FEDERAL UNIVERSITY OF SANTA CATARINA
Computer Science

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Earned Value Management Board Game

Purpose
The purpose of board game is to apply Earned Value Management (EVM) for the monitoring and control of the execution of a software project as part of teaching project management.

Goals and objectives
Goal
On the cognitive level, the learning objective of the game is to reinforce EVM concepts and to teach the competency to apply basic EVM calculations covering the cognitive levels remembering, understanding and application in accordance to the revised version of Bloom's taxonomy of educational objectives (Anderson and Krathwohl, 2001).
Objectives
After the game session, participants will be able to calculate and interpret Performance Indexes (Cost Performance Index (CPI) and Schedule Performance Index (SPI)) to track project progress and to calculate and interpret estimate at completion (EAC) as part of Earned Value Management.

Primary target audience
The activity is intended to be used as part of project management courses (either as part of a university course or professional training) targeted to teach project management professionals and students. A pre-requisite for the application of the game is that the participants have a basic understanding of project management and earned value management taught, e.g., through lectures.

Group size
The game should ideally played in groups composed of about 4 pairs of participants.

Duration

Phase	Time
Explanation of the activity	15 min
Project planning	10 min
Project execution and monitoring & control	50 min
Debriefing	15 min
TOTAL	90 min

Physical setting
Room size depends on the number of groups providing sufficient space for each group for playing the game. At least one large table (or several small ones used together) should be available for each group.

Materials and equipment

Slides for the explanation of the game
Template for project plan, register of costs spent and status report (one per pair of participants)
Game board (one per group)
Instruction sheet (one per group)
Game pawns (one for each pair of participants)
Dice (one per group)
Money in notes of $100, $500 and $1000 (70 of each note per group)
Human resource cards (one set of 24 cards per group)
Risk cards (one set of 33 cards per group)

Process

1. Game preparation

The Project: The objective of the project to be executed in this game is to develop a web-based software system to make appointments for the bathing and grooming of animals in a pet shop.
Client: PET SHOP Beauty Ltd.
Total cost: $ 20,000

Project Team: Each pair of players chooses project team members among the pool of available human resources for all pair of players. The respective cards of the chosen human resources are kept by the pair of players. Human resources can only be acquired/dismissed at this point of time and at a milestone during project execution.

Financial resources: Each pair of players receives $ 20.000 as financial resources to cover project costs. Each pair of players plans the budget considering the salaries of the chosen human resources.

2. Game execution

Each pair of players in turn throws the dice proceeding clockwise. The pair of players with the highest total starts the play. Place your token on the field marked "Start", then throw the dice:
Dice = 1,2,3,4 ⇨ move your pawn the number of fields = number indicated by the dice multiplied with the sum of productivity factors of your human resources.
Given = 5,6 ⇨ take a risk event card and follow the instructions on the card.
Two or more tokens may rest on the same space at the same time.

At the end of each round, a project week ends and therefore, the human resources of your project team have to be paid. Each pair of players has to pay the sum of weekly salaries of their human resources to the bank.
A pair of players who does not have any financial resources is excluded from the game.

Milestones: A stop at a milestone at the end of each phase is mandatory for all pair of players.
At this point, the pair of players must hold a status meeting analyzing the project performance (SPI – Schedule Performance Index and CPI – Cost Performance Index) and make a prediction (EAC - Estimate At Completion).
Based on the project status, the composition of the project team can be changed at this point, dismissing members (returning them to the pool of available human resources) and/or including new members from the pool of available human resources.

The winner is the group who first delivers the product to the customer arriving at the field "Product delivery".

Figure 1. Students of a Project Management Course of the Information Systems Undergraduate Course at the UFSC - Federal University of Santa Catarina/2010.

Debriefing main points

The debriefing is directed to reflect on the usage of earned value management to track the progress o the project, including discussion questions, such as: What do the performance indices indicate? How did your project perform regarding the performance indices? Why did this happen (e.g., why did you spent more than planned on resources? Why did the execution take longer than planned?

In a second part of the debriefing the objective is to briefly reflect on the activity as a learning opportunity, discussing questions, such as: What did you learn through this activity? How can you apply this in your daily work?

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References

Anderson LW, Krathwohl DR (eds) (2001) A taxonomy for learning, teaching, and assessing: a revision of bloom's taxonomy of educational objectives. Longman, New York