysis shall be the foundation of the analysis of the working effectiveness of BizTalk.

D. Analysis of Previous Studies

1. The Role of Middleware in IT Integration

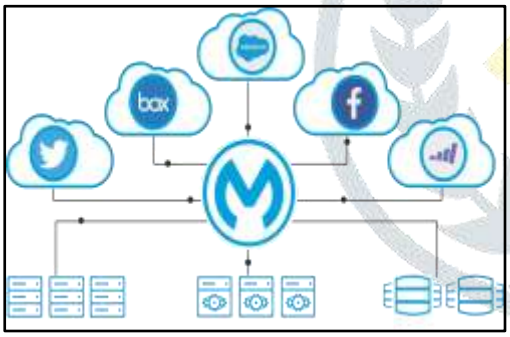

Fig. 2: Middleware in IT Integration

The middleware platforms have become one of the key facilitators of communication between incompatible systems under contemporary organisations. According to [3], the middleware leverages heterogeneous software applications by standardising the exchange of data and automating processes. Enterprise Application Integration (EAI) is quite critical in industries where systems developed on diverse platforms need to work together in real time [4]. The middleware enables easy integration through offering a uniform layer of communication, and BizTalk Server is well known with a similar reputation in this area.

2. Microsoft BizTalk Server and Its Capabilities

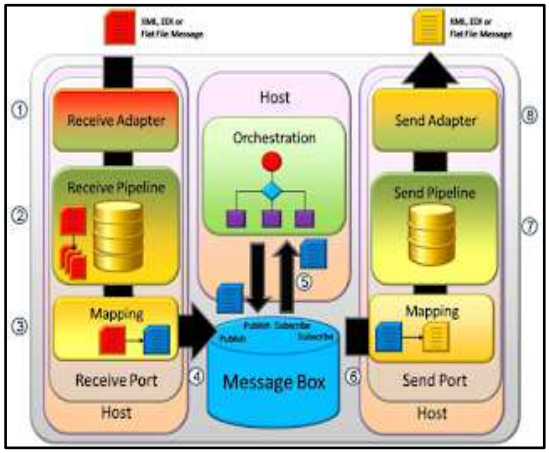

Fig. 3: Microsoft BizTalk Server

According to [5], the Microsoft BizTalk Server is a middleware that allows one to automate and integrate business processes by the use of adapters that talk to other software systems. BizTalk is compatible with multiple standards and protocols, including XML, SOAP, and REST APIs that make the protocol appropriate to be used by both cloud-based and legacy systems [6]. The orchestration engine in the server enables the creation of intricate message integration workflows, providing the guarantee to transform and route the messages and monitor them. A number of pieces of evidence have shown that it can minimise manual interventions and enhance the accuracy of data in the enterprise environment.

3. Case Studies on BizTalk Implementation

The utility of applying the BizTalk Server in the real world is displayed in many case studies. According to [7], a multinational logistics company identified that BizTalk enabled faster data processing by 40 per cent, due to the feature of real-time system integration. The BizTalk Server, bridging the gap since the initial release in the year 2000 through Azure Services, low-cost solutions that are used at 1 per cent of the legacy systems cost-value, proving their long-term compatibility and enterprise integration capabilities [8].

4. Challenges and Limitations of BizTalk Implementation

BizTalk implementation is very challenging. Adjustments in the configuration of adapters and orchestrations, especially of large-scale enterprise systems [9]. The identified barrier to adoption in small to medium enterprises is the need for specialised skills and training. Other issues mentioned in the literature are security, version control, as well as system downtime during implementation.

Literature gap

The study finds that the gaps from this literature analysis are, most of the organisations focused on technical specifications rather than the organisational impacts of Microsoft BizTalk Server to integrate their systems [10]. Others are, minimal understanding of recurring issues and best options, however, exist in qualitative terms, both in terms of user experience, change management, and long-term integration sustainability. In

order to fill these gaps, the thematic analysis will be conducted in this study to get solutions to these challenges.

III. METHODOLOGY

The study uses a qualitative research design based on a ***secondary thematic analysis*** that has been completed to establish that Microsoft BizTalk Server is used in the integration of IT systems [11]. The study is based on an ***interpretivist philosophy*** that emphasises is made on the employment of the context and subjective experiences of the objects of study that have adopted the use of BizTalk [12]. Interpretivism is correct since this approach enables the researcher to study the lived experiences of participants using meanings, patterns, and themes in available qualitative evidence, like case studies, journal articles, and industry reports.

Data in the study is obtained through peer-reviewed scholarly sources, case studies, and white papers from 2015 to 2018. The sources used are properly drawn based on relevancy, soundness and concentration on BizTalk integration in real-life situations in the organisation [13]. It is searching for a resource in a systematic manner with keywords like BizTalk integration, enterprise middleware, and system integration case study in databases, such as ScienceDirect, IEEE Xplore, and Google Scholar.

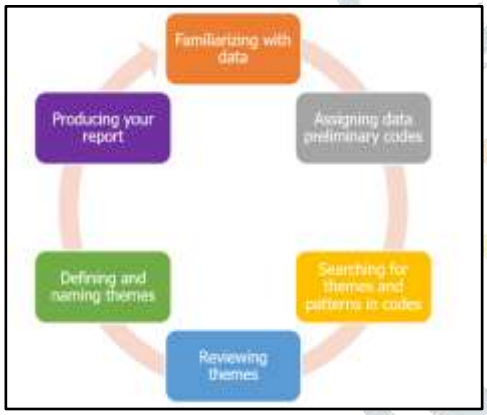

Fig. 4: Braun and Clarke's Thematic analysis model

Thematic analysis of the data has been done with reference to the six phases of data analysis recommended by Braun and Clarke: familiarisation, coding, theme development, theme review, defining and naming of the themes and writing the report [14]. It is possible to identify the existing patterns that include integration advantages, technical issues, and strategic activities. The method will facilitate a clearer insight into the practical application of BizTalk in promoting the seamless integration of IT systems in the various sectors.

IV. ANALYSIS

A. Thematic Analysis

Theme 1: Microsoft BizTalk Server Enhances Organisational Efficiency through Seamless IT System Integration

Thematic analysis of relevant literature has indicated that Microsoft BizTalk Server is one application that ensures organisational efficiency through the creation of homogeneous integration of heterogeneous IT systems. According to [15], both the orchestration, transformation and messaging features that BizTalk server offers enable organisations to integrate disparate systems, including old databases, as well as new cloud-based platforms without the need to completely change them. This brings about less manual input of data, better real-time communication and more streamlined operations.

Logistic, healthcare, and manufacturing firms have reported that automation of their workplace and high data accuracy can be achieved by formats such as XML, JSON, EDI and multiple protocols such as FTP, SOAP, REST, supported by BizTalk [16]. Take the case of business information mixing with BizTalk in a logistics company, processing of invoices once took a long time, integration of BizTalk into the logistics company reduced the processing time by 40% [17]. This theme directly relates to the first research objective, that is, to assess the integration capabilities of BizTalk, and addresses the gap because the research looks into real-life applications based on results in different industries.

The efficiency of operation due to an automated system integration implies that BizTalk is a credible middleware technology that can be applied to various settings. This confirms that it is not only a technical tool, but it is also a strategic means of digital transformation and the improvement of processes.

Theme 2: Implementation of BizTalk Server Faces Common Challenges that Require Strategic Planning and Skilled Resources

The second theme is that although BizTalk Server bears numerous capabilities to integrate, it often fails to be implemented on both technical and organisational levels. The problematic cases of complex configuration of the adapters, long set-up time, and specialised development skills are reported [18]. Organisations are turned down by a lack of internal experience or training and end up delayed, with cost increases and integration failures.

