

# Study on an Innovative Time-Cost-Quality Tradeoff Modeling of Building Construction Project Based on Resource Allocation

Mr. Neeraj Londhe<sup>1</sup>, Dr. Pratibha M. Alandkar<sup>2</sup>, Prof. Pooja Sonawane<sup>3</sup>, Dr. P. R. Bamane<sup>4</sup>

<sup>1</sup>M.tech Student, Department of Civil Engineering

<sup>2</sup>Professor, Department of Civil Engineering

<sup>3</sup>Assistant Professor, Department of Civil Engineering

<sup>1, 2, 3</sup>RMD Sinhgad School of Engineering, Pune, Maharashtra, India.

<sup>4</sup>Associate Professor, Department of Civil Engineering,  
Arvind Gavali College of Engineering, Satara, Maharashtra, India.

**Abstract:** *The construction industry which provides large-scale employment is the foundation of development for emerging countries like India. The productivity of the construction industry depends largely on resource management methods. Also, it is very difficult to prepare accurate and achievable plans in large construction projects. As the complexity of the project increases and the cost of the project surges, companies must effectively manage their budgets and schedules. Using automated software tools is essential for successful planning and managing of projects. Many automated software tools have been developed in the industry. The literature on how to select the appropriate project management software tools is quite limited. This study provides a comparison of a set of project management software tools (PMST). In this study, first, we developed criteria to determine which PMSTs would be subject to our analysis. Then, we developed criteria to compare and evaluate these PMSTs. Finally, we present our findings in a tabular format. Our findings will help project managers to assess the strengths and weaknesses of these tools. Using automated software tools is essential for successful planning and managing of projects. Many automated software tools have been developed in the industry. The literature on how to select the appropriate project management software tools is quite limited.*

**Keywords:** Resource allocation.

## REFERENCES

- [1] Roya M.Ahari and S.T.A.Niaki “Fuzzy optimization in cost time and quality trade – off in software projects with Quality Obtained by Fuzzy Rule base” International journal of modelling and optimization vol.3 no.2 April 2015.
- [2] 2.Rhuta Joshi<sup>1</sup>, Prof. V. Z. Patil<sup>2</sup> “Resource Scheduling of Construction Project: Case Study International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064.
- [3] SK. Nagaraju, B. Sivakonda Reddy, and Prof. A. Ray Chaudhuri “Resource Management in Construction Projects – a case study IRACST – Engineering Science and Technology: An International Journal (ESTIJ), ISSN: 2250-3498.
- [4] Ming Lu and Heng Li “Resource-Activity Critical-Path Method for Construction Planning” ASCE Library volume 4412.2.
- [5] Reza Ghodsi, Mohammad Reza Skandari, and Morteza Allahverdiloo, Seyed Hossein Iranmanesh “A New Practical Model to Trade-off Time, Cost, and Quality of a Project “Australian Journal of Basic and Applied Sciences, 3(4): 3741-3756, ISSN 1991-8178.
- [6] Vikash Agarwal Dr.Rajeev Kumar Upadhyay, Dr. Bhupendra Kumar Pathak : A State of Art Review on Time Cost Trade off Problems in Project Scheduling International Journal of Application or Innovation in Engineering & Management (IJAIEM) Volume 2, Issue 5, May 2013 .
- [7] N. Ravi Shankar, M. M. K. Raju, G. Srikanth and P. Hima Bindu “Time, Cost and Quality Trade-off Analysis in Construction of Projects” Contemporary Engineering Sciences, Vol. 4, no. 6, 289 – 299

- [8] T. Subramani and M. Sekar, "Preplanning and scheduling of road construction by using PPM," *International Journal of Application or Innovation in Engineering & Management*, vol. 4, no. 5, pp. 234–244, 2015. View at: Google Scholar
- [9] B. Koo and M. Fischer, "Feasibility study of 4D CAD in commercial construction," *Journal of Construction Engineering and Management*, vol. 126, no. 4, pp. 251–260, 2000. View at: Publisher Site | Google Scholar
- [10] V. K. Bansal and M. Pal, "Generating, evaluating, and visualizing construction schedule with geographic information systems," *Journal of Computing in Civil Engineering*, vol. 22, no. 4, pp. 233–242, 2008. View at: Publisher Site | Google Scholar
- [11] V. R. Keesara and D. Karthik, "4D planning and scheduling of the construction project using project management software and GIS," *Geoinformatics & Geostatistics*, vol. 2, no. 3, 2014. View at: Publisher Site | Google Scholar
- [12] R. R. A. Issa, I. Flood, and W. J. O'Brien, *4D CAD and Visualization Inconstruction: Developments and Applications*, A. A. Balkema Publishers, 2003.
- [13] S. E. Poku and D. Arditi, "Construction scheduling and progress control using geographical information systems," *Journal of Computing in Civil Engineering*, vol. 20, no. 5, pp. 351–360, 2006. View at: Publisher Site | Google Scholar
- [14] V. R. Keesara and D. Karthik, "4D planning and scheduling of the construction project using project management software and GIS," *Geoinformatics & Geostatistics*, vol. 2, no. 3, 2014. View at: Publisher Site | Google Scholar
- [15] R. R. A. Issa, I. Flood, and W. J. O'Brien, *4D CAD and Visualization Inconstruction: Developments and Applications*, A. A. Balkema Publishers, 2003.
- [16] S. E. Poku and D. Arditi, "Construction scheduling and progress control using geographical information systems," *Journal of Computing in Civil Engineering*, vol. 20, no. 5, pp. 351–360, 2006. View at: Publisher Site | Google Scholar
- [17] M. Y. Cheng and S. C. Yang, "Planning, scheduling and tracking of a residential project using Primavera software," *Journal of Construction Engineering and Management*, vol. 127, no. 4, pp. 291–299, 2001. View at: Publisher Site | Google Scholar
- [18] K. Williams, B. Elizabeth, and M. Jenks, "Achieving the compact city through intensification: an acceptable option," in *In The compact city: A sustainable urban form?* pp. 83–96, 1996. View at: Google Scholar
- [19] B. M. Vagun, *GIS applications for hazard preparedness, response, and mitigation, Graduate project, MSc in Interdisciplinary Science Studies [M.S. thesis]*, Johns Hopkins University, Baltimore, Maryland, 1996.
- [20] S. Staub-French, A. Russell, and N. Tran, "Linear scheduling and 4D visualization," *Journal of Computing in Civil Engineering*, vol. 22, no. 3, pp. 192–205, 2008.
- [21] A. Sarma and A. van der Hoek, "Towards Awareness in the Large" Proc. Int'l Conf. Global Software Engineering (ICGSE 06), IEEE CS Press, 2006, pp. 127–131.
- [22] G. Booch and A.W. Brown, "Collaborative Development Environments," *Advances in Computers*, vol. 59, 2003, pp. 2–29.
- [23] Barry W. Bohem, "Software Risk Management: Principles and Practices", *IEEE Software* Vol 8 No 1 January 1991, pp. 32-41
- [24] Capers Jones, "Software Project Management Practices: Failure versus Success", *Crosstalk – The Journal of Defense Software Engineering*, Oct 2004.
- [25] <http://en.wikipedia.org/wiki/GanttProject>
- [26] Duncan Haughey, "A Perspective on Programme Management", <http://www.projectsman.co.uk>, April 2001.
- [27] Margo Visitacion, "Project Portfolio Management", Forrester's Ultimate Consumer Panel, March 13, 2006.
- [28] Kastor A. and Sirakoulis, K. , "The effectiveness of resource levelling tools for resource constraint project scheduling problem", *International Journal of Project Management*, doi:10.1016/j.ijproman.2008.08.006., 2008
- [29] Young, N. W., Jones, S. A., Berstein, H. M., & Gudgel, J. E. (2009). *The business value of BIM*. New York: McGraw-Hill Construction SmartMarket Report.
- [30] Thomas, H., & Npolitian, C. L. (1995). Quantitative effects of construction changes on labor productivity. *Journal of Construction Engineering and Management*, 121(3), 290-296.