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**Potentials of Blockchain for Claim Management of Islamic Insurance (*Takaful*)
Operators in Malaysia**

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Abstract

As a result of its rapid rate of change, the *takaful* industry is now one of the most exciting industries in the digital era. Emerging technologies and innovations are now a means of streamlining and simplifying the current system. Blockchain technology has also piqued the industry's interest in innovations that enhance how *takaful* is traditionally assembled, purchased, and experienced. Therefore, this paper aims to investigate the potential for implementing blockchain technology in claim processing in Malaysia's *takaful* industry, where innovation is believed to serve the *takaful* participants as the primary beneficiaries and the *takaful* operators to a greater height.

Keywords: *Takaful*; Blockchain; Insurance; Digitalization

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1.0 Introduction

Islamic finance continues to pique the interest of society among not just Muslims, but also non-Muslims. Digitalisation and technology are predicted to contribute to the growth of Islamic finance and subsequently promote the local *takaful* industry's growth. In today's world, the global financial services business relies heavily on technology and automation, and the same can be said for the *takaful* industry, which is now required to utilise financial technologies (fintech) extensively to keep up with technological changes and remain relevant. The use of fintech in today's world is a must. In fact, Oktavia and Taufiq (2021) stated that technology itself can enhance the decision-making processes of Islamic financial institutions and increase economic sustainability. Hence, the *takaful* industry must apply technology and operate in a more efficient manner to improve its customer service and, ultimately, achieve the *Maqasid al-Shariah* (Muhamat & Azizan, 2022). By implementing the most recent technologies, the *takaful* sector may experience rapid development and customer acceptance globally (Billah, 2019).

One of the benefits of utilising technology in the goods of the *takaful* sector in this digital financial era is to improve people's financial development. For instance, the *takaful* industry may expand rapidly and be acknowledged globally through the implementation of new

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technologies. This would give *takaful* payers immediate market access and increase productivity (Billah, 2019). Elarag (2019) suggested that the insurance industry should utilise digital technology to improve efficiency, particularly as new technologies continue to exceed expectations, show exceptional capabilities, and grab the attention of governments and business leaders.

For many firms, digital transformation is considered essential, which is particularly true for the insurance sector. For instance, by utilising smart technology and real-time data, insurers can create a cutting-edge business model that prioritises consumer needs such as good customer experience and service (Radwan, 2019). In addition, blockchain is also a technology that has the ability to support Islamic economies around the world (particularly in the financial sector) to improve complex financing processes and to cut expenses in the processing system in the effort to achieve their objectives (Elarag, 2019). Additionally, the implementation of blockchain technology serves to successfully reduce the need for manual interactions within all organisations, which includes the insurance system. As a result, associated administrative and operational costs can be significantly reduced (Loukil et al., 2021).

The combination of security, decentralization, and transparency that blockchains offer will prove to be of great value in managing the growing complexity of the global system and they will empower customers and attract new participants to the market (Radwan, 2019). Blockchain technology has the potential to make a significant impact on the Islamic economy. The integration of blockchain technology in Islamic finance and banking is poised to greatly benefit Islamic banks and financial institutions. Islamic banking system will be able to function more efficiently without concerns about interest and other related issues. The fundamental characteristics of blockchain indicate that it has a significant future for application in Islamic finance due to the fact that it is transparent, secure, and provides information in real time. Based on its characteristics, blockchain technology can reduce insurance fraud by transferring insurance claims to an unchanging ledger.

Hence, the objective of the proposed study is to investigate the potential for implementing blockchain technology in claim processing in Malaysia's *takaful* industry. The study intends to achieve this objective by selecting blockchain technology, which provides several characteristics elaborated in the following sections.

2.0 Literature Review

2.1 *Takaful*

The word "*takaful*" comes from the Arabic word "kafala", which means "joint guarantee". It refers to a financial transaction in which two parties aid and protect others (Billah, 2019). The concept of *takaful* is founded on the principles of mutual aid (*ta'awun*), mutual security and guarantee (*tadamun*), and mutual protection and assurance (*takaful*). Most researchers believe that the *takaful* sector has global growth potential, as Muslim scholars have devised *takaful* as an alternative to conventional insurance (Eldaia et al., 2020). In fact, in Malaysia, the *takaful* industry was established in response to the Muslim population's demand for a Shariah-compliant alternative to conventional insurance.

Table 1. Number of *Takaful* Operators in Malaysia

Operators	Ownership
AlA Public <i>Takaful</i> Bhd	Foreign
AmMetLife <i>Takaful</i> Berhad	Local
Etiqa Family <i>Takaful</i> Berhad	Local
Etiqa General <i>Takaful</i> Berhad	Local
FWD <i>Takaful</i> Berhad	Local
Great Eastern <i>Takaful</i> Berhad	Foreign
Hong Leong MSIG <i>Takaful</i> Berhad	Local
Prudential BSN <i>Takaful</i> Berhad	Local
Sun Life Malaysia <i>Takaful</i> Berhad	Local
Syarikat <i>Takaful</i> Malaysia Am Berhad	Local
Syarikat <i>Takaful</i> Malaysia Keluarga Berhad	Local
<i>Takaful</i> Ikhlas Family Berhad	Local
<i>Takaful</i> Ikhlas General Berhad	Local
Zurich General <i>Takaful</i> Malaysia Berhad	Foreign
Zurich <i>Takaful</i> Malaysia Berhad	Foreign

(Source: Bank Negara Malaysia, 2021)

The *takaful* sector has grown rapidly in Malaysia, with 15 *takaful* operators licensed by Bank Negara Malaysia (BNM) (the Malaysian Central Bank). In Malaysia, the insurance market is divided between conventional insurance and *takaful* (Islamic insurance). The Insurance Act 1996 regulates the former, whereas the *Takaful* Act 1984 (that governs through Islamic rules and principles) regulates the latter (Islamic Financial Services Act, 2013). Malaysia's *takaful* business, which constitutes the two main categories of family *takaful* and general *takaful* packages, has faced continuous and increased competition from conventional insurance (Eldaia et al., 2020). Similar to conventional insurance, for instance, in the case of a disaster that causes material damage or loss, general *takaful* plans can help compensate individuals and businesses financially.

Malaysia has taken an integrated approach towards establishing an Islamic financial system that emphasises Islamic banking, *takaful*, Islamic funds, and capital markets. The central bank has also permitted *takaful* operators to be more innovative in offering products while still adhering to Shariah principles. In fact, Malaysia is one of the world's major *takaful* markets, and the *takaful* business has developed to become an important component in the worldwide Islamic financial system since its inception. Hence, despite the

competition faced from conventional insurance, the *takaful* industry has been able to sustain tremendous growth at 20.6% annual growth rate in the first nine months of 2022 compared to conventional insurance at 10.8% (Bernama, 2023). In fact, according to the Malaysia *Takaful* Association Annual Report, the latest 2022 data showed that the total gross contribution of family *takaful* amounted to RM10.06 billion as compared to RM8.5 billion a year earlier (Malaysian *Takaful* Association, 2022).

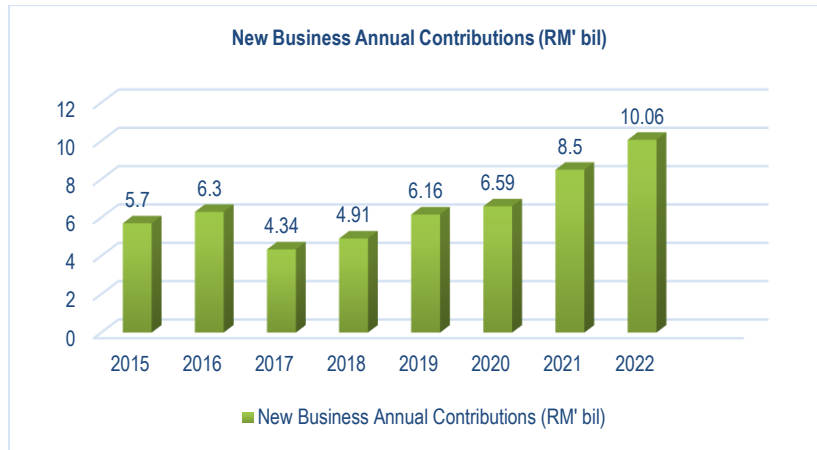


Fig. 1: New Business Annual Contribution
(Source: Malaysia *Takaful* Association, 2022)

