

Dependency Test: Portraying Pearson's Correlation Coefficient (PCC) Targeting Activities in Project Scheduling

Jana Shafi

Department of Computer Science and Information, Prince Sattam bin Abdul Aziz University, Saudi
Arab j.jana@psau.edu.sa

ABSTRACT: As we know today for every software project we need a clear, unambiguous and facile schedule which can communicate with our complex project's work that need to be performed in a timely manner. Project Scheduling is process scheduling which aims for creating a network (tasks, amount of work, people involved, risks consideration, interdependencies, efforts and utmost deadline). Once network created, roles and responsibilities can be provided to adapt in the organization. Project scheduling is matured enough now to accurately schedule and result in successful products. In this paper we purposes TVs (Transparent view of Scheduling) with broader view of activities in project scheduling can be computed via Dependency Test (Pearson's Correlation Coefficient (PCC)).

Keywords— TVS, Dependency Test

I INTRODUCTION (MOTIVATION)

With the development of project management system in order to direct the project schedules along with the activities and various resources project scheduling becomes the helpful tool for standardizing and ordering activities as well resources according to specifications.

However project schedules returned by popular methods are not satisfactory. Sometimes much of the resources are linked with the activities which have nothing to do with them. It is astonishing part for the developers to pick resources in order to get an appropriate activity.

In order to show where the problem is we input the following activity and resources: Activity1 "Questionnaire: Public" Activity2 "Demonstrating new software: Public" Resources: Vehicles, Chauffer, Maps, Locations

We can exemplify from above that as both the activities requires some common resources for example Vehicles, Chauffer, Maps, and Locations which set both the activities having invisible relation.

Let's analyze the foresaid activities. We want resources in order to to accomplish activity1 "Questionnaire: Public" which requires "Vehicles, Chauffer, Maps, Locations" and activity2 "Demonstrating new software: Public" requires same kind of resources as activity1 as mention above. However both the activities are totally different.

Colliding resources with more than one activity leads an invisible relation among activities.

Corresponding Author: Jana Shafi j.jana@psau.edu.sa

Department of Computer Science and Information
University of Prince Sattam bin Abdul Aziz, Saudi Arab

Colliding resources-this is the key of the whole problem in prioritizing the activities.

Nothing in this boundless universe exists independently. All objects are related to other activities in various means.

We comprehend this activity from the way it relates to other activities.

For example: Regard activity1 "Questionnaire" and activity2 "Demonstration" one of the relations between them are resources "Vehicles, Chauffer, Maps, Locations" in this context.

For better understanding the relationships between activities have to be defining before the developers, a tester understands the semantic of each other.

In the project management system, schedules are presented by the activity estimation of resources for example "System Configuration" an activity presented by "IT block" resources they dealt with activity resource combinations.

As we have experience in using project schedules every day, the result set returned by estimation of activity resource set is really too big and mostly and merely useless. The relationship between the activities is obvious to users or managers, while it is not for the project schedules.

However, it is not always necessary that all activities must be related to each other or with any other kind of activities.

Activities which carry out in individual manner are called isolated activities.

Late delivery of software projects results in huge loss of manpower, industrial efforts and money which discouraged our software industry less or more for accepting challenges for successful projects in recent years[1].

Developers, Engineers and researchers gave a thought of planning all parameters of software management in an organized manner so that the modules of project become transparent with due time. This outcome called as Project scheduling which minimizes the failure of projects and encourages workers morale[1][2]. For Complex projects mostly engineering tasks takes place in parallel so one work may be interdependent on another work or task. These interdependencies can be understood by schedules only.

Schedule's point of view can be understood by TVS which is able to provide a transparent view of interdependent and independent tasks. TVS provides a computational framework for network activities. TVS abandons complication at the work place. Thus in TVS everything

(activity) is belongs to some or the other category which separates various activities from to be get confused or left behind. As we are using mathematical computation to be more focused on points

With each task efforts and duration of time is allocated and thus a task is a part of network that aware the software team to meet the product delivery deadline.

Fig.1 proper scheduling is essential for the project which an experience team can do [1] and must include

- a) Tasks must be created inside network as shown in.
- b) Efforts and timings are allocated to each task
- c) Interdependencies between tasks must be transparent
- d) Resources must be allocated for the targeted work



Figure 1. Activity Network

Work done for both optimistic and pessimistic scheduling in order to get more realistic parameters for project to proceed

An activity – Must have a clear start and a clear stop – Must have a duration that can be forecasted – May require the completion of other activities before it begins – should have some „deliverables“ for ease of monitoring

II RELATIONAL WORK

With the development of Project Scheduling, hundreds of methods, ways established algorithms. Project scheduling in the recent years observed along heuristics, constraint-resources, metaheuristics, and resource based constraints, consistency tests are furnished[4].

