

Appendix one

CASE EXAMPLE OF THE CREATIVE PROBLEM SOLVING PROCESS GREAT NORTHERN BUS COMPANY

The Great Northern Bus Company is based in Newcastle upon Tyne and runs regular services to other parts of the UK. The company defines its competitors as all carriers of passengers to all parts of the United Kingdom. The company is forward looking and recently appointed you as a consultant to advise on how it might get to grips with the current problems which it faces. These are summarised by the marketing director as follows:

‘Recently we have experienced a drop in sales and loss of market share in our long distance business and we need to find ways to improve our position. We desperately need some good ideas and a specific plan of action to help us get to grips with this problem. Can you advise, or better still see, what solutions to our problem you can come up with?’

You, of course, want to help and decide that the best way is to make use of the creative problem solving process in which you are an expert. As a first step you decide to gather a small group of personnel with interest and expertise in the subject together to start the process rolling.

You start with *objective finding* and ask the group to defer judgement and list some major concerns in the company. The following list is generated:

- 1 Recruitment of more qualified personnel.
- 2 Improved customer service among long distance passengers.
- 3 Increasing market share.
- 4 Better prediction of customer responses to marketing.
- 5 Developing a marketing slogan.
- 6 Improving manager–subordinate relations.
- 7 Reducing promotional costs.
- 8 Improving target market identification.
- 9 Determining customer preferences.
- 10 Improving focus group procedures.

Next you identify ‘hits’. This is a subjective process and varies from company to company and from person to person. In this case suppose the company identifies items 1, 2, 4 and 9. Items 2, 4 and 9 clearly represent hotspots concerning customers. If the group members agree, they might identify an objective involving customers.

To identify this area, they apply the criteria of ownership, priority and critical nature. They decide they have ownership over all the hits, since customers are a prime marketing responsibility. Of the hits they decide that item 2 (improving customer service among long distance passengers) has higher priority than the other hits, since it is more likely to affect financial profit. (Remember, this was the concern of the marketing director.) It is also critical because an improvement in the financial position is critical and there is a definite need to increase market share. Improved customer service may result in more customers (or repeat business) and therefore more profit.

After reviewing the hits and applying the criteria, they decide on the problem statement: 'IWWMW improve customer service for the long distance passengers?' They are now ready to move on to the next stage – *fact finding*.

Fact finding

The purpose of this stage is to generate relevant data to improve understanding of the problem. This in turn allows you to consider different problem perspectives. To search for data systematically the group uses the 5 W's method. They generate a list of Who? What? Where? When? and Why? questions and answer them as follows:

Who are the potential customers?

The long distance travellers
People on business
People on vacation/holiday
People combining business and pleasure
Frequent travellers
People visiting families
Males and females
Young and old people
Rich and poor people
People travelling with other bus companies

Who provides customer service?

Couriers
Ticket counter personnel
Catering personnel
Drivers
Maintenance staff

Travel agents

What is customer service?

Learning customer preferences

Attending to customer needs

Solving customer problems

Anticipating problems before they occur

Interacting with customers with a positive attitude

Where is customer service most evident?

During journeys

When delays occur

At ticketing counters

When any other problem affects customers

During peak travel periods

When do most people notice customer service?

When they are ignored

When someone goes out of his or her way to help

When they receive prompt attention

When an employee overlooks a minor policy to help someone in trouble

Why is good customer service important?

It helps to attract new customers

It helps to retain old customers

Sustained profits depend on it

It helps the company project a positive image

It creates satisfied customers who are more likely to travel with us again

The group members then converge and identify hits among the fact finding data. To do this they underline the most important responses to the questions and list the results. For example:

The long distance traveller

People travelling with other bus companies

Couriers

Drivers

Ticket counter personnel
Learning customer preferences
Anticipating problems before they occur
During journeys
When delays occur
When someone goes out of his or her way to help
When they receive prompt attention
It helps attract new customers
It helps retain old customers
It produces satisfied customers
It helps the company project a positive image

Next the group examines the hits to see if might group some together as hotspots. The group members develop the following list:

Employees

Couriers
Ticket counter personnel
When someone goes out of his or her way to help

Customers

The travelling public
People travelling with other bus companies
Learning customer preferences
It helps to attract new customers
It helps retain old customers
It produces satisfied customers

Travel related data

During journeys
When delays occur

Problem finding

The group now is ready to enter the *problem finding* stage to consider a variety of problem perspectives. Restating the problem might unlock a new viewpoint that could lead to many creative solutions. To create these viewpoints, the group examines the fact finding hotspots and uses the

hotspots to generate possible problem redefinitions. The group members generate the following list of problems:

In which ways may we

- 1 encourage employees to go out of their way to help customers?
- 2 attract passengers who regularly travel with other bus companies?
- 3 attract new customers?
- 4 increase long distance traveller customer satisfaction?
- 5 reduce the number of departure delays?

Next they converge and identify hits using the criteria of ownership, likelihood of stimulating many ideas, and freedom from criteria. After analysing all the statements they select problems 1, 3 and 4. Of these they decide that problem 4 is most likely to resolve their objective of improving the company's financial position. The primary reason for this choice is one of ownership. Their marketing data suggests that the long distance market is the most unstable because no bus company has established itself in a dominant market position, as is the case with short distance travel. Thus, they may be able to capture a larger market share and improve their financial position.

Idea finding

The group is now ready to begin *idea finding* using the problem 'IWWMW increase long distance traveller satisfaction?' The members start with a purge to list more conventional ideas:

- install more comfortable seats
- offer good entertainment
- provide more leg-room
- train personnel to be more courteous
- lower ticket prices

Next they select a formal idea generation technique such as the two words method to implement the approach. To implement this approach, they follow these steps:

- 1 List alternative word meanings for two keywords in the problem statement.
- 2 Examine combinations of two words, one word from each list.
- 3 Use combinations to suggest ideas.

For instance, they might focus on the words *increase* and *satisfaction* and set up the technique as follows:

<i>Increase</i>	Satisfaction
Improve	Pleasure
Enlarge	Ease
Enhance	Enjoyment
Renew	Peace of mind
Upgrade	Contentment

Different combinations of these words suggest such ideas as:

- Gourmet food (upgrade–pleasure)
- Seconds on food and drink (renew–satisfaction)
- Free travel insurance (upgrade–peace of mind)
- Better seats (enhance–enjoyment)
- Shortening ticket-buying queues (improve–ease)

After generating these and other ideas, the group might try another technique such as brainwriting. Brainwriting is a brainstorming variation in which a group generates ideas silently and in writing. The steps for this method are:

- 1 Each group member is given a stack of index cards.
- 2 Each member writes down one idea per card and passes it to the person on the right.
- 3 The person receiving a card examines the idea on it for possible stimulation of a new idea.
- 4 Members write down (on another card) any new ideas suggested and pass the card to the person on the right.
- 5 After about ten minutes of this activity, the idea cards are collected and evaluated.

Some possible ideas from this technique are:

- Videocassette players built into seat backs.
- Free snacks.
- On board business card raffles.

In this example, the group has generated a total of twenty ideas for improving passenger satisfaction. Group members now need to converge, identify any hotspots, and select idea-finding hits. For hotspots, they identify:

- Travel comfort (e.g. more comfortable seats, more leg-room)
- Food enhancements (e.g. gourmet food, free snacks).

To select hits from among these hotspots, they decide upon three criteria: cost, ease of implementation, and likelihood of increasing passenger satisfaction. After examining all the ideas and applying the criteria, they reduce the list of twenty ideas to two:

- 1 More comfortable seats.
- 2 Video-cassettes built into seat backs.

The group is now ready to move to the next CPS stage and select a final problem solution.

Solution finding

Solution finding contains two sets of divergent activities. First, the group generates evaluative criteria:

- 1 Cost.
- 2 Time to implement.
- 3 Degree to which current equipment will require modification.
- 4 Effect on routine travel operations.
- 5 Acceptance by bus crew.
- 6 Passenger long term interest level.
- 7 Ability to interest a broad cross-section of passengers.

The second divergent solution-finding activity is to improve the ideas from idea finding. In this case the group members decide the ideas don't need improvement and move on to convergent solution finding.

Of the seven criteria they generated, the group members decide to delete criteria 2 and 5. They then construct a weighted decision matrix (Table A1.1). This allows different weighting for each criterion; thus cost may be seen as more important than acceptance of an idea by a bus crew.

