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## Penn State Smeal CMTOC: Forty-Ninth Meeting

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### "Incentives To Optimize The Design Of Profitable Products"

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Pitney-Bowes (PB) is known primarily for its metered postage machines. It considers itself broadly as a messaging company that helps its customers to be as proficient as possible in getting their mail out. It has \$4.1 billion in sales, 30,000 employees and 600 engineers. It makes more than 1,000 products of varying size and sophistication that are marketed in 121 countries. In the early 1990s, PB's product development projects were large in scope, often rifle shots with no follow-through plans to create product families or product sequences. Engineers negotiated projects independently. There was little formality or discipline in passing through project stages. Most projects were over budget, missed performance targets because of too much stretch, and were late to market. In 1994, a disciplined five-phase process called PACE was introduced, as were cross-functional teams (including non-engineering functions) with core team leaders. In 1996, time to market became a critical objective, but there were still continuous changes in product requirements long after commitments were supposed to be made.

The biggest unresolved issue concerned conflicting incentives among team members. Marketing would try to keep sales projections low. Service tried to delay investment in training people as late in the cycle as possible. Manufacturing didn't want to sign-off on a product because there were many changes after the product launch. Manufacturing wanted zero changes post-launch and wanted to charge engineering for extra tooling costs. Engineering was accountable for time to drawing release, and sales preferred selling what was already successful and was reluctant to launch new products. Data to tailor products for international markets was not collected very well or was late. A major consequence of these problems was that phase gate meetings were highly politicized, and core team leaders took heat from the Product Acquisition Committee that reviewed their projects. During this time, PB's product lines grew rapidly from one-two lines in 1997 to seven lines in 1999. The number of projects undertaken simultaneously grew five times, from 5-10 projects to 37.

PB responded to its problems by embarking on new directions. It benchmarked its peers and the best in class. It agreed to "commit with integrity", which meant "don't commit unless you can do it", and only make commitments if all four key interactive goals were considered simultaneously; speed, product cost, development expense, and performance. Incentives for directors, engineering managers, section managers, and principle engineers were based on commitment and achievement of project as well as company objectives. Core team leaders received a 5% bonus for project success.

Other issues concerned resource availability. In a matrix structure, the appropriate people may not be free when you want them, and is a major impediment to time to market. Another issue was that development cost was overemphasized compared to other variables. Two million dollars and four months once were spent trying to save \$2 million in development costs. PB found itself short on core team leaders, so were using excellent engineers to play this role, and they were not necessarily best at it.

PB changed the product development mission from developing new products to developing profitable products, and developed a single measure of profitability. One core team first experimented with net present value (NPV) in 1998, but this measure had too many variables (40-

50), led to manipulation of the equation, and to lack of appreciation of trade-offs. A simpler conception developed by Reinertsen was then introduced that allowed the team to see the profitability implications of missing targets for schedule, product cost, performance, and development cost. The latter is usually overemphasized because so many people are watching it.

PB used data from PTRM, a Boston consulting firm, that benchmarked thirty-six companies on the four key factors that affect profitability. The data showed that the average company had slippage against commitments of 35%. World-class companies had a 20% slippage. PB simplified its measure of profitability and required core team leaders and members to set targets on the factors that they could influence. Those that they could not influence or predict, e.g., sales volume in five years or price changes due to competitors' moves, number of service contracts sold, were locked in. The other variables can be allowed to change. For example, Pretax Profitability = Volume x (sales margin + service margin) - development budget. The team can affect sales margin via product cost, and service margin via number of failures. Volume is reduced by 1/60 (assuming five year sales horizon) for every month of schedule slippage.

The process begins by setting a profitability target that is based on a realistic business case. The target is then discounted by PTRM's benchmark data for world-class (20%) and average performance (35%) for product cost, schedule, performance, and development budget. If the team achieves profitability that is based on meeting world-class standards, its bonus is calculated as "far exceeds" standards. If profitability is based on meeting average standards, its bonus is calculated on "exceeds" standards. The simplified profitability formula helps the team to make quick and realistic tradeoffs. The standards can be re-calibrated for unexpected hits or great opportunities. The core team leaders and their team members like the new system. Their paychecks depend on it.

The result of implementing the new system is that there has been a dramatic improvement in time to market, faster decision-making, achievement of world-class standards, and still introducing state-of-the art or "cool" products. The benchmarking database will be updated soon to reflect new data from PTRM.

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Last modified Sunday, 07-Oct-2001 21:52:40 EDT