RESOURCE ALLOCATION IN CONSTRUCTION MANAGEMENT pdf

1: Resource Allocation in Project Management Software

Limited Resource Allocation Where resources e.g., plant, labour, materials (or capitals) are restricted, the activities have to be rescheduled to satisfy this form of constraint. This will imply scheduling those activities that use such resources, in a sequential or serial fashion.

Introduction Project management is all about managing tasks carefully. Project management gained popularity in the last few decades due to its effectiveness as it helps the organizations to generate extra revenues and complete the tasks within given time. Project managers take salary for managing resources and time from the start till the end of the project. Although, there are a lot of things to take care of in project management but resource allocation and time management are the two main tools or you may say building blocks without which it is simply impossible to complete the project successfully. Why Resource Allocation is so important in Project Management? By the word resources, I am referring to all the resources required for a project such as financial resources, natural resources, human resources, etc. Resource allocation involves the planning of all the resources required for the project. It helps you to utilize only that much resources which are required. We all know that economy is going down these days which have resulted in a tough competition especially with regard to financial resources. The operating cost of doing business has increased. Companies have limited budget for projects so there is no margin for you to waste or misuse any material. Project managers have to work in limited or even tight budgets. Everyone can perform well within huge budgets but only a professional and experienced project manager can manage to work in every situation. If you do resource allocation efficiently then it means your half project is already completed as resource allocation is the most important yet difficult part of project management. Being a project manager, you should know its importance so that you may not do any mistake while allocating the resources. One simple tip is to make the list of all the resources needed for project and then shortlist them to select only those which are most important. Significance of Time Management in Project Management Time management is yet another important part of project management. You have to divide all the tasks on daily manner in order to complete the project within given time. Delay in the completion of project may affect your goodwill no matter what is the reason of delay so try your best to manage work within given time. You may use various tools such as critical path method to select the shortest path for completing every task. You should not waste even a single second. I have one tip for you. Never ever set the project completion date same as that given by your boss, always set it 2 to 3 days before that day so that you can meet the deadline even if any problems comes your way during the project. Now when you have realized the importance of resource allocation and time management in project management then you must adopt it in your next projects to achieve customer satisfaction.

2: Resource Levelling Allocation Management Techniques |

Resource allocation is the process of assigning and scheduling available resources in the most effective and economical manner. Projects will always need resources and resources are scarce. The task therefore lies with the project manager to determine the proper timing of [ ].

Contact Managing Resource Allocation Across Multiple Projects One of the biggest problems small contractors have is managing multiple projects at the same time. It is rare to have all the resources you need on every project. Continual changes, complexity of projects, demands from clients and cash flow requirements mean we are constantly forced to do more with less. Project Management methodologies can be used as a better way to manage multiple projects. If we use program management for the company as a whole, we can deliver more benefits to our clients than if each project were managed in a standalone manner. Through program management, it is easier to optimize resources and productivity and resolve conflicts between projects that affect our ability to deliver client satisfaction. This is especially necessary since resource allocation is a key priority to delivering projects on time, on budget and profitably. The role of the manager is more challenging than that of the project super. Serving as a program manager, you have a far larger scope and must deal with more diverse stakeholders. You also must expect and embrace change and use change to your advantage. Your goal is to make sure your project teams complete the assigned work and meet their objectives, but a major issue is how to best leverage resources use across all your projects. Resource Plan One approach you can use is to develop a resource plan. This is different from a staffing management plan, as you are looking at all resourcesâ€"people, tools, facilities, materials and finances. It has been said that anything worth doing is worth measuring. This means you need up-to-date information on resource availability to see if one project has underallocated and can be better used on another project. And you may have key trade personnel who are required on several projects. Too often this is done on the fly with no planning or foresight. While it may or may not work, it is inefficient and results in lost productivity and increase in overall cost to the company. What is that and can you really think a small contractor will use one? Remember, we are using the tools and techniques of Project Management. This is just a fancy way of saying that you need to develop a SYSTEM that focuses on resource productivity to enable you to quickly identify any resource conflicts that may occur in advance, since projects require different resources at different times. This system collects status and performance needs across all projects to assist you in identifying early any resource issues and evaluate their effect on productivity. Developing such a system and maintaining it is easier said than done. If you do, it will never be used. You want to easily locate the information you need to assist you in leveraging company resources. The object is to show when a resource may be overused or underused at various time periods to help you determine whether you can adjust your resource plan. Your PMIS can help you decide whether some activities on your program can be delayed until an overcommitted resource can be reassigned to work on another project. You must be proactive and work diligently to manage resource allocation and identify and resolve any conflicts as early as possible. Did you like this?

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3: Critical Path Method (CPM) Tutor for Construction Scheduling & Management

Allocation of resources can be a complicated process without the knowledge. Find out how resources are allocated in project management at Resource Guru.

Request Demo Project Resource Allocation and Resource Management The resources of an organization consist of people, materials, equipment, knowledge and time. Organizations typically have limited resources; therefore, tradeoffs on what project resources are expended and when are made every day within organizations. A resource allocation plan is an important tool in effective management of scarce resources. The timing of the need of those resources can be and should be determined within the project schedules. A resource plan, which describes the type of resource needed and the timing of that need, is critical to effective resource management. As the project schedule changes, the resource plan must also be flexible enough to adjust as these changes occur. Dealing with unknowns In developing resource plans, there is little chance that the project manager will have all of the necessary resources assigned to the project at its start. The fact is when starting a project the details of that project are typically unknown. Therefore, knowing the types and duration of resources necessary is not always possible. Known knowns are events that can be planned for. In building the schedule, some deliverables can be decomposed in sufficient detail creating tasks, while other deliverables will only be known at the highest level. When details of a deliverable are not sufficiently known, a planning package should be used. The details of the deliverables defined within planning packages can be considered known unknowns, or risks. In these instances, the work has not been fully decomposed. Known planning events, as well as planning packages, can be assigned individual resources and durations that have been established by the people who will be doing the work. The only difference is in planning packages, the duration and resource estimates are typically less accurate. The use of historical information or industry standards can provide a higher degree of confidence in estimates, when available. It is not necessary to have all deliverables decomposed and assigned to individuals prior to beginning work on a project. In fact, it is very common to set a baseline schedule and resource plan based on planning package estimates. As the project progresses, these known unknowns become clearer to the project team warranting changes within the project schedule and resource plan. Events that cannot be planned for are called unknown unknowns. These events are not known in the realm of possibilities, yet could occur. An example is a warehouse fire that destroys inventory and delays the project completion. This would not normally be factored in as a known event during the project planning, so it is an unknown unknown. Since projects are unique and temporary endeavors, project managers will always work in a world of unknowns. Therefore, resource management and planning should continue throughout the project life cycle. Prepared by Metafuse, Inc.

RESOURCE ALLOCATION IN CONSTRUCTION MANAGEMENT pdf

4: Project Planning - Resource Allocation and Levelling

Abstract Computerized project management in construction is traditionally based on precedence diagrams such as PERT or CPM. Resources required for the execution of activities are usually scarce and therefore.

Microsoft Project plan tried and tested on real projects s of tasks covering the whole project lifecycle. Project Planning - Resource Allocation and Levelling This is a guide to project planning covering 4 steps. You have entered all of your tasks and task duration in your scheduling software, so now it is time to add resources. Resources are usually people, but they can also be materials, for example machinery or automated process - on software projects you might have tasks that are completed by an automated script. There are several ways to add resources in Microsoft Project. However, as soon as you do know the person name them, this will help you to hold them accountable for progress and to manage their work by producing to do lists, calendars and work load profiles. Mastering the Key Skill in Project Management - balancing Time and Resource The skill in project planning comes in balancing two key factors: Alternatively resource requirements may be within limits, but the project end date is much later than your Client would like. Solving the most common challenge in Project Planning This simple example illustrates the common challenge in Project Planning. You are going to use reclaimed bricks, which require cleaning and you need to lay a foundation. If we put this into Microsoft Project we can see that the project can be completed in time, but that you will have to work two 12 hour days! We could change the project logic so that the foundation is laid after the bricks are prepared. Alternatively you could recruit extra resource so that you can still finish the wall in time for your barbecue. There are many ways to resolve scheduling issues and more detail is given in the Microsoft Project User Guide provided with our Microsoft Project Templates. Project Planning Guide - the Key points Thank you for reading this guide to project planning. I hope it was useful. During stage 4 you probably started to notice how important the previous stages were. Stage 1 - Work Breakdown Structure - ensures that you have captured all of the work required to deliver the project. Stage 2 - Precedence Diagram - gives a clear understanding of the order the work needs to happen in. Stage 3 - Estimate Effort - focuses on accurately estimating the effort involved to complete each piece of work Stage 4 - Resource Allocation - brings everything together by adding resources so that the time bound schedule takes into account resource availability and constraints. Project planning can be carried out perfectly well without scheduling software and indeed was done so before programs like Microsoft Project were available. This applies to all stages of planning and I recommend that you avoid even opening your software until you have completed stage 2 and have a detailed precedence or workflow diagram. If you are a Microsoft Project user you will find tutorials and best practice suggestions here.

