RICARDO VARGAS

PERT Analysis in Projects

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Ricardo Viana Vargas is a project, portfolio and risk management specialist. During the past 15 years, he has been responsible for over **80 major projects** in various countries in the areas of petroleum, energy, infrastructure, telecommunications, information technology and finances, comprising an investment portfolio of over 18 billion dollars.

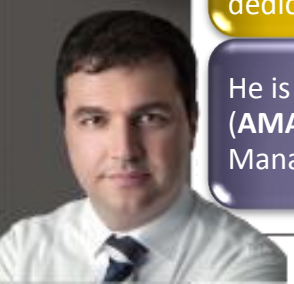
He was the first Latin American volunteer to be elected Chairman of the Board for the **Project Management Institute (PMI)**, the largest project management organization in the world with close to 500,000 members and certified professionals in 175 countries.

Ricardo Vargas has written **ten books** on project management, published in Portuguese and English, which have sold over 200,000 copies throughout the world. In 2005 he received the PMI Distinguished Award for his contribution to the development of project management and the PMI Professional Development Product of the Year award for the PMDome® workshop, considered the best project management training solution in the world.

He is a project management professor for various MBA courses, and actively participates on editorial boards for specialized journals in Brazil and the United States. Vargas is a recognized reviewer of the **PMBOK Guide**, the most important reference in the world for project management, and also chaired the official translation of PMBOK into Portuguese.

He is a chemical engineer and holds a master's degree in Industrial Engineering from UFMG (Federal University of Minas Gerais). Ricardo Vargas also holds a Master Certificate in Project Management from George Washington University and is certified both as a Project Management Professional (PMP) by PMI and as IPMA-B by the International Project Management Association. He attended the Program on Negotiation for Executives at **Harvard Law School**.

Over an eleven year timeframe, which began in 1995, Ricardo, in conjunction with two partners, established one of the most solid Brazilian businesses in the area of technology, project management and outsourcing, which had a staff of **4,000 collaborators** and an annual income of 50 million dollars in 2006, when Ricardo Vargas sold his share of the company to dedicate himself on a fulltime basis to the internationalization of his project management activities.



He is a member of the Association for Advancement of Cost Engineering (**AACE**), the American Management Association (**AMA**), the International Project Management Association (**IPMA**), the Institute for Global Ethics and the Professional Risk Management International Association (**PRMIA**).

PERT Analysis

Use of three parameters to calculate the average time to finish an activity.

The 3 parameters are:

Most Optimistic (Opt) – Assumes the best scenario for the conclusion.	Most Probable (Est) – Assumes normal conditions to finish the activity.	Most Pessimist (Pes) – Assumes the worst scenario for the conclusion.

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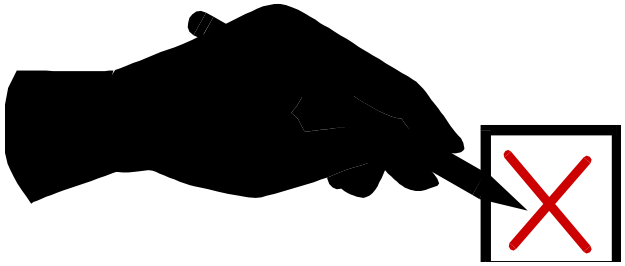
PERT Benefits

The PERT Analysis provides approximating estimates using a relatively simple calculation process that allows better results than other techniques.



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PERT Calculation Process

The expected duration is calculated as

$$D_{expected} = \frac{1xOpt + (4xEst) + 1xPes}{6}$$

The expected duration also takes the non-productive time into consideration

$$D_{expected\ adjusted} = \frac{D_{expected}}{1 - \%\ non\ productive}$$

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Standard Deviation

The standard deviation of an activity duration is calculated by subtracting the pessimistic duration from the optimistic duration, divided into 6

$$S = \frac{D\ pes - D\ opt}{6}$$

The variance is the squared standard deviation

$$V = S^2$$

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Central Limit Theorem

It says that the total variance of the critical path is the sum of the variances of its constituent activities

$$V_{final} = \sum V_{critical\ activities}$$

The standard deviation of the critical path is the square root of the critical path's variance

$$S_{final} = \sqrt{V_{final}}$$

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Probabilities

Duration= Dur Esp + X . Std Dev

- Where X is the number of standard deviations

Number of standard deviations	Prob < Upper Limit	Prob between LL and UL
1,282	90,00%	80,00%
1,645	95,00%	90,00%
1,960	97,50%	95,00%
2,325	99,00%	97,99%
3,300	99,95%	99,90%

