

英汉语言差异

Bodkhe, U., Tanwar, S., Parekh, K., Khanpara, P., Tyagi, S., Kumar, N., Alazab, M., 2020. Blockchain for industry 4.0: A comprehensive review. IEEE Access 8, 79764–798.

原文

Abstract: Due to the proliferation of ICT during the last few decades, there is an exponential increase in the usage of various smart applications such as smart farming, smart healthcare, supply-chain & logistics, business, tourism and hospitality, energy management etc. However, for all the aforementioned applications, security and privacy are major concerns keeping in view of the usage of the open channel, i.e., Internet for data transfer. Although many security solutions and standards have been proposed over the years to enhance the security levels of aforementioned smart applications, but the existing solutions are either based upon the centralized architecture (having single point of failure) or having high computation and communication costs. Moreover, most of the existing security solutions have focussed only on few aspects and fail to address scalability, robustness, data storage, network latency, auditability, immutability, and traceability. To handle the aforementioned issues, blockchain technology can be one of the solutions. Motivated from these facts, in this paper, we present a systematic review of various blockchain-based solutions and their applicability in various Industry 4.0-based applications. Our contributions in this paper are in four fold. Firstly, we explored the current state-of-the-art solutions in the blockchain technology for the smart applications. Then, we illustrated the reference architecture used for the blockchain applicability in various Industry 4.0 applications. Then, merits and demerits of the traditional security solutions are also discussed in comparison to their countermeasures. Finally, we provided a comparison of existing blockchain-based security solutions using various parameters to provide deep insights to the readers about its applicability in various applications.

With the wide popularity of Internet and related technologies, various Industry 4.0-based applications have been used across the globe in which sensors and actuators sense, compute and communicate the data for industry automation. As in Industry 4.0-based applications, data between different locations flows using an open channel, i.e., Internet, so threats to security and privacy has also increased manyfold [1]. Such applications deal with data in large volumes and hence, so it is necessary to consider issues such as data heterogeneity, data integrity, and data redundancy along with the security and privacy concerns. Moreover, different applications require datasets from different domains in different formats. Therefore, it is also needed to standardize the data format so that it can be used by different Industry 4.0-based applications. The usage of smart phones and smart applications for personal, professional, and social activities is increasing exponentially across the globe. It results an increase in both the network data traffic (in GBs) and overall expenditure (in Billions USD) as shown in Fig. 1 (a) and (b) as per the report mentioned in [2], [3]. According to this report, smart industries would spend \$40B on IoT by 2020 in various sectors including transportation and manufacturing. However, due to the large number of data exchanges over the Internet, maintaining confidentiality, privacy, and integrity becomes a major issue in Industry 4.0 [4]. Moreover, according to the surveys conducted by different agencies [5], [6] nearly 60 millions people are affected by identity theft and 12 billion peoples records misused in 2018 and expected to increase to 33 billion by 2023 as shown in Fig. 2 (a). Fig. 2 (b) shows the 10 recent security breaches incidents reported till July 2018, which are expected to increase in the years to come.

译文

摘要： 由于过去几十年ICT的激增，各种智能应用的使用呈指数级增长，如智能农业、智能医疗、供应链和物流、商业、旅游和酒店、能源管理等。然而，对于上述所有应用，考虑到开放渠道的使用情况，即用于数据传输的互联网，安全和隐私是主要关注点。虽然多年来已经提出了许多安全解决方案和标准来提高上述智能应用程序的安全级别，但现有的解决方案要么基于集中式体系结构（具有单点故障），要么具有较高的计算和通信成本。此外，大多数现有的安全解决方案只关注少数几个方面，无法解决可扩展性、健壮性、数据存储、网络延迟、可审核性、不变性和可跟踪性问题。为了处理上述问题，区块链技术可以是解决方案之一。基于这些事实，在本文中，我们系统地回顾了各种基于区块链的解决方案及其在各种基于工业4.0的应用中的适用性。我们在本文中的贡献有四个方面。首先，我们探讨了智能应用程序区块链技术中当前最先进的解决方案。然后，我们说明了用于区块链在各种工业4.0应用中的适用性的参考体系结构。然后，对传统安全解决方案的优缺点进行了讨论，并对其对策进行了比较。最后，我们使用各种参数对现有的基于区块链的安全解决方案进行了比较，以深入了解其在各种应用中的适用性。

随着互联网和相关技术的广泛普及，全球各地都在使用种基于工业4.0的应用程序，其中传感器和执行器感知计算和通信数据，以实现工业自动化。与基于工业4.0应用程序一样，不同位置之间的数据通过开放渠道（即联网）流动，因此对安全和隐私的威胁也增加了许多[1]。此类应用程序处理大量数据，因此有必要考虑数异构性、数据完整性和数据冗余等问题以及安全和隐私题。此外，不同的应用程序需要来自不同域的不同格式数据集。因此，还需要标准化数据格式，以便不同的基工业4.0的应用程序可以使用它。智能手机和智能应用序在个人、专业和社交活动中的使用在全球呈指数级长。如图1（a）和（b）所示，根据【2】、【3】中提的报告，这导致网络数据流量（以GB为单位）和总体支（以十亿美元为单位）都有所增加。根据这份报告，2020年，智能产业将在包括运输和制造业在内的各个领投入400亿美元用于物联网。然而，由于互联网上的大数据交换，维护机密性、隐私性和完整性成为工业4.0的一个主要问题[4]。此外，根据不同机构进行的调【5】，【6】2018年，近6000万人受到身份盗窃的影响120亿人的记录被滥用，预计到2023年将增加到330亿，图2（a）所示。图2（b）显示了截至2018年7月报告的1起最近的安全违规事件，预计在未来几年还会增加。

英汉差异

• 原文

However, for all the aforementioned applications, security and privacy are major concerns keeping in view of the usage of the open channel, i.e., Internet for data transfer.

译文

然而，对于上述所有应用，考虑到开放渠道的使用情况，即用于数据传输的互联网，安全和隐私是主要关注点。

差异

There are obvious differences in logical thinking between English and Chinese: English is often "straight to the point", indicating the conclusion first, and then demonstrating, describing or telling the facts. It can also be simply summarized as "first result, then cause", that is, focusing on the first; The Chinese language is used to "step by step", and it is often discussed from facts to conclusions or from causes to consequences according to the development order of things, which can be simply summarized as "first cause and consequences", that is, focusing on "last". When translating from English to Chinese, we should pay attention to the difference in logical thinking. Specifically, on the basis of a correct understanding of the original logical relationship in English, the sentence structure in English is disrupted and the word order of the sentence is rearranged according to the expression of Chinese thinking logic.

• 原文

Although many security solutions and standards have been proposed over the years to enhance the security levels of aforementioned smart applications, but the existing solutions are either based upon the centralized architecture (having single point of failure) or having high computation and

communication costs.

译文

虽然多年来已经提出了许多安全解决方案和标准来提高上述智能应用程序的安全级别，但现有的解决方案要么基于集中式体系结构（具有单点故障），要么具有较高的计算和通信成本。

差异

Although passive voice exists in both English and Chinese, English prefers to use passive voice compared to water, especially in some formal written styles, such as technical English, medical English, etc. Sometimes, Chinese often use some passive sentences guided by "被", but more often they use active expressions to express passiveness, such as "让", "给", "由", "根据" and other words expressive sentences. Therefore, when translating from English to Chinese, try to translate passive sentences in English into active sentences in Chinese, especially some customary expressions, such as: it is said that..., it is generally considered that... and other conventional usages. Generally speaking, the subject of the English sentence can be turned into the object of the Chinese sentence, and then the passive voice part can be translated into the active part; if the English sentence has an actor guided by "by", it can be translated into the Chinese subject; If not, it can be omitted or supplemented as needed.

• 原文

With the wide popularity of Internet and related technologies, various Industry 4.0-based applications have been used across the globe in which sensors and actuators sense, compute and communicate the data for industry automation.

译文

随着互联网和相关技术的广泛普及，全球各地都在使用各种基于工业4.0的应用程序，其中传感器和执行器感知、计算和通信数据，以实现工业自动化。

差异

Although English sentences are combined according to certain rules and their structure can be known at a glance, English is also accustomed to using ellipsis. On the one hand, omission is for brevity and avoid repetition; on the other hand, due to the strict structure of English sentences, even if some elements are omitted, it will not hinder the expression of its meaning. However, for non-native English-speaking Chinese students, it brings difficulties in understanding and translation. This is mainly because: on the one hand, lack of necessary understanding of English logical thinking and expression; The vocabulary of the comparison is often the more expressive, the more I feel that it is not enough, and the more I want to add explanations. Therefore, when translating from English to Chinese, we must pay attention to the respective usage habits of English and Chinese. When analyzing English sentence structure, especially when encountering abnormal structures, be sure to consider whether there is omission. Although the phenomenon of omission in English is common, almost all components can be omitted, but its omission has certain rules: the omission must appear before it, or some grammatical omission, such as attributive When the antecedent pronoun in the clause is the object, the omission of "if" in the subjunctive language, etc.