5: Project Management Basics: Resource Management

Resource AllocationResource allocation is used to assign the availableresources in an economic www.enganchecubano.com project management, resource allocation is thescheduling of activities and the resources requiredby those activities while taking into considerationboth the resource availability and the project time.

The ROI for Construction Management Software is Shocking Most professionals in the construction industry will agree that projects are becoming increasingly complex. Considering all of the changes in construction and engineering methods, rising labor and materials costs, and larger project teams, competent management is more essential than ever before. Construction workers are faced with the constant challenge of hectic schedules and hazardous working conditions, but construction management software can empower employees to gain better control over their work â€" completing projects quickly and efficiently. It helps construction professionals standardize processes, gain insight into problems, improve communication, and increase the accuracy of time and cost estimates. Better process management and automation allows contractors to reduce resource and time requirements, meet deadlines, and archive project records for future reference. Construction worker working on a construction site When financial and operational information is combined into a single database, there is greater visibility across the entire organization. This makes it easier to determine the profitability of each project, improve efficiency through elimination of multiple entries, and increase accuracy in bids and pricing. If a business lacks integrated construction software, duplicate data entry, tracking issues, and forecasting errors are much more common. Unintended waste accounts for a substantial percentage of construction costs, but construction management software allows you to analyze every resource â€" from materials to manpower â€" for the most efficient allocation and reallocation possible. It can spare you from hours of crunching numbers, digging through invoices, and creating estimates. The right software solution allows better control over your entire process, including bidding, accounting, and estimating â€" saving you time and allowing you to create more accurate reports on your projects. It provides access to data in real time, rather than waiting for spreadsheets to be emailed, entered, and analyzed. The type of work you do and the volume of data you need to manage will directly impact your software choice. As with many situations of waiting for features to be built and may not work to extend the life of your existing system. Instead, start with a list of problems that need fixing and look for software that can solve those problems. With that in mind, here are some tips for smart software selection: Start with your needs. Are all of your projects internal, or do you also work with external vendors and clients? Do you need to assign tasks to specific workers? Will your projects involve budgets and invoices? For any construction software to be useful, it has to be used. Include people from finance, project management, and procurement that may be using the software. Your team can help you better determine your needs, and offer useful advice. Find a scalable solution. Implementing a construction management software solution throughout your company is a long-term project in itself, so choose a solution that grows with you â€" offering features you might not even consider using initially. Solicit feedback from each department, as they may have goals they wish to pursue that are different from your own. Asking employees for their opinions also helps implementation, since involving them in decision-making and considering their needs makes them feel invested in the process. Your entire organization should understand the objectives behind the adoption of a construction management software solution. What do you need it to do? A modern technology platform should be capable of adapting to the way you do business, but new implementations require some time to retrain your staff. Offer multiple training sessions, and set up a project so employees can practice creating posts, attaching files, and working with the system. You should have at least one responsible team member tracking projects in real time. A project manager should communicate frequently with the project team, and ensure that everyone is using the software. Track expenses in real time, and receive up-to-the-minute cost analysis. Knowing exactly where you stand helps you keep track of your money, fix overages, and stay on task. The right software will will ensure all departments and workers are in sync in real time. Real Time Updates â€" When a small task is completed, concrete is poured, or perhaps weather is prohibiting progress; project managers and field workers need real time communication to

maximize work efficiencies and minimize mistakes. Make sure your software allows field workers to access files and documents in real time and as they are updated by project managers. There are many moving parts of a successful construction job and as things change, all staff should be able to access any updates to the project. The best construction firms emphasize teamwork, and construction management software enhances the team dynamic. It encourages collaboration and cultivates a communicative environment, in which team members vocalize their thoughts and opinions freely. Every decision is accountable, due to the thorough audit trail documentation. Accountability with respect to project records and finances ensures that each employee takes responsibility for the changes he makes. Since numerous companies and contractors must work together to complete a single job, organization can be a chore, and construction management software is the solution. All of your important documents are safely stored in an electronic format, eliminating the risk of having critical information lost due to an accident, error, or negligence. Proper electronic standards and regular backups keep your important data safe. Document management is an important component of construction management software â€" helping you locate documents and forms quickly, and reducing the amount of time devoted to completing paperwork. Having everything digitized and prefilled frees up time for other projects. Numerous documents must be shared over the lifespan of a construction project. During the early stages, RFIs will be exchanged, submittals will be proposed, and every party needs access to the most up-to-date information. Good software makes it easy to store and transmit every document electronically. This improves communication between parties, and allows for more detailed oversight of information relevant to a project. Purchase and change orders become much easier to track. It improves project efficiency and accountability, by providing a centralized repository for documentation and communications. Construction management software provides immediate visibility into your finances without the time-consuming and error-prone task of manual data entry. It also enhances communication to establish transparency in construction projects. Software makes it easier to maintain logs regarding what happens on the job site â€" allowing you to keep track of materials and tools, for more accurate purchase orders and reduced waste. When purchasing new construction management software, you should expect a positive ROI. Measuring the ROI of your construction software can be complicated, but you can simplify this process by establishing some benchmarks. Decide on the return that you expect to achieve, and the timeframe you consider reasonable. Are you looking for a productivity boost, or easier team collaboration? Whatever your goal, set some objective benchmarks that you can measure. Construction management software reduces the amount of time required to determine the costs associated with a project, allowing you to win more bids, and create a more efficient process for your team. Furthermore, accurately planning for construction costs can mean the difference between making a fair profit versus barely squeaking by. Of course, not all savings can be readily quantified. You may have difficulty determining how big your company is going to grow, and you may not realize all of the benefits a piece of software offers before you begin using it. But, estimating savings as accurately as possible will help you determine the value of construction management software to your company. While some elements of your business are pretty easy to measure, other factors are more difficult to determine â€" such as your need to attract and retain the best employees. Aging technology and complicated systems can have a negative impact on employee morale. An engaged, enthusiastic workforce has a powerful impact on your bottom line, and they need access to tools that allow them to efficiently manage projects and satisfy customers. People are a critical differentiator: Any company can purchase new technology, but they cannot assemble your mix of talent. Establish some subjective benchmarks to track the impact of construction management software on your organization. Consider doing employee surveys before and after changing your software, to determine its affect on your workforce. Combining an investment in current technology with a culture where employees feel valued produces the best ROI. Watch your expenses, but invest for the long term to maximize payoff from intangibles, and realize true ROI. Finally an easy way to protect your subcontractor firm Construction management software streamlines financial operations, speeds up payment processes, and improves collaboration between workers, managers, and clients. It facilitates management of every aspect of the project. Construction management software increases efficiency â€" providing a central location for all of your project information to be instantly stored, accessed, and easily updated. By defining your needs, engaging your users,

and evaluating vendors, you can find the best software for your needs, boost the productivity of your entire staff, and increase your ROI.

6: Importance of Resource Allocation and Time Management in Project Management

Why Resource Allocation is so important in Project Management? By the word resources, I am referring to all the resources required for a project such as financial resources, natural resources, human resources, etc. Resource allocation involves the planning of all the resources required for the project.

Resource allocation will ensure that the work can be completed; however, the early finish of the project is likely to be delayed. There are mathematical algorithms that will provide the optimal solution to resource allocation problems, however, these methods are not of practical value to project managers. Since the optimal method cannot be practically used, project managers and software implement a variety of procedures or algorithms to produce possible resource allocation solutions. Each of these algorithms produces schedules that are acceptable, given the required resource limits. Differences in the solutions may, however, result in different project end dates. Given the different possible results, experienced project managers apply multiple algorithms to evaluate different possible solutions. Regardless of the algorithm used it is assumed that activities are not split. The algorithms also do not consider splitting crews between multiple activities. As a result, resource allocation algorithms are the beginning of evaluating the impact limited resources on the sequence and duration of activities in a project. The first and third activities require one crew per day. We will assume that only one crew is available for the duration of the project. As you can see there is a possible overlap in when the work of the first and third activities can be accomplished. Due to the resource limitation, however, project completion will have to be delayed for the duration of the overlap. The duration of the project is extended two days, because only one crew is available to complete the project. Even the simple schedule, below, can be used to demonstrate the results provided from different allocation algorithms. By inspection you should be able to determine the impact of having only one crew available. Take a moment and determine the earliest that the project can finish given on one crew. Unlike the way that you arrived at your solution, computer software must follow specific algorithms. These algorithms rank activities to determine which activity will receive resources. The basic role of the algorithms is to determine, in cases where activities could begin at the same time, which activity should be given the resources first. Scheduling algorithms must use data that is already part of the schedule. In this case, when two activities could start at the same time the activity with the least total float i. In this case the order of activities to receive the crew will be Activity 1, Activity 3, and Activity 4. The resulting schedule is shown below. What happens, however, if we use the earliest start and then earliest finish as the sorting algorithm? The order of activities would be Activity 1, Activity 4, and Activity 3. The difficulty with using one specific algorithm, only, is that the organization of the network has an impact on the results obtained by the algorithm. An essential lesson from these two simple examples is that a good project manager will know the allocation algorithm being used by their software. If only a single algorithm is available in the software, the project manager should never take the answer provided by the software at face value. The primary sort pertains to all activities, the secondary sort pertains to activities where two activities have the same primary sort.

Enable Resource Management to Make Decisions About Workloads. Sheet owners and team members on the same account that are shared to the sheet with Admin-level permissions can turn on resource management in the sheet so that resource viewers can track and make decisions about workloads.

Illinois State University Normal, Illinois Project scheduling is one of the most important topics in construction management. Many construction projects, such as highway construction, pipelines, tunnels, and high-rise buildings, typically contain activities that are repeated continuously at different locations. Research has shown that many widely used scheduling techniqu es are not efficient enough in scheduling linear construction projects with repetitive activities. An Ant Colony Optimization ACO approach is proposed, evolutionary methods based on the foraging behavior of ants, to resource allocation in repetitive construction schedules constrained by the activity precedence and multiple resource limitations. The algorithm is used to optimally assign resources to repetitive project activities in order to minimize the overall project duration as well as the number of int erruption days. A sample case study is utilized to illustrate the application of the model. Construction scheduling, Resource Allocation, Ant Colony Optimization Introduction Project scheduling is one of the most important topics in construction management. Many scheduling techniques have been developed and are widely used for construction projects. A bar chart is one of the simplest scheduling techniques but it does not clearly show the dependency among activities. Many construction projects, such as highway construction, pipelines, tunnels, and high-rise buildings, typically contain activities repeated continuously at different locations. Research has shown that CPM lacks efficiency in scheduling linear construction projects with repetitive activities Rahbar and Rowings, According to Harris , CPM is unable to provide work continuity for crews or resources to plan the large number of activities necessary to represent a repetitive or linear project, to indicate rate of progress, to accommodate changes in the sequence of work between units, and to accurately reflect actual conditions. A typical Linear Scheduling Method Diagram Figure 1 is a time- versus -distance or -location diagram. Activities are presented as line segments, blocks , or bars in the diagram. The slope of the segments represents the production rate of the corresponding activities. A LSM diagram, which provides a visual presentation of an activity, can clearly show the scheduled progress status of any activity at any given time, as well as identify conflicts between activities. Few of the previous LSM researchers have studie d the impact of project duration with resource limitation constraints. He established a heuristic algorithm to determine the controlling activities path but with no resource limitation considered. Mattila proposed a model of a highway construction project with the consideration of resource leveling. The proposed model was solved by mixed integer programming. Liu proposed another resource allocation model with the consideration of a single resource. He also developed a heuristic solution procedure using the Tabu Search Algorithm. Typical Linear Scheduling Method Diagram The previous research projects initiated the study of Linear Scheduling with resource constraints. However, in real world practice, resources are usually limited. In many cases there may be more than one critical resource that is limited and may affect the proje ct duration. Therefore, it is important to study project scheduling with the constraints of multiple resource limitations. Optimizing resource usage under multiple resource limitation profiles is the primary consideration, but minimizing the resource usage fluctuation is also important. Levelling the resource usage will minimize the amount of idle resources and, therefore , reduce the total cost. Resource levelling and resource allocation problems usually can not be formulated as a linear programming problem without adding assumptions to simplify the problem. This type of problem usually requires a great deal of computing time to identify the global optimum Clough and Sears, ; Ahuja, et al. Therefore, heuristic algorithms are often utilized to efficiently find a reasonable solution for such problems. In this paper, the authors propose an Ant Colony Optimization ACO approach to resource allocation in repetitive construction schedules constrained by the activity precedency and multiple resource limitations. In ACO several generations of artificial ants search for good solutions. Every ant of a generation builds up a solution step by step, going through several probabilistic decisions. In general, ants that found a good solution mark their paths through the decision space by putting

some amount of pheromone on the edges of the path. The following ants of the next generation are attracted by the pheromone so that they will search in the solution space near good solutions. In addition to the pheromone values , the ants will us ually be guided by some problem-specific heuristic for evaluating the possible decisions. Problem Description The resource constraint project scheduling problem is normally characterized by objective functions, features of resources, and pre-emptive conditions Lee and Kim, Minimizing of project duration is often used as an objective function, while other objectives such as minimization of total project cost and levelling of resource usage are also considered. This paper will assume a construction project containing repetitive activities N that are repeated at different locations M. D ifferent critical resources I will affect the project schedule. The problem is to determine the resource assignments of all resources for all activities at all locations. The goal of this problem is to find a best - resource assignment combination and a project schedule to optimize the following two objectives: The resource assignments also need to satisfy the resource limitation constraint, while the project schedule needs to follow the activities precedence relationships. The model will be based on the following assumptions: However, the amount of resources assigned to a task can vary from location to location. Based on the assumptions described above, the formulation of a repetitive project scheduling problem with multiple resource constraints can be presented mathematically as: The first one is to minimize the project duration. Since the largest finish time a mong all activities is equal to the project duration, it can achieve the purpose of minimizing the project duration. The second objective function is to minimize the total sum of the absolute resource usage fluctuation, which can be achieved by minimizing the total sum of the absolute resource usage change at any two consecutive days for the entire project time span. Because resources may have different critical levels, a weighting factor w_i is used and multiplied to its respective resource fluctuation. Ants communicate among themselves through pheromone s, a substance they deposit on the ground in variable amounts as they move about. It has been observed that the more ants use a particular path, the more pheromone is deposited on that path and the more it becomes attractive to other ants seeking food. If an obstacle is suddenly placed on an established path leading to a food source, ants will initially go right or left in a seemingly random manner, but those choosing the side that is, in fact, shorter will reach the food more quickly and will make the return journey more often. The pheromone s on the shorter path will therefore be more strongly reinforced and will eventually become the preferred route for the stream of ants. Ant System Colorni et al. An ACO meta-heuristic was used to treat the complex problem that has been described. Each node will be processed to represent eac h activity location and will be treated as an empty site in the QAP network. In a single objective QAP network, a matrix D shows the relative importance between each facility resource and the empty site. In our optimization problem, each d_{ij} 5 represents a set of conditions required to allocate resources for activity j if it is preceded by activity i. When the ant moves from node I to node j, it will leave a trail analogous to the pheromone on the edge ij. The trail records information related to the previous use of the edge ij and the more intense this use has been, the greater the probability of choosing it once again. At time t, an ant k at node I chose the nest node j to visit based on the probabilistic rule p_{ijk} t as calculated in the following equation: To ensure the production of a feasible assignment, nodes that have already been visited on the current assignment are excluded from the choice through the use of a taboo list. Each ant will have its own tab list, tab_{uk} recording the ordered list of nodes already visited. At any given time, more than one ant seeks a feasible tour. A cycle is completed when each of the m ants have completed a tour of the n nodes. At the end of each cycle, the pheromone trail intensity will be updated according to the evaluation of solutions found in this cycle. Numerical Example and Results The numerical example used in this study illustrates the application of the model. The example considers an artificial housing project. Assume the project consists of four activities: A total of five housing units will be constructed in this project and all activities are identical for each unit. The following table lists the activity ID, the duration, the precedent relationship with other activities, and the required resources for each activity. The five units are planned to be built in order, from unit 1 to unit 5. Two different labor resources were assumed to be required in the housing project. The activity priority shows the importance in which it will be used in the resource allocation procedure. The only exception is parameter q 0 ; it was increased from 0. An alternative solution is obtained from the model created, with project duration of 37 days ,

compared to the original project duration of 25 days, and is presented in the following table: An Alternative solution obtained from the Ant Colony Optimization Model Activity Start Finish Duration L1 assigned L2 Assigned A1 0 1 1 2 3 A2 1 2 1 2 3 A3 2 4 2 1 3 A4 4 5 1 2 3 A5 5 7 2 1 3 B1 2 6 4 3 2 B2 6 10 4 3 2 B3 10 14 4 3 2 B4 14 18 4 3 2 B5 18 22 4 3 2 C1 7 12 5 3 2 C2 12 17 5 5 2 C3 17 22 5 5 2 C4 22 27 5 5 2 C5 27 32 5 5 2 D1 22 25 3 3 4 D2 25 28 3 3 4 D3 28 31 3 3 4 D4 31 34 3 3 4 D5 34 37 3 3 4 Conclusion An Ant Colony Optimization model has been developed to satisfy practical requirements in repetitive construction schedules to find a best-resource assignment combinatio n and a project schedule to optimize the following two objectives: The ant colony optimization algorithm is very efficient and is able to solve difficult problems, such as the proposed one. An artificial housing project was utilized to illustrate the application of the model. In real-world practice, resources are usually limited and repetitive project scheduling with resource constraints is always encountered in construction management. The ant colony approach can be included in the list of reliable and useful optimization tools for solving such problems. An ant colony optimization approach for the single machine total tardiness problem. Distributed optimization by ant- colonies. Ant system for job- shop scheduling. Scheduling single machines by ants. Collective patterns and decision-making. Ethology and Evolution 1 , â€" Probabilistic behaviour in ants: A strategy of errors. Journal of Theorical Biology , â€" Optimization, learning and natural algorithms. Thesis, Politecnico di Milano, Italy. The ant colony optimization meta-heuristic. Ant colonies for the traveling salesman problem. BioSystems 43 , 73â€" Optimization by a colony of cooperating agents. How trail laying and trail following can solve foraging problems for ant colonies.

8: Managing Resource Allocation Across Multiple Projects :: The Construction Management Pro

limited resource allocation Limited resource allocation analysis is needed when there are insufficient resources for the work to be accomplished in the time allotted to the project. Resource allocation will ensure that the work can be completed; however, the early finish of the project is likely to be delayed.

9: Project Resource Plan: Example and Explanation

Unintended waste accounts for a substantial percentage of construction costs, but construction management software allows you to analyze every resource - from materials to manpower - for the most efficient allocation (and reallocation) possible.

RESOURCE ALLOCATION IN CONSTRUCTION MANAGEMENT pdf

Crime control by the national government. Papers on social science utilisation. Attitudes and expectations of deans, directors, and staff Pleura, chest wall, and diaphragm David S. Gierada and Richard M. Slone Pro/ENGINEER Wildfire MECHANICA Structure Tutorial 4 Direct and Subdirect Products 63 Quantitative view of future world economic development Critical thinking brooke noel moore 9th edition Revival training manual Jeanne Masoero: background to an artists life Edward Rutherfurd New perspectives in magnetism of metals Landmarks of Rochester and Monroe County Discovering world geography with books kids love Stealing the magic fruit Germanys Tiger Tanks D.W. to Tiger I Writing for the technical professions Evaluating problems Harvest Sam Inglis Florida: A Guide To The Best Restaurants, Resorts And Hotels Booster and the snitch Hardware Specification, Verification and Synthesis: Mathematical Aspects What every new manager needs to know Ing practice book grade 5 Complementary medicine and non-medical approaches. DNA damage and repair in human tissues Collins Complete Works of Oscar Wilde (First Collected Edition 1948, Reprinted 2001) The Best Breweries and Brewpubs of Illinois Catalogue of Cunieform Texts in the Birmingham Museum SUSE LINUX PRPFESSIONAL USER GUIDE 9.1 New conquest of central Asia Balancing empathy and interpretation Perspectives in Nuclear Physics Obesity, diabetes, and endothelial dysfunction Geetha Soodini and Edward Horton Science fair projects paper TVs sacred cows by Rod Serling Direct Stock.Com (Direct Stock) Vol. I, pt. 1-3. Descendants of Daniel, James and Joshua Brainerd, sons of Daniel and Hannah (Spencer Bra English dictionary with meanings Using technology in education : an introduction to expectations and reality The Annual of Psychoanalysis, V. 29