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| --- | --- | --- | --- | --- | --- |
| Author | Country | Cost | Time | Waste | Phase of Construction |
| Bataglin, F.S., Viana, D.D., Formoso, C.T. and Bulhões, I.R., 2020. Model for planning and controlling the delivery and assembly of engineer-to-order prefabricated building systems: exploring synergies between Lean and BIM. *Canadian Journal of Civil Engineering*, *47*(2), pp.165-177. | UK | 1. Pull Production 2. Prefabricted Building systems 3. Cost Reduction | 1. Pull Production 2. Cost Reduction | 1. Labour Productivity 2. Cost Reduction 3. Innovation | Pull Production – Initiation |
| Jiang, L., Zhong, H., Chen, J., Su, Z., Zhang, J. and Wang, X., 2019. Lean construction practice: culture, standardization and informatization—a case from China. IGLC. | China | 1. Improving work flow 2. Worker Satisfaction 3. Competitive Advantage 4. Low Error margin | 1. Improving workflow 2. Competitive Advantage | 1. Productivity 2. Low Error margin |  |
| Sertyesilisik, B., 2016. Embending sustainability dynamics in the lean construction supply chain management. *YBL Journal of Built Environment*, *4*(1), pp.60-78. | Turkey | 1. Lean Supply Chain 2. Efficiency | 1. Lean Supply Chain 2. Long Term Value | 1. Foot Print Reduction 2. Lean Supply Chain 3. Efficiency 4. Quality |  |
| Boateng, A., 2019. Supply Chain Management in the Ghanaian Building Construction Industry: a Lean Construction Perspective. | Ghana | 1. Lean construction 2. Continuous Improvement 3. Optimized Value | 1. Continuous Improvement 2. Waste | 1. Lean Construction 2. Continuous Improvement 3. Smooth Service Flow 4. Waste |  |
| Mossman, A., 2018. What is lean construction: another look-2018. In *26th Annual Conference of the International Group for Lean Construction. Chennai, India* (pp. 1240-1250). | India | 1. Costumer Value 2. Production Time | 1. Costumer Value 2. Production Time | 1. Quality Project 2. Functionality 3. PDCA |  |
| Ebeid, O.M. and Alhallaq, K., 2018. An empirical study on the impact of lean construction techniques on sustainable construction in the Gaza Strip. | Gaza  Strip | 1. Performance Improvement 2. Lean Production | 1. Better Products | 1. Performance Improvement 2. Sustainable Construction 3. Better Products 4. Production waste |  |
| Rybkowski, Z.K., Munankami, M., Shepley, M.M. and Fernández-Solis, J.L., 2016, July. Development and testing of a lean simulation to illustrate key principles of target value design: A first run study. Proceedings of the 24th annual conference of the International Group for Lean Construction. | USA | 1. Target Cost 2. Target Value Design | 1. Reduce Time 2. Lower Overhead | 1. Waste Reduction |  |
| Issa, U.H. and Alqurashi, M., 2020. A model for evaluating causes of wastes and lean implementation in construction projects. *Journal of Civil Engineering and Management*, *26*(4), pp.331-342. | USA | 1. Lean Implementation 2. Lean Construction 3. Total Costs 4. Reduced Costs | 1. Reduced Costs | 1. Lean implementation 2. Lean Construction 3. Five s |  |
| Singhal, N. and Ahuja, R., 2018, July. CAN BIM furnish lean benefits–An Indian case study. In *Proceedings of the 26th Annual Conference of the International Group for Lean Construction: Evolving Lean Construction Towards Mature Production Management Across Cultures and Frontiers* (pp. 90-100). | India | 1. BIM 2. Economic Aspects 3. Stake Holders 4. Value Added Services 5. Operations | 1. Value Added Services | 1. BIM 2. Economic Aspects 3. Stake Holders |  |
| Freitag, A.E.B., Anholon, R., de Oliveira, V.M. and Larrain, T.V., 2017. Integration of concepts about lean construction, sustainability and life cycle of buildings: a literature review. *Brazilian Journal of Operations & Production Management*, *14*(4), pp.486-499. | Chile | 1. Saving Costs 2. Sustainable Buildings 3. Cost Barriers 4. Kaizen | 1. Efficient Building | 1. Sustainable Buildings 2. Efficient Buildings |  |
| Tabatabaee, S., Mahdiyar, A., Yahya, K., Marsono, A.K. and Sadeghifam, A.N., 2017. Level of Awareness on Lean Thinking Concept in Construction Among Higher Learning Students in Malaysia. *Malaysian Journal of Civil Engineering*, *29*(1). | Malaysia | 1. Lean construction 2. Estimation | 1. Lean construction 2. Lean management 3. Quality | 1. Communication 2. Quality |  |
| Uusitalo, P., Olivieri, H., Seppänen, O., Pikas, E. and Peltokorpi, A., 2017, July. Review of lean design management: processes, methods and technologies. In *Proceedings of the 25th annual conference of the international group for lean construction, Heraklion, Greece* (pp. 571-578). | Finland | 1. Virtual Design Construction 2. 3D 3. Team Integration | 1. Virtual Design Construction 2. Team Integration 3. Quality | 1. Virtual Design Construction 2. Lean design management 3. Quality |  |
| Saini, M., Arif, M. and Kulonda, D.J., 2018. Critical factors for transferring and sharing tacit knowledge within lean and agile construction processes. *Construction Innovation*. | UK | 1. Cost estimation 2. Construction Stages 3. Coustomer Value’ 4. Key process | 1. Coustomer Value 2. Key process | 1. Supply Chains 2. Construction stages 3. Coustomer Value 4. Key Process |  |
| Emuze, F., Monyane, T. and Awuzie, B., 2017. Performance Indicators for Lean Construction in South Africa: Lessons from the Port Elizabeth province. | South Africa | 1. KPI’s 2. Lean management 3. Lean Six Sigma 4. Lean Six Sigma Stratergy | 1. KPI’s 2. Lean Construction | 1. KPI’s 2. Lean Construction 3. Lean Management 4. Lean six Sigma |  |
| Gunduz, M. and Naser, A., 2019. Value Stream Mapping as a Lean Tool for Construction Projects. | Qatar | 1. Cost Overrun 2. Waste Time Identification 3. Value stream Adoption 4. Design Production | 1. Cost Overrun 2. Waste Time Identification 3. Construction planning 4. Design Production | 1. Waste time Identification 2. Design production |  |
| Leksic, I., 2018. Lean model for construction project effectiveness measurement. *Annals of the Faculty of Engineering Hunedoara*, *16*(1), pp.45-51. | Croatia | 1. Lean Methodology 2. Construction site 3. Average Required Laboures | 1. Lean Methodology 2. Construction site 3. Project Progress 4. Scheduling | 1. Lean Methodology 2. Construction site 3. Scheduling |  |
| Hui, K.P., Akemi Yokota, A. and Aye, L., 2018. Education & training for zero energy and lean manufacturing & construction of housing in Australia. | Australia | 1. Housing affordability 2. Zero energy 3. Additional cost 4. Required Cost Estimation | 1. Additional Cost 2. Required Cost estimation 3. Coustomer value | 1. Zero energy |  |
| Nowotarski, P., Paslawski, J. and Skwarek, J., 2019, September. Waste Reduction by Lean Construction-Office Building Case Study. In *IOP Conference Series: Materials Science and Engineering* (Vol. 603, No. 4, p. 042061). IOP Publishing. | Poland | 1. Quality management 2. Production | 1. End to End Design | 1. Quality management 2. DMAIC 3. Lean tools 4. Production |  |
| Lotti de Oliveira Paula, G., 2019. Real-time Dynamic Schedule Updating Through Integrated Lean Construction Methods. | Oregon | 1. Valued Activitires 2. Time Delays 3. Scheduling | 1. Time Delays 2. Scheduling 3. Planning | 1. Lean Philosophy 2. Valued Activities |  |
| Aisha, M.L. and Kasimu, A.M., 2019. ASSESSMENT OF READINESS OF NIGERIAN CONSTRUCTION FIRMS ON ADOPTION OF LEAN CONSTRUCTION PRINCIPLES. *COLLABORATION FOR SUSTAINABLE DEVELOPMENT IN THE BUILT ENVIRONMENT*. | Niegaria | 1. Sustainibility | 1. Time 2. Continous Improvement | 1. Lean construction 2. ICT 3. Continous Improvement 4. Sustainibility |  |
| Mirzaeifar, S., Dave, B. and Singh, V., 2017. DEVELOPMENT OF SYSTEMATIC CONSTRUCTION LOGISTICS USING ‘INTELLIGENT PRODUCTS’. In *Proceedings of the 25th Annual Conference of the International Group for Lean Construction, Heraklion, Greece* (pp. 103-110). | Greece | 1. Resource Transfer 2. Cost | 1. Cost effective transfer 2. Resource Transfer 3. Cost | 1. Systematic Construction Logistics 2. Logistics |  |
| Sospeter, N.G. and Kikwasi, G.J., 2017. The state of adoption of lean construction in the Tanzanian construction industry. *Journal of Construction Project management and Innovation*, *7*(1), pp.1689-1711. | Tanzania | 1. Lean thinking 2. Client Satisfaction | 1. Lean Construction 2. Client Satisfaction | 1. Lean Construction 2. Lean construction Principles 3. Value |  |
| Usman, I. and Rendy, O., 2017, July. Toward Lean Construction through Critical Chain Project Management and Root Cause Analysis in a Construction Project. In *2017 International Conference on Organizational Innovation (ICOI 2017)*. Atlantis Press. | Indonesia | 1. 5M 2. Lean Production 3. Exceeding Demand | 1. Exceeding Demand | 1. 5M 2. Lean Production 3. Project Risks 4. Project Effect |  |
| Binninger, M., Dlouhy, J., Schneider, J. and Haghsheno, S., 2017. How Can Lean Construction Improve the Daily Schedule of A Construction Manager?. *MS&E*, *245*(6), p.062019. | Germany | 1. Work Prioritization 2. Resource Need 3. Project Estimation | 1. Resource need 2. Project Estimation | 1. Lean Construction 2. Labour Scarcity |  |
| Mohamed, A.H., 2016. *Lean Construction as an innovative approach for minimising risks in Mega-Construction projects in the Kingdom of Saudi Arabia* (Doctoral dissertation, University of Salford). | Saudi  Arabia | 1. Over Budget 2. Realistic Constructability 3. Measuring Cost | 1. Project Delay 2. Over budget 3. Project Baseline 4. Realistic Constructability | 1. Realistic Constructability |  |
| Abu Musameh, S., 2017. Developing a Framework for Implementing Green-Lean Construction Techniques. *Developing a Framework for Implementing Green-Lean Construction Techniques*. | Saud Arabia | 1. Economic Impact 2. Green Lean Construction 3. Lean construction | 1. Lean construction | 1. Economic Impact 2. Green lean construction 3. Sustainability Requirement 4. Quality |  |
| Poshdar, M., González, V.A., O’Sullivan, M., Shahbazpour, M., Walker, C.G. and Golzarpoor, H., 2016, July. The role of conceptual modeling in lean construction simulation. In *24th annual conference of the international group for lean construction* (Vol. 7, p. 20). | USA | 1. Pull Driven Approach 2. Sequence Work Progress | 1. Sequence Work Progress | 1. Transparency |  |
| Álvarez, M.Á., Bucero, A. and Pampliega, C.J., 2017. Integrated project delivery, an alternative to the usual form of construction work in Spain= Métodoscolaborativos, un cambio para la construcciónenEspaña. *Building & Management*, *1*(3), pp.30-36. | France | 1. Lean Construction | 1. Techniques of Lean Construction 2. Production Level management | 1. Lean Construction 2. Transformation 3. Construction Sites |  |
| ABAJI, I. and ALHASHHOUSH, H., 2019. Operation Strategy for Contractors What is beyond lean?. | USA | 1. Production Philosophy 2. Cost effective | 1. Cost effective 2. Production Management | 1. Production Philosophy 2. Information flow 3. Supply Chain |  |
| Kawish, S.E., 2017. *Identifying and Prioritizing Barriers and Overcoming Strategies in Implementing Lean Construction Principles and Methods within Transportation Projects*. Michigan State University. | USA | 1. Project Delays 2. Working Efficiency | 1. Project Delays 2. Working Efficiency 3. Last Planner | 1. Maximizing Project Value 2. Lean Construction Implementation |  |
| Schöttle, A., Arroyo, P. and Christensen, R., 2018, July. Demonstrating the value of an effective collaborative decision-making process in the design phase. In *Proc. 26th Annual Conference of the International Group for Lean Construction*. | India | 1. Quality 2. WBS | 1. Quality 2. Scheduling 3. Control | 1. Quality 2. WBS 3. Assembly Chains |  |
| Broft, R.D. and Koskela, L., 2018, July. Supply chain management in construction from a production theory perspective. In *IGLC 2018–Proceedings of the 26th Annual Conference of the International Group for Lean Construction: Evolving Lean Construction Towards Mature Production Management Across Cultures and Frontiers* (Vol. 1, pp. 271-281). | India | 1. Sub Process | 1. Planning 2. Project Efficiency | 1. Transformative process 2. Flow perspective |  |
| Boateng, A., 2019. Supply chain management and lean concept in construction: a case of Ghanaian building construction industry. *Organization, Technology and Management in Construction: an International Journal*, *11*(1), pp.2034-2043. | Ghana | 1. Minimum Cost 2. Lean Journey | 1. Lean journey 2. Improvement | 1. Lean Management 2. Communication 3. Lean journey |  |
| Amin, T.O.M., 2016. *Implementing lean construction using the last planner system in Northern Iraq* (Master's thesis, Eastern Mediterranean University (EMU)-Doğu Akdeniz Üniversitesi (DAÜ)). | Iraq | 1. Supply Chain Management 2. Activities 3. Waste | 1. Planning Efficiency 2. Activities | 1. Supply Chain Management 2. Activities 3. Custom Product 4. waste |  |
| Neeraj, A., Rybkowski, Z.K., Fernández-Solís, J.L., Hill, R.C., Tsao, C., Seed, B. and Heinemeier, D., 2016. Framework Linking Lean Simulations to Their Applications on Construction Projects. In *24th annual conference of the international group for lean construction*. | UK | 1. Collaboration 2. Value Added Activities | 1. Collaboration 2. Waiting Time | 1. Lean simulations 2. Collaboration 3. Practical Approach 4. Value Added Activities |  |
| Feng, C.W., Mixco, F.E. and Chen, Y.J., 2018. Employing critical chain and lean concepts to develop the planning and control framework for linear construction projects | Taiwan | 1. Efficiency 2. Scheduling 3. Inventories | 1. Efficiency 2. Scheduling 3. Transportation 4. Processing | 1. Transportation 2. Inventories |  |
| Adnan, A.E., Lina Ahmed, A.H. &Alkilani, S. 2018, "Studying the Benefits of Building Information Modeling (BIM) in Architecture, Engineering and Construction ( AEC) Industry in the Gaza Strip", *Jordan Journal of Civil Engineering,* vol. 12, no. 1. | Gaza | 1. Technology 2. Productivity 3. Defective Production | 1. Defective Production | 1. Movement 2. Resources |  |
| Wong, L.S. & Mohammed ElhajAlsoufi, M.A. 2018, "A Critical Review of Lean Construction for Cost Reduction in Complex Projects", *Jordan Journal of Civil Engineering,* vol. 12, no. 4. | China | 1. Organizational Structure 2. Training | 1. Training | 1. Information 2. Specifying Value 3. Value stream |  |