Resistance to the change and inadequacy of stakeholder involvement as other factors that complicate implementation even more. Organizations are not able to link BizTalk integration projects with the already set IT governance frameworks and compliance measures [19]. This created a deployment blockage and inefficient systems. Such obstacles are particularly evident in SMEs where resources such as financial and technical are scarce [20].

This theme can define the second objective of the research, that find out the implementation barriers and the best practices, and also address the gap. Among the best practices that will result from the review are phased implementation, stakeholder early involvement and continuous training [21]. Companies that have made pre-deployment investments in terms of planning and change management systems have voiced the issue of transitioning being much easier, and the results of integration being sustainably achieved.

B. Results

The overall results of secondary thematic analysis showed two main issues with respect to the usage of Microsoft BizTalk Server in integrating IT systems. These results resolve the research problems and fill the gap in the literature.

The first critical finding demonstrates that Microsoft BizTalk Server positively contributes to the efficiency of organisational operations since it allows integrating a variety of IT systems with ease. It is always mentioned that the BizTalk capabilities, namely message transformation, real-time data exchange, and orchestration, enabled organisations to integrate disparate platforms, legacy and modern [22]. This elimination of redundancy, clearance of data errors, and enhanced overall workflow automation is achieved due to this integration. As an example, in logistics and manufacturing, real-time transfer of data between the procurement systems, inventory systems, and the billing systems resulted in quicker processing of transactions and improved decision making [23]. BizTalk is used in the healthcare system to integrate clinical systems with management systems, eliminating duplication of patient records and thereby improving the delivery of services. These indicators point to the fact that BizTalk is not only a technological component but rather a main driver of digital efficiency that allows scaling business process automation in any industry.

The second key finding notes that technical and organisational issues are a common problem that can be encountered in the BizTalk implementation process, and these complications demand detailed planning and specific requirements. The difficulty of configuration and orchestration, the most cases, will require the services of trained individuals to set up and maintain successfully, is also noted as a major issue [24]. Firms that have inexperienced employees or are semi-trained would experience delays, excessive implementation and integration costs, and poor integration. Moreover, the decisive obstacles are resistance to change and negative interaction of the stakeholders, especially within SMEs that have a small budget and a rigid IT setup [25]. Positive integration included best practices that contained phased implementations, cross-functional teams, as well as continual employee development.

All the great integration capabilities of the Microsoft BizTalk Server are highly determined by the capability of the organisation to manage the implementation process in a strategic way. Organisational preparedness and plain planning, accompanied by change management practices, should go hand in hand with technical excellence. There is also a lack of knowledge-sharing across industries in establishing an approach to middleware integration on a standardised basis using platforms like BizTalk [26]. The results of the study provide a strong basis for coming up with useful guidelines that can be used to facilitate the proper integration of systems in different organisations.

C. Discussion

The previous studies mostly emphasised the technical features of BizTalk or individual case implementations. This research takes a cross-sectoral, qualitative thematic approach to examine BizTalk functions as a strategic integration tool in various organisational environments. Among the more important innovations regarding this study is the observation of outcomes of integration not only based on system performance, but also associated with that of organisational influence, such as enhanced service delivery, streamlined operations and improved decision-making. This fulfils the area of literature gaps where previous research only focused on the bigger meaning of BizTalk implementation in the business processes [27]. Capturing industry patterns in this way, the study will generalise the role of BizTalk in improving the overall efficiency of the enterprise beyond the IT performance.

As well, critical recognition is the impact of organisational readiness and strategic planning towards effective implementation of BizTalk that has been given minimal attention in the previous studies. This paper concludes that technical expertise is not the only factor that guarantees successful integration, but also needs the involvement of the employees as well as leadership provision and change management in phases [28]. This brings a different managerial aspect into the discussion that has been mainly technical in its nature as far as historical study is concerned.

Another area that has not been much discussed in the literature also emerges in the paper, namely, the frequently emerging implementation challenges and strategic solutions. It puts forward some typical obstacles, including the complexity of adapters, the slowness of deployment, and a lack of skills, and offers such retorts as training staff, employing pilot programs, and aligning integration with business objectives [29]. These conclusions are not limited to isolated technical problems, as they provide an overall account of sustainable integration. Considering both of the primary goals of the research, such as assessing the integration features of BizTalk and determining the obstacles to its practical implementation, the study creates a more detailed image of the positive influence of the platform on practice. This wider view goes beyond achieving the objectives of the present research but also addresses the gap in the previous studies with its multi-dimensional approach in terms of theme by integrating technology with strategy and people. The new findings of this research concerning the organisational outcomes, strategic enablers, and cross-industry best practices can help to broaden the current knowledge base and enhance the subsequent BizTalk deployments.

V. FUTURE RESEARCH

Further study will be aimed at conducting primary information gathering by means of interviewing IT managers and system integrators to gain experience on the issue of implementing BizTalk. A wider picture can be seen through a comparative study with one of the other integration platforms, such as Mulesoft or Dell Boomi [30]. It is suggested that an organisation implementing BizTalk should invest in establishing preliminary planning, employee training as well and employee engagement. The introduction of a staged rollout plan and the accounting of integration purposes to business aims can give much improvement in results and minimise the risks of failure. Institutions of higher learning ought to come up with case-based materials to enable the deployment of the effective use of the middleware in a wide spectrum of industries.

VI. CONCLUSION

The aim of the present study is a thematic analysis of secondary qualitative data concerning the integration of IT systems with the help of Microsoft BizTalk Server. It exposed two of the predominant themes, such as the efficacy of BizTalk in improving system integration and efficiency of operations and the consistent problem that organisations exhibit when undergoing implementation. The results show that BizTalk is an effective integration tool, but it has to be accomplished with strategic planning, valuable resources, and organisational preparedness. The research makes contributions to the theoretical and applied knowledge as it fills the gaps in the literature and provides answers to problems of integration at the enterprise

level. The adoption of BizTalk should be balanced in terms of addressing technology, people, and processes.

VII. REFERENCES

[1] Honkavaara, E. (2017). Implementing enterprise application integration with cloud services.

[2] Selmeci, A. (2015). Workflow processing using ERP Objects. *Acta Cybernetica*, 22(1), 183-210.

[3] Chauhan, M. A., Babar, M. A., and Benatallah, B. (2017). Architecting cloud-enabled systems: a systematic survey of challenges and solutions. *Software: Practice and Experience*, 47(4), 599-644.

[4] Rosa-Sequeira, F., Basto-Fernandes, V., and Frantz, R. Z. (2018). Enterprise application integration: Approaches and platforms to design and implement solutions in the cloud. *Advances in Engineering Research.*

[5] Berglund, A., and Fredriksson, O. (2018). Can Microsoft Logic Apps replace Microsoft BizTalk?: An evaluation of integration platforms.

[6] Seroter, R., Brimble, M., Cooper, J., Dijkgraaf, C., and Morar, M. (2015). SOA Patterns with BizTalk Server 2013 and Microsoft Azure. *Packt Publishing Ltd.*

[7] Beckner, M., and Jones, D. (2017). Upgrading and Migrating to BizTalk Server 2016. *Walter de Gruyter GmbH & Co KG.*

[8] Machiraju, S., and Gaurav, S. (2018). BizTalk: Azure Applications. *Walter de Gruyter GmbH & Co KG.*

[9] Bygstad, B., Hanseth, O., and Truong Le, D. (2015). From IT silos to integrated solutions. *A study in e-health complexity.*

[10] Zikra, I., Stirna, J., and Zdravkovic, J. (2017). A quality-driven methodology for information systems integration. *Complex Systems Informatics and Modeling Quarterly*, (12), 39-65.

[11] Tatra, D. (2015). Impact of Enterprise System roll-out project–CRM system upgrade & deployment.

[12] Hanson, J., Ohlsson, J., Ertan, N., Johannesson, P., Wernmo, S., Schjødt-Osmo, O., ... and Hedlund, T. (2015). P2PIE: a New Enterprise Application Integration Solution 60-70. *In CAiSE-2015 Industry Track co-located with 27th Conference on Advanced Information Systems Engineering (CAiSE 2015) Stockholm*, Sweden, June 11, 2015 (pp. 60-70).

[13] Elbardan, H., Kholeif, A. O., Elbardan, H., and Kholeif, A. O. R. (2017). An interpretive approach for data collection and analysis. *Enterprise resource planning, corporate governance and internal auditing: An institutional perspective*, 111-165.

[14] Terry, G., Hayfield, N., Clarke, V., and Braun, V. (2017). Thematic analysis. *The SAGE handbook of qualitative research in psychology*, 2(17-37), 25.

[15] Liu, S., and Li, J. (2015, October). Analysis and Realization of Eliminate the "Information Isolated Island" in Enterprise E-commerce. In 2015 3rd International Conference on Mechatronics and Industrial Informatics (ICMII 2015) (pp. 611-616). *Atlantis Press.*

[16] Seroter, R., Brimble, M., Cooper, J., Dijkgraaf, C., and Morar, M. (2015). SOA Patterns with BizTalk Server 2013 and Microsoft Azure. *Packt Publishing Ltd.*

[17] Akinsola, A. (2018). Evaluation of JSON-API-Format REST API for Business-to-Business Integration Scenarios.

[18] Morar, M., Kumar, A., Abbott, M., Gautam, G. K., Corbould, J., and Bhambhani, A. (2017). Robust Cloud Integration with Azure. *Packt Publishing Ltd.*

[19] Jackson, K. L., and Goessling, S. (2018). Architecting Cloud Computing Solutions: Build cloud strategies that align technology and economics while effectively managing risk. *Packt Publishing Ltd.*

[20] da Cruz, D. R. (2018). Service Integration Framework for TIBCO ActiveMatrixR BusinessWorks TM 6.

[21] Kuate, G. B. F. E. (2017). Business Process Reengineering in Integrating Enterprise Resource Planning (ERP) and Bank Systems in Consulting Companies: A Case Study of Parity Software in South Africa. *University of Johannesburg (South Africa).*

[22] Briggs, B., and Kassner, E. (2016). Enterprise Cloud Strategy: Enterprise Cloud epUB _1. *Microsoft Press.*

[23] Banerjee, A. (2018). Blockchain technology: supply chain insights from ERP. In Advances in computers (Vol. 111, pp. 69-98). *Elsevier*.

[24] Ranjan, R., Benatallah, B., Dustdar, S., and Papazoglou, M. P. (2015). Cloud resource orchestration programming: overview, issues, and directions. *IEEE Internet Computing*, 19(5), 46-56.

[25] Vrhovec, S. L., Hovelja, T., Vavpotič, D., and Krisper, M. (2015). Diagnosing organizational risks in software projects: Stakeholder resistance. *International journal of project management*, 33(6), 1262-1273.

[26] Alfaki, I., and Ahmed, A. (2017). From oil to knowledge: Transforming the United Arab Emirates into a knowledge-based economy. *Routledge*.

[27] Honkavaara, E. (2017). Implementing enterprise application integration with cloud services.

[28] Takala, O. (2015). Invoice process analysis and development. Case: *Power and automation technology company.*

[29] Mántaras, A. (2018). A BizTalk Server Tale. In BizTalk Server 2016: Performance Tuning and Optimization (pp. 501-519). *Berkeley*, CA: Apress.

[30] Rajesh, R. V. (2017). Spring 5.0 Microservices. *Packt Publishing Ltd.*