INFORMATION, DECISION MAKING AND ENROLLMENT MANAGEMENT IN A PUBLIC RESEARCH UNIVERSITY: A CASE STUDY ANALYSIS USING BOUNDED RATIONALITY THEORY

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Submitted to the Graduate Faculty of

The School of Education in partial fulfillment

of the requirements for the degree of

Doctor of Education

UNIVERSITY OF PITTSBURGH

SCHOOL OF EDUCATION

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Organization theorists have argued that organizations in higher education have difficulty making decisions that effectively address or change their environment. They have been characterized as loosely coupled structures that have difficulty in decision making to solve problems. This study examined the decision making process of enrollment planners at a large public research university in response to an enrollment crisis in the first half of the 1990's that affected the flagship campus and many of its satellite campuses.

The theoretical framework is Herbert Simon's theory of Bounded Rationality and the anarchic (or garbage can) decision making model created by James March, Michael Cohen and Johan Olsen. Simon theorized that many problems are surrounded by complex amounts of information needs and a variety of possible responses that make decision making problematic. Calculating what response or action is optimal can be unfeasible because of the degree of complexity involved. Simon called this a theory of Bounded Rationality. In a departure from more orderly models of organizational decision making, Cohen, March and Olsen suggested a more radical interpretation of organizations as organized anarchies. The "Garbage Can" model was originally formulated in the context of the operation of universities and their many inter-departmental communications problems.

One of the most important factors influencing decisions is the management, dissemination and analysis of information. An intrinsic component of the management of information is communication. Analyses of the information management and communications processes were key components of this study. This research study assessed the overall quality of the decision making and suggested ways of improving the process.

The study described a "real world" decision making environment in a situation affecting enrollments at a major research university. In the search of higher education administration literature on decision making, there seemed to be a paucity of case studies similar to this one. Therefore, it proffers a description of what may happen when decision makers fail to realize the complexities and limitations of human and organizational capabilities in a turbulent environment.

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ACKNOWLEDGEMENTS

This researcher would like to acknowledge those persons who provided support and encouragement throughout this academic endeavor, and who helped make the research and writing of this dissertation a valuable and rewarding experience.

I am most grateful to William B. Thomas who served as my dissertation chair and adviser. He was instrumental in working with me and supporting my often tardy progress. He helped shape the dissertation topic and kept me focused. I greatly appreciate his efforts to guide me through this process. I could not have a better friend and teacher. Also, I thank the members of my dissertation committee: Sean Hughes, Erik Ness, Betsy Porter and John Weidman. Their observations and suggestions were most helpful. Dr. Elaine Rubinstein deserves mention and thanks. She made the statistical analysis clear and understandable.

This research was possible because of the individuals who participated in this study. I want to thank each of them for the time they gave and insights they shared with me. I have a much greater appreciation for the complexities of the decision making process in the university because they shared their knowledge and experience as decision makers with me.

I would like to thank my colleagues at "Darwin University" who allowed me to pursue this goal and supported me in a variety of ways.

I would like to thank my brother, Paul for the proofing, re-writes and suggestions. Most importantly, for Gloria and Lauren, it is finally done. I promise to clean up my room and get rid of the clutter.

1.0 CHAPTER

1.1 BACKGROUND AND SITUATION

From the fall of the academic year of 1990-91 to 1995-96, Darwin University (Darwin is a pseudonym for a large public research university in a northern industrial state) and the Commonwealth Education System (CES) of the Darwin University experienced enrollment declines at 14 of its 18 campuses. Of these campuses six experienced dramatic enrollment losses. These declining enrollments coincided with a national economic recession (1992) and a significant demographic decline in Northern high school graduates (Holsworth, 1989, 1990, 1991, 1993, 1995; Esteban, personal communication, June 1, 1992). Enrollment analysts and demographic forecasters did not anticipate this economic recession with attendant high unemployment.

Initially, campus and university enrollment planners and decision makers were at a loss to explain and ultimately understand these declines. Enrollment declines had a serious impact on campus and Commonwealth Educational System budgets. They also resulted in faculty and staff furloughs and curtailment of student services. Under these conditions, campus admissions offices were under increased pressure to recruit and admit new students. In some cases, admissions office budgets were reduced as the demands on these offices increased. In addition, morale declined among admissions officers system-wide.

