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Road to Construction 4.0: Is the Malaysian Construction Industry Up for It?



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The construction industry is acknowledged as one of the main drivers of Malaysia's economic growth. However, it continues to be operating in conventional ways, which has hampered the effort made for it to become a world-class player. There is a high need for Malaysian industry players to embrace digital technologies for their growth.

In line with rapid technological progress, the Ministry of Works Malaysia or Kementerian Kerja Raya (KKR), through the Construction Industry Development Board (CIDB) and in collaboration with parties with interests in the construction industry, has developed a Construction Strategy Plan 4.0 (2021–2025) to achieve the aspiration of transforming the Malaysian construction industry into a more competitive and productive sector.

This is CIDB's short-term plan, which will be implemented within a five-year period. It will be a basis to devise a programme to improve the ability of the construction industry in the new millennium. This strategic plan is developed in line with the Wawasan Kemakmuran Bersama (WKB) 2030 or Shared Prosperity Vision 2030 agenda and National Industry 4.0 Policy (Industry4WRD). It also supports and complements other national policies, including the National Internet of Things (IoT) Strategic Roadmap, the Malaysian Smart City Framework, and the Digital Economy Policy.

Despite the benefits of C4.0, key players in the industry such as contractors, developers and consultants are still struggling to adopt the C4.0 concepts. This was mentioned in a preliminary survey conducted by Swinburne University of Technology (Sarawak Campus) in Malaysia's southern region in July 2022. It was also stated that the Construction Strategy Plan 4.0 should focus more on the tactical plan, rather than on creating ideas and informing the CIDB visions. However, the study was conducted only in the southern region and does not represent the nation's construction industry as a whole. It also failed to notice the initiatives taken by CIDB throughout the years.

Hence, the Study on the Readiness of the Malaysian Construction Industry Players towards Construction 4.0 was commenced on 16th November 2021 in collaboration between Universiti Sains Malaysia (USM) and the Construction Research Institute of Malaysia (CREAM). A series of surveys were carried out among active contractors and professionals in the construction industry.

The study found that contractors' level of knowledge of C4.0 technologies is still inferior and unsatisfactory. Only 23.90 per cent of Malaysian contractors have a high level of knowledge of C4.0 technologies (Internet of Things). On the other hand, only 9.76 per cent have a high level of knowledge of 3D Printing and Additive Manufacturing. This clearly shows the need for improvement to enhance the level of knowledge of the construction players.

Despite the low level of knowledge, there is a higher recognition among the contractors and professionals of the relevance of the C4.0 technologies to their work. However, some of the technologies are not seen as relevant by the contractors. As high as 48.14 per cent of the contractors say that 3D Printing and Additive Manufacturing are not relevant to their companies. Besides that, they also mentioned that Autonomous Construction (47.92 per cent) and Augmented Reality and Virtualisation (47.92 per cent) technologies are irrelevant to their work. This finding is alarming as, generally, players in the construction industry do not appreciate the potential of these technologies for aiding its transformation process. Nevertheless, a total of 49.2 per cent of the professionals from Town Planning Malaysia (LPBM) also agreed that current technology is efficient to be used during the ongoing pandemic.

The finding also revealed that the level of utilisation of C4.0 technologies among Malaysian contractors is very low for almost all C4.0 technologies. The level of utilisation of the C4.0 technologies only reaches as high as 20.29 per cent for the utilisation of the Internet of Things. The level of utilisation of all of the other technologies is below 20 per cent. A similar result was

found among the engineers, whereby the level of digitalisation is presently assessed to be only 38.91 per cent. However, a contrasting result was found among the professionals from LPBM and the Board of Quantity Surveyors Malaysia (LJBM). The majority of the town planners claimed to use at least basic technology (93.9 per cent) when practising. There was also an increasing trend of technology adoption among the quantity surveyor professionals from 2016 to 2020. They started to adopt more advanced software such as Glodon Cubicost, iTwo – costX, CAD Measure, and Buildspace.

From the study, it can be concluded that the overall knowledge, technology relevance, and implementation of the C4.0 technologies among Malaysian contractors and professionals are at a moderate level. This also shows that their degree of readiness for widespread adoption and deployment of CR 4.0 technologies lags a bit behind what policymakers had anticipated. However, there is room for improvement to tackle this problem. There is a need for interventions to increase the knowledge, technologies' relevance, and implementation, which will also indirectly increase the Malaysian construction industry's readiness toward C4.0. Thus, 11 key recommendations are suggested in the study to bridge the gap and prepare the industry to adopt C4.0 technologies in the future, including improving the general awareness of C4.0, relevant training programmes, and skill enhancement programmes.

CIDB also has undertaken an initiative to increase the construction industry readiness toward C4.0 by conducting the Construction 4.0 Digitisation Tour with the theme of 'Next Revolution of the Malaysian Construction Industry'. The tour serves as an information-sharing platform and initiatives that focus on automation and digitisation in the global construction industry scenario. This tour programme will also provide an added value to the construction industry in the implementation of C4.0. A total of six roadshow series had been planned throughout Malaysia, whereby three of the series have been carried out in Selangor (24th March 2022), Penang (5th July 2022) and Sabah (20th September 2022). The remaining three roadshows will be carried out in Sarawak (29th September 2022), Terengganu (11th October 2022), and Johor (end of November/early December).

Figure: List of Recommendations

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