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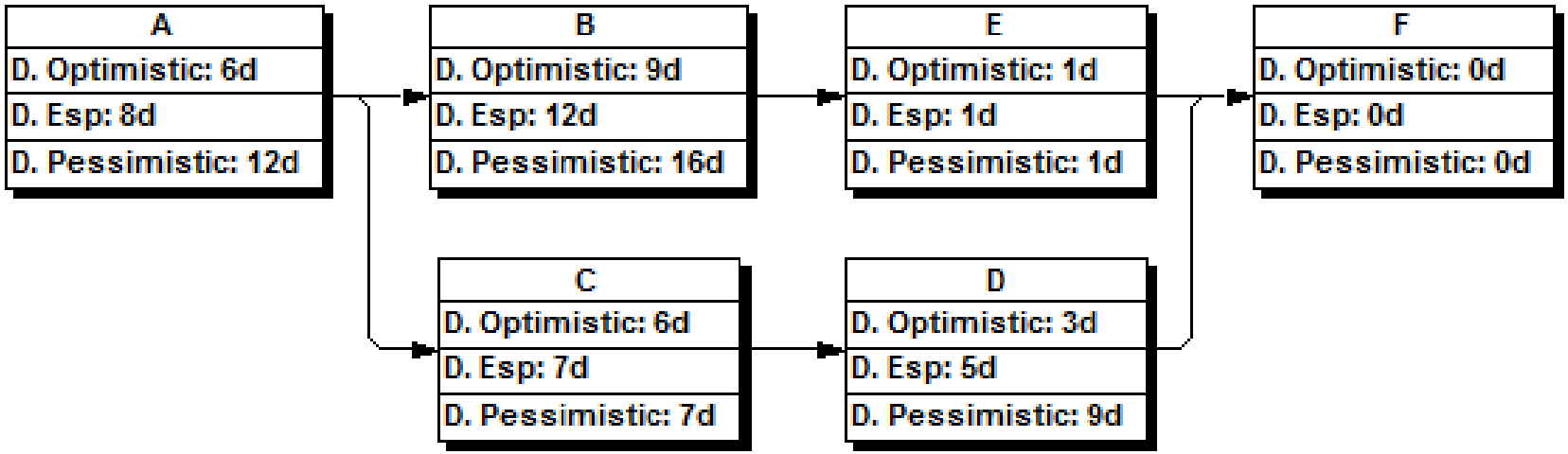
Example



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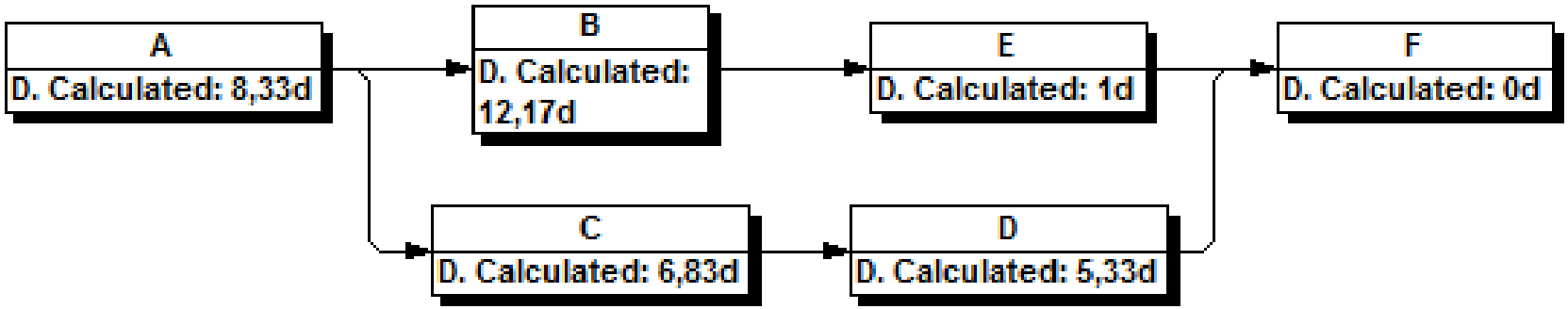
Calculating the Expected Duration



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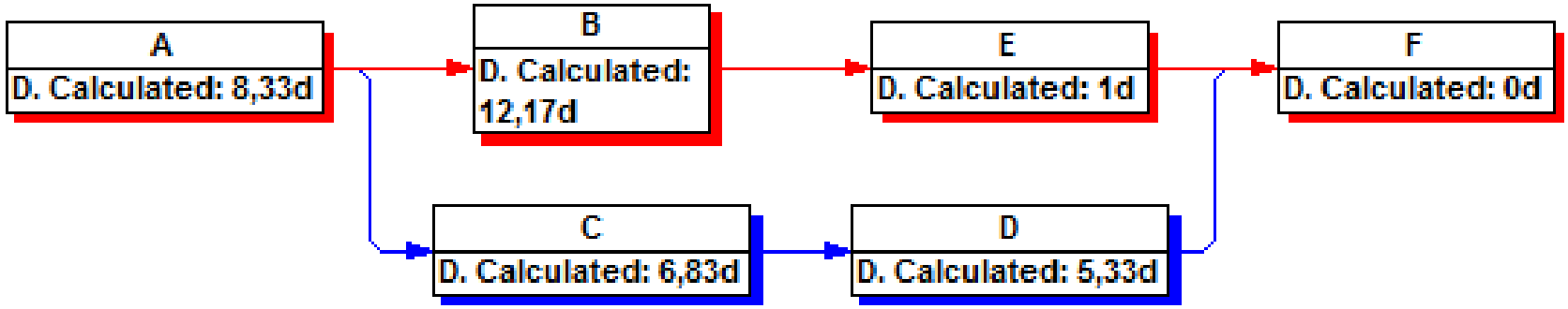
Determining the Critical Path



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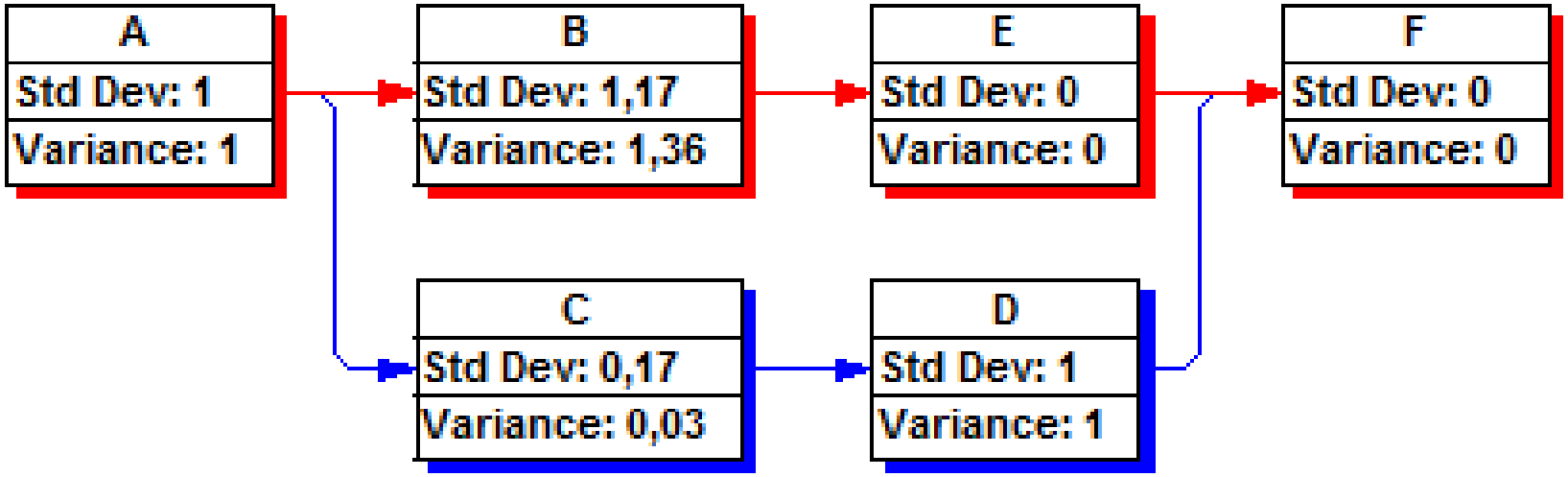
Calculating the Standard Deviation and Variance



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Visit www.ricardo-vargas.com to access other presentations, podcasts, videos and technical content about project , risk and portfolio management.