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Faculty of Architecture, Planning and Surveying (FSPU)
and,
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Malaysia

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A REVIEW OF CONSTRUCTION WASTE MANAGEMENT AND INITIATIVES IN MALAYSIA

Noor Rizallinda Ishak*, Siti Akhtar Mahayuddin
Department of Building, Faculty of Architecture Planning and Surveying, Universiti Teknologi MARA, Perak Branch, Seri Iskandar Campus, Seri Iskandar,32610 Perak,Malaysia

Abstract:

Construction industry is considered as one of the major stimulant industries that not only generates wealth, but also the social and economic growth of the country. However, this industry also produces large amounts of waste from the construction activities. This paper is set out to analyse the existing literature on construction waste management in Malaysia and the initiatives that have been implemented in the Malaysian construction industry. Systematic reviews have been carried out on the initiatives that have been implemented on construction waste management in Malaysia. This study is guided by the PRISMA Statement (Preferred Reporting Items for Systematic reviews and Meta-Analyses) review method, a systematic review of the Scopus and Web of Science databases of which has identified 17 related studies. Further review of these articles resulted in four main themes namely technology, strategies, enforcement and also procurement. These four themes further produced a total of 14 sub-themes. A total of 35 studies focused on the strategies initiative which reported the highest number of study areas, followed by enforcement initiative with 16 studies. Next is technology initiative reported 11 studies and the least was procurement initiative with 10 studies. Thus, these initiatives show their positive impact to the environment and the construction waste management practice in Malaysia

Keywords: *systematic review, construction waste, construction industry, initiatives, Malaysia.*

1.0 INTRODUCTION

The exponential growth of construction activities and their associated waste have given rise to construction waste management (CWM) around the world. The growing urban population has become a catalyst for economic growth, making substantial impact particularly on the construction industry (Esa et al., 2017). A construction and demolition (C&D) waste, using interchangeably with the term construction waste, refers to the solid waste that arises from construction activities, such as new building, site formation, renovation, or demolition (HKEPD, 2019; Begum et al., 2007; Roche and Hegarty, 2006). Construction and demolition (C&D) waste normally forms a significant portion of total solid waste. According to Maués et al.(2020), approximately 35% of the solid waste generated in the world comes from construction and it is usually disposed of in landfills or uncontrolled or inadequately maintained locations. Therefore, it is certainly a sector that is worth shaking up. Without proper management, construction waste will cause severe damage to the natural environment and quality of life.

Construction waste is the material that was made by human and industrial activities that has no residual value. Construction waste can be categorized into two groups of construction waste which are physical waste and non-physical waste. Physical waste from construction sites can be known in the form of material waste such as concrete, timber, steel and others. Disadvantages of physical wastes are their impacts to project cost and also adverse impacts to the environment. Non-physical wastes are the time and cost overrun for the construction project. This problem can become critical when the project has to be stopped and thus lead to project abandoning. There are many factors that lead to the waste at construction sites. Several factors identified are inadequate monitoring and controlling, lack of coordination between parties, slow information flow between parties, shortage of technical personnel (skilled labour), changes in material specification, effect of weather, poor site management and

supervision, lack of experience, inadequate planning and scheduling, mistakes and errors in design, mistakes during construction, incompetent subcontractors, rework, frequent design changes, and low labour productivity (Sasitharan Nagapan et al., 2012).

In Malaysia, the rapid development of the construction industry led to a lot of waste generated due to increasing infrastructure projects, commercial and housing buildings (Begum et al., 2010). In 2016, about 35,335 tons per day of waste disposed of in landfill and waste expected to be generated by Malaysian in the year 2020 is approximately 16.76 million tons (Taha 2016). In order to solve this issue, Malaysia needs strong support from all stakeholders to effectively manage the construction waste in Malaysia(Rahim et al., 2017). Hence, it is vital for the Malaysia government to address this issue by providing comprehensive legal enforcement in regards to the construction waste minimization. This paper is set out to analyse the existing literature on construction waste management in Malaysia and the initiatives that have been implemented in the Malaysian construction industry.

