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A Review on Application of Microsoft Project Software in Multi-Storeyed Buildings

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Abstract: ***The construction of a multi-storeyed building is a very lengthy process. It involves a large number of activities that are to be performed by different teams belonging to different age groups, cadre, level of skills and expertise. Also the number of activities to be performed is variable and complicated in nature. Also, it involves a huge amount of money as well as proper management of manpower and resources. So, to satisfy all the above requirements, a proper project management should be adopted so as to give possessions to the customers on time and maximize the efficiency. Project management software can become a boon in managing the project efficiently. Owing to traditional trend and ease of use Microsoft Excel is mostly preferred at construction sites. With advancement in technology usage of modern and more efficient software is the need of time. This paper aims to highlight the need of Microsoft Project software in Multi-Storeyed building construction project on the basis of an online survey.***

Keywords: Multi-Storeyed Buildings, Project Management Software, Microsoft Project, Microsoft Excel, Planning, Scheduling

I. INTRODUCTION

Construction Industry in India has increased significantly in the recent decade. Construction is a complex activity that involves proper planning and management of resources and capital. The projects these days are becoming complex in nature. Management of projects is assuming greater and greater importance. Whether a project is small or large, simple or complex of the industrial or service sector, the need to complete them most efficiently and make them operational within set targets is rather critical. The delay means not only greater capital costs but also loss of future gains. In spite of best intentions and efforts in most of the projects in central government, public sectors as well as a few private sectors the magnitude and incidences of cost and time over runs are alarming. The quality of projects in most cases is also poor. Time and Cost are always critical and need special attention.

The success of any Project lies in the efficient management of TIME, QUALITY and COST. Even a mini construction project includes various activities commencing from acquisition of land ending with finishing and handing over the project to end user. Thus Contractor/ Client/ Developer commitment to the customer plays an important role. For timely completion of project, construction project Planning, Scheduling and controlling of activities from commencement stage up to completion stage is essential. Hence reduction in Cost Overruns and Schedule Overruns can be observed only if proper Planning and Controlling of project is carried out.

Construction Firms in India, Construct the Projects in a Traditional ways which sometimes proves to be Uneconomical & Tedious too. Traditional way also proves to be Time Consuming and Confusing. It has now become a formidable challenge which can only be met by adopting innovative construction technology. With the need of time and technology change, using software in construction project management arises to be the best suitable option to cope up with the problem. Microsoft Project is a project management software product which is developed and sold by Microsoft. It assists a project manager to develop a schedule, assign resources to tasks, track progress, manage the budget, and analyse workloads.

II. LITERATURE REVIEW

Akshayakumar V. Hanagodimath, et.al, (2016), focused on Planning, Scheduling and Tracking a real time eighteen storey luxury apartment construction project using Microsoft Project. They observed the pattern of construction project by tracking the building for near about seven months and also carried out Earned Value Management (EVM) to measure the efficiency and performance of the project. Along with this they governed the result of Cost performance Index (CPI) and Schedule Performance Index (SPI). At the end of research they arrived at the conclusion that the MS Project software tool simulates the project's Budget at Completion (BAC) and Variance at Completion (VAC), and this directly helps project manager in controlling the cost and avoiding the delay of the project. Planning, scheduling, tracking and controlling plays a major role in any project, the cost variance at different situations may increase if the project is not properly planned and tracked. Also for a project to be more successful it is important to implement project management with the assistance of any software. [1]

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Ch. Chowdeswari, et.al, (2017), focused on to do planning and scheduling for a multi-storied (G+8) building with Microsoft Project (MSP) software on the basis of observing the site conditions, labour productivity, and proper utilization of time and available resources. They emphasized the use of Microsoft Project software over the traditional common technique of using Microsoft Excel. Their research methodology was done by phases which comprises of three phases. Phase one included Site supervision, Observation at site, Labour productivity. Phase two included Study of drawings and Constructability checks. Phase third included Basic ideas in the improvement of construction plan, Planning activities, Work Breakdown Structure (WBS), Scheduling activities. On completing the research, the authors concluded that listing of activities involved in project and identification of drawings required for execution of work should be done according to priority. At the time of planning key elements of plan like WBS, Activity duration and their dependencies should be implemented. Based on Project start date and Project end date, Critical path and critical activities of the project should be identified and scheduled. Extreme importance should be given to Labour Productivity. SWOT analysis should be adopted at the time of planning to decrease the risk factor. [2]

Rashmi J V, et.al, (2017), worked on to find the difference in the overall cost and time required to execute a multi-storeyed residential building by use of conventional construction execution practices and by applying project management techniques. Their research focused on the cost, duration and resource management that have been employed for the execution of the project. In this research work, data obtained from the building site is named as plan 'A' Conventional execution approach. To obtain comparison with plan 'A'- Conventional execution approach, an analysis of planning and scheduling was again carried out for the same multi-storeyed building by applying project management skills and techniques with help of M.S. Project software. It is named as Plan 'B'- Project Management approach. The results concluded that the proper use of project management techniques reduces the cost and time of construction, without affecting the quality and performance. Also a proper scheduled path can be achieved using Microsoft Project software which helps in setting a track for all the activities, to inspect if there is deviation from planned cost and schedule. [3]

Abhishek Sharma and K.K.pathak, (2015), this study focused on the manpower planning, scheduling and tracking of construction of a residential block at mahadev parisar, Bhopal. It was a six storied (G+6) under construction building project at Shivaji Nagar, Bhopal, Madhya Pradesh. They made a comparison between the baseline duration and cost to actual duration and cost of manpower of project using project management software tool Microsoft Project. They inspected schedule report and analyzed causes for delay. Results concluded that this delay is due to inadequate manpower, shortage of shuttering material, contractor not initiating the multitasking activities at site, and the work executed by the activity in haphazard manner at site. The study implies that software Microsoft Project 2013 is the widely used tool to manage the project efficiently. The software also helps to enhance project manager's effective performance towards wastage of resources and its minimization during the construction process. [4]

Chourajit K Sharma, et.al, (2016), increasing complexity in the nature of construction project deviated the interests of researchers towards this topic. Time, Quality and Cost plays vital role in success of any project. Resource Scheduling of the project is the most important factor of project management, the researchers say on basis of experiencing practical knowledge of management on site. The authors studied total project management, function, process and application of project management software - MS Project. They identified the specific area of total project management, where MS Project software should be implemented. A residential building (Villa) at Anand was considered and MS Project software was implemented during its construction. At the end of the project they concluded as, For better planning, scheduling, monitoring and controlling of small as well as large projects, Project management Software MS Project should be used. Implementation of MS Project software provides effective monitor and control for construction of Buildings such as Villas, for Time and Cost Management. [5]

E. Suresh kumar and S. Krishnamoorthi, (2015), according to the authors for completion of the project in time and matching the resources with the allocated time construction scheduling is necessary. Scheduling through MSP Software involves estimation, sequencing the activities, resources allocation and timing. To achieve good controlling and clear schedule to a project, Scheduling using MSP Software comes out to be helpful. Authors conducted scheduling for an apartment building using MSP and EV Analysis. Measuring a project's progress at any given point of time, its completion date, final cost and analysis variance forecast in the schedule and budget of the project can be achieved through EV analysis. Also MSP and EV Analysis help to avoid process time and cost overrun. After completing the schedule and financial analysis of the building authors concluded that difference in budget cost and actual cost is substantial. Increase in the material's price and the labor's wages is the reason for cost difference. Natural disturbances affected the time duration of constructions activities. [6]

Raj Thakur and Harish Kumar Dwivedi, (2019), the authors focused on to study the construction sequence of work and scheduling techniques for multi storey buildings and to apply Microsoft Project software in planning and scheduling of a RCC building construction. They considered a hypothetical RCC residential G+5 building. A comparison is made between the complete planning and scheduling of this building by traditional method used by Architects, Engineers and contractors and by modern software method.

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According to observation of authors, for generating Gantt chart for the schedule of a construction project Microsoft Project software serves as an effective tool. Also by schedule crunching and project crashing methods it provides the minimum duration of construction time. Authors emphasize the application of Microsoft project software for the planning and scheduling of building construction. [7]

Dipti R. Shetye and Dr. S.S.Pimplikar, (2014), informs cash flow is important in every construction project because it gives the detail idea about cash outflow and cash inflow & when we combine the both with the help of graph we can understood that how much inflow and outflow is there in each month. This helps in comparing and to find out profit. 'S' curve of month Vs cumulative cost can be plotted from which month wise how much cost gets added up to the last month of the project can be known. For detailed research author took case study of 'Pebbles' 9 Floored building in Bavdhan. Author collects data like each activity's item wise quantities then basic material and labor rates, then for each activity total consumption of items and to show item wise quantity, rate and amount total BOQ is prepared. Then using Microsoft Project software she prepares work breakdown structure (WBS) in which she inputs duration of activities and does linking. After setting the baseline tracking part is done through tracking grant. This works gives difference in planned and actual duration of the project. Also using visual reports resource cost summery report is generated in MSP. This can be conducted for every month and inflow-outflow is generated. So cash flow report is necessary for every project to ease spending. [8]

B. Arun Kumar, et.al, (2019), to reduce complexities in the project such as maintaining the work flow, resources and the cost of the project authors prefer use of the Project Management Tools. They adopted Microsoft Project for planning and scheduling of the Multi-Storey Building. The building under consideration was of G+16 in which for parking stilt floor is used and the remaining sixteen floors are utilized for flats. The building consists of entirely sixty-four flats in which thirty-two 3BHK flats and thirty-two 4BHK flats are planned. They divided research work in 3 stages. First stage consists of pre data collection such as setting out the objectives, literature review and on basis of area of research case study is adopted. Second stage consists of site supervision to understand the working status, observing drawing details for effective planning, estimation for knowing cost of construction and analysis of material and labour. Third stage involves post data collection to analyse it in Microsoft Project where planning, scheduling and tracking of the project is done. After completion of research work authors implies that Microsoft Project aids to overcome the obstacles faced in traditional way of planning and management. It helps for the effective and optimum organization of activities which leads to the vision to complete the project in planned duration and within the economy. [9]

Shubham Laddha, et.al, (2017), conducted the working and functioning of a project using the modern project management tool available in the market and then compared it with the traditional software (Excel) which is being use. With a view to obtain an idea of various project management practices in construction industry, Also they carried out an online survey focusing on all the stakeholders related to the project. Notably, 80% of the total construction industries in India still for planning, scheduling and controlling of their projects use traditional software Microsoft Excel and 86% felt the need for adapting to new software. Then they approached a Pune based construction company in which Microsoft Excel is still the main source of managing the projects. With a keen desire to work on one of their projects using Microsoft Project, they expressed them their visions. Using Microsoft Project tool they carried on the planning & scheduling of the building. The results they obtained were positive than those using traditional software in a considerable amount. [10]

Rhuta Joshi and Prof. V. Z. Patil, (2015), using Microsoft Project 2013 author analyzed resource constrained project by resource levelling and compares the time cost implications with scheduled time and estimated cost. This study aims at to analyze the Project management techniques by scheduling various construction activities, allocation of resources and resource levelling using Microsoft Project 2013 for residential building. They have selected a residential building G+13 at Karve Nagar, Pune for the analysis. This study reflects a resource constrained project schedule as per the site conditions. Resource levelling is done for resource constrained analysis. Manpower (labor) is considered as the resource type for this project. The overall cost of the project gets affected as project schedule increases day by day cost due to sudden requirement of labor or any unavoidable conditions. Decrease in resource constraints increases the duration. The resources are Male coolie, masons and Electricians etc. Increase in duration (% increase) is 10.38% due to which project cost increases by 0.94%. Thus the unexpected loss of the project which may be caused due to the huge variations in the usage of the resources is reduced by resource scheduling. [11]

Umang Gangil, et.al, (2018), author focused to change traditional techniques of planning using manually with pen and paper or using MS Excel sheets by advanced automated tool like MS project. MS project automatically create graphical charts, cash flow models, timeline model and resource sheets etc according to the requirement from the user. In this work, planning of the construction of foundation is done by MS project. Work schedule consists of task starting from bidding for contract to completion of foundation work with water proofing. All the data is feed up into the MS project. Easy and smooth analysis of the construction work

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is achieved using MS project tools as it provide multiple graphical views like Gantt chart, timeline, network diagram. With the available tools in the software, Resource management and relational task can be easily feed up in the task information. These graphical views help in providing the status of the project to clients. [12]

Monish Kumar K, et.al, (2017), studied that the efficiency of the construction industry is reduced by use of traditional practices and improper planning. This leads to increased duration of the project which causes increased overhead cost of the project and poor quality of work. An effective project management tool is introduced in the form of Microsoft Project 2013 software in order to eliminate these flaws in construction project. In MK apartment residential construction project using MS project 2013 software project scheduling, estimation and resource allocation are adapted. Resource allocation produces budgeted cost, time, and materials of the project. Thus project planning is done accurately using MSP 2013 as a construction project management tool and this enables the management to organize the resources required for the project effectively. [13]

P M Wale, et.al, (2015), focused on a project executed in Pune, Maharashtra. They highlighted on the difference between the Traditional Planning Techniques and Microsoft Project (MSP) which speeds up construction and also make the project cost effective with proper planning. Various methodologies are adopted and to find out remedial measures, international journal papers were referred for finding out different aspects that shows resourceful planning & execution of the project. Methodology adopted includes defining of problem statement, indicating the objectives from the data collected in two part viz. Primary data and secondary, analyzing the data and finally coming up to the conclusion. From the study it observed that construction of building using Traditional technique proves to be uneconomical and consumes more time. It involves many complexibility and enormous errors are observed during actual execution of the project. The main task is not sub divided in traditional way which further gets the difficulty of improper judgment of resources, over allocation of resources for particular activities etc. The modern method of project management i.e. Software Microsoft Project helps to overcome the difficulties involved in traditional way of planning and management. It helps for the effective and optimum organization of activities which provides vision to complete the project in planned duration and within the economy. [14]

Roopa M (Ph.D.), et.al, (2019), to eliminate the flaws of traditional practices in construction project author introduces Microsoft Project software as an effective project management tool. The author undertook 'UNICON NORTH BROOKS 46' as construction project site. It consist of A, B, C and D Blocks planned over in a combination of 13 and 14 floor towers which consist of 264 residencies of 2, 2.5 and 3 BHK apartments varying from 1045 sq. ft. to 1350 sq. The study is conducted only for tower 'a' in which planning and scheduling is done for entire 14 floors and only for first floor further resource allocation, resource levelling, updating and tracking is done. After completion author observed that Microsoft Project 2013 is used by construction companies for their effective output and it is very much efficient than excel. Managers can control over delays in the work and easily manage the situation with help of tracking at any sort of date. Companies can utilize this system of analysis and can update with the best possible alternatives as per the requirements in case of handling several number of similar projects. [15]

III.ONLINE SURVEY

An online form was generated using forms application and shared to be filled up by people associated with Civil Engineering field. One hundred people took part in survey and filled up the form. In this form general questions were asked regarding usage and experience of software in Project Management. Survey is categorized in two parts as general survey and particular survey. General survey consists review from people of different designations. Particular survey consists reviews from only people who have worked in multistoried building construction project. The response of online survey is summarized in form of bar chart and pie chart as shown in figure 1 and figure 2. In this survey comparison is made between Microsoft Excel and Microsoft Project.

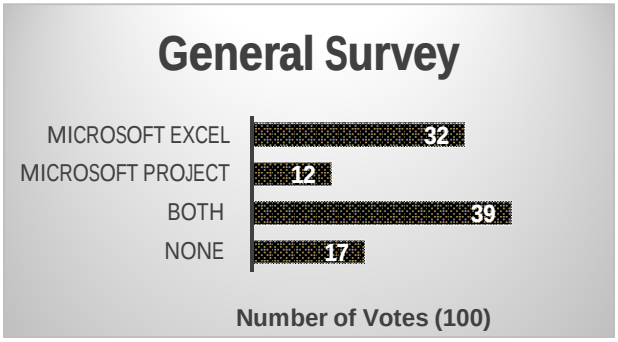


Fig. 1 General Survey

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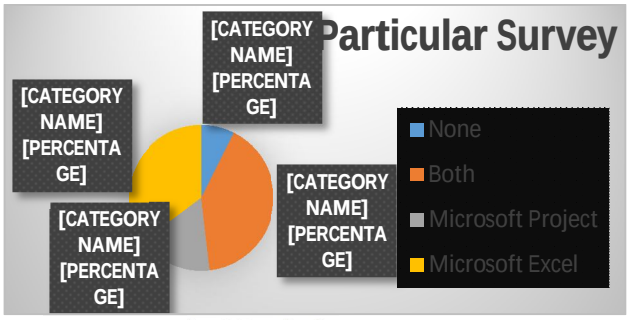


Fig. 2 Particular Survey

IV. RESULT AND DISCUSSION

From General Survey it is observed that 39 out of 100 people have chosen option of using both software i.e. Microsoft Excel and Microsoft Project. Also 32 out of 100 people have chosen Microsoft Excel which is quite higher than votes of Microsoft Project.
From Particular Survey it is seen that 41% of people who have worked in multistoried building construction project have used both software. 35% people have only used Microsoft Excel and this figure is double the use of Microsoft Project by people in multistoried building construction project. In both surveys it is seen that there are still people who are not familiar to any of the Project Management software.

V. CONCLUSIONS

The study shows that a large number of people are still using Microsoft Excel as Project Management software. Microsoft Project is lagging behind Microsoft Excel in terms of usage by a large amount. The literature study shows numerous advantages of using Microsoft Project in multi-storeyed building construction project. Online survey shows that a large number of people suggested Microsoft Project along with Microsoft Excel. From literature study and online survey it is concluded that upgrading to Microsoft Project as Project Management Software is the need of time. Also there is good future scope for conducting research on this study.

VI. ACKNOWLEDGMENT

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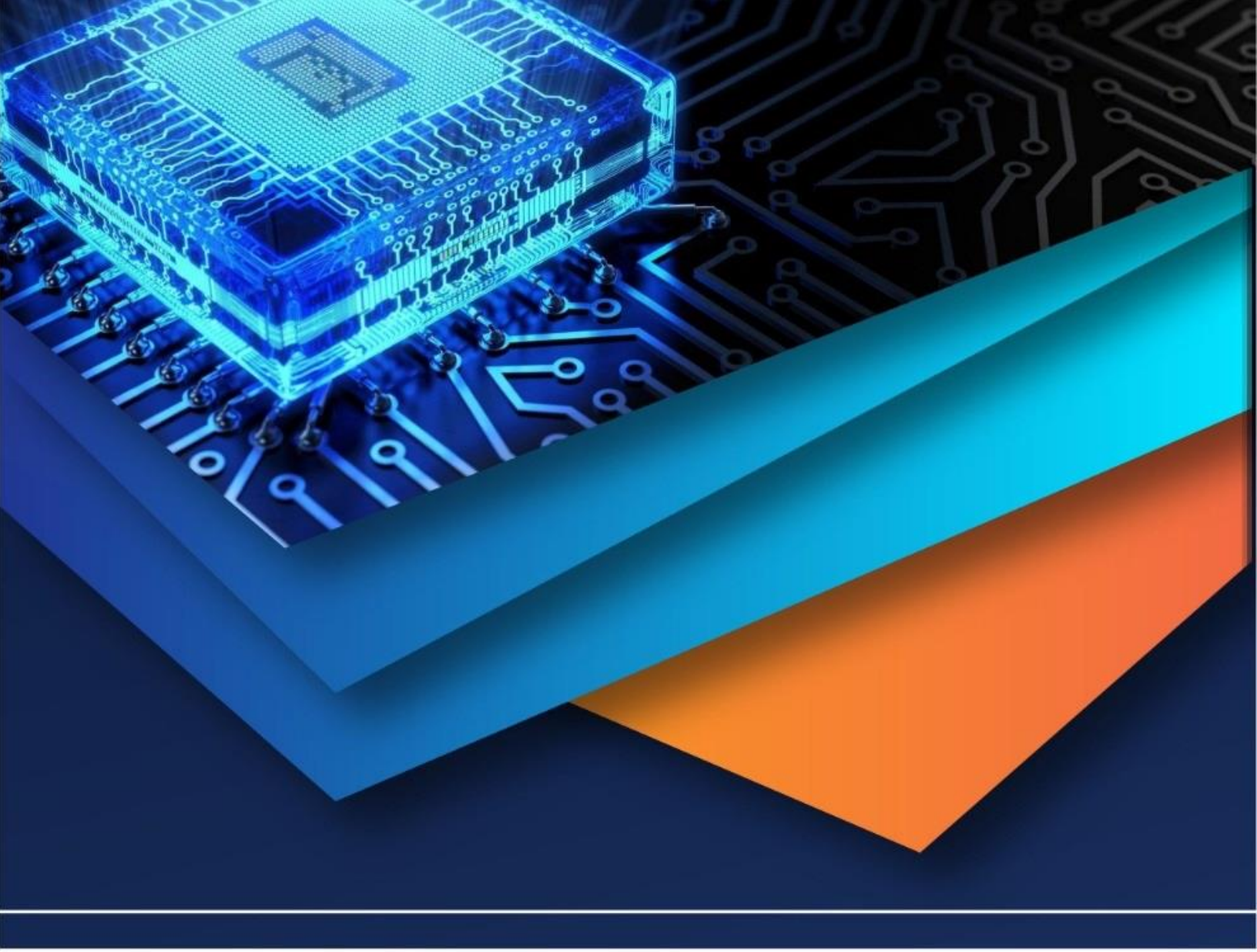
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