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**CASE STUDY METHODOLOGY IN THE AVIATION INDUSTRY**

Jeffrey C. Johnson

**Abstract**

This was a paper showing the utility of the use of case study methodology as a means to enhance student learning in aviation education. A short discussion of the case study methodology based on R. Yin's case study approach was presented to give the reader background knowledge from which to perform a case study. Through the case study methodology, the aviation instructor can identify key variables of airline management, define and present these variables to the students in the classroom, and then have the students perform a case study investigation of their selected airline over the course of a semester. Day-to-day operational variables of aviation organizations can be investigated from several sources included documentation, archival records, direct observation, participant observation, and physical artifacts. Use of these data sources will ensure correlation of collected data among multiple sources and increased reproducibility of collected data thus strengthening the validity of the instructor's and students' study. A sample case study is presented with its associated selected, identified and defined variables. By tasking the students to perform the sequential parts of a case study in multiple parts over the course of a semester, each student will have a complete, well investigated case study of an airline of their choice at the end of the course. A sample case study of Aloha airlines is presented as an example of a completed case study on an airline. Recommendations for incorporating a case study into the curriculum of an airline management course are presented as a sample of the use of this teaching technique in the aviation classroom.

Case study methodology is a tool that aviation instructors can use successfully to enhance student learning about airline management. Case study research facilitates an in-depth understanding of a current complex issue and strengthens previous knowledge, while providing opportunities for further research. Yin defines the case study research method as, "an empirical inquiry that investigates a contemporary phenomenon within its real life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" (Yin, 1994, p. 23). Yin goes on to say that case studies are the preferred strategy when "how" or "why" questions are asked in empirical studies, when the researcher has little control over the events, and when there is a contemporary focus within a real life context. Case studies tend to be selective, focusing on one or two issues fundamental to understanding the system being examined (Tellis, 1997).

Case studies are most useful and as comprehensive as possible when the researcher utilizes the process of "thick description." "Thick description" involves an in-depth

description of the entity being evaluated, the circumstances under which it is used, the characteristics of the people involved in it, and the nature of the community in which it is located (Yin, 1994).

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According to Yin (1994), there are three types of case studies: *Exploratory* – searching without first defining specific variables; *Explanatory* – searching after defining specific variables; and *Descriptive* – reporting on findings not related to specific variables. Robert Stake (1995) included three others: *Intrinsic* – when the researcher has an interest in the case; *Instrumental* – when the case is used to understand more than what is obvious to the observer; *Collective* – when a group of cases is studied. Illustrative case studies are primarily descriptive studies. They typically utilize one or two instances of an event to show what a situation is like. Illustrative case studies serve primarily to make the unfamiliar familiar and to give readers a common language about the topic in question. Exploratory (or pilot) case studies are condensed case studies performed before implementing a large scale investigation. Their basic

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function is to help identify questions and select types of measurement prior to the main investigation. Cumulative case studies serve to aggregate information from several sites collected at different times. Critical instance case studies examine one or more sites for either the purpose of examining a situation of unique interest with little to no interest in generalizability, or to call into question or challenge a highly generalized or universal assertion.

Regardless of the many forms it can take, "a case study is generically a story; it presents the concrete narrative detail of actual, or at least realistic events, it has a plot, exposition, characters, and sometimes even dialogue" (Baum, 1996, pg. 21). Generally, case study reports are extensively descriptive, bringing with them the problem of determining the optimal combination of description and analysis. Dul and Hak (2007) define a case study as a study where a single or multiple organizations are chosen, selected attributes are measured and scored and the scores are analyzed in a qualitative manner.

Case studies are detailed explanations of the researchers' theoretical positions; of how those theories drove the inquiry or led to the guiding research questions; of the participants' backgrounds; of the processes of data collection; of the training and limitations of the coders, along with a strong attempt to make connections between the data and the conclusions evident. Because case studies tend to be exploratory, most end with implications for further study (Soy, 2005).

Yin (1994) further suggested that every investigation should have a general analytic strategy, so as to guide the decision regarding what would be analyzed and for what reason. Yin, in particular, refuted the criticism of this decision by presenting a well constructed explanation of the difference between analytic generalization and statistical generalization: "In analytic generalization, previously developed theory is used as a template against which to compare the empirical results of the case study" (Yin, 1994, pg. 32). The inappropriate manner of generalizing assumes that some sample of cases has been drawn from a larger universe of cases. Thus the incorrect terminology such as "small sample" arises, as though a single-case study were a single respondent.