J.Alcaraz focused Genetic Algorithm counting resource allocations[10].

Dale.F.Cooper suggested project scheduling-a problem with multiple constrained resources with an experimental investigation with a set of project their characteristics is scheduled by each of these heuristics with a variety of priority rule[8].

J-H-Cho and Y-D Kim emerges with another simulated annealing algorithm for resource constrained project scheduling proble[9].

Christian Artigues presented the flow network model for static and dynamic resource-constrained project scheduling.

Peter Brucker encompasses notations, classifications, models and methods of project scheduling problems[11].

And R.Kolisch compiled a survey on deterministic project scheduling remarking net present value maximization and makespan minimizatio[7].

The main issue address in this paper is how to identify the relations between the various activities which carried out in project scheduling later in project development.

The resources are viewed as independent or interdependent.

Currently a challenge is to know when prioritizing resources using an activity, how many activities are implicitly interconnected to each other which should be recognize to identify the dependent activities.

In this paper we concentrate on the framework of activities along with computation and manipulation in order to identify, sort as well categorize dependent and independent activities.

[A]Paper Organization

In the rest of the paper Section III will introduce the introduces the system of “Tranparent view of scheduling”TVS , depicts its various classification and its formal model.

Section IV will analyze and manipulate the Pearson’s Correlation Coefficient to find out correlation value of activities.

Concepts of Transparent view of Scheduling or TVS (Section III)

Fig.2 Transparent view of scheduling enables specification viewers as well as programmers and clients to instantly associate their activity in concerning categories to carry out process interdependently or independently according to the requirements and resources.

TVS includes

- a) Outsource Activities-Those activities which include all external resources,external components,external behavior and resources other than usual which is or will affect on our activities in near or far future.For Example:Power-shortage,Politics,Rate ofInflamation etc
- b) Insider-Activities which can be completed within organization including manpower, resources and Coordination.(internal resources)
- c) Dependent-Some insider and outsource activities cannot be completed without each other. These are the proportional activities which change with the variance of each other.

For example:-Detail Marketing Plans sales tax, Bond insurance etc

For example:Clients,Distributors,advertisement etc.

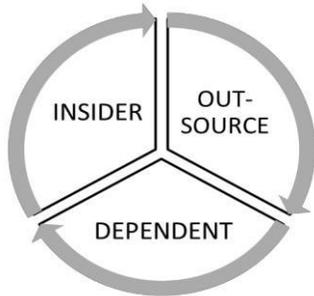


Figure 2. Transparent view of scheduling

I. MODALITIES WITH EXAMPLE:-

A. As we already know that we have TVS classes as Inside,Outsider,Dependent which we abbreviated for our convenience in the following way.

- Inside-In,
- OutSource-Os,
- Dependent-De

B. FORMAL MODEL

Fig.3 portrays how the activities are linked with each other.

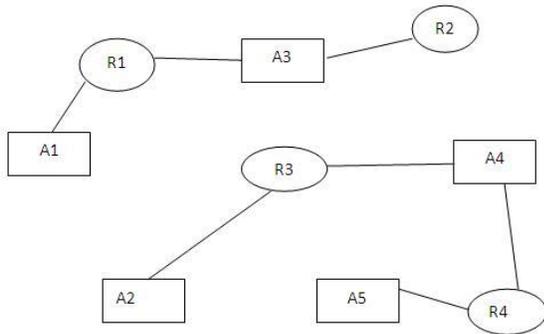


Figure 3 Resource-Activity Relationship Model

Definition 1: A keyword „Is“ is a set of activities which Include internal resources.

Definition 2: A concept of activities C in a given schedule is Presented by a square vertex of graph.

Definition 3: A relation collection in a given domain R is a Set of related activities. It represented by arch of graph.

Definition 4: A graph of an activity relation G is a set of Vectors of the form (A, R) where A is activity Set and is relation.

Definition 5:An activity relation sub graph Gp is a subgraph of G.

Definition 6:Keyword „Os“ is a set of activities belongs to outside resources.