2.0 METHODOLOGY

In this section the method used to retrieve articles related to construction waste management and initiatives in Malaysia is discussed. The reviewers used the method called Preferred Reporting Items for Systematic reviews and Meta-Analyses, which includes resources (Scopus and Web of Science) used to run the systematic review, eligibility and exclusion criteria, steps of the review process (identification, screening, eligibility) and data abstraction and analysis.

2.1 PRISMA

The review was guided by the PRISMA Statement (Preferred Reporting Items for Systematic reviews and Meta-Analyses). The PRISMA Statement allows for rigorous search of terms related to construction waste management and initiatives in Malaysia.

2.2 Resources

The review relied on two main journal databases – Scopus and Web of Science (WoS). WoS is a robust database consisting of more than 33,000 journals with coverage of over 256 disciplines including subjects related to environmental science, social science, and management. WoS includes over 100 years of comprehensive back file and citation data, established by Clarivate Analytics and ranks them by three separate measures: citations, papers, and citations per-paper. Scopus is the second database used in the review. Scopus is one of the largest abstract and citation databases of peer-reviewed literature with more than 22,800 journals from 5000 publishers worldwide. Scopus consists of diverse subject areas such as environmental sciences, social science and engineering and energy.

2.3 Eligibility and exclusion criteria.

Several eligibility and exclusion criteria are determined. First with regard to literature type, only journal articles with empirical data are selected which means article reviews, book series, books, chapter in books and conference proceedings are all excluded. Secondly, in order to avoid any confusion and difficulty in translating, the search efforts excluded the non-English publication and focused only on articles published in English. Thirdly, with regard to timeline, a period of 13 years is selected (between 2007 and 2020), an adequate period of time to see the evolution of research and related publications. Lastly, in line with its objective which focuses on Malaysia, only articles in Malaysia are selected (see Table 1).

Table 1: The inclusion and exclusion criteria

Criterion	Eligibility	Exclusion
Literature type	Journal (research articles)	Book series, book chapter in book
Language	English	Non-English
Timeline	Between 2007 and 2020	<2007
Indexes	Social Science Citation Index	Science Citation Index Expanded
Country	Malaysia	Other Countries

2.4 Systematic Review Process

Four stages were involved in the systematic review process. The review process was performed in August 2020. The first phase identified keywords used for the search process. Relying on previous studies and thesaurus, keywords similar and related to construction waste, and initiative were used (Table 2). At this stage, after careful screening, three duplicated articles were removed. The second stage was screening. At this stage, out of 564 articles are eligible to be reviewed, a total of 459 articles were removed. The third stage is eligibility, where the full articles were accessed. After careful examination, a total of 88 articles were excluded as they are not empirical. Other factors of being excluded are because the articles do not focus on construction waste, initiatives practices and Malaysian context. The last stage of review resulted in a total of 17 articles that were used for the qualitative analysis (see Figure 1).

Table 2: The search string used for the systematic review process

Databases	Keywords used
Scopus	TITLE-ABS-KEY (("construction waste" AND (initiativ* OR strateg*))
Web of Science	TS = KEY ("construction waste" AND (initiativ* OR strateg*))

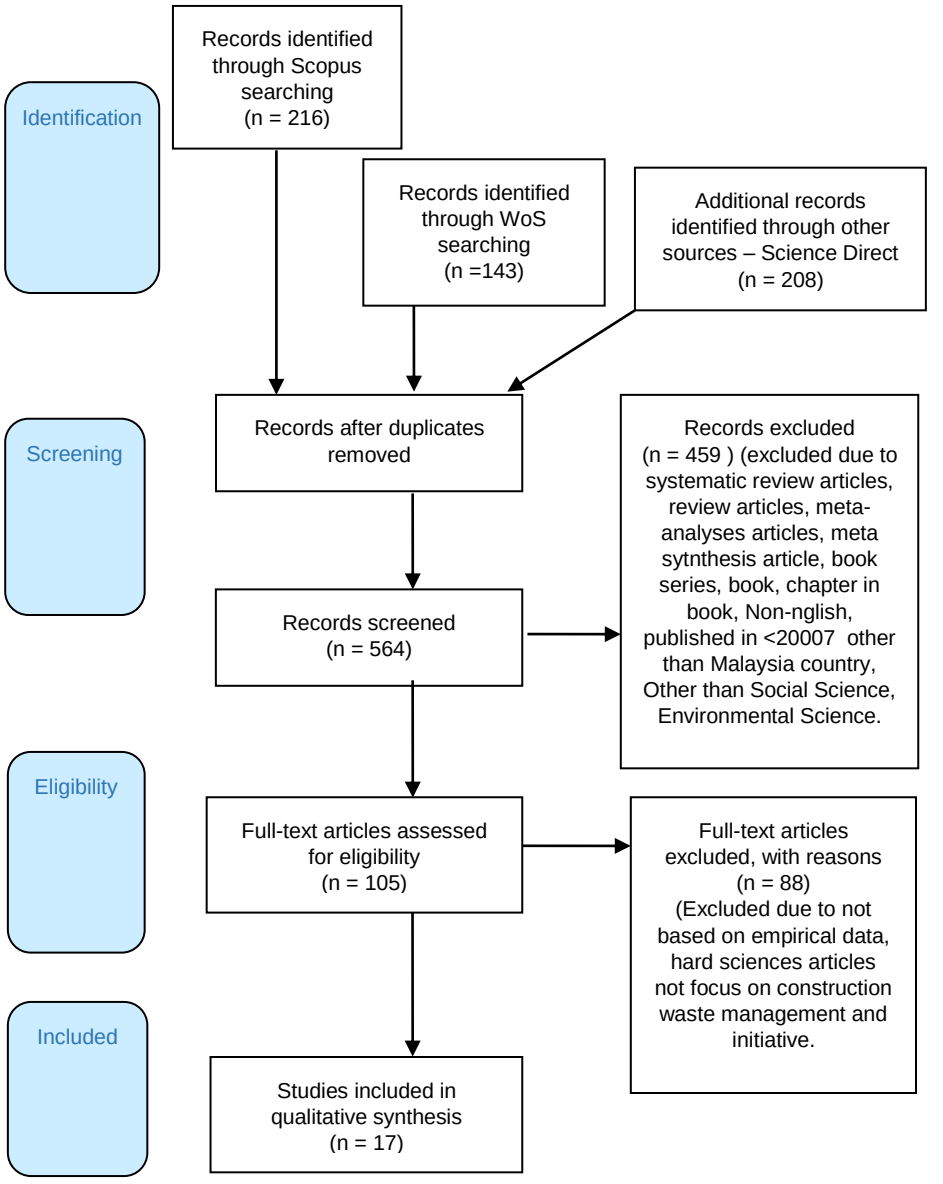

Figure 1. The Flow Diagram of the study
(Adapted from Moher et al., 2009)

2.5 Data Abstraction and Analysis

The remaining articles were assessed and analysed. The data were extracted by reading through the abstracts first, then the full articles (in-depth) to identify appropriate themes and sub-themes. Qualitative analysis was performed using content analysis to identify themes related to initiative of construction waste management. Then sub-themes were organized around the themes established by typology.

3.0 RESULTS AND DISCUSSION

The review resulted in four main themes and 14 sub-themes related to initiative implemented. The four main themes namely are technology (three sub-themes), strategies (four sub-themes), enforcement (three sub-themes) and procurement (four sub-themes) (Table 3). The results provided a comprehensive analysis of the current initiative implemented in Malaysia. A rigorous review sourced from two data based has resulted in 17 articles related to waste management and initiative in Malaysia.

3.1 Technology

A total of 11 studies focused on technology as one of the initiatives in order to have a good waste management practice. The most common technology practice is Industrialized Building System (IBS) (6 studies) while 3 studies found that Building Information Modelling (BIM) and Geographic Information System (GIS) found to have 2 studies. The use of IBS components for building constructions is an effective waste minimization solution for the general project and commercial project in the construction industry. The most important benefits of this system are reduction of the overall cost, time, manpower, produces better quality buildings and improves the environmental performance for overall site conditions. (Ashikin Suhaini et al., 2019). Meanwhile BIM was helping in reducing construction waste generation by enhancing the communication reaching extent to all parties involved, establishing a constant collaboration among them and reducing probable errors and thus will increase efficiency in energy, resources, materials savings (Wai et al., 2020). GIS is one of the mapping tools that help with the familiarization with amount and composition of construction waste generated and the flow of where these waste will be directed to in a given geographical area. (Wai et al., 2020; Manoharan et al., 2020). Therefore, a more effective and acceptable waste management practice is through innovation of technology.

3.2 Strategies

A total of 35 studies focused on the strategies initiative. The most common strategies practice are 3Rs which reduce reuse and recycle practice. Majority of the study reported that 3Rs is the best initiative in order to have the best waste management practice. Awareness reported 15 studies which is second highest studies in the strategies practise. Meanwhile training reported 9 studies and lastly initiative through award was found the least total studies accounted for 5 studies in the strategies practise. 3Rs principle known as the hierarchy of waste management which is arranged in the ascending order of their adverse impacts to the environment from low to high. These practices or initiatives tend to be the favourable exercise among construction players (Esa et al., 2017a; Esa et al., 2017b; Saadi et al., 2016; Manoharan et al., 2020). In practice the level of awareness of construction waste is relatively low as seen from little measures taken against the issue. Therefore, it is vital to increase the level of awareness among stakeholders involved in the construction industry. Hence the attitude of each individual engaged with the project directly influences waste levels. (Othuman Mydin et al., 2014; (Ng et al., 2018; Abidin et al., 2020; Nagapan et al., 2013; Esa et al., 2017b; Saadi et al., 2016; Sa'adi et al., 2016). Meanwhile, training practice needs to be implemented as one of the induction way to prevent waste on-site and along with that award should be given for those who highlighted success in the program. (Manoharan et al., 2020; Esa et al., 2017b; Bohari et al., 2020; Ikau et al., 2016; Begum et al., 2007b)

Table 3 : The finding

Authors	Main Study Design	Technology			Strategies				Enforcement		Procurement				
		BIM	GIS	IBS	AWS	TRN	AWD	3Rs	RGN	PCY	GDL	EDN	GNP	GBI	EPD
(Wai et al., 2020)	QL	√	√		√	√					√				
(Manoharan et al., 2020)	QL		√		√	√	√	√	√	√					
(Ashikin Suhaini et al., 2019)	QL			√	√			√							
(Rahim et al., 2017)	QL				√	√		√							
(Saadi et al., 2016)	QL				√	√		√				√			
(Sa'adi et al., 2016)	QL				√			√		√	√	√			
(Esa et al., 2017b)	QN	√		√	√		√	√				√	√	√	√
(Bohari et al., 2017)	QL					√		√				√	√	√	
(Bohari et al., 2020)	QN	√		√	√	√	√	√		√	√		√	√	
(Ikau et al., 2016)	QN				√	√	√	√		√					
(Othuman Mydin et al., 2014)	MM			√	√			√						√	
(Begum et al., 2007b)	QL			√	√	√	√	√	√	√	√				
(Nagapan et al., 2013)	QL				√			√		√					
(Hung & Kamaludin, 2017)	MM			√	√			√		√	√				
(Umar et al., 2016)	MM							√						√	
(Abidin et al., 2020)	QL				√			√							
(Ng et al., 2018)	MM				√	√		√	√		√			√	

Technology	Strategies	Enforcement	Procurement
BIM- Building Information Management	**AWS-** Awareness	**RGN**- Regulation	**EDN-** Eco Design
GIS- Geographic Information System	**TRN-** Training	**PCY**- Policy	**GNP**-Green Procurement
IBS- Industrialized Building System	**AWD-** Award	**GDL**- Guideline	**GBI-** Green building Index
	3Rs- Reduce Reuse Recycle		**EPD-** Eco Industrial Park Development

QN= Quantitative; QL= Qualitative; MM= Mix Method

3.3 Enforcement

A total of 16 studies reported enforcement as one of the initiatives taken in managing construction waste. Under these themes, a total of 3 sub-themes emerge namely regulation, policy and also guidelines. Regulation reported 3 studies found. Based on the increasing construction waste generation issue each year Malaysian Government has announced the Solid Waste and Public Cleansing Management Act (Act 672) on 30 August 2007. This Act or regulation focuses on control, reduce, recycle, recover and dispose of solid wastes in the right manner without affecting the surrounding environment and local communities. Though this act mentioned construction solid waste as part of controlled solid waste management, the scope of proper construction waste management as a whole is not enough and comprehensive, therefore there is an urgent need to come out with a proper framework in order to have best waste management practise. (Manoharan et al., 2020; Begum et al., 2007b; Ng et al., 2018). Meanwhile policy and guideline reported 7 and 6 studies respectively. Low enforcement and less implementation initiative through policies and guidelines were discovered among researchers. Thus this factor need to be look into consideration in order to have best waste management practise. (Sa'adi et al., 2016; Bohari et al., 2020; Begum et al., 2007b; Hung & Kamaludin, 2017)

3.4 Procurement

A total of four sub-themes emerged under procurement themes namely eco design, green procurement, green building index and also eco industrial park development. Eco design and green procurement reported 4 and 3 studies respectively. Adopting green procurement and eco design means an organization needs to commit to minimizing the environmental impacts and consequences of its construction activities by the deliberate selection and assessment of products and services at all developmental stages. For the construction industry, project performance is typically measured in terms of quality, cost and time. Thus this initiative leads to a positive impact to the construction waste management. (Esa et al., 2017b; Bohari et al., 2017; Bohari et al., 2020). Meanwhile, the green building index reported 6 studies under this theme on procurement. The Green Building Index (GBI) is Malaysia's industry recognised green rating tool for buildings to promote sustainability in the built environment and raise awareness among stakeholders about environmental issues and our responsibility to the future generations. The GBI rating tool provides an opportunity for developers and building owners to design and construct green, sustainable buildings that can provide energy savings, water savings, a healthier indoor environment, better connectivity to public transport and the adoption of recycling and greenery for their projects and reduce our impact on the environment hence increase the progressive effect of waste management. Eco industrial parks only reported 1 study under this theme.

4.0 CONCLUSION

This systematic review has highlighted the waste management initiative within Malaysia context. Based on the systematic reviews performed, four initiative themes have been identified namely technology, strategies, enforcement and also procurement. These initiatives were further extended to 14 sub-themes. A total of 35 studies focused on the strategies initiative which reported the highest number of studies. It is followed by an enforcement initiative with 16 studies. Next is technology initiative reported 11 studies and the least was procurement initiative with 10 studies. Moreover, PRISMA method aids to practice complimentary searching techniques such as citation tracking, reference searching, snowballing and contacting experts.

The review suggests several recommendations for future studies. First, more studies are needed to offer in-depth analysis and detailed explanations regarding waste management practices and initiatives. Second, it is important to have specific and a standard systematic review method for guide research synthesis in the context of waste management initiative.

REFERENCES

Abidin, N. A. Z., Ghani, A. H. A., & Mohammad, H. (2020). Identifying the Environmental Strategies in Construction Site for Malaysian Contractors in Johor. IOP Conference Series: Earth and Environmental Science, 498(1). https://doi.org/10.1088/1755-1315/498/1/012108

Ashikin Suhaini, N., Haslinda Abas, N., Nagapan, S., & Nadarason, K. (2019). Identification of Construction Waste Generated at Precast Concrete Plants: Case study. IOP Conference Series: Materials Science and Engineering, 601(1). https://doi.org/10.1088/1757-899X/601/1/012036

Begum, R. A., Satari, S. K., & Pereira, J. J. (2010). Waste generation and recycling: Comparison of conventional and industrialized building systems. American Journal of Environmental Sciences, 6(4), 383–388. https://doi.org/10.3844/ajessp.2010.383.388

Begum, R. A., Siwar, C., Pereira, J. J., & Jaafar, A. H. (2007a). Factors and values of willingness to pay for improved construction waste management - A perspective of Malaysian contractors. Waste Management, 27(12), 1902–1909. https://doi.org/10.1016/j.wasman.2006.08.013

Begum, R. A., Siwar, C., Pereira, J. J., & Jaafar, A. H. (2007b). Implementation of waste management and minimisation in the construction industry of Malaysia. Resources, Conservation and Recycling, 51(1), 190–202. https://doi.org/10.1016/j.resconrec.2006.09.004

Bohari, A. A. M., Skitmore, M., Xia, B., & Teo, M. (2017). Green oriented procurement for building projects: Preliminary findings from Malaysia. Journal of Cleaner Production, 148, 690–700. https://doi.org/10.1016/j.jclepro.2017.01.141

Bohari, A. A. M., Skitmore, M., Xia, B., Teo, M., & Khalil, N. (2020). Key stakeholder values in encouraging green orientation of construction procurement. Journal of Cleaner Production, 270, 122246. https://doi.org/10.1016/j.jclepro.2020.122246

Esa, M. R., Halog, A., & Rigamonti, L. (2017a). Developing strategies for managing construction and demolition wastes in Malaysia based on the concept of circular economy. Journal of Material Cycles and Waste Management, 19(3), 1144–1154. https://doi.org/10.1007/s10163-016-0516-x

Esa, M. R., Halog, A., & Rigamonti, L. (2017b). Strategies for minimizing construction and demolition wastes in Malaysia. Resources, Conservation and Recycling, 120, 219–229. https://doi.org/10.1016/j.resconrec.2016.12.014

Hung, F. C., & Kamaludin, N. S. (2017). Professionals' views on material wastage level and causes of construction waste generation in Malaysia. Malaysian Construction Research Journal, 21(1), 33–54.

Ikau, R., Joseph, C., & Tawie, R. (2016). Factors Influencing Waste Generation in the Construction Industry in Malaysia. Procedia - Social and Behavioral Sciences, 234, 11–18. https://doi.org/10.1016/j.sbspro.2016.10.213

Manoharan, E., Othman, N., Mohammad, R., Chelliapan, S., & Tobi, S. U. M. (2020). Integrated approach as sustainable environmental technique for managing construction waste: A review. Journal of Environmental Treatment Techniques, 8(2), 560–566.

Maués, L. M. F., Nascimento, B. do M. O. do, Lu, W., & Xue, F. (2020). Estimating construction waste generation in residential buildings: A fuzzy set theory approach in the Brazilian Amazon. Journal of Cleaner Production, 265. https://doi.org/10.1016/j.jclepro.2020.121779

Nagapan, S., Abdul, I., Asmi, A., & Fadhilah, N. (2013). Study of Site's Construction Waste in Batu Pahat, Johor. Procedia Engineering, 53, 99–103. https://doi.org/10.1016/j.proeng.2013.02.015

Ng, L. S., Tan, L. W., & Seow, T. W. (2018). Constraints to 3R construction waste reduction among contractors in Penang. IOP Conference Series: Earth and Environmental Science, 140(1). https://doi.org/10.1088/1755-1315/140/1/012103

Othuman Mydin, M. A., Khor, J. C., & Sani, N. M. (2014). Approaches to construction waste management in Malaysia. MATEC Web of Conferences, 17, 3–9. https://doi.org/10.1051/matecconf/20141701014

Rahim, M. H. I. A., Kasim, N., Moham, I., Zainal, R., Sarpin, N., & Saikah, M. (2017). Construction waste generation in Malaysia construction industry: Illegal dumping activities.

IOP Conference Series: Materials Science and Engineering, 271(1). https://doi.org/10.1088/1757-899X/271/1/012040

Sa'adi, N., Ismail, Z., Makmor, M., & Zawawi, E. M. A. (2016). Implementation of Malaysian goverment initiatives in managing construction waste. Jurnal Teknologi, 78(5–2), 55–60. https://doi.org/10.11113/jt.v78.8490

Saadi, N., Ismail, Z., & Alias, Z. (2016). A review of construction waste management and initiatives in malaysia. Journal of Sustainability Science and Management, 11(2), 101–114.

Sasitharan Nagapan, Ismail Abdul Rahman, & Ade Asmi. (2012). "Construction Waste Management: Malaysian Perspective." The International Conference on Civil and Environmental Engineering Sustainability IConCEES 2012, 2. http://eprints.uthm.edu.my/2530/1/Construction_Waste_Management_Malaysian_Perspective.pdf

Umar, U. A., Shafiq, N., Malakahmad, A., Nuruddin, M. F., Khamidi, M. F., & Salihi, I. U. (2016). Impact of construction waste minimization at construction site: Case study. Jurnal Teknologi, 78(5–3), 33–40. https://doi.org/10.11113/jt.v78.8508

Wai, T. K., Ismail, R., Jing, K. T., Riazi, S. R. M., & Nawi, M. N. M. (2020). Innovation technology towards construction & demolition (C&D) waste management. International Journal of Advanced Science and Technology, 29(6 Special Issue), 1971–1985.

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