Table A1.1 Weighted decision matrix

<i>Criteria</i>	<i>Criteria importance</i>	<i>More comfortable seats</i>		<i>VCRs in seat backs</i>	
		<i>Idea score</i>	<i>Subtotal</i>	<i>Idea score</i>	<i>Subtotal</i>
1 Low cost	5	2	10	3	15

2 Equipment modification	5	1	5	2	10
3 Routine travel operations	4	2	8	3	12
4 Passenger interest level	4	3	12	5	20
5 Interest to cross-section	3	3	9	5	15
Totals			44		72

The group rates each criterion on importance, using a five-point scale (1 = not very important; 5 = very important). Next, each solution is rated on the degree to which it satisfies each criterion. The lower the number, the less the criterion is satisfied. For instance, more comfortable seats were rated a 2 on the criterion of low cost. This means the group believes they will be relatively expensive. (Cost is always a confusing item since low cost will receive a high rating). Finally, they multiply the criterion ratings by the ratings for each solution ('idea score') and sum the products (subtotal). For instance, they multiplied the criteria importance rating of 5 for low cost by the rating of 2 for more comfortable seats and recorded a response of 10 as the subtotal. Then they summed the products in each column. As shown below, they rated VCRs the higher of the two options. In this case, however, the group decides to select VCRs.

Acceptance finding

It is not enough to select the best solution. Steps must also be taken to ensure the solution can be implemented successfully. This requires consideration of implementation obstacles and ways to overcome them.

A systematic way to ensure effective implementation is to conduct a potential problem analysis (PPA). Although different versions exist, the PPA used here was developed originally by Kepner and Tregoe (1976) and later modified by Van Gundy ([1981] 1988). The steps for conducting a PPA are as follows:

- 1 Generate a list of potential problems that might hinder solution implementation.
- 2 Select the most important problems and list the possible causes of each.
- 3 Rate the probability of occurrence of each (1 = not very probable; 5 = very probable) and the seriousness of each (1 = not very serious; 5 = very serious).
- 4 Multiply each probability rating (P) times each seriousness rating (S) to obtain a PS score.

- 5 Generate preventive actions for each problem cause.
- 6 Rate the residual probability (RP) that each problem cause still will occur after a preventive action has been taken.
- 7 Multiply the PS score by the RP score.
- 8 Develop contingency (back-up) plans for causes with the highest $PS \times RP$ scores.

An example of a PPA using the VCR is shown in Table A1.2. There are two problems with three causes each. The group estimates that all the preventive actions will reduce the probability of occurrence of each cause. For instance, equipment failure owing to lack of maintenance is reduced from a probability value of 3 to a 1 after the preventive action of checking the VCRs after every trip. Group members then multiply the PS ratings by the RP ratings to determine which causes should have back-up or contingency plans. In this case, the most important area seems to be equipment failure owing to misuse. If built-in ‘help’ functions do not prevent misuse, they suggest a computer diagnostic program that automatically signals potential misuse. If the group wanted, it could also have developed contingency plans for the other, more highly rated causes.

The last acceptance finding activity involves developing an action plan to guide solution implementation. A useful way to structure this plan is to use the Five W’s questions of Who? What? Where? When? and Why? For instance, they might ask such questions as:

Who will be responsible for implementation?

What will they implement?

Where will they need to go to implement it?

When should it be implemented?

Table A1.2 Example of a potential problem analysis (PPA)

<i>Potential problem/causes</i>	<i>P</i>	<i>S</i>	<i>Preventive actions</i>	<i>PS</i>	<i>RP</i>	<i>PS × RP</i>	<i>Contingency plan</i>
1 Equipment failure							
(a) Heavy use	4	5	Use industrial equipment	20	2	40	
(b) Misuse	5	5	Built in help	25	2	50	Computer diagnosis
(c) Lack of maintenance	3	5	Check after every journey	10	1	10	
2 Passengers do not know how to use equipment							

(a) Unfamiliarity	2	3	Instructional video/film	6	1	6
(b) Poor instructions	5	3	Write own instructions	15	1	15
(c) Not user friendly	5	4	Test with passenger sample	20	2	40

The Why? question can be used by asking ‘Why?’ of all the other questions – that is, asking why a particular person (or persons) should be responsible for an implementation activity (Who?); why a particular thing should be implemented (What?); why it should be implemented in a particular location (Where?); and why one time rather than another would be better to implement it (When?). This stage ends with a sequential listing of specific action plan steps. For instance, the group might want to survey customers, then contact VCR manufacturers and take bids, consult with engineers on installation problems, rewrite instructions if necessary, and so forth.

After implementation, the only remaining CPS activity is to follow up the effectiveness of the solution. In this instance, the group would want to know if it has solved the original problem of increasing passenger satisfaction. If so, the next task would be to relate improved satisfaction with increased revenues from ticket sales.