MODULE TWO- INTRODUCTION TO AN IPPD METHODOLOGY

LESSON ASSIGNMENT

Objectives:

- To introduce the student to the need for a generic IPPD Methodology.
- Present a model for required transitions from conventional to future practices
- To highlight the key processes in the Acquisition Process to apply IPPD/IPTs.
- To introduce a generic methodology with the key elements.

Desired Learning Outcomes: The student should be able to:

- Understand the DoD strategy and philosophy for IPPD.
- Explain the key issues involved with implementing IPPD.
- List the required elements within the IPPD methodology.
- Comprehend the product design and development cycles.

Assignments / References

Overall Perspective, Presentation slides.

WORKBOOK FOR MODULE TWO

INTRODUCTION TO AN IPPD METHODOLOGY

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Preparations:

This module includes several discussion questions to be considered before viewing the video, and a set of questions to be answered at the end of the video. You should have viewed the Module one video, Titled "Why IPPD is Important". There is also a paper that is included at the end of this chapter, it is a good idea to read it before answering the discussion questions.

STAGE ONE (Discussion)

D1. List some key features of implementing IPPD.

D2. Can you list five of the many transitions needed for a company to make in initiating Integrated Product Process Development methods.

D3. Can you list some "barriers" to implementing an IPPD methodology on any government program with which you are familiar.

(Start the Video Now)

STAGE TWO (End of Video)

Q1. What, if any, are the differences between the government and industry definitions of IPPD?

Q2. With reference to the Traditional Serial Approach versus A concurrent Engineering Approach of a program, identify three significant differences in the two approaches.

Q3. Where do you believe companies and government acquisition lie along the axis of where competition is determined today?

Q4. What are the three main ingredients of the Defense Manufacturing Council's Integrated Strategy for Cost Reduction?

Q5. What are the interfaces between the phases of the traditional DoD acquisition process and the S&T phases?

Q6. According to the Boeing Company's Ballistic Missile system Life Cycle Cost charts, how much cost was incurred at the end on concept development? How much cost was committed at the same period of time?

Q7. What other affordability themes are supported by Integrated Product Process Development Methods?

Q8. What are the three elements that comprise system effectiveness?

Q9. What is the catalyst for performing cost/performance tradeoffs in system decomposition/recomposition?

Q10. What are all process metrics based upon?

Q11 What are the four ingredients of the generic IPPD methodology presented by Dr. Schrage?

Q12. List the steps in the "Decision Support Process"

Answers To Workbook Questions

ANSWERS for Module Two

INTRODUCTION TO AN IPPD METHODOLOGY

D1. List some key features of implementing IPPD?

Early "buy in" of all participants, including the customer
Concurrence from the start of development
Total system lifetime consideration
Early Risk Identification

D2. Can you list five of the many transitions needed for a company to make in initiating Integrated Product Process Development methods.

Design for performance to design for affordability, individual innovation to team, no customer involvement to customer as a team member, serial Vs concurrent development, hard prototype to simulation, paper to digital, inspection to certification, lowest bid supplier to strategic partner, design review to six sigma, inspection to process control, new technology to dual use, operational test to simulation, single program to tech transfer.

D3. Can you list some "barriers" to implementing an IPPD methodology on any government program with which you are familiar.

Possible "barriers" might include:

Regulatory barriers. For example, for years there has been an on-going discussion if not outright controversy on the right to data and intellectual property. Since one of the more important factors of the IPPD methodology is the sharing of information, determining the right of company and/or customer to data deliverables has not yet reached a level of sufficient resolution.

Managerial barriers. For example, traditionally defense programs were conducted in house on a program-by-program basis instead of one agency contracting and service multiple programs for multiple agencies. Although there is movement id that direction this management barrier still remains.

Technical barriers. For example, manufacturability of a product and the processes that support it are traditionally settled after design completion. Critical Design Review was normally complete before any aspects of manufacturing was considered. As materials used in future products become more exotic, the need to understand their parameters by everyone involved in the product becomes increasingly important.

Q1. What, if any, are the differences between the government and industry definitions of IPPD?

A1. Essentially the differences between the two definitions are grammatical and choice of words. Each embraces early involvement of expert multidisciplinary teams and a systematic approach to all of the activities in the entire life cycle of a product.

Q2. With reference to the Traditional Serial Approach versus A concurrent Engineering Approach of a program, identify three significant differences in the two approaches.

A2. Three significant differences in the two approaches are:

1. The IPPD process applies more resources to the design and development phase of a program, with the attendant risk of design changes being higher.

2. The traditional process relies on engineering changes to be accomplished in the test and production phase of a program resulting in a larger, more costly number of ECP's.

3. The support phase of a systems life cycle is dramatically compared in the costs of making changes.

Q3. Where do you believe companies and government acquisition lie along the axis of where competition is determined today?

A3. According to the ***Technology for Affordability*** report, companies tend to be on the verge of achieving "Company Goodness", a term coined by the Japanese. In the Quality revolution, companies will operate at a level where quality is a "given" entity, expected by the customer and provided by the company with no additional effort. This situation will be preceded by products being produced at a lot size of one where their costs can be independent of economies of scale, learning curves, and effected by agile manufacturing. Companies will form consortia and operate

outside of the brick and mortar of plant. Companies will exhibit "goodness" as they then concentrate on environmental issues, and products that are tailored to the consumers desires.

Q4. What are the three main ingredients of the Defense Manufacturing Council's Integrated Strategy for Cost Reduction?

A4. The three main ingredients of the Defense Manufacturing Council's Cost Reduction strategy are: The Use of Best Commercial Practices and re-engineering the Acquisition Process, The use of Affordable Technology for insertion, and lastly the utility of "affordable parts".

Q5. What are the interfaces between the phases of the traditional DoD acquisition process and the S&T phases?

A5. Advanced Concept Technology Demonstrations, Advanced Technology Demonstrations, Manufacturing Technology.

Q6. According to the Boeing Company's Ballistic Missile system Life Cycle Cost charts, how much cost was incurred at the end on concept development? How much cost was committed at the same period of time?

A6. 1% of the program costs were incurred at the end of Concept Development. These decisions, however committed 70% of the program resources.

Q7. What other Affordability themes are supported by Integrated Product Process Development Methods?

A7. Cost As An Independent Variable (CAIV), Robust Design Simulation, and Open Systems are concepts that are supported by the IPPD methodology.

Q8. What are the three elements that comprise system effectiveness?

A8. Capability, Dependability, and Availability. The other metrics for the system are cost and schedule.

Q9. What is the catalyst for performing cost/performance tradeoffs in system decomposition/recomposition?

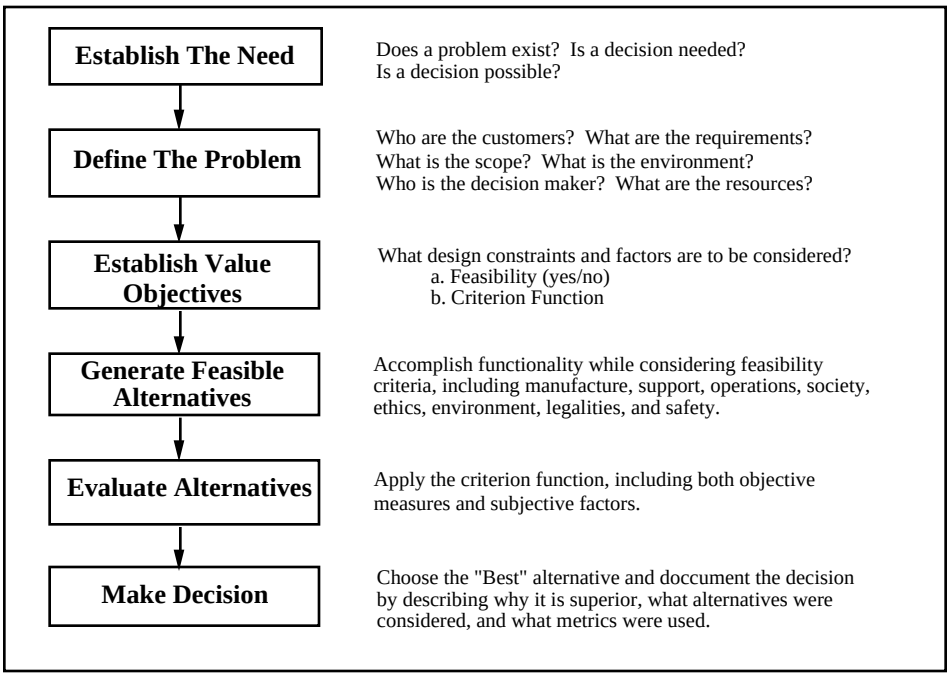
A9. The catalyst for performing cost/performance tradeoffs during systems decomposition and recomposition is IPPD.

Q10. What are all the process metrics based upon?

A10. All of the process metrics as shown on the chart are based upon cost and time required.

Q11 What are the four ingredients of the generic IPPD methodology presented by Dr. Schrage?

A11. The Four Ingredients are the merging of Systems Engineering methods and tools with Quality Engineering Methods and tools facilitated by a Top Down Design Decision Support Process and a Computer Integrated Environment

Q12. List the steps in the “Decision Support Process”

A12. Establish the Need, Define the Problem, Establish Value Objectives, Generate Feasible Alternatives, Evaluate Alternatives, Make Decision. See Below: