American Journal of Interdisciplinary Research and Development
ISSN Online: 2771-8948
Website: www.ajird.journalspark.org
Volume 05, June, 2022

MODERNTECHNIQUE IN CONSTRUCTION PROJECT MANAGEMENT

Ismael A. J. Al-Mashhadani
General Manager

Abstract

In project management, resource types, and other business practices increase, RCSP issues become more important. Thus, recent research has focused on metaphysics or evolutionary algorithms, mainly genetics (GA), and these methods include the work of. Martínez-Rojas, Marín and Vila (2016) recently developed a two-step genetic algorithm that also took into account litigation and resource constraints. To maximise these two objectives together, two subsystems were developed and implemented in parallel. One of the biggest challenges for project management is a limited resource plan. This is a merger optimisation problem with many contradictory goals and limitations, that is, limiting the daily use of resources within available resources, completing the project as soon as possible and manage your daily resources in the most coordinated way possible (Faghihi et al., 2015). Also, there are reports on time and cost savings, better communication and coordination, quality improvements, negative risk reduction, scope explanation, better organisation, reduction of software problems, reduction of knowledge growth and reduction of design costs and outsourcing.

Habibi, Barzinpour and Sadjadi (2018) believe that these methods often involve inadequate methods and can only give partial results. Environmental impact assessments, such as project scope and stakeholder participation, are ignored. In the material mentioned above, the researcher will look at different management methods that can be explored along with exploration of inherent features of genetic algorithms, or develop the latest products. In the literature, the researcher has noticed that construction management is mainly about collaboration and knowledge management, which is a stage of project management during a project. Also, much effort has been put into data management, stakeholders and collaboration.

Introduction

Bettemir and Sonmez (2015) performed material analysis and measured the frequency of events in each direction in the sample documents. The researcher receives information about the purpose, content and results of the relevant research. Peripheral management, good governance and supply chains, and quality and risk assurance. These categories are not static or global, and there is some overlap in between, as some management guidelines are cornerstones of other management methods. However, this classification makes it possible to divide documents into smaller thematic groups organisational structure and discussions on process changes. This is a very exciting time for BIM and construction technology (Martínez-Rojas, Marín and Vila, 2016). The essence of these tools and processes is the adaptation of processes and delivery values to the operation. However, this value is better known than before, and there is now a more integrated, simpler and performance-oriented approach to this information. As the researcher consider the possible use of a virtual model, which may include information on all doors, ceilings, tiles and windows, the researcher begins to gain a deeper understanding of the consequences of assessment and planning, sales coordination and installation. The design and construction industry continues to become more efficient in creating and using models. As such, it is exploring ways to use the data and information generated by the model to eliminate unwanted input and data loss at entry points and to identify trends, patterns and problems that cannot be identified earlier its promotions.

Research Methodology

The detailed method used in this study is as follows. The method includes an analysis of the factors that affect the delay in the construction of the structures and the completion of a questionnaire. Furthermore, this data is used to develop genetic algorithms to optimise the construction plan of the project. First, the researcher analyse previous research to examine the various factors that slow down construction. This includes poor organisation, lack of technicians, poor coordination and strikes on construction sites. The construction school has conducted detailed research to create and change the severity of the construction project index. In the workshop, the required MRP exceeded 38 severity indicators that were considered statistically significant (Martínez-Rojas, Marín and Vila, 2016). There are specific guidelines for the workshop evaluation process and additional information on the criteria for supporting small and medium-sized enterprises. At the workshop, the author presented the research objectives, research methods and methods of the SME workshop before being asked to complete the document.

Case and Stylios (2016) then described 38 levels of difficulty and the process of finding their definitions based on literary criticism, industry experience, brainstorming, and group discussion. The author offers statistically significant measurements for the analysis of projects with low and high levels of complexity. The results show that the difference in 38 difficulty levels in 11 categories is statistically significant in the distribution of problems with great and low difficulty. In this study, statistical tests were performed on 101 variables in 11 categories that may affect the challenge (Chawla et al., 2018). The analysis is based on responses from 44 studies and shows that 38 variables are statistically significant to distinguish between units with lower and higher levels of complexity (Marzouk and Abubakr, 2016). A detailed analysis of this Recently, innovation in design management has been proposed, which has proved to be a key element in the role of the designer.

main disadvantage is that they cannot be used to solve large and complex problems efficiently, as they are impractical from a computational point of view and can cause merger explosions in large and complex projects. Researchers prefer to use heuristics to manage large-scale projects effectively. Although their activity is highly dependent on the problem, heuristic methods can be able to solve complex problems on a large scale compared to analytical methods. Efforts have been made to develop fair rules on resource balance to develop a high-quality usable solution. The model proposed by Sonmez and Uysal (2015) is a descriptive example of polynomial heuristics for various types of resource balance problems, where a general time error is specified between the minimum and maximum covert operations. In recent years, more advanced computational methods such as the genetic algorithm (GA) and particle optimisation have been used to solve resource balance problems. Similarly, Chawla et al. (2018) proposed a method of using artificial neural networks (ARNs) to solve resource balancing problems.

After examining the optimal time and cost of various TCO analysis methods, the user will see that the best solution obtained with a simple CPM and LP algorithm is almost the same as the results obtained with IP and GA as well. It can also be seen that if the time/cost relationship is assumed to be linear and continuous, LP is better than CPM in terms of efficiency and optimisation method. When margins are divided into smaller parts, IP and GA can solve persistent and linear problems (Marzouk and Abubakr, 2016). However, since the time-cost relationship is generally non-linear and single in construction, IP and GA are more suitable for utilisation. Although the best solutions obtained with IP and GA methods are very similar, IP is behind GA because its performance depends on the number and limit of variables inherent in IP software. This means that IP is better suited for small projects and cannot take into account the cost of incentives and penalties. Also, IP cannot provide global search like GA. GA based solution (i.e. 67 days, 222,300 pounds price) is not part of the best IP generation solution and is better than the preferred IP based solution (Kyriklidis and Dounias, 2016).

The first and last users of most users tend to be more analytical than the "technical" ones and have a significant impact on how BIM is used. Compared to its predecessors, there is more discussion about workflow, data flow and organisation. The compatibility of devices has always been a big issue, and the reason for data binding or variables related to many factors (models) has been investigated further. However, the value of BIM information is still determined by the industry as a whole. It offers many opportunities for future innovations that go through more technological cycles. Many industry associations have held presentations and discussions where BIM was not only introduced as a concept but also as a detailed analysis of the project, the topic is based on the results of IIC difficulties. First, the purpose of this study is to determine the level of difficulty based on the opinion of industry experts.

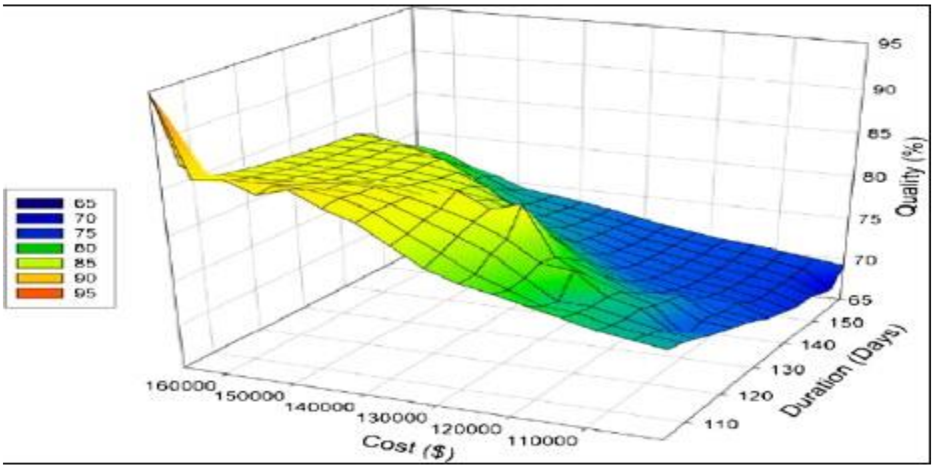
The researcher explores the possibilities of Construction management projects from a theoretical and practical point of view. The researcher analyses which management guidelines were studied as well as BIM research and whether and how these methods can be applied in practice. First, the researcher collects material from literary criticism. This software is a built-in feature of the BIM design tool, enhanced functionality or custom software other than the BIM software package. The researcher first uses an IFC (industrial) compliant database developed and published by the international Building SMART implementation team (Papadaki and Chassiakos, 2016). Among other things, the researcher only focuses on applications used in project management in AEC and exclude applications that are strictly used in 3D modelling and design structure. The researcher then collects data from software vendors and publisher websites and compare it with requirements for managing the BIM environment. Based on this, the researcher uses BIM software to determine the actual outcome of the project. Finally, the actual relationship between a possible BIM outcome and project management also shows the use of BIM as a PM.

The method the researcher has adopted is divided into four main stages: (1) revision of literature; (2) A-BIM presentation; (3) modelling process; (4) Evaluated and collected. The first step in this article is "document evaluation" based on the critique of many books that discuss the impact of digital technology on architecture in recent years (Pérez, Posada and Lorenzana, 2016). More specifically, the researcher focus on two important developments that digital technology brings to architectural design: the development of algorithms and the construction of information models. This development is shown and illustrated in architecture. Finally, the researcher explores how to integrate these advances into architectural practices using existing BIM tools. In the second phase of this dissertation, the researcher introduces algorithms based on building information models and define a programming rule based on the difference between geometric CAD programming and BIM-based programming. The third step begins with getting to know the situation and the modelling process. The researcher then experimented with the model using three other methods based on the analysis of public architectural drawings, photographs, transportation, photographs and text descriptions of existing buildings (Pérez, Posada and Lorenzana, 2016). Next, the researcher conducted a comparative study of the modelling process using three other methods to identify the advantages and disadvantages of A-BIM.

Result and Discussion

Costantino, Di Gravio and Nonino (2015) have been working on the development of CBR solutions for journaling since 2001. First, they introduced their new planning algorithm based on the SiN case. SiN can create project plans using the above examples while providing incomplete domain theory. They then focus on how to do this automatically or with minimal effort from the end-user to get the appropriate project case. They then use the Integrated Recovery Plan (CBR) model to help developers build WBS more effectively. In the second half of 2003, they described how algorithms were developed using JTMS technology (Kaiafa and Chassiakos, 2015). By using this technology in conjunction with the CBR module, they can create an interactive environment where users can modify the project plan or query a copy of the database to reuse in the planning process. They also introduced their CBM-Gen + algorithm, which can modify and modify the instances in the database if a new solution is available (Kaiafa and Chassiakos, 2015).

The software can accurately identify copies of the project plan, use previously recorded cases to create new plans and maintain coherence throughout the project plan (Elhadidy, Elbeltagi and Ammar, 2015). They also studied another software called DInCAD (Case-Based Task Decomposition Domain-Independent System) that covers four main levels of CBR and uses the causes of globalisation to solve ideas for new problems (Pollack and Adler, 2015). These most recent studies have also been published in detail as an essay. They have proposed many options for construction planning workflows and a method for evaluating all options. Its algorithm can automatically create project graphs at any time and use typical logical theory to harmonise current constraints (Rashedi and Hegazy, 2015). They then used the 3D model data in the form of Industry Class (IFC) along with copies of previous designs. When you need to create a new program for a particular 3D model, the algorithm uses functional logic to find observations in the 3D model, and CBR then uses the scheduling method provided to retrieve similar observations from the database. Therefore, they use Building Information Modelling (BIM) to identify problems that need to be solved and learned by collecting, reusing, adapting and retaining the lessons learned from CBR examples.



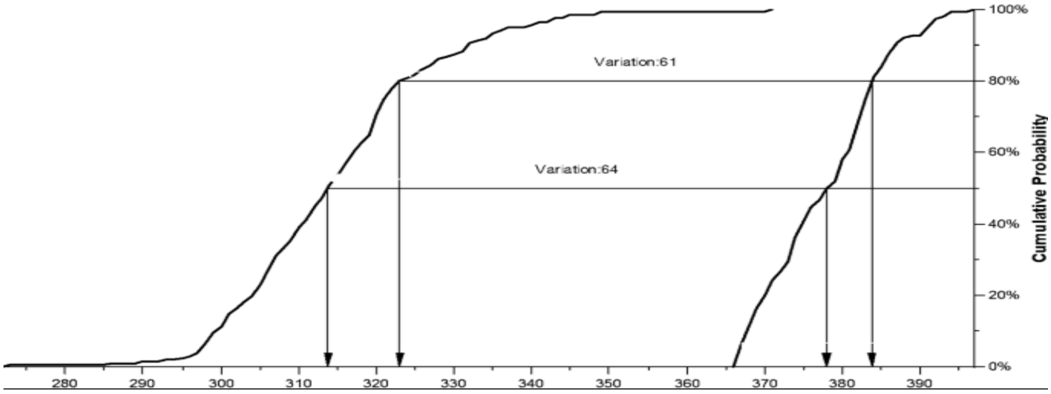
Fischer and his team have shown great interest in using design models as input into the building plan algorithm since 1994. Based on work done at the Integrated University Facilities Engineering Center. Stanford (CIFE), expanded the concept of automated design to design to include models of construction methods. Their system is called MOCA, which uses a formal construction method model to create model-related graphics of products. They analysed the following five characteristics for each process: components, domains, component components, resource requirements, and workflow. These methods describe events at a higher level than events at a lower level to facilitate timing, and the detail varies (Abdel-Basset, Aliand Atef, 2020). They then proposed an information method on the possibility of testing reinforced concrete structures. This approach is divided into five aspects: design knowledge, practical science, measurement knowledge, external knowledge and advanced knowledge. In the next phase, they started using CAD models of components as data sources. They discussed the disadvantages of traditional 4D (3D + time) models and demonstrated that CAD tools require design support. Besides, they presented their solution to the planning problem by creating a 4D + x model to explain the construction process better. A few years later, they removed the limitations of the Critical Path Method (CPM) for the transformation and defined the "limitations of ontology" and the "classification process". They used their methods as prototypes and could quickly find tasks that needed to be postponed to speed up tasks or skip stages (Sonmez and Uysal, 2015). An enhanced equilibrium line (ALoB) is then used, based on position due to the consequence proposed to map and solve organisational problems. The model consists of two stages: the first is the master plan using the mentioned sub-model. Finally, he extended his model to allow quantitative calculations in housing projects using the BCIM and ALoB sub-model approach.