| Shurrab, J. &Hussain, M. 2018, "An empirical study of the impact of lean on the performance of the construction industry in UAE", *Journal of Engineering, Design and Technology,* vol. 16, no. 5, pp. 694-710. | UAE | 1. Long term contacts 2. Cost savings methods 3. Flow 4. Pull | 1. Long Term contacts 2. Flow 3. Pull | 1. Lean Management 2. Flow 3. Pull |  |
| Nguyen, P. &Akhavian, R. 2019, "Synergistic Effect of Integrated Project Delivery, Lean Construction, and Building Information Modeling on Project Performance Measures: A Quantitative and Qualitative Analysis", *Advances in Civil Engineering,* vol. 2019, pp. 9. | New  York | 1. Cost of Construction 2. Key Analyses | 1. Key Analyses 2. Continuous Improvement | 1. Value Streaming 2. Improvements |  |
| Al-Aomar, R. 2012, "A lean construction framework with Six Sigma rating", *International Journal of Lean Six Sigma,* vol. 3, no. 4, pp. 299-314. | UK | 1. Competition 2. Lean Thinking | 1. Competition | 1. Flow 2. Quality systems 3. Process Designing |  |
| Jin, R., Zou, Y., Gidado, K., Ashton, P. & Painting, N. 2019, "Scientometricanalysis of BIM-based research in construction engineering and management", *Engineering, Construction and Architectural Management,* vol. 26, no. 8, pp. 1750-1776. | Atlanta | 1. Cost estimates 2. Project Delivery 3. Values | 1. Project Delivery 2. Just in Time | 1. Designing |  |
| Seethapathy, S. &Henderson, J.H. 2017, "Management of Construction Waste in Nuclear and Thermal Power Plant Projects in India", *Journal of Construction in Developing Countries,* vol. 22, pp. 19-46. | India | 1. Building materials 2. Reduction in Cost | 1. Process mapping | 1. Productivity 2. Building materials 3. Reduction in Cost 4. Process mapping 5. Visual control |  |
| Adnan, A.E., Lina Ahmed, A.H. &Alkilani, S. 2018, "Studying the Benefits of Building Information Modeling (BIM) in Architecture, Engineering and Construction ( AEC) Industry in the Gaza Strip", *Jordan Journal of Civil Engineering,* vol. 12, no. 1. | Australia | 1. Technology 2. coordination | 1. Scheduling 2. Planning Parameters | 1. Con current Engineering |  |
| Yuan, F. & Ng, S.T. 2019, "Genetic algorithm for determining the construction logistics of precast components", *Engineering, Construction and Architectural Management,* vol. 26, no. 10, pp. 2289-2306. | Hong  Kong | 1. Logistics 2. Cost – Schedule 3. Planning | 1. Kanban system 2. Planning | 1. Lean Project Delivery System(LPDS) 2. Planning |  |
| Zanchetta, C., Croatto, G., Paparella, R. &Turrini, U. 2014, "Il performance based building design per la qualitàedilizia: dallanormalizzazionealla LEAN construction/Performance based building design to ensure building quality: from standardization to LEAN construction", *Techne,* vol. 8, pp. 62-69. | UK | 1. Quality 2. Regulation | 1. Last Planner System 2. Project Planning | 1. Lean Management |  |
| Xu, Y.G. & Qian, C. 2013, "Lean Cost Analysis Based on BIM Modeling for Construction Project", *Applied Mechanics and Materials,* vol. 457-458, pp. 1444. | Zurich | 1. Feasibility 2. Allocation | 1. Management 2. Production Unit | 1. Work Flow |  |
| Fu, F., Sun, J. &Pasquire, C. 2015, "Carbon Emission Assessment for Steel Structure Based on Lean Construction Process", *Journal of Intelligent & Robotic Systems,* vol. 79, no. 3-4, pp. 401-416. | China | 1. Construction Methods 2. Cost saving 3. Lean construction | 1. Production Planning | 1. Construction Methods 2. Cost saving 3. Workshop 4. Lean construction |  |
| Andújar-Montoya, M.D., Galiano-Garrigós, A., Echarri-Iribarren, V. &Rizo-Maestre, C. 2020, "BIM-LEAN as a Methodology to Save Execution Costs in Building Construction—An Experience under the Spanish Framework", *Applied Sciences,* vol. 10, no. 6, pp. 1913. | Spain | 1. Extra – Costs 2. Demolition of Units 3. Management Support 4. Lean construction | 1. Demolition of Units | 1. Performance Improvement Process 2. Lean construction |  |
| Ekanayake, E. &Sandanayake, Y.G. 2017, "LiVEapproach: Lean integrated Value Engineering for construction industry", *Built Environment Project and Asset Management,* vol. 7, no. 5, pp. 518-533. | UK | 1. Non – Value Adding Activities 2. Functionality | 1. Production Management Paradigm | 1. Design Construction 2. Labour Performance |  |
| Fábio Bellotti, d.F., Vanalle, R.M. &Camarotto, J.A. 2018, "Identification of ex-ante and ex-post transaction costs in industrial construction engineering projects", *Journal of Civil Engineering and Management,* vol. 24, no. 5, pp. 424-436 | Brazil | 1. Transaction Cost 2. Production Cost | 1. Lean Tool | 1. Performance 2. Waste 3. Lean Tool |  |
| Jamil, G.S., Xia, B., Fawzia, S., Karim, A., Ayokunle, O.O. & Coffey, V. 2019, "Framework for the implementation of lean construction strategies using the interpretive structural modeling (ISM) technique", *Engineering, Construction and Architectural Management,* vol. 27, no. 1, pp. 1-23. | Saudi Arabia | 1. Completion Cost 2. Reduction of Waste 3. Construction reengineering frame work | 1. Computer Simulation | 1. Reduction of waste  2. Computer Simulation  3. Efficiency |  |
| Saba, S.B., Goh, S. &Wandel, A. 2019, "Development of a weighted leanness measurement method in modular construction companies", *Journal of Industrial Engineering International,* vol. 15, no. 4, pp. 603-625. | Heidelberg | 1. Production 2. Cost Planning | 1. Vertically Integrated Scheduling | 1. 3-D Visualization 2. Suppliers |  |
| Pandithawatta, T., Zainudeen, N. &Perera, C. 2019, "An integrated approach of Lean-Green construction: Sri Lankan perspective", *Built Environment Project and Asset Management,* vol. 10, no. 2, pp. 200-214. | Sri Lanka | 1. Cost of Investment 2. Customer Responsiveness 3. Investment | 1. Dynamic Schedule | 1. Principles |  |
| Koseoglu, O., Sakin, M. &Arayici, Y. 2018, "Exploring the BIM and lean synergies in the Istanbul Grand Airport construction project", *Engineering, Construction and Architectural Management,* vol. 25, no. 10, pp. 1339-1354. | Istanbul | 1. Life Cycle Costs 2. Life Cycle Management | 1. Standardised System | 1. Efficiency 2. Requirements |  |
| Na, S. & Paik, I. 2019, "Reducing Greenhouse Gas Emissions and Costs with the Alternative Structural System for Slab: A Comparative Analysis of South Korea Cases", *Sustainability,* vol. 11, no. 19, pp. 5238 | South Korea | 1. Construction Cost 2. Evaluation | 1. Operations | 1. Details 2. Micro Process |  |
| Usama, H.I., Salah, A.M. & Mohamed, S.H. 2019, "A model for evaluating the risk effects on construction project activities", *Journal of Civil Engineering and Management,* vol. 25, no. 7, pp. 687-699. | Saudi Arabia | 1. Risk 2. Variables | 1. Value Stream | 1. Issue Detection 2. Profitability |  |
| Mohamed, S.B. &Chafi, A. 2018, "Lean construction implementation in the Moroccan construction industry", *Journal of Engineering, Design, and Technology,* vol. 16, no. 4, pp. 533-556. | Morocco | 1. Training 2. Cost effectiveness | 1. Lean thinking | 1. Lean thinking 2. Eliminating waste 3. Cost Effectivenesss |  |
| Eriksson, P.E. 2010, "Improving construction supply chain collaboration and performance: a lean construction pilot project", *Supply Chain Management,* vol. 15, no. 5, pp. 394-403. | UK | 1. Supply Chain 2. Long- Term contracts | 1. Communication 2. Scheduling | 1. Workflow |  |
| Didehvar, N., Teymourifard, M., Mojtahedi, M. &Sepasgozar, S. 2018, "An Investigation on Virtual Information Modeling Acceptance Based on Project Management Knowledge Areas", *Buildings,* vol. 8, no. 6. | Australia | 1. Overhead Costs 2. Cost reduction | 1. Delays | 1. Continuous improvement 2. efficiency |  |
| Herrera, R.F., Sanz, M.A., Montalbán-Domingo, L., García-Segura, T. &Pellicer, E. 2019, "Impact of Game-Based Learning on Understanding Lean Construction Principles", *Sustainability,* vol. 11, no. 19, pp. 5294. | UK | 1. Material Cost 2. Minimization of Waste | 1. Lean Guidance | 1. Minimization of waste 2. Project safety 3. Training |  |
| Chakwizira, J. 2019, "Low-Income Housing Backlogs and Deficits "Blues" in South Africa. What Solutions Can a Lean Construction Approach Proffer?", *Journal of Settlements and Spatial Planning,* vol. 10, no. 2, pp. 71-88. | South Africa | 1. Cost Building Materials 2. Construction Cost | 1. Lean Principles | 1. Lean construction Process 2. Wastes |  |
| Hosseini, S.A., Akbarpour, A., Ahmadi, H. &Aminnejad, B. 2017, "Balance of Cost, Time, and Quality Related to Construction Projects Regarding the Reinforced Concrete of Underground Structures using a Meta-Heuristic Algorithm", *Archives of Civil Engineering,* vol. 63, no. 4, pp. 103-121. | UK | 1. Balance 2. Execution 3. Cost and schedule | 1. Balance 2. Execution 3. Cost and Schedule | 1. Lean Thinking 2. Lean Practices |  |
| Dallasega, P., Rauch, E. &Frosolini, M. 2018, "A Lean Approach for Real-Time Planning and Monitoring in Engineer-to-Order Construction Projects", *Buildings,* vol. 8, no. 3, pp. 38. | UK | 1. Budget Cost 2. Cost Explosion | 1. Coordination | 1. Lean construction 2. Pre Conditions |  |
| Jin, H., Shen, L. & Wang, Z. 2018, "Mapping the Influence of Project Management on Project Cost", *KSCE Journal of Civil Engineering,* vol. 22, no. 9, pp. 3183-3195. | China | 1. Project Cost 2. Cost Control | 1. Lean Management 2. Control | 1. Collaborate |  |
| Athapaththu, K.I. &Karunasena, G. 2018, "Framework for sustainable construction practices in Sri Lanka", *Built Environment Project and Asset Management,* vol. 8, no. 1, pp. 51-63. | Sri Lanka | 1. Energy Cost 2. Capital Costs | 1. Lean Production Delivery(LPD) | 1. Design 2. Process |  |
| Yang, S. 2019, "APPLICATION OF BIM DURING LEAN CONSTRUCTION OF HIGH-RISE BUILDINGS", *Civil Engineering Journal,* , no. 3. | China | 1. Social Costs 2. forecasting | 1. Prioritization of Works | 1. Task Preconditions 2. Look Ahead Plan |  |
| Wu, X., Zhao, W. & Ma, T. 2019, "Improving the Impact of Green Construction Management on the Quality of Highway Engineering Projects", *Sustainability,* vol. 11, no. 7. | China | 1. Initial capital cost 2. Total energy Cost 3. Parametric Design | 1. Weekly Learning | 1. Collaboration 2. Parametric Design |  |
| McArthur, J.J. &Bortoluzzi, B. 2018, "Lean-Agile FM-BIM: a demonstrated approach", *Facilities,* vol. 36, no. 13, pp. 676-695. | UK | 1. Faculty Management 2. Cost reductions | 1. Joint Design | 1. Design Reviews 2. Multi Discipline Design 3. Joint Design |  |
| Enshassi, A., Saleh, N. &Sundermeier, M. 2019, "BARRIERS HINDER THE APPLICATION OF LEAN CONSTRUCTION TECHNIQUES TO IMPROVE SAFETY IN CONSTRUCTION PROJECTS", *Annals of the Faculty of Engineering Hunedoara,* vol. 17, no. 3, pp. 77-88. | UK | 1. Workshop 2. Implementation | 1. BIM 2. Last Planner | 1. 3D model |  |
| Khaba, S. &Bhar, C. 2017, "Modeling the key barriers to lean construction using interpretive structural modeling", *Journal of Modelling in Management,* vol. 12, no. 4, pp. 652-670. | UK | 1. Overruns | 1. Auxiliary Information systems | 1. Waste minimization 2. Procurement System 3. Value adding Calculations |  |