Definition 7:An activity-resource pair set RksetIsOs is a set of activities of the form(Kis,Kos,Risos) where Kis and Kos where Kis refers to Insider,Kos-Outsource Rqisos-is a relation between Ki and Ko.

Definition 8:An activity-resource pair candidate set CRksetp is a set an activity-resource pair set and every Rqisos presents an arc of Gp .

Definition 9:A result set U(Kis,Kos,Rqisos is the returned Dependency value when we correlate an activity of CRksetp into TVS.

C. Demonstration

We are going to demonstrate how to classify activities and to get correlation coefficient of „In“ and „Os“.In the figure 3 Activity classification below some of the activities are given which are analyzed and given 1 and 0

1-For being an activity in particular category

0-For non-existence of activity in particular category

If both In and Os have 1s then the activity meant to be an Dependent activity.

For example:- „Perform survey“is an Outsider activity so 1 appear in it while „Draft Design Documents „is an Insider activity so 1 appear in that column ,even in „Create initial bill of materials“ is an In as well Os so it must be a De(dependent) activity related to each other with resources.A handful experience is needed in order to sort out and classify the activities.

Table 1. Activity Classification

Activity Classification				
S.no	Name of Activities	Insider	Outsource	Dependent
1	Activity	In	Os	De
2	Identify Focus Group Targets	1	0	0
3	Prepare Focus Group Objectives	1	0	0
4	Perform Focus Group	1	0	0
5	Perform Survey	0	1	0
6	Perform Analysis	1	0	0
7	Create Market Research Findings	0	1	0
8	Review Market Research Findings	1	0	0
9	Develop Design Options	1	0	0
10	Present Design Options	1	0	0
11	Draft Design Document	1	0	0
12	Design Document Review	1	0	0
13	Final Design Document	1	0	0
14	Develop Concept Model	1	0	0
15	Review Concepts	1	1	1
16	Create Initial Bill of Materials	1	0	0
17	Develop Initial Prototype	1	0	0
18	Revise Initial Prototype	1	0	0
19	Test Prototype	1	0	0
20	Design Production Process	1	0	0
21	Design Production Testing Process	1	0	0
22	Design Quality Assurance Tests	1	0	0
23	Develop Marketing Strategy	1	0	0
23	Develop Initial Marketing Plan	1	0	0

Table 1.Example:Activity classification

- c) Third, in the "Result Details & Calculations" box, you'll find what we've called a cross-check value, which is the R value calculated using an algorithm supplied by the Meta Numeric statistical library. This should be identical to the value that we've calculated.
- d) Forth, In the graph Depicting Correlation also we showed you that as the result is zero means the Dependability between Insider and Outsider activities is not proved hence no correlation.
- e) Hence this experiment proven that how we can weight our activities as well classify them as dependent or independent

V APPLICATION

The concept can be useful to accurately correlate activities according to their nature which gives perfect scheduling/sequence to carry out in an organization as well activities can be assigned independently or dependently to the team or individuals according to the requirements.

VI (SUMMARY & CONTRIBUTION)

The situation of having no way to process links among activities due to current project scheduling manner will be improved considerably.

In the project scheduling, estimation of activity-resource is recorded and prioritize. We call the activity defining the resource and its relations (among various activities). Then the question is how to define activity resource. Should we use activity -activity- resource. The answer is no. In fact the schedule of activity resource can be standardized by correlating them and weighing them.

The paper purposes "TVS" activity-resource-activity correlation base schedule. It takes advantage of activity-resource estimation and achieves whole correlation value of activities.

The core idea of "TVS" refers the ability of processing relations among activities by retrieving the correlation first and assembles these relations in kind 0,1 for existence and non-existence, dependent or independent into activity-resource pair set and finally indicate it to get the value.

In this paper, The Key idea in Project scheduling is the sequence of events according to their category Insider(Is), Outsider(Os) and Dependent(De). It offers a close view of complex, time-taking Project Scheduling activities an approach through which many activities can be weighed accordingly and we can easily correlate the dependency also.

VII FURTHER FUTURE WORK

Future Work involves many such manipulations in applications which can be used for project development, Scheduling and various accurate computations. The transparent view of scheduling can lead to an era of automatic generalizing events and sequences of Project scheduling engrave with computations for accuracy.

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Author Profile

Ms. Jana Shafi receive B.E Honours (Computer Science & Engineering) as well M.tech honours (Computer Engineering) from MDU. She have research interests in Soft-computing, Fuzzy, Web Computing & Software Project fields. She have many publications in conferences & journals.