Stake (1995) argued for another approach centered on a more intuitive, empirically-grounded generalization. He termed it "naturalistic" generalization. His argument was based on the harmonious relationship between the reader's experiences and the case study itself. He expected that the data generated by case studies would often resonate experientially with a broad cross section of readers, thereby

facilitating a greater understanding of the phenomenon.

### Yin's Case Study Methodology Suggestions

Yin (1994) explains that the case study methodology is a complex methodology resulting in extensive study of one or more real-life situations with the intent of generalizing those happenings to other, similar circumstances. This methodology lends itself to the study of contemporary situations such as instances of peculiarity in the airline industry of an airline's operations. It also allows the researcher the ability to clearly and succinctly present data, findings, and conclusions to the public in a recognizable format through a written report. Many studies of the airline industry should take the form of a case study because it is the most applicable methodology for the study of the factors leading to the successful operation of an airline. This is evident from the numerous case studies in modern scholarly journals including an investigation of Air Baltic and SAS by Huettinger (2006), and an analysis of Air China by Ahmed, Zairi, and Almarri (2006). In each study, airline management is studied by identifying key variables and performing a case study using those identified variables to come to conclusions on various airline management techniques. Dul and Hak (2007) maintain that the case study methodology, if employed correctly, is often the preferable and most appropriate research strategy in management investigations.

Once the case study methodology is chosen, Yin (1994) suggests the research follow four stages:

1. Design the case study,
2. Conduct the case study,
3. Analyze the case study evidence, and
4. Develop the conclusions, recommendations and implications.

During the course of the case study, Yin (1994) suggests the researcher applies the following four research techniques:

1. To explain complex causal links in real life interventions
2. To describe the real life context in which the intervention has occurred
3. To describe the intervention itself
4. To explore those situations in which the intervention being evaluated has no clear set of outcomes

Yin (1994) listed several characteristics that a successful case study should entail. The list of characteristics put forth by Yin follows.

- Collects data about a specific individual, object, or group.
- Uses multiple sources of evidence.
- Frequently includes accounts from the subjects themselves.
- Studies events and subjects in real-life contexts.
- Draws conclusions about the research and limits them to the subject(s) within the defined context only. No attempt is made to focus on or discover universal truths or theories.
- Seeks to understand complex phenomena from the participant's point of view. It does not seek to discover relationships among measured, more empirical variables.
- Seeks answers to questions of how and why, instead of who, what, where, how much, and how many.

#### *Designing a Case Study*

*Identifying a Theoretical Perspective.* According to

Becker, et al. (2005), researchers must first develop explicit questions for exploration to design successful case studies. These questions are the equivalent of the hypothesis statement or question in other forms of research. From these questions, the researcher then must decide from which theoretical perspective the study will approach the case.

Research design, according to the CSU writing guide (Becker, et al., 2005), provides the plan the researcher will follow to begin the research project; limit the scope of the research project by deciding which data are relevant to the research; accomplish the research project; analyze the data collected during the research project; and, finally, draw conclusions from the research. A strongly designed research project has a definite link between the research questions, the data presented and the conclusions proposed. Simply stated, research design provides the roadmap for getting from the research question to the research conclusion.

*Case Study Methodology Design Components.* In order to design a successful case study, the researcher must define five components into the overall research design (Yin 1994). Lee (2005) shows the interrelationships of these five components in the design of a case study in figure 1.

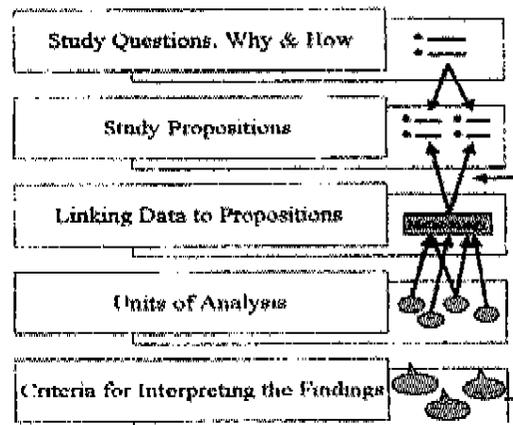


Figure 1. Case Study Design Components (Lee, 2005)

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Yin (1994) defines the five components of a case study as:

1. A study's questions.
2. A study's propositions (if any).
3. A study's units of analysis.
4. The logic linking the data to the propositions.
5. The criteria for interpreting the findings.

*Case Study Design Conditions.* Yin (1994) presented three conditions for the design of case studies: a) the type of research question posed, b) the extent of control an investigator has over actual events, and c) the degree of focus on contemporary events. In case studies of airline operations, the research question seeks to identify key characteristics of an airline that, if duplicated, may hold the key to successful operations in other, similar airlines. The strength of the question is its limitation to the scope of the research project. The initial research should be limited to one airline, making it a single case study, and should define the unique operating environment and geographical area to be studied. By limiting the study to this degree, the researcher satisfies two goals. First, the project is of such a scope that it can be completed accurately and in a timely fashion. Timeliness is especially important in the ever-changing aviation industry. If the study were to continue for too long a period of time, the context in which the study started could change drastically enough as to negate the need for the study. Second, limiting the scope of the study in the manner described opens up further investigation into similar airline operations in other regions of the world. Follow-on multi-subject case studies may strengthen this initial study's findings.

*Recommended Procedures.* Yin (1994) identified six primary sources of evidence for case study research. They were documentation, archival records, interviews, direct observation, participant observation, and physical artifacts. Because no single source of data is better than another during the course of a case study, Yin suggested researchers use as many varying sources as possible but cautioned that researchers follow three principles during the collection of data. The researcher should use multiple sources of data, create a case study database to organize and track data, and maintain a chain of evidence appropriate for each type of data. The validity of the study is strengthened greatly by keeping an accurate data base and a thorough chain of evidence. Because of the sensitivity of the information relayed to the researcher during employee interviews, senior airline management often limits dissemination and publication of written records of individual employee interviews. Relying on Yin's proposed course of action, interview results can be correlated with public domain information collected from various sources including the Federal Aviation Administration, the National Transportation Safety Board, the Department of Transportation, the Airline Transport Association, the

Airline Pilots' Association, the Regional Airline Association and other industry sources. In this way, the validity of the data gathered during interviews would be available for inclusion in the final report.

### *Conducting the Case Study*

Robert E. Stake, Helen Simons, and Robert K. Yin refined Yin's initial description of case study methodology (Lee, 2005). They suggested case study researchers should use six steps rather than the original four offered initially by Yin. These six steps were:

- Determine and define the research questions
- Select the cases and determine data gathering and analysis techniques
- Prepare to collect the data
- Collect data in the field
- Evaluate and analyze the data
- Prepare the report

Lee (2005) suggests that establishing a definite research focus should be the first step in case study research. This will guide the researcher during the project by providing an overall goal to the study. Lee (2005) goes on to suggest that most case study research projects answer one or more basic questions that begin with "how" or "why." To maintain a manageable scope, the researcher must ensure the questions are general enough to allow investigation of the proposed subject but also specific enough to set boundaries for investigation. Once the initial goal of the study is determined and the scope is defined by the initial questions, the researcher then conducts a literature review. During the course of this review, the researcher should search for sources that may already answer the initial questions of the project. The researcher will discover those areas that were undiscovered and should apply investigative resources to answering those questions remaining unanswered.

After setting the purpose of the study, the researcher should next design the case study research to accomplish the proposed goal of the investigation (Lee, 2005). In some instances, the researcher may decide the proposed case is unique and does not have any other real-life case that is comparable to the proposed subject. In this instance, the decision would be fairly straightforward; the single case study method would be warranted. But what if the researcher studied something in comparison to other, comparable real-life cases? Should the researcher then always choose to perform a multiple case study? Typically, the answer would depend on the type of subject proposed for the study. The strength of the case study is the use of multiple techniques and sources for data to cover the subject of the investigation. The researcher must rely on the basic questions proposed for the study to determine whether or not inclusion of comparative cases would strengthen or weaken the project.

Once the researcher decides on the methodology the study will follow, decisions on data gathering tools and

techniques are made. Taking precautions in this area will strengthen the study and enhance its validity and reliability.

Once the type of case study methodology to be used for the project is selected, the researcher must obtain resources to gather data and obtain proper permissions for observation during the data gathering phase (Lee, 2005). This step is integral to the study because the researcher must have the ability to observe all aspects of the subject to ensure validity of the collected data.

Once the project progresses into the data collection phase, the researcher must collect, catalog and store multiple sources of evidence (Lee, 2005). Proper cataloging and storing of collected data will allow the researcher show a direct relationship between conclusions drawn and data collected.

Researchers at Colorado State University propose that using multiple sources of evidence increases the reliability and validity of the data. This, in turn, causes the case study to be much more convincing and accurate because it is based on several different sources of information (Becker, et al., 2005). This causes the researcher to keep facts fresh and allows subtle threads of similarity to emerge during data collection.

After the researcher is satisfied enough data has been collected from which to draw conclusions to answer the basic research questions and satisfy the purpose of the case study, the researcher next analyzes and evaluates the data (Lee, 2005). The researcher reviews the raw data using as many perspectives as possible with the objective of finding linkages between the observed and recorded data and the research subject.

Finally, once the study is complete and the conclusions answer the original research questions and satisfy the purpose of the study, the researcher presents the data in such a way that allows the reader to follow the collection of data and the subsequent analysis of data. If this is done properly and the linkage of the data to the conclusion is done correctly, the reader will come to the same conclusions as the researcher.

#### *Application of Case Study Methodology in the Study of Airline Management*

The methodological approach is successful when used in the study of airline management. As described in Case Study Methods, the "case study is an in-depth study of the cases under consideration" (Hamel, et al., 1993, pg 32). The authors go on to say, "the degree of detail in the description of the case study thus serves to ensure that the representativeness of the case under investigation" (Hamel, et al., 1993, pg. 32) of the entire population. There is no more appropriate application of this research methodology than studying the uniqueness of a particular airline. To accurately present the total picture of an airline's business model and operational performance, this type of study provides an accurate representation of both the environment

within which this airline operated and how it operated successfully in that environment. By performing a detailed case study, a study of this nature accomplishes this task.

The aviation instructor can use the case study methodology to enhance the students' learning by developing a case study with them throughout the course of a semester. The instructor and each of the students should select an airline they will investigate. In the beginning of the semester, the students, under the direction of the instructor, should develop a list of management variables that they should study generically in airline management. As a guide, the following areas of an airline should be examined by the students:

- Airline history
- Competitive advantage
- Airline economics
- Service strategic strategy
- Human resources
- Management control
- Service-price offer
- Management information systems
- Airline fleet composition
- Communications
- Service-delivery
- Internal and external relationships

Once the students identify the variables, the instructor can either define them for the students, or, preferably, have the students define the variables through investigative reading of selected airline management journals. Each student should be required to prepare a paper listing the selected variables and defining each variable. This could be the first required submission of the course.

Next, the class should collaborate and agree upon the design of the individual studies. By having one set design, the instructor can guide the entire class through their investigations even though each student will be investigating a separate airline. These studies should be designed along the four-stage structure suggested by Yin (1994) as discussed earlier in this paper. The first section should define the variables studied and show the students' linkage of those variables to the operation the subject airline. The next section should contain the students' observations of the subject airlines' operations and data from various other sources documenting aspects of the airlines' operations that are not observable from a researcher outside the airline industry. This chapter should also contain an analysis of the various data points from which the students drew conclusions on the factors that may lead to successful operations by new entrants into areas. Finally, the last section should contain conclusions and generalizations that show the applicability of the study's findings to airline operations in other, similar operating environments.

Case studies of airline operations should use five of the six primary sources available to case study researchers.

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These five primary sources are documentation, archival records, direct observation, participant observation and physical artifacts (Yin, 1994). Because of the non-reproducibility of the sixth source, personal interviews, conclusions drawn from them must be corroborated with other reproducible data (Lee, 2005). In this way, the validity of these studies will be ensured by the reproducibility of data from which conclusions and recommendations are drawn.

#### **Design of a Case Study in the Airline Industry**

Basic management theories apply to the aviation industry except that safety is paramount in all aspects of this unique industry. According to Rodwell (2003), strategic management, one business principle, refers to the management of long-term goals. Service strategic management, another business principle, is the means through which a service organization will implement its vision of its specialized service (Holloway, 2002). While still a long-term implementation plan, service strategic management deals specifically with the delivery of a specialized service. In the airline industry, this service is travel and the various facets that make up that service specialization such as route structure, fleet make-up, aircraft cabin class structure, and fare structure.

In successful endeavors, strategy is formed through the implementation of a systematic process that follows a well-defined, step-by-step process (Houger, 2006). Often times, organizations will take this too literally and forget to modify the plan as time passes. When this happens, various opportunities become evident and are missed. In order for a company to have a successful strategy, the stakeholders must specify the organization's objectives, analyze the various organizational environments, make assumptions of expected and forecasted future events, formulate several possible plans of action to attain the stated objectives, and then select and implement one of these choices. Finally, the organization must set up control, or feedback, mechanisms and measurement standards to provide a means to ensure adequate progress toward the strategic goal.

As the students begin to identify and define the variables they will consider in their case studies, the instructor should ensure the variables are defined adequately. The following discussion shows an appropriate level of definition for the variables previously presented.

#### *Airline History*

Historically, according to Dempsey and Gesell (1997), several key events have shaped the aviation industry. The first powered flight in 1903, the development of mail contracts in the U.S., the formation of flying clubs and regulatory bodies in Europe, WWI and WWII and their effects on the advancement of aeronautical technologies, the invention and advancement of the jet engine, the advancement and aviation application of computer technology, and the proliferation of a worldwide economy

are examples. Each step in the advancement of aviation ushered in new requirements for increased performance. These requirements, in turn, led to further research and development and the invention of exciting new aviation technologies.

During the growth of aviation, the application of basic management theory to aviation became more defined and could be seen as a cyclical process. In his study of management versus leadership, DeGrosky (2006) defined the four basic functions of management as planning, organizing, directing, and controlling. Studying factors that lead to innovation in facilities maintenance management, Pitt, Goyal, and Sapri (2006) provided linkages of these management functions to the aviation industry. The management function of planning refers to formulating the road map an organization will take toward its stated goals. Organizing for the voyage toward these goals includes identifying what resources the organization will need to succeed in attaining their goals. Once organized to accomplish the tasks required to attain the stated goals, an organization must have leadership directing and coordinating the actions of its various parts toward the common goals. Finally, to ensure the organization is moving toward its goals according to its original plan, the leadership of the organization must measure their progress through a systematic control system to give feedback on its progress. If the organization's progress toward its goals is proceeding according to plan, the organization continues to move forward toward attaining the goals. If, on the other hand, the organization is not making progress toward its goals, the management on the organization will see this lack of progress in the control function of management and must then go back to the planning function to redraw a roadmap toward the intended goals.

In the aviation industry, implementing these four management functions allowed aviation managers to become aware that the ever increasing capabilities of aircraft in the aviation industry demanded a cyclical application of the management functions. This allowed aviation managers to adequately manage and control further advancement. An example of this is shown in a management study by Houger (2006). In this study, Houger shows that through the application of a cyclical management process, the Boeing Corporation redefined its overall goal to remain competitive in the market. In its early years, the Boeing Corporation focused on wing design and manufacture as its main product. The company dominated large aircraft mainframe production by consistently producing unique, better performing wings that redefined the existing performance standards. As time past, and new competitors entered the market, Boeing realized it could no longer rely solely on wing design to stay ahead of its competition, instead, as it cyclically went through the four functions of management, it changed the focus of the company from wing design to

total aircraft integration making wing design and production one of its strengths instead of its only strength.

In their study, *Competitive Dynamics of Interfirm Rivalry*, Baum and Korn (1996) studied the entrance of new air carriers to specific markets in the aviation post-deregulation period. This study, a dynamic analysis of California commuter airlines from 1979 through 1984, showed that when market domain overlap increased, airlines' rates of market entry and exit rose, but when multi-market contact between rivals increased, the entry and exit rate decreased. This was observed even more markedly where one dominant airline was present. Thus, in contradiction to what the researchers intuitively suggested, in market segments of this type, close competitors were not the most intense rivals. Rather, airlines were less aggressive toward each other when they met in multiple markets than those that met in one or even a few markets. However, Baum and Korn found a distinct correlation between market entry and exit, and competition in a single market versus multi-markets. In the case of regional airlines, the authors concluded that airlines that competed in multiple markets challenged each other's operations in each other's markets far less vigorously than those that competed in a single market. A corollary to the study's conclusion is that airlines that operate together in single markets compete with each other's operations far more vigorously than those that compete in multiple markets.

Baum and Korn (1996) also concluded that age of an airline also correlates positively with its expansion into new markets and routes. They stated that the newer the airline the greater the desire to enter new markets. Size of an airline, however, showed to have a negative correlation with market entry. The authors concluded that as an airline grew in size, it became less likely to enter new markets. Their view agreed with Amburgey & Miner (1992) who concluded that the previous entry and exit patterns of airlines played little role in their current willingness, or lack thereof, to expand or contract route structures.