Vanhoucke, Coelho and Batselier (2016) proposed their algorithm that takes the construction sequence from a 3D building model. They detect an increase in proximity and use downward movement to find the transverse sections of the objects. Others are coming too. Sharing objects for synchronisation when using BIM generally solves a problem and provides an algorithm to represent the boundaries of the BIM objects as defined in IFC. Kaiafa and Chassiakos (2015) described its new approach to automated building models using "building method models" stored as a knowledge base. Since his team uses IFC directly as input for the 3D model of the algorithm, model-related approaches can also be mentioned in their work. Martínez and Fernández-Rodríguez (2015) considered a planning method based on BIM and BIM and examined the synchronisation process of a building. In 2012, Vleda and Knapp developed a periodic approach to spatial reasoning that uses the geographical relationship between BIM components and automatically forms a meaningful time frame to create a specific 3D model (Vanhoucke, Coelho and Batselier, 2016).

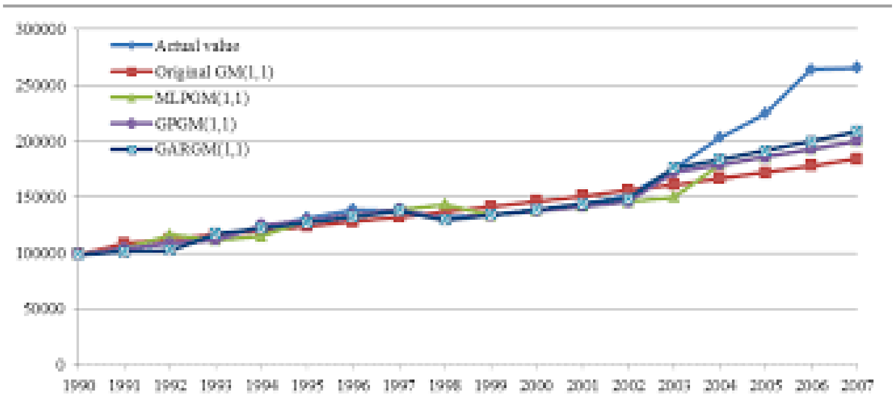
Genetic algorithms are optimisation tools that use a heuristic search to mimic natural evolution. By using a well-defined fit function, such as an objective function or key measurement, a random set of genes can initially evolve towards an optimal solution to a particular problem. The optimisation is based on a goal that is mathematically determined by the fat drop. This work was followed by a review of multi-project programs with limited resources, a genetic algorithm that enables AMS to track

American Journal of Interdisciplinary Research and Development
ISSN Online: 2771-8948
Website: www.ajird.journalspark.org
Volume 05, June, 2022

construction projects with and without resource constraints. Abdel-Basset, Aliand Atef (2020) introduced development algorithms (also known as GA) to reduce project construction time in the context of development links, available resources and resource requirements for each project.



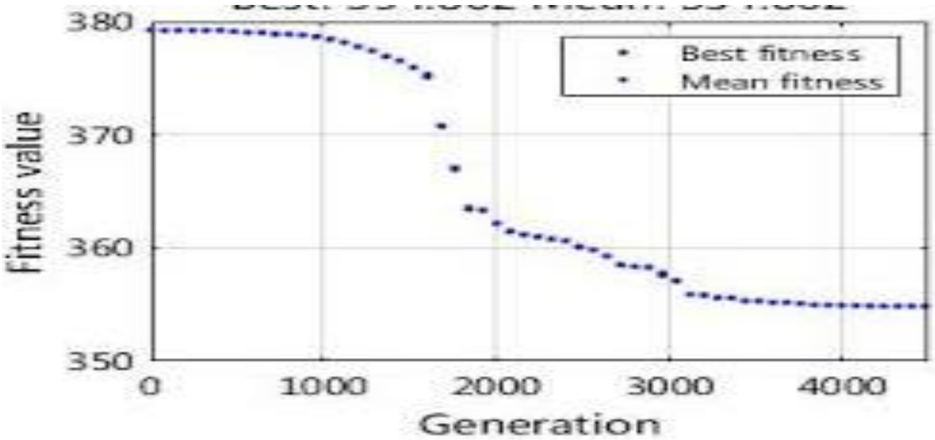
Researchers have successfully used genetic algorithms to maximise reusable construction time. Habibi, Barzinpour and Sadjadi (2018) introduced a genetic algorithm method to maximise costs and time in construction projects. They also proposed their diverse genetic algorithm with an adaptive balancing method that can isolate the cost and duration of an entire project using a genetic approach based on general algorithms (Chawla et al., 2018). In the next step, they showed that the use of specialised formulations, Pareto scaling and adaptive weight methods in general genetic algorithms could lead to reliable results in time and cost optimisation. Another team of scientists developed their comprehensive code of ethics to achieve the best project plan, allocate costs and resources, and also to incorporate their algorithms into the MS project component.



Faghihi et al. (2015) showed the points and scores of the ten main seriousness indicators in the first and second rounds of the workshop. As assessors must select and score each difficulty level, each difficulty level was assigned at least one job in the first round of the Delphi survey. Fifteen best indicators of difficulty. As small and medium-sized enterprises were not selected as one of the top ten indicators of severity in the second round of the DELPHI survey, eight severity indicators remained in the ranking.

As Kaiafa and Chassiakos (2015) show, the maximum full-time equivalence (FTE) of PMT members at the difficulty/development stage is considered as another complicating factor, as the overall stage is the first workshop. Sixty-seven people climbed to the top in one lap and used Delphi as the first indication of difficulty in the second round.

Small and medium-sized enterprises feel that the PMU has too many full-time positions at the beginning of a project, which can improve the methods and communication of project team members and lead to confusion, misunderstandings and potential conflicts. Also, if the maximum full-time position of a PMU group is much higher than the average number of members in the same group, this means that many team members are involved in the concept of development/design at the end of the project and may not fully understand the project. Key points, challenges and standards (Kyriklidis and Dounias, 2016). Therefore, in this case, one of two possible scenarios is adopted. First of all, it takes time to get information about beginners and others who contribute. New members can also contribute to the project, but they know little about it, leading to disagreements and conflicts. In any case, this will have a significant impact on the success of the project, and if new work is undertaken, this impact will affect not only the design of the project but also the quality and cost.



Another important indicator of the level of complexity that SMEs agree on is the impact of the number of change orders on the implementation of the project. Experts at the workshop pointed out that a large number of orders to change owners, contractors or designers can complicate the project and disrupt construction in the short or long term. Also, if the size of the change request is large, and there is no change plan, the availability of content can be another important issue (Martínez-Rojas, Marín and Vila, 2016). In the second round of Delphi research, the third most important indicator of the complexity of the frequency of the work area was due to the inability to use the necessary materials to maintain the quality of the structure and the results. Therefore, small and medium-sized enterprises actively recommend avoiding employment during construction.

Conclusion

In recent years, the AEC industry has taken a new approach to integrate and to integrate architecture, engineering and construction information. This method contains the necessary information about the whole project in the form of a 3D image of the project or connects this three-dimensional part to an information database called a building information model. BIM offers faster and more efficient processes, better design and better production quality. A key benefit is the precise geometric representation of building elements in an integrated data environment. On the other hand, a project plan is a key tool for managing time, costs and capital during construction. This chapter introduces a new approach to planning a construction project using the spatial information of the project and its components to build array links. BIM projects are known as a confirmed and defined subgroup of project components, an important source of geometric information.

With this concept in mind, a computer program can infer the overall construction sequence of a project from its three-dimensional description, which has the most features and characteristics of the project. To create a project plan, it is necessary to understand the connections and inter-construction project elements to fully understand the "structural context" of the project elements. Structural stability relationship" is defined as a logical relationship between two factors that ultimately leads to a stable and constructive combination of these two factors. The so-called stable and compatible refers to the condition of the assembled component structure where the components should not collapse during or after construction due to lack of sufficient support components.

References

1. Abdel-Basset, M., Ali, M. and Atef, A., 2020. Resource levelling problem in construction projects under the neutrosophic environment. The Journal of Supercomputing, 76(2), pp.964-988.
2. Bettemir, Ö.H. and Sonmez, R., 2015. Hybrid genetic algorithm with simulated annealing for resource-constrained project scheduling. Journal of Management in Engineering, 31(5), p.04014082.
3. Case, D.M. and Stylios, C.D., 2016, October. Fuzzy Cognitive Map to model project management problems. In 2016 Annual Conference of the North American Fuzzy Information Processing Society (NAFIPS) (pp. 1-6). IEEE.
4. Chawla, V., Chanda, A., Angra, S. and Chawla, G., 2018. The sustainable project management: A review and future possibilities. Journal of Project Management, 3(3), pp.157-170.
5. Costantino, F., Di Gravio, G. and Nonino, F., 2015. Project selection in project portfolio management: An artificial neural network model based on critical success factors. International Journal of Project Management, 33(8), pp.1744-

1754.

6. Elhadidy, A.A., Elbeltagi, E.E. and Ammar, M.A., 2015. Optimum analysis of pavement maintenance using multi-objective genetic algorithms. HBRC Journal, 11(1), pp.107-113.
7. Faghihi, V., Nejat, A., Reinschmidt, K.F. and Kang, J.H., 2015. Automation in construction scheduling: a review of the literature. The International Journal of Advanced Manufacturing Technology, 81(9-12), pp.1845-1856.
8. Habibi, F., Barzinpour, F. and Sadjadi, S., 2018. Resource-constrained project scheduling problem: review of past and recent developments. Journal of project management, 3(2), pp.55-88.
9. Kaiafa, S. and Chassiakos, A.P., 2015. A genetic algorithm for optimal resource-driven project scheduling. Procedia Engineering, 123, pp.260-267.
10. Krzywanski, J., Grabowska, K., Herman, F., Pyrka, P., Sosnowski, M., Prauzner, T. and Nowak, W., 2017. Optimisation of a three-bed adsorption chiller by genetic algorithms and neural networks. Energy Conversion and Management, 153, pp.313-322.
11. Kyriklidis, C. and Dounias, G., 2016. Evolutionary computation for resource leveling optimisation in project management. Integrated Computer-Aided Engineering, 23(2), pp.173-184.
12. Martínez, D.M. and Fernández-Rodríguez, J.C., 2015. Artificial Intelligence applied to project success: a literature review. IJIMAI, 3(5), pp.77-84.
13. Martínez-Rojas, M., Marín, N. and Vila, M.A., 2016. The role of information technologies to address data handling in construction project management. Journal of Computing in Civil Engineering, 30(4), p.04015064.
14. Marzouk, M. and Abubakr, A., 2016. Decision support for tower crane selection with building information models and genetic algorithms. Automation in Construction, 61, pp.1-15.
15. Papadaki, I.N. and Chassiakos, A.P., 2016. Multi-objective construction site layout planning using genetic algorithms. Procedia Engineering, 164, pp.20-27.
16. Pérez, E., Posada, M. and Lorenzana, A., 2016. Taking advantage of solving the resource constrained multi-project scheduling problems using multi-modal genetic algorithms. Soft Computing, 20(5), pp.1879-1896.
17. Pollack, J. and Adler, D., 2015. Emergent trends and fads in project management research: A scientometric analysis of changes in the field. International Journal of Project Management, 33(1), pp.236-248.
18. Rashedi, R. and Hegazy, T., 2015. Capital renewal optimisation for large-scale infrastructure networks: genetic algorithms versus advanced mathematical tools. Structure and Infrastructure Engineering, 11(3), pp.253-262.
19. Sonmez, R. and Uysal, F., 2015. Backward-forward hybrid genetic algorithm for resource-constrained multiproject scheduling problem. Journal of Computing in Civil Engineering, 29(5), p.04014072.
20. Vanhoucke, M., Coelho, J. and Batselier, J., 2016. An overview of project data for integrated project management and control. Journal of Modern Project Management, 3(3), pp.6-21.