While planners had not expected such a decline, an annual internal report had projected a downturn in high school graduates during this time period. This report originated from the office of budget and planning in Old Main at Darwin (Holsworth, 1989). It stated the decline would be most severe in southwestern, northwestern and northeastern Northern. It is not clear however if some campus and university decision makers were aware of this report and others like it. Also, there were other sources of information that corroborated the Holsworth projections. University decision makers made decisions that appeared on the surface to respond to the admission application and enrollment shortfalls. In an attempt, to increase enrollments, the Commonwealth Education System (CES) reduced out-of-state tuition for campuses (Arnold, 1993). The results of these decisions would have little effect and in some cases created morale and administrative difficulties. These declines were more rooted in the external environment and circumstances. Table 1 below indicates the freshmen enrollment decline that began in the fall of the academic year of 1990-91 and continued until the fall of the academic year of 1995-96.

Table 1. Darwin University Freshmen Enrollments 1990-1995
(Undergraduate Admissions Office, Darwin University, 1995)

Darwin University Undergraduate Admissions Office Freshmen Enrollments	**1990 Freshmen Enrolled**	**1991 Freshmen Enrolled**	**1992 Freshmen Enrolled**	**1993 Freshmen Enrolled**	**1994 Freshmen Enrolled**	**1995 Freshmen Enrolled**
CES Total	6,008	5,436	5,578	5,270	5,719	7,501
Monroe	640	514	549	544	643	772
Darwin	4,482	3,629	3,414	3,497	3,755	4,362
Grand Total	**11,130**	**9,579**	**9,541**	**9,311**	**10,117**	**12,635**

One analyst reported, "The number of Northern high school graduates has continued to decline from its high in 1976 to another record low in 1994. Over the last four years, we have seen a fluctuation in the number of applications and admissions to Darwin University. Some of this can be attributed to the changing number of high school graduates and the portion continuing to college in the following years" (Holsworth, 1992, p.2). In figure 1, the total number of Northern high school graduates is indicated from 1976 at its height to the low point in 1994. The number of high school graduates going on to college is indicated in the lower stack or red.

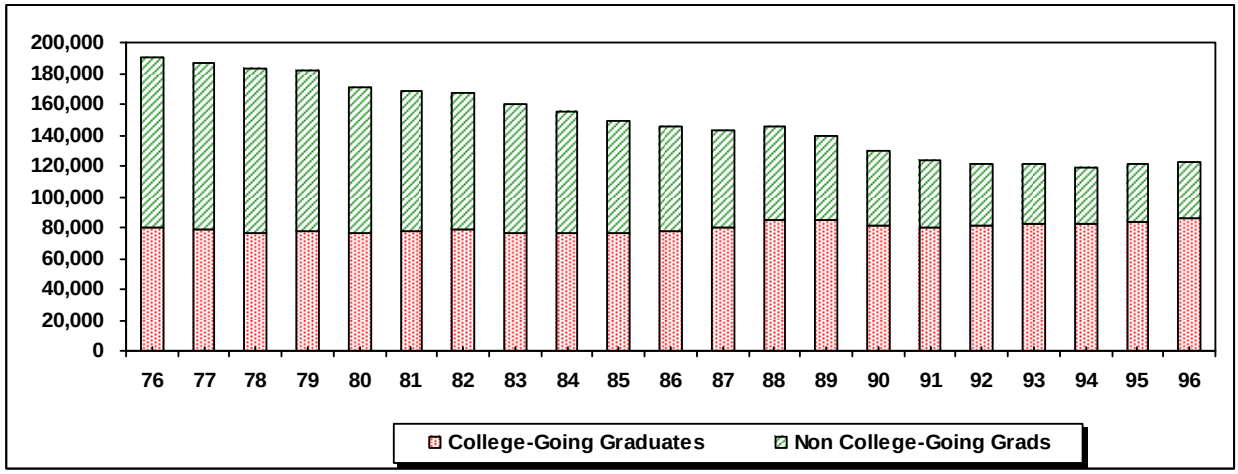

Figure 1. Northern State High School Graduates and Portions to College 1976 – 1996 (University Budget Office, 2000)

2.0 CHAPTER

2.1 PROBLEM STATEMENT

This study examined the decision making process of enrollment planners at Darwin University as they responded to an enrollment crisis in the early to mid 1990's. One of the most important factors influencing decisions is the management, dissemination and analysis of information. An analysis of the information management process was a key component of this study. This research study attempted to assess the overall quality of the decision making process and to suggest ways to have improved the process.

2.1.1 Research Questions

The research questions were formulated based on the theoretical framework of Simon (1955), March and Cohen (1972), and the case study model of Choo (1998).

1. Was the information relevant to aid and support decision making?
2. Were the decision makers overwhelmed by information and the complexity of the decision situation?

3. Was decision making typified more by clarity and consistency or by ambiguity and inconsistency? What was the degree of coordination and structure in the organization for decision making?
4. Since one or more individuals may monopolize the decision making process, were individual personalities more influential than information in the decision making process?

2.1.2 Research Questions

This case study is first and foremost descriptive. As such, it does not have the controlled conditions of the laboratory. Conclusions about cause-and-effect relationships therefore may not be drawn. Case studies may involve only a single or a few individuals and therefore may not be representative of the general group or population. They often rely on descriptive information provided by various people, leaving room for gaps in detail about the situation or events under study. Furthermore, much of the information collected is retrospective data, recollections of past events, and is thereby subject to problems related to recall.

2.1.3 De-Limitation of Scope

The focus of this study is the time period of the academic years 1990-91 to 1995-96 at Darwin University and the undergraduate admissions office and other relevant administrative units related to the management of enrollments.

2.1.4 Educational Significance

The results of this study can offer some insights and direction pertaining to the difficulties involved in university decision making during environmental turbulence. The purpose of this study described a real world decision making process in a situation affecting enrollments at a major research university not accustomed to such an uncertain environment. In the search of higher education administration literature on decision making, there seemed to be a paucity of case studies similar to this one. Therefore, it proffers a description of what may happen when decision makers fail to realize the complexities and limitations of human capabilities in turbulent environment.

2.1.5 Definition of Terms

AIDAA – Administrative Information Decision Aid for Admissions

AIS -- Administrative Information System

Alternative or Referral offers- Applicants If they did not meet the admission criteria for the first preference campus, they were considered for the second and third campus in order of preference.

Branch/Satellite -- Terms for Commonwealth Campuses.

CEO- Campus executive officer

CEPO- Campus enrollment planning officer

CES- Commonwealth Education System

Commonwealth Campus -- term used for one of the 17 lower division campuses.

Community Recruitment Centers -- located in the three largest urban centers in downtown offices; primary function is to recruit qualified minority students.

Direct offers- Applicants were allowed to choose or prioritize three campuses for admission consideration.

Lower Division Campus -- campuses offering the freshman and sophomore year; all campuses except Capitol.

Offer – Students who meet the admission criteria are accepted or extended an offer of admission to the university.

Paid Accept -- student has accepted the offer and has returned a deposit ($125.00).

Service area – The university system was composed of satellite or branch campuses located throughout the state. Each campus serves a geographical area or service area.

NOHEAA -- Northern Higher Education Assistance Agency

UAO -- Undergraduate Admissions Office

Upper Division Campus -- campuses which offer the junior and senior year: Darwin, Capitol and Monroe College.

Yield - the percentage of students who are offered admission and who eventually enroll.

3.0 REVIEW OF LITERTURE

3.1 ENROLLMENT MANAGEMENT

The individual most often credited with inventing and developing the term and concept of enrollment management was John Maguire, the former dean of admissions at Boston College from 1971 to 1982. He told one interviewer:

> "But what enrollment management really is—data-driven decision making and fact-based management, linking people and resources to get it done in the area of higher education marketing. It's not a euphemism for marketing, but some might think of it as that. We were coupling admissions, financial aid, retention, registrar, student flow, information systems and research, market research, and strategic pricing into a package that would allow interactive effects and generate an ideal outcome" (Helms, 2003, p.33).

In 1976, Alan Cartter of the California State University at Long Beach was possibly the first to write about the impending decline in the number of traditional-age college students (Hossler and Hoezee, 2001). Carter was an early proponent of the need to collect data about student markets and to understand demographics for better planning for short and long-term

enrollment changes. The theory of enrollment management developed and evolved from the late 1970s as a response to the higher degree of volatility in enrollments in institutions of higher education. As a result, colleges and universities increasingly focused their attention on attracting and retaining students. In the late 1970s and early 1980s, college admