Data Migration Technique Options on Reforming Jiwasraya's Existing Database

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Abstract - *PT Asuransi Jiwasraya has been facing a crisis since 2020, which later probably demand them to reconstruct their insurance policy. Nothing is decided aside from the reconstruction idea. This is a hard task to deal with as there is a high risk to be borne along. In the worst case, bankruptcy awaits. As technology has taken over most industries, including insurance, it is only normal for the company to take advantage of the applied technology. However, it is still unknown whether the database used could help fulfill the mission. Considering loads of data might be higher by year, it will be more efficient to use the integrated database to transfer the whole data into a new-adapted database rather than creating a new one and manually adapt then add the data. This could be done by doing a Bottom-up approach that occurs in two big steps. This is the safest choice now which is handy and possible.*

Keywords: Database Integration; Digital Technology in Insurance, Jiwasraya Insurance.

I. INTRODUCTION

Insurance has been one familiar aspect of society. As life provides nothing but uncertainty, people go for insurance to get assurance in return. Therefore, the insurance industry is considered as one of the high growth fields nowadays. Exceedingly, the COVID-19 breakout brings horror along. No wonder the number of insurance companies increases as the customer rate soared.

PT Asuransi Jiwasraya was one of them. However, a case of corruption goes public in 2020, resulting in a decrease in fame. The case has been in progress. According to Trihatmoko and Kuncoro (2021), this would be solved by either liquidation, recapitalization, merger and holding, privatization, or recapitalization and privatization. Whichever way, there is one sure impact left by this problem, there would be a need to do reconstruction on their insurance policy that results on their whole database. In this study, we ought to analyze how the database usage is going to leave an outcome.

The database has been widely used as a method of data management. Almost every industry has been in touch with the database concept itself as each has loads of data stored for needs. However, not so many cases require mass data movement, nor reconstruction. As for PT Asuransi Jiwasraya, it is one of the biggest steps to work on after the announcement of their insurance policy reconstruction to lessen the loss caused by corruption.

This means the whole database is going to be readapted as insurance policy plays the primary key role and is most likely always related to any other data stored. It is still unknown if the usage of the database itself brought convenience to the process or otherwise. Therefore, we try to study how the database using both, directly and indirectly, affects this whole project. While working on it, we would like to find out which method best suited the requirements of this case.

PT Asuransi Jiwasraya is an insurance company with one hundred and sixty years of journey. Throughout the journey, it had gained its investors' trust with great financial statements from year to year. However, in 2019, the company suffered a big amount of loss that comes around sixty-two trillion rupiahs (Gusti, 2019). Around forty-nine trillion was counted as debt. This is a long-time loss calculated by years as Jiwasraya has always faked its financial statements, but it came big because the management of Jiwasraya, unfortunately, placed a wrong investment that was soon tailed with a bigger loss.

II. METHODS

This research was conducted using the literature review method of study. Therefore, we analyzed the case based on the previous example collected in the field of the database, insurance, and digitalization. To tone down the topic, we used one research question as our focus.

2.1 Literature Study

As for data and information collecting regarding the topic, we used https://scholar.google.com as our main search engine with database, distributed database, database integration, technology, insurance, Jiwasraya Insurance, database in an insurance company, digital technology in insurance, and digitalization in insurance as our keywords. From approximately fifty-three papers regarding the mentioned issue, we filtered them down based on their publication year and only used those published among the last five years as reference. A similar case was not found, but we believe other cases could also bring justice to this study. Thus, we ended using nineteen papers which we concluded as the most relatable ones.

2.2 Research Question

The main purpose of this research is to answer how does database relates to the policy reconstruction of PT Asuransi Jiwasraya. Recently, Jiwasraya suffered a huge loss due to several committed corruption inside the company. This surely gained a lot of interest. So, to prevent anger from both public and existing customers, Jiwasraya goes down the option of restructuring policies that can be saved. Far before the case itself, Jiwasraya has always been using a database as their way of storing and managing data that has become one with their system. In this process, the database will be cleaned as Jiwasraya goes back in touch with their customer by accessing the stored data. Customers' data will be checked again if they are willing to deal with a new policy and updated if needed. Otherwise, all the data will vanish. Upon the fresh data, Jiwasraya may start to move the latest and corresponding data to a new database.

III. RESULTS AND DISCUSSION

Based on the literature review done, there are several possibilities that we cannot overlook. Most of the research we have studied points out a few possibilities available.

3.1 Solutions

PT Asuransi Jiwasraya has been known to experience a serious problem which issue starts at the beginning of 2020 (Trihatmoko *et al.*, 2021). The case was said to face two dilemmatic choices between "the company to be liquidated or run again". However, it

Table 1 List of Relevant Publications

No	Title	Author	Publication Year	Purpose	Method and Model	Dataset/ Sample	Evaluation & Result	Conclusion
1	Enhance Confidentiality by the usage of a Database Management Framework Features to Facilitate Applications Integration	Iqbal, H., Habli, M., & Zeki, T.	2020	To find a way to improve the efficiency of file sharing using database management framework features.	Research Work, Proposal Design, The Prototype	8	Development of SAQeLSql query interface to remove the need in the name and key of the customer, provide additional details about the efficiency of operations, exploring how to return details about the implementation directly through DB2 application, and how to stop using an automatic failover to do so.	There is a way to improve the efficiency of file sharing using database management framework features, which will include various software and searching for DB2 software to install SAS systems.
2	Insurance Transformed Technological Disruption	Naylor, M.	2017	To show how technology transforms the industry of insurance.	Qualitative research by studying literature related to the topic.	20	Technological disruption brings a reduction in human services costs.	Technology transforms the insurance industry from an economical side by reducing human services costs.
3	Use of Information Technology in Insurance Industry	Shinde, O.	2019	To help readers understand and highlight the importance of Information Technology in the Insurance Industry.	Qualitative research by studying literature related to the topic.	Various	There are demands of technology usage as the trend changes and customers' demand raises, so insurance companies should be aware and able to identify the specific needs to offer relevant products and services to their customers.	Information Technology is concluded as something important as the existing technologies have been seriously taken into consideration while calculating potential advantages and costs for installing such technologies. The bigger the company is, the bigger needs and costs await
4	Impact of Technology on Insurance Industry	Mosleh, N.	2019	To show how big the growth of technology affects and challenges the insurance industry.	Qualitative research by studying gained information and data related to the topic to generate a specific conclusion.	Various	There would be lots of profits and challenges along the way so mentorship, apprenticeship, and training must be utilized to rejuvenate the workforce after the old generation exit, and insurers should embrace the radical and incremental technology innovations to enhance their insurance products and explore new distribution channels to be able to survive and overcome the future challenges.	The industry is extremely affected by technology as it is poised to affect beneficial means by which it will cater to the challenging times ahead while it continues to do business. So, the industry itself needs to adapt depending on the growth process of technology.
5	Contribution of Technology to Insurance in Indonesia	Safitri, K. A.	2020	To describe how technology contributes to the development of insurance in Indonesia.	Qualitative research by doing a literature review and followed by hypothesis testing.	13	Insurance industry policymakers should start developing online premium policies and online claim systems.	The technology could contribute to the development of the insurance industry in Indonesia by providing online services like premium policies and a claim system.
6	Application of Big Data Technology in Insurance Innovation	Zheng, L., & Guo, L.	2020	To learn how big the influence left by the application of big data to the insurance industry.	Qualitative research by doing a literature review and followed by an analysis of past cases.	Various	Digital technology represented by the Internet, mobile networks, social networks, cloud computing, and big data increasingly influences the daily operation of the industry and will usher in a golden development period in China's insurance industry.	The application of big data leaves more positive sides to the insurance industry, but the fact that there are challenges brought could not be ignored. Thus, strategies are needed.

No	Title	Author	Year	Purpose	Method	Sample	Findings	Conclusion
7	Is Distributed Database Evaluation	Seybold, D., & Domaschka, J.	2017	To ensure how ready the distributed database evaluation cloud is to be used.	Qualitative research by doing literature reviews and followed by an analysis of current framework compared to the ideal achievement wanted.	8	The result of this analysis shows that the performance, scalability, elasticity, and consistency tiers are well covered, while resource selection and availability are not considered by existing evaluation frameworks. Traditional requirements are covered, while cloud-centric requirements such as orchestration are only partially supported.	The distributed database evaluation cloud is only half ready so it's not yet able to be used
8	Distributed Database Problems, Approaches and Solutions—A Study	Rana, M. S., Sohel, M. K., & Arman, M. S.	2018	To learn the problems that usually occur on distributed databases and find both the best approaches and solutions which suit the case.	Qualitative research by doing literature review with case study approach on similar cases.	Various	Each approach suits only some kind of case, it is important to learn the case thoroughly before choosing an approach and solution. To maintain mutually reliable data in all sites, replication control procedures need to be implemented.	The problem areas declared in the paper are very useful while implementing distributed database so that concurrency, deadlock, replication control, security, and privacy is easily managed. Yet, each case has its own best approach and solution for sure.
9	Database Integration Based on Combination Schema Matching Approach (Case Study: Multi-database of District Health Information System)	Rachman, M. A. F., & Saptawati, G. A. P.	2017	To learn how the multi-database of District Health Information System is best integrated.	Qualitative research by doing literature reviews and followed by experiments on datasets.	3	From some experiments that have been done considering the elements of semantic conflict on schema identification, hybrid combination schema matching can be used for query rewriting on multi-databases. The limitations of this research are: (1) element-level matching is restricted to local cardinalities of 1:1, and (2) query rewriting is still limited to the same DBMS. For future work, the schema matching techniques that have been used can be combined with other techniques to produce a more accurate matching schema in query rewriting.	Hybrid combination schema matching can be used for query rewriting on multi-databases to meet the best-integrated condition, but there are some limitations. So, it would be better if combined with other techniques.
10	A Review on the Settlement of 'Jiwasraya' Case: A Study of Governance of State-Owned Enterprises (SOEs) Based on the Indonesian Economic Constitution	Trihatmoko, R. A., & Kuncoro, M	2021	To study how the case of PT Asuransi Jiwasraya is possibly going to be settled.	Qualitative research by doing literature review with case study approach on similar cases.	50	Constitutionally the government could take policies in solving the Jiwasraya case, namely liquidation, recapitalization, merger and holding, privatization, or recapitalization and privatization.	The case of PT Asuransi Jiwasraya is possibly going to be solved by liquidation, recapitalization, merger, and holding, privatization, or recapitalization and privatization.
11	Big Data Platform Architecture under The Background of Financial Technology: In the Insurance Industry as An Example	Yi Liu, Jiawen Peng, and Zhihao Yu	2018	improving financial efficiency and reducing the cost of financial transactions is an important driver in insurance.	Qualitative Research	16	As big data technology matures, sparks collide with each other innumerable	Big Data platforms combined with space-time data can integrate their own data resources but can also come from many products, on cost reduction, risk prevention in business is helpful.
12	Digital technology in insurance	A. A. Mustafina, G. N. Kaigorodova, P. D. Alyakina, N. Y. Velichko, and M. R. Zainullina	2020	studying the impact of information technology on the development of direct insurance in Russia.	Mixed-methods Methodology	20	85% of insurance companies use IT solutions in the sales process. Currently, 75% of insurance companies are engaged in the introduction of new IT products and solutions.	Research materials are practically important for insurance companies, as they provide the concept of correlation between the digitization of the business and its level of profitability.
13	Wearables and the internet of things: Considerations for the life and health insurance industry	A. Spender, C. Bullen, L. Altmann-Richer, J. Cripps, R. Duffy, C. Falkous, M. Farrell, T. Horn, J. Wigzell, and W. Yeap	2019	to see the emergence of wearable technology and the internet of things (IoT) and its current and potential use in the areas of health and care.	Qualitative Research	51	general insurance community faster acting and products that integrate technology to improve the quality of underwriting and claims management become more common	Technology may be a major opportunity and threat to the insurance industry. technology can enable the sector to significantly increase old client engagement and trust issues and create a variety of new products
14	Challenges for the Insurance Industry in the Future.	Jack E. Nicholson	2019	Discussing some insurance-related developments and trends presented in May 2019 at Florida State University Future of Insurance Forum, including the role of technology and disaster exposure	Qualitative Research	57	Traditional insurers are challenged by new insurers, who are designing new business models to capitalize on inefficiencies that disrupt traditional markets.	The future insurance industry workforce must be flexible and creative, continue their education, think broadly about the global business environment, and prepare for rapid change.
15	Blockchain-based data management and analytics for micro-insurance applications	Hoang Tam Vo, Lenin Mehedy, Mukesh Mohania, and Ermyas Abebe	2017	Demonstrate blockchain-based solutions for managing and analyzing data transparently in pay-as-you-go car insurance applications	Quantitative Research	8	Data management issues. Some technical decisions need to be made when implementing blockchain technology as part of a database solution for microinsurance applications.	It still requires deeper research because it is expected that blockchain-based solutions to manage and analyze data transparently

16	Digitalization in insurance companies	Krzysztof ŁYSKAWA, Arleta KĘDRA, Lyubov KLAPKIV, and Jurij KLAPKIV	2019	Characterize the process of digitization in insurance companies through the application of information and communication technology (ICT)	Mixed-methods Methodology	44	The study examined the relationship between the information technology costs of selected insurance companies and the results of their activities.	digitization in insurance becomes an important topic in science; There is some ambiguity of understanding of definitions, structures, and mechanisms of digitization in insurance. Information technology is generally accepted as an attribute of digitization
17	Measuring Efficiency of Life Insurance Institution in Indonesia: Data Envelopment Analysis Approach	Aam Slamet Rusydiana, and Taufiq Nugroho	2017	The efficiency of the life insurance industry in Indonesia. The calculation of efficiency levels in this study is relative, not absolute. The approach used is Data Envelopment Analysis (DEA).	Literature Analysis and Comparative Method	17	The results have implications for the life insurance industry, both conventional and sharia in Indonesia	Life insurance both conventional and sharia needs to calculate the level of efficiency periodically to know the level of efficiency, potential improvement, and excellence in general in the framework of efficiency analysis.
18	The impact of digitalization on the insurance value chain and the insurability of risks	Martin Eling and Martin Lehmann	2018	Analyze the impact of digital transformation on the insurance sector using Porter's value chain	Mixed-methods Methodology	84	This paper is a comprehensive review of the impact of digitization on the insurance industry. It creates databases of studies, articles and working papers, and systematically evaluates the impact of digitization concerning Porter's value chain and Berliner's insurability criteria	So far there has been little academic research on digitization in the insurance segment. This seems surprising, given that digitization and big data offer enormous potential for empirical research.
19	Enacting actuarial fairness in insurance: From fair discrimination to behavior-based fairness	Gert Meyers, and Ine Van Hoyweghen	2018	The idea that insurance products should primarily be 'fair' to policyholders is increasingly voiced by commentators	Mixed-methods Methodology	67	Actuarial fairness is enforced by the insurance industry as a necessity of actuarial evidence to discriminate or segment policyholders in insurance.	In this article, we analyze the two ways in which actuarial justice, the descriptive neoclassical economic concept, is enforced in insurance practices and how this endorsement relates to changes in assumptions about economic actors.

was reported that the value and assets of the company were not enough to cover all the losses. So, it would be running all over again with adjustments made to the insurance policy.

A research study showed the dilemma between theoretical background and the practical realization of digitalization processes in insurance (Łyskawa, 2019). However, both the technology and insurance industry are now hard to separate. A study done provided a statement that the insurance industry is in a period of technology-driven change globally (Zheng *et al.*, 2020). Nowadays, technological developments in insurance companies in the international arena have developed rapidly (Mustafina *et al.*, 2020). This means, most of the process has gone through digitalization. In Jiwasraya's case, due to many customers, the company uses database-based storage so that data management can be done quickly and efficiently online. To improve efficiency, data management must be done using an automatic synchronization system so that all changes made will be updated immediately and well connected. Based on this, we could say that Jiwasraya followed the trend of any other similar cases for insurance companies, and the technology usage of those companies would be quite a fit for PT Asuransi Jiwasraya. Digitalization is the integration of the analog and digital worlds with new technologies that enhance customer interaction, data availability, and business processes (Nicholson, 2019). Spender *et al.* (2019) mentioned numerous relevant technologies in the fields of data acquisition and analysis (artificial intelligence, big data, Internet of things), data storage (blockchain, cloud computing), and communication (apps, chatbots, Roboadvisor, web pages, social networks, messenger, video calls, video platforms).

All of these bring new opportunities for business development. It can also be said that "financial technology" helps the insurance industry (Vo *et al.*, 2017). This is supported by Shinde, vocalizing that the role of IT in insurance has always been a critical one (Shinde, 2019).

Primarily, given the long-term nature of products sold, technology becomes a very key component for onboarding, retaining, and servicing customers. On the other side, there is also stated that most of the insurers in the industry will continue to implement new technologies in their mix to remain competitive while distributing it through new and old means (Mosleh, 2019). From here, we can assume that database as one familiar type of data-storing and management system is most likely has and will be consistently used in the industry. So, despite the changes in the insurance policy, it is safe to assume that the existing database would not be abandoned but modified or adopted instead.

The conclusion in the previous paragraph is also supported by the fact that it would be a hassle for the company to manually sort and change the data too. Literacy and public awareness about insurance have developed from year to year, so there must be a lot of data stored and it would take a literal long time to manually adjust them or build a brand-new database (Safitri, 2020). Yet, this change would leave inevitable damage since fundamentally, insurance is about the pricing and selection of risk (Naylor, 2017). However, both could have changed from one type to another depending on technology's growth and the change itself will be complex. It might be a solution, but not a completely safe one, as Eling and Lehmann (2018) stated that digitalization and automatization influence all the business processes (e.g., automated processing of contracts) and the decision-making process, including the risk assessment (e.g., automated underwriting with artificial intelligence and big data), digitalization changes existing products (e.g., telematics insurance) and allows new product offerings (e.g., cyber risk insurance). Rusydiana and Nugroho (2017) also provided support saying digitalization changes the way insurers and customers interact which made it more concrete that this could be a risky step. Worse, Meyers and Hoyweghen (2018) assumed that dynamics of adverse selection will result in the bankruptcy of insurance providers.

3.2 Analysis of Real Actions

From the technological point of view, there is a simpler and less risky method that could be used. All the data needed could be integrated into another database. This option is considered simpler since all the needed data will be transferred by the system and directly goes into a new database. Therefore, there won't be more effort and cost for data recollection which is not relevant as Jiwasraya has owned the proceeded data. Input would also be done by system and data that is no longer used will simply be excluded. By doing so, we could also lessen the time taken and the cost for human resources which we believe is important as Jiwasraya had gone through such a huge loss. Going this way, we could also lower data loss and security risk during the transfer. Throughout data migration, data across various separate data holders must be moved to one position where the convergence occurs (Iqbal *et al.*, 2020). Data holders will be obligated to control who handles their data and how they interpret it. Research showed that this is possible since the results point out that the evaluation tiers' performance, scalability, elasticity, and consistency are well supported, in contrast to resource selection and availability (Seybold *et al.*, 2017). Further, the analyzed frameworks do not support cloud-centric requirements but support classic evaluation requirements.

Another study supported this method saying that it is possible to use the bottom-up approach as it is used only when the distributed database already exists, and we just add another database to an existing setting (Rana, 2018). The bottom-up approach method occurs in two steps, namely Schema Translation and Schema Generation which both help the process of converting each data source schema into a common representation to make it easier to analyze and process (Rachman *et al.*, 2017). Using a big data platform combined with space-time data could integrate its own data resources and provide cost reduction, followed by risk prevention which is pretty much helpful for business (Liu *et al.*, 2018). This could also be an option. Usage of Big Data could be implemented by keeping all the data in cloud-based storage for both short and long periods. Data stored should be synchronized from both sides, named the data owner or the one that uploads it to the cloud and data editor or the ones that receive access to those data. By then, the editor may gain the old data right into their new database. Long-term usage would be helpful in the transition too, as the user could easily stick to their old database which they surely are more familiar with, and let the cloud synchronize the data for the new database. It could be constantly implemented until the new database is considered fit, comfortable, and familiar enough for users to completely move. Therefore, it is ultimately possible for PT Asuransi Jiwasraya to use one of the methods above to create and manage its new policy.

IV. CONCLUSION

Policy reconstruction of PT Asuransi Jiwasraya is a hard yet possible choice in an effort of reducing the company lost due to the case. Since moving and adapting all the data manually is a lot of work, the existence of a database used would be a great help. By applying the integrated database concept, the overall data could be directly moved to a new-adapted database. This solution is doable due to the nature of the old database is already organized. Well-organized data give the most benefit for effective queries and faster processes. Therefore, the company can access and mutate the data by doing specific queries that are needed. Mostly, it is an effective solution to move the entire data without any significant changes, except for adding and removing some fields. This solution may be used in many other industries by adjusting the data by manipulating it slightly. Nevertheless, the Cloud-centric database option might not be ready for use by now, but this could be an open choice for the future.

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