#### *Competitive Advantage*

Competitive advantage can mean many things depending on the context in which it is examined. In their study of management, Henard and McFadyen (2006) define competitive advantage as result of the investment made by an organization in key areas that differentiate its product in the marketplace thus ensuring long-term success. In the aviation industry, it refers to the ability of one carrier to find some advantage in an area over another carrier. Because of the complex relationships between carriers, a competitive advantage in one area toward one carrier may not be the same competitive advantage over another carrier. Depending on the route segment, the local economy, and the general economic environment, airlines and aviation industry members remain flexible to vary competitive advantages, depending on the geographic or economic segment in which

it is sought. Without competitive advantages in various areas, a carrier will lose its ability to attract a suitable customer base and remain economically viable in an industry where profit margins rarely top 3%.

Henard and McFadyen (2006) maintain that to capitalize on an organization's competitive advantage, the organization must persistently invest in those differentiating characteristics that provide success in the marketplace. Depending on the operational environment, marketing efforts may take varying amounts of resources to be effective. What may work in one segment may not work in another. Again, the unique global nature of the aviation industry dictates that marketing efforts vary widely for a company as it markets itself across national borders. The application of the basic marketing principle of addressing the price, product, place and people in marketing efforts varies based on specific market analysis in specific segments.

#### *Airline Economics*

Basic economic principles apply to the aviation industry, but the global, fast-paced nature of the industry make their application vary slightly from other industries (Rodwell, 2003). In the economic study of several airlines, Tegmeier (2006) proposes that good economic initiatives that are non-aviation related are just as important as those that deal directly with aviation activities. Things such as landscaping expenses, utilities, terminal and hangar rent, and maintenance spare parts inventory cost all impact the viability of an airline's economic situation. Using natural lighting through the installation of sky lights in their hangers resulted in a considerable energy savings for Aloha airlines. Cash flow in the aviation industry is much more important than in many other industries because of the consumption of fuel. However, the consumption of fuel does not, in itself, produce revenue. Rather, revenue is produced through the delivery of all the services that make up the traveling day for the customer (Dempsey, 1997). Sufficient revenue must be diverted to the purchase of fuel to ensure continued operations. This will, in turn, allow the airline to purchase more fuel. Maxon (2005) cautions, however, that the increase in fuel prices over the past several years place extreme economic pressure on airlines and must be guarded against with alternative fuel purchasing strategies. One example was America West's second quarter fuel purchase hedge (Choe, 2005). Because the airline was able to by bulk fuel futures for the second quarter of 2005 at what turned out to be at a cost considerably less than what the fuel price rose to, the airline was able save \$11.3 million in jet-fuel expenses during that quarter.

#### *Service Strategic Strategy*

In considering the formation of service strategic strategy, an aviation organization must find areas of competitive advantage. While analyzing the various environments in which it operates, an organization must

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determine the competitive scope in which it will operate (O'Malley, 2005). This competitive scope includes decisions on the types of services the organization will offer to differentiate it from its competition. The way a service organization will use this competitive scope to attain its strategic goals is the organization's service strategic strategy. In the case of an airline, the types of geographical and demographical environments in which it will operate and compete are among the variables that must be planned for. The direction defined by this competitive scope results in a set of service concepts. These dictate what type of operations the airline will offer, which will, in turn, determine the operational guidelines for the airline to attain its strategic goal. The service strategic strategy is, therefore, determined by discovering competitive advantages, defining how the competitive scope will capitalize on those advantages, and determining what service concepts will deliver the service required to realize those advantages.

#### Human Resources

To attain a strategic goal, an organization must staff itself appropriately. In their study of innovation performance in companies, Cano and Cano (2006) observe that the human resource function of management is responsible for this. Recruiting, training, and decruiting are also the responsibility of Human Resources. The difference between the aviation industry and other industries is that matching very specialized skill levels to specific positions to ensure safe operations at all times is a paramount concern. While other industries can accept a certain amount of incompetence, the aviation industry has no room for error. An employee must perform the assigned tasks correctly the first time or a mishap may result. This means there is no room for Human Resources to fail in its screening process. Human Resources in the airline industry are one of the most powerful entities serving one of the most critical management functions.

#### Management Control

Management must set a common path for the organization to follow. Progress toward the desired end state is monitored through a series of measurements and observations that make up the control function of management (Beranek et al., 2006). To perform the control function properly, managers must set measurement standards to indicate proper progress toward attaining unit objectives. Most often, these measurements are set in the form of goals. To be effective, goals must be both attainable and measurable. Goals must be challenging and indicate when progress toward the end objective is being made and are often referred to as outcome controls.

#### Service-Price Offer

Once the strategy is set for an organization, and the markets most likely to produce the best return on service are identified, the organization sets about the task of developing the "service-price offer." In a study of product market

regulations, Messina (2006) defines the "service-price offer" as the relationship of an organization's chosen service offerings and its pricing scale. After an organization determines the set of services that a certain market demands, the organization must then decide what costs the market will support and, finally, the correct mix of services to satisfy as many of the customers' desires as possible, while still allowing the organization to operate profitably. To determine this mix, the organization looks at the individual services and determines the distinguishing characteristics of each.

Intangible services are those services that do not produce physical products (Bourdeau et al., 2005). Rather, they produce actions that customers desire. Cardinal Airlines (Press, A., 1999) began service between Florida and New York offering only first class seating, in the hopes of capturing the business traveler sector of the travelers between the two states. The basic characteristics of services are intangibility, perishability, inseparability, and variability (Bourdeau et al., 2005). Intangibility refers to the extent to which a service renders no physical product. While a hotel chain may produce the intangible product of a place for a traveler to stay for the evening, its service product is less intangible than an airline's service of moving the same traveler from point "A" to point "B" because of the short amount of time the passenger takes advantage of the airline service. The traveler is exposed to a hotel's service for much longer and develops a correlation between the service the hotel provides and the physical attributes of the hotel. Therefore, hotel service is less intangible than airline service. Similarly, perishability refers to shortness of time a service has an impact on the customer. In the example of a hotel chain, the service offered may last for several days depending on the traveler's needs. Because an aircraft must land to refuel, an airline's service will only last several hours at most. The airline's service is more perishable and therefore has higher perishability.

Logically, the third attribute of a service is inseparability (Bourdeau et al., 2005). This concept refers to the ability of a service provider to separate its intangible service offer from the physical capital equipment used to produce the intangible service. In the case of a hotel, the service a traveler receives is tied directly to the type of building and furnishings offered by the hotel. An airline, in contrast, can offer the same flight segment on a myriad of different aircraft with little or no difference in the traveling environment. This is due to the aerodynamic design requirements of various aircraft. All commercial aircraft are driven to similar design based on segment requirements. Hotels vary widely because the services offered vary requiring various physical attributes from the service provider to support the production of the chosen service.

Finally, the concept of variability refers to a service's consistency over time (Bourdeau et al., 2005).

Individual organizations use measurements of certain products and procedures to examine the amount of variability of their production. Because of the great regulatory requirements of the airline industry, airline operations are consistent and the services provided by the industry's members do not vary widely. The Federal Aviation Administration tracks the on-time service delivery of the industry's airlines. A flight is considered delayed if it departs more than fifteen minutes late.

An airline examines each of these characteristics from a demand view point and a supply view point. Once this is accomplished, the airline can make the correct service-price mix and market to the selected customers. After the mix is decided upon and marketed, the airline assesses the effectiveness of the offering. This is most often done with the reception of the offer by the customer base and is measured primarily through sales data. If the offering does not satisfy the market, either through improper pricing or improper mix, sales data will show an insufficient amount of revenue to justify continuing the offer. The airline will then reassess the service-price mix and decide to adjust or abandon it.

#### *Management Information Systems*

Management Information Systems (MIS) are used extensively in the airline industry. Organizations, including airlines, rely heavily on MIS while performing market analyses (Leahy, 2006). The use of MIS in the aviation industry is mandated by the fast paced industry trends such as introduction of new low cost carriers to market segments during post-regulation and post 9/11 industry reorganization. Timely, proper evaluation of choices is necessary so narrow profit margins are not lost (O'Connor, 1995). Saving time on the evaluation of a service-price offer mix can often mean the difference of discontinuing an offering before it leads to a loss in revenue. In other cases, the use of accurate, automated planning computer systems and the related software often allow airlines to maximize the efficiency of the match of their aircraft fleet with their route structure (DeBoer, 2004).

The entire aviation industry's reservation system, including scheduled carriers, corporate operators and general aviation, is housed in computer systems. Extensive financial studies are done several times a year to identify wasteful practices and eliminate non-profitable operations (Gillie, 2004). Capitalizing on the speed and accuracy of MIS is a top priority for the industry (Milne, 1999).

#### *Airline Fleet Composition*

While testifying before the House Transportation and Infrastructure Committee during hearings on airline pensions, Delta Senior Vice President Donald Yohe (2005) stated that beginning with the terrorist attacks of 9/11, several economic crises have befallen the nation's struggling airline industry. The airline industry has lost over \$33 billion, and the latest crisis plaguing the industry is sky rocketing fuel costs. Acquisition of efficient regional jet liners with low fuel consumption rates

have allowed low cost carriers to gain control of 30% of the domestic market and they are gaining even greater market share quickly. The flexibility in route structure these smaller jets give these regional carriers also adds to their utility in a market with very low profit margin. To gain competitive advantage, airlines must control costs.

#### *Communications*

One of the most important tasks for any organization is communicating its activities to its constituencies. For an airline, once the decision is made on the desired service-price mix, it must communicate the make-up of the mix to its customers. This is called "marketing" (Thogersen, 2006). Effective marketing, and successful operation, therefore, is grounded in effective communication.

#### *Service-Delivery*

Once the service-price mix is communicated to the customer, an organization must decide how to deliver the service to the customer. This is known as the "service-delivery" model (Harvey, 2006). Because there are limited ways an industry can deliver its services to the public, differences in service-delivery models between competitors are based upon the effectiveness and efficiency of the operations model of each. Accomplishing each approach requires differing amounts of resources. Each organization must optimize its effectiveness and efficiency to minimize cost and maximize profitability.

#### *Internal and External Relationships*

Relationships in organizations include internal relationships between employees and external relationships between employees and customers. Internal relationships are affected by the corporate culture of an organization. External relationships are affected by the environment in which the organization operates. The most productive relationships are those that are mutually beneficial. These collaborative relationships are symbiotic and result in win-win situations where each party gains from the other. This is the type of relationship an organization should foster between its employees and its customers (Herington et al., 2005).

The external relationship between the management of an airline and its unions is extremely important to successful airline operations. When considering this external relationship, care must be taken to examine the relationship with each individual union bargaining group. In the U.S. airline industry, pilot union contract negotiations typically precede all other union contract negotiations. This is due to the amount of the pilots' salaries compared to other airline employees. A concession that results in a small proportional reduction in pilots' wages typically results in a greater cost saving than a far greater proportional reduction in other employees' wages. Because of this, airline management negotiates with the pilots' unions first, and then with the other bargaining units.

#### **An Example Case Study of Aloha Airlines**

The next exercise for the students will be to perform a case study of their selected airline using the list of defined variables they presented in their papers. Performing such an investigation is a daunting task, and a preferable method to enhance learning is to investigate and report on three or four variables at a time as the instructor leads classroom discussions

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on the variables. In this way, all the variables can be investigated and reported on over a period of two months. The students should prepare and turn in a paper on each group of variables separately. At the end of the semester, the final assignment should be for the students to merge the various papers they have prepared and provide conclusions on the selected airline and the various management techniques that proved successful or detrimental.

#### **Conclusion**

Through the use of the case study methodology, an aviation instructor can structure a semester long course on airline management around a case study of an airline chosen by each individual student. The instructor can use the identification and definition of a list of variables for investigation as the script for teaching the various management

techniques that affect the airline industry. Once this is accomplished, and each student has prepared and submitted a formal paper detailing these variables, the instructor can verify the applicability variables to the airline industry by guiding classroom discussions where the students will discuss their investigative findings of three or four variables at a time. After these discussions, the students should submit written reports detailing their findings. Once the entire list of variables is covered over the course of the semester, the final project should be for each student to merge the various papers into one final project and add their own conclusions on which variables were beneficial or detrimental to their selected airline's operations and profitability. →

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**Appendix A**

**Sample Discussion Guide**

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Subject: \_\_\_\_\_

Title: \_\_\_\_\_

Subject's credentials (why is he/she appropriate for this subject matter?):

Subject's position in the airline industry:

Reason for the interview:

**Question:**

**Subject's response:**

What is your position?

How long have you had this position?

What are your qualifications?

What is your assessment of the state of Aloha?

Comments on specific area of research:

