COBE Problem-Solving Model

I. Introduction: Objectives

This COBE problem-solving model document is intended for distribution to students to support and promote problem-solving skill development in COBE classes. An appendix will be added for instructors to use as a guide for introducing the general model and focusing the model for particular disciplines.

The general goal is to provide a model and vocabulary for problem solving that can be used across the COBE curriculum to generate consistent, repeated exposure for long term retention.

As a student, one of the principle ways that you can add value to your organization is to be able to take a systematic approach to solving problems. Whatever your particular specialty is, you will be called upon to address problems that stretch across disciplinary boundaries. This model should help you and your organization accomplish your objectives.

As a teacher, this general model is intended to help you work with students to help them discover problems in their thought processes as they grapple with difficult problems that you throw at them. It will help identify teachable moments to help your students troubleshoot how to improve their problem-solving skills.

From Structured Problems to Messy/Unstructured Problems
Business problems range from structured problems (where the problem is clearly identified and the steps to resolve the problem are clearly specified) to messy or unstructured problems (where you have to figure out what the problem might be and you must explore many strategies to address and the apparent problem).

The COBE problem-solving model should help students and faculty work effectively with a broad range of problem types.

II. The COBE Problem-Solving Model
### III. Step-by-Step Descriptions

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| 1. Identify need for problem solving | Recognizes that there is an issue to be addressed—usually some type of discrepancy or gap between current and desired conditions; may be a problem or opportunity. | • Environmental scanning  
• SWOT analysis  
• Gap analysis  
• Strategic planning | Write initial working problem statement (one sentence): “The initially-perceived problem (opportunity) is…” |
| 2. Analyze Problem/Opportunity | Determines the causes of the problem, or nature of the opportunity. Separates root causes from symptoms. Distinguishes facts from assumptions and assesses the credibility of information. Weighs the immediacy and long term importance of solving the problem, identifying criteria a solution must meet. Considers the ethical and value dimensions of the problem. | • Research  
• Quantitative analysis  
• Fishbone Diagram  
• Business Process Modeling | Refine working problem statement based upon analysis. Write one-sentence problem statement: “The underlying problem is…” Determine if the problem is actionable and worthwhile. |
| 3. Generate Alternatives | Generates or collects several alternative solutions. The goal is to arrive at multiple, feasible possibilities for comparison and consideration. | • Brainstorming  
• Nominal group technique  
• Benchmarking  
• Research best practice models | Develop multiple alternatives that address the defined problem |
| 4. Decide Solution | Evaluates alternatives using established criteria. Alternatives may be combined and synthesized. Risks, constraints, and barriers to implementation are also considered in selecting the preferred course of action. | • Cost/Benefit Analysis  
• Feasibility Analysis  
• Risk Analysis  
• Financial Analysis | Develop a solution that best addresses criteria and demonstrates awareness of risks, constraints and barriers Make a compelling case for the selected solution for all relevant stakeholders |
| 5. Implement Solution | Plans and implements the project, including marshaling necessary resources, ordering of activities and allocation of people to required tasks. | • Project Management  
• Team Leadership  
• Change management  
• Marketing  
• Solution branding | Develop a viable, detailed plan of action and implementation of the plan |
| 6. Evaluate Implementation | Assesses the effectiveness of the solution in solving the problem and reaching the desired goal. This may involve developing a monitoring process for generating such feedback. | • Assessment strategies will depend upon the nature of the proposed solution  
• Six Sigma  
• Project Review | Evaluate gap between current and desired conditions  
Provide individual, team, and organizational learning  
Leverage learning & continuous improvement |
IV. Narrative Step Descriptions

1. Identify need for problem solving

Description
This step recognizes that there is an issue that needs to be addressed. Often, this appears as a discrepancy or gap between current and desired conditions, such as sales that are below expectations, or a production line that produces too many defects. Instead of a problem, this step may identify an opportunity that you might take advantage of. In either case, it appears that some effort is needed to change things.

Purpose
One must first find, separate, then clearly and succinctly communicate, the initial problem or opportunity in order to focus problem solving efforts. This statement will be used to guide the analysis work in the next step.

Techniques and Activities
Some examples of techniques and activities that are used in this step include:
- Environmental scanning
- SWOT analysis
- Gap analysis
- Strategic planning
- Continuous improvement efforts
- Business process improvement efforts

Acceptance/Completion Criteria
This step is complete when a clear initial statement of the general problem or opportunity is created. This is understood to be an initial statement, that may change with further analysis. Write a succinct, working problem statement (one sentence): "The initially-perceived problem (opportunity) is…"

2. Analyze Problem/Opportunity

Description
Thoughtfully defines and represents the problem. This entails determining what is known and needs to be known about the issue, and gathering needed information. Causes of the problem are ascertained and separated from symptoms, and stakeholders are identified. The objectives to be achieved and criteria for evaluating a successful solution are developed and prioritized. Ethical considerations also may be included.

Purpose
After the initial identification of the problem (opportunity), a full understanding (as far as possible) must be gained. Working only with assumptions can be counterproductive.

Techniques and Activities
Conduct appropriate research related to the nature of the problem/opportunity. Different research strategies may be required for different situations and contexts.
- Evaluate the reliability of sources.
- Consider the expectations of stakeholders.

Acceptance/Completion Criteria
- Refine working problem statement based upon analysis.
- Write a refined one-sentence problem statement: "The underlying problem is…"
- Make sure the problem is actionable and worthwhile.

3. Generate Alternatives

Description
Generates or collects several alternative solutions. This may entail such activities as brainstorming and benchmarking. The goal is to arrive at multiple possibilities.
Purpose
Often there is not just one answer or solution to a problem (opportunity). To identify the best solution, it is imperative to consider as many candidates as possible. Many problem-solving endeavors suffer from selecting one solution too quickly.

Techniques and Activities
- Brainstorming.
- Nominal Group Technique.
- Research best practice models.

Acceptance/Completion Criteria
Develop multiple alternatives that address the defined problem

4. Decide Solution
Description
Evaluates alternatives on the basis of established criteria. Alternatives may be combined and synthesized. Risks and barriers in implementation are also taken into account in selecting the preferred course of action. Selection can be justified to critical stakeholders.

Purpose
Mere selection of a solution is often not sufficient. A compelling/persuasive case for the selected solution often must be presented to various stakeholders in the situation.

Techniques and Activities
Methods can include cost/benefit analysis, feasibility analysis

Acceptance/Completion Criteria
Develop a solution that best addresses criteria and demonstrates awareness of risks and barriers to implementation

5. Implement Solution
Description
Plans and implements the project, including marshalling necessary resources, ordering of activities and allocation of people to required tasks.

Purpose
Implement the solution in a controlled, methodical fashion. Enable on-going monitoring of the process for evaluation.

Techniques and Activities
- Project planning and management
- Team leadership

Acceptance/Completion Criteria
Use a viable, detailed plan of action/ implementation plan.

6. Evaluate Implementation
Description
Assesses the effectiveness of the solution in solving the problem and reaching the desired goal. Identifies opportunities for improving the solution. This may involve developing a monitoring process for generating such feedback.
Purpose
You can never presume that a solution will work. Many proposed solutions fail. The important point is to
collect data to learn from the process and to ensure continuous improvement.

Techniques and Activities
Evaluation will depend upon the nature of the implemented solution and the desired goal. Reliability of
information is critical to the effectiveness of this step.

Acceptance/Completion Criteria
- Close gap between current and desired conditions
- Solution works
- Provide individual, team, and organizational learning
- Leverage learning & continuous improvement

V. Appendix: Instructor Guide (TBD)
The instructor guide will need to address issues such as:
- Providing realistic contexts for a specific discipline.
- Providing support for using messy/unstructured problems in addition to structured problems.
- Identifying relevant portions of the problem solving model.
- Wrapping the process inside lesson plans that use problem-based instruction.
- Providing examples of similar problems and how the model might help address them.
- Stressing that the problem solving model is data-driven and client-centric.

VI. Contributing Faculty
The following faculty have been involved in various aspects of developing these ideas.
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