2.1 *Takaful*tech

In today's era of the industrial revolution, there is a need for aspects of life to be operated swiftly, effortlessly, and securely. Therefore, technology is essential to meet the demands of the industrial era's rapid development, which has caused rapid changes and modification in all sectors (Oktavia & Taufiq, 2021). In the financial sector, the term "fintech" refers to a combination of technology and financial services that improve how financial companies conduct their operations as well as interact and engage with customers, regulatory bodies, and others in the sector. All types of companies, from start-ups to tech companies and established firms of all sizes, use fintech (PricewaterhouseCoopers International Limited, 2017). Along this vein, both the conventional and Islamic insurance industry have adopted technologies to facilitate digital communication with policyholders, coining the term "Insurtech".

The term "*Takaful*tech", like "fintech" and "Insurtech", has emerged as a new term in the financial service industry which combined the Arabic word *takaful* (insurance) and technology (tech) (Kader et al., 2010). This refers to innovations to allow insurers to better serve their clients by customising their policies to their specific risks and preferences. According Billah (2019), implementing the latest technology into *takaful* operations will help facilitate a more efficient distribution of information throughout the worldwide *takaful* network. Technology used by the management should include client feedback, online claim submission, and a statistical database to track claim progress. The advantages of technology in the insurance industry may include a lower probability of errors and a higher rate of automation. In fact, *Takaful*tech can be utilised for a wide range of transactions, such as payment, product information, registration, product quote, and claim processes. As a result, this may enhance customer service while reducing processing time (Oktavia & Taufiq, 2021). This change may also boost competition among *takaful* providers, which benefits customers by lowering costs while offering better services. Moreover, the utilisation of the latest technology within the *takaful* industry may also help in the distribution of information across the global *takaful* network (Billah, 2019).

2.2 Blockchain

Blockchain, also known as distributed ledger technology (DLT), is a protocol to exchange data online without an intermediary by creating a shared, encrypted record of transactions and data. A blockchain is a connected chain that stores verifiable data in blocks. Blockchain technology can assist in reducing prevalent forms of fraud in the insurance sector by transferring insurance claims to an unchangeable record. Blockchain technology has been proven to be a disruptive technology in numerous industries, such as finance, governance, commerce, and business. Blockchain technology has already influenced some changes in the financial sector. There are two main types of blockchains: public and private. Public blockchains are open to everyone and do not have a single owner. on the other hand, privileges allow private blockchains to manage who can access and update the ledger (Elasrag, 2019). Transparency is one of the benefits of blockchain technology, which allows regulators and auditors to identify any suspicious transaction patterns and market behaviour from the system. Blockchain technology also has the potential to bring in a new era of multilateral financing mechanisms and significantly reduce the rate of fraud and corruption in the growth of global health (Till et al., 2017). The implementation of blockchain technology is essential for the growth of numerous financial institutions, including *takaful* operators. *Takaful* operators can enhance their productivity by focusing solely on their responsibilities without being distracted by other issues. Furthermore, it has the potential to reduce the significant costs associated with Islamic finance by reducing the likelihood of fraud and risk associated with the practice (Elasrag, 2019).

3.0 Research Methodology

The primary objective of this research is to investigate the potential for implementing blockchain technology in claim processing in Malaysia's *takaful* industry. This study performed a systematic and comprehensive literature search to collect academic papers, reports, studies, and policy documents relevant to the use of blockchain technology in the insurance industry's claim processing. Reliable databases were utilised and academic journals were reviewed to conduct a thorough evaluation of the existing body of knowledge. An explicit inclusion and exclusion criteria were established to identify the most relevant literature for this study and ensure that the selected literature aligns with the research objectives. From this, key concepts, theories, and findings from the selected literature on blockchain technology's insurance potential were extracted. The extracted data were then analysed to identify common themes, patterns, and correlations pertaining to the utilisation of blockchain technology in the context of insurance claims processing. Qualitative analysis involves reviewing past literature to identify the potential in the implementation of blockchain technology for claim management of Islamic insurance *takaful* operators in Malaysia. According to Pillay (2018), this type of research was considered suitable due to the limited existing research in this field. Therefore, further studies will be needed to validate the findings.

4.0 Results

4.1 Blockchain in Claim Management

In the context of insurance and *takaful*, blockchain technology comes with numerous benefits and advantages for the insurance business where one of the advantages is that it can be performed automatically. It can be used to construct a platform that integrates customer data with the artificial intelligence of the *takaful* core system (Loukil et al., 2021). The technology can also identify, verify, and automatically determine medical claim mistakes, rejects, and possible denials issued in real time (Nair, 2019). It is believed that the implementation of blockchain technology could lower the amount of money invested for operating expenses by *takaful* companies, thereby improving their cost effectiveness (Radwan et al., 2020). Furthermore, blockchain may be able to securely store and promptly verify transactional data (VanderLinden et al., 2018). The Islamic finance sector can make use of blockchain in the form of smart contracts to help the sector recover from the financial effects of the pandemic. In addition, the technology allows for speedier claim processing as it can be exceedingly tedious, time-consuming, risky (due to human error) and inefficient to use a manual system for the claiming process. However, since the blockchain can speed up the creation and acceptance of claims, the claim process may be easier and inexpensive (Amponsah et al., 2021).

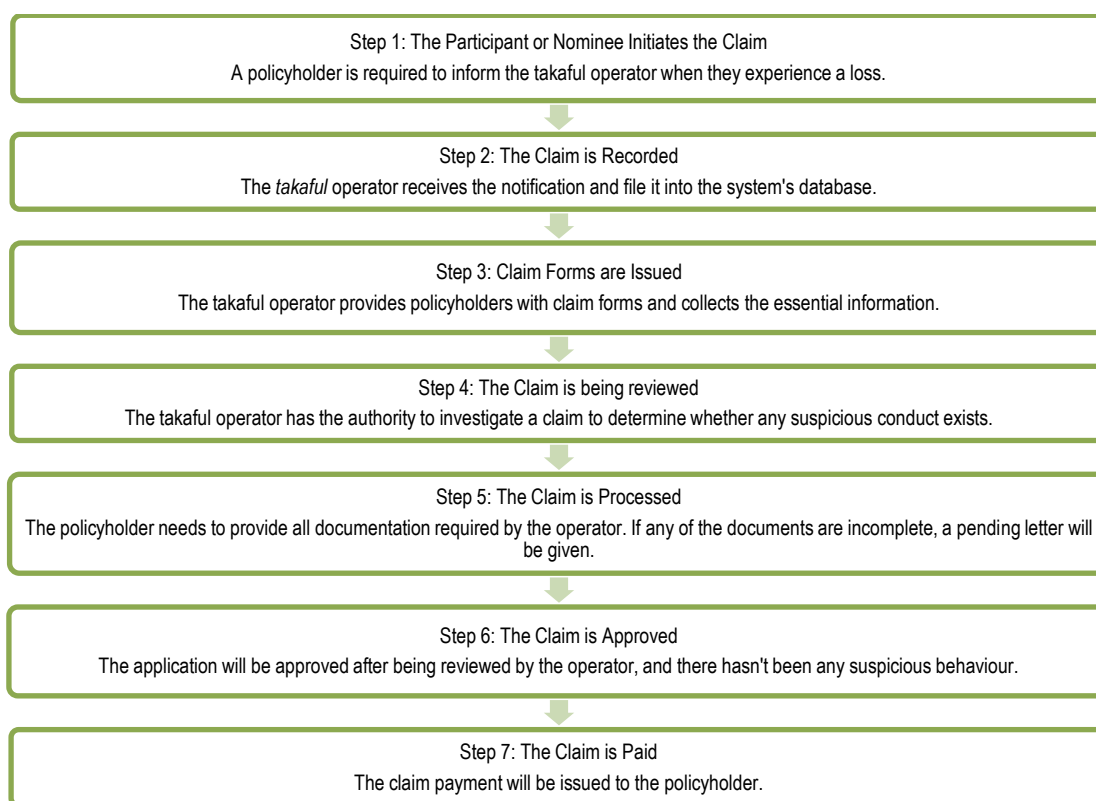


Fig. 2: Claim Process Flow
(Source: Malik & Ullah, 2019)

In short, blockchain can be viewed as an innovative data protection technology that can transform how the financial sector operates in the future. It also has the potential to improve complex financial activities and reduce costs in the back-end processing system and is expected to influence companies in the next 15 years (Elasrag, 2019).

Claim management covers the process of handling claims, where its objective is the prompt payment of claims to policyholders (Malik & Ullah, 2019). The use of digital technology is not restricted to just premium payment transactions but may also be applied to other types of transactions, such as enrolment and claims processing (Oktavia & Taufiq, 2021). Hence, claim processing helps insurance businesses with profitability, product development, and corporate business information. Nowadays, technology and software help reduce claim errors and human errors before and during claim process. Modern claim technology optimises claim processing so the management or underwriting can use the claims information to minimise investigative costs, enhance customer satisfaction, and introduce self-service processing (Capgemini, 2012).

According to the Malaysia *Takaful* Association's 2020 Annual Report, *takaful* operators receive a total of 8,185 claims in 2020, and approximately RM1.1 million was paid out in total claim amounts to policyholders. Hence, effective claim handling will improve the policyholder's experience, which enhances their engagement with the operators and the products (Capgemini, 2011). However, according to Capgemini (2012), several insurers still use manual procedures or systems that are insufficient for adapting to industry changes. As a result, this contributes to increased maintenance costs and reduced policyholder satisfaction. Hence, the advancement of technology is necessary to improve processing, reduce paperwork, speed up the completion of various duties, and limit human errors at the front end. Technology and software should also play a key role in reducing claim errors as the combination of technology with well-educated and trained workers is the most efficient strategy to limit human errors at the front end (Pillay, 2018). In addition, another attempt to improve claim handling is to use information technology to reduce fraudulent claims and improve policyholder protection through a variety of complaint forums. In the insurance industry, the processing time of transactions, the settlement and payment time of claims, and the execution security of the process are major concerns. The transaction based on the blockchain also seems to be faster than traditional transactions since it will not involve the banks (Loukil et al., 2021).

4.2 Fraudulent Claim

The most significant challenge for insurance companies nowadays is to detect insurance claims that contain fraudulent elements. In the insurance industry, "fraud" is any activity done by the policyholder or a third party to obtain benefits they are not legally entitled to (Patil & Godbole, 2018). It is one of the major concerns that affect fintech companies. According to Persatuan Insurans Am Malaysia (2021), technology allows fraudsters to target a large number of victims. In addition, insurance fraud is a major problem that forces all policyholders to pay extra for coverage (Persatuan Insurans Am Malaysia, 2021).

Based on the findings of KPMG (2022), fraud is the biggest fear of an organisation, where the number of reported cases of fraud that have been reported has increased by around 71% in 2021. This is particularly because the majority of insurance fraud cases are typically difficult and complicated as they involve various types of illegal activity. Hence, there is a need for insurance companies to have an advanced system to detect claim fraud. In fact, BNM has issued guidelines indicating that in order to prevent fraudulent claims or false claims, all *takaful* operators should have an effective support system (Bank Negara Malaysia, 2021). In this vein, the adoption of blockchain technology has the potential to serve as a preventive measure against fraudulent claims to mitigate the risk of financial loss for *takaful* operators (Nair, 2019).

To ensure that policyholders remain loyal to the operators, the operators are pressured to provide a high-quality experience to the customer, satisfaction to the policyholders, and the general value of the product or services given when a claim request is submitted. However, complicated insurance terms, expensive claim processing costs, long delays in processing, and strict underwriting procedures can lead to the growth of claim fraud cases (VanderLinden et al., 2018). Consequently, this can cause a deficit for the operator when there is a high volume of fraud involved in the claim process compared to the contribution paid (Muhamat et al., 2017). In short, fraud prevention nowadays depends significantly on technology and digitalisation. The prevention of fraud and other economic crimes is a difficult matter has progressively required the utilisation of advanced technological tools (PricewaterhouseCoopers International Limited, 2022). Utilising Blockchain technology enables efficient management of claims in a transparent, rapidly, and secure manner, while also preventing fraud and false reports of damage and injury.

4.3 Maqasid al-Shariah – Protection of Wealth

Maqasid al-Shariah refers to the goals and objectives of Islamic law's legislation. The *Maqasid al-Shariah* principles consist of protection of religion, protection of life, protection of intellect, protection of lineage, and protection of wealth (Ahmed, 2013). Both the Qur'an and the Hadith do not prohibit the protection of wealth. This is because humans are unable to predict what will occur, when, where, and how it will take place in the future, which are all within Allah's knowledge. Hence, in line with the element of *Maqasid al-Shariah*, the purpose of *takaful* in the protection of wealth is to protect assets and property from unexpected events and financial risks. The financial support received from *takaful* operators is thus used to sustain the standard of living prior to the occurrence of an unfortunate event (Muhamat & Azizan, 2022). By using advanced technology in the processing, policyholders can protect their wealth from fraudsters and help the operator be more efficient in the processing.

Efficient claims processing can reduce expenses, fraud, and the loyalty of the policyholder to the operator, which can also improve responsiveness towards policyholders (Radwan et al., 2020). By using blockchain technology, operators can verify claims and track the ownership of the property. Moreover, claims management through blockchain technology enables clients to track the claim process in real time, thereby eliminating uncertainty and lack of transparency (Nair, 2019). Blockchain technology also allows insurers to prevent fraud and enhance claims reviews by providing a transparent, unchangeable, and distributed ledger that cannot be edited, destroyed,

or manipulated (Radwan et al., 2020). These are thus consistent with the goals of *Maqasid al-Shariah*, which are to preserve wealth as blockchain technology has the ability to store huge amounts of information that cannot be manipulated. In addition, authorities and auditors can also identify potentially fraudulent transaction patterns and market behaviours due to this transparency (Loukil et al., 2021).

5.0 Discussion

The potential for the application of blockchain within the Islamic insurance (*takaful*) industry has been highlighted in this paper. Firstly, policyholders can monitor the current status of their claim in real time, which helps them avoid elements of claims that are unchangeable and ensures that only genuine claims are paid out. This can be independently verified by each party without involving a third party (Lewis, 2018). Secondly, utilising blockchain technology can automate claim applications and processing where the operators can use blockchain to automate choices based on third-party information. The other benefit would be a reduction in transaction risk and cost, as well as an improvement in untrustworthy processes (Amponsah et al., 2021). Moreover, administrative and operational costs can be minimised by reducing manual procedures between insurance systems (Loukil et al., 2021). Besides that, it has been shown that blockchain technology can be used to improve fundamental internal processes such as claim submission and processing, fraud detection, and prevention (Amponsah et al., 2021). Blockchain transactions are public and can be viewed by policyholders, which makes it difficult to make changes to policies, contracts and clauses (Nair, 2019). Hence, *Takaful*tech serves as a valuable tool in enhancing and simplifying the operational abilities of *takaful* operators, thereby enabling them to optimise their performance in their aim of achieving the *Maqasid al-Shariah* (Muhamat & Azizan, 2022). As a result, blockchain technology is important for both operators and policyholders because it is involved in the entire claim management process. In addition, there is the possibility of introducing new innovations into the process and expanding the market opportunities for this technology. Blockchain is a viable alternative to the operators for ensuring the transparency and security of policyholder data and transactions. It may help to resolve issues related to Sharia compliance, such as fraudulent claim transactions. It shows that, digitization and blockchain technology have the potential to have an impact on the daily transactions of the *takaful* industry, which in turn contributes to the expansion of the industry, significantly improves the efficiency of transactions, and expands access to financial services.

6.0 Conclusion

Islamic finance plays a crucial role in the expanding global economy. The revolution in *takaful*tech that has occurred over the last ten years has had an impact on the way in which innovations in *takaful* industry are emerging. The majority of *takaful* administrators will maintain their competitive edge by incorporating new innovations into their mix and delivering it through both traditional and innovative methods. *Takaful* operators can remain competitive through implementing this technology as a new innovation into the claim management process. Besides that, utilizing an immutable and decentralized ledger can help decrease fraud among *takaful* operators. Future research might explore more into how blockchain technology can be used in the process of claiming policies among *takaful* operators in Malaysia. In relation to this issue, it is recommended that researchers conduct additional research on the operators' perspectives regarding the implementation of this technology.

Paper Contribution to Related Field of Study

This paper contributes to further discussion in implementing blockchain technology for claim management of *takaful* operators in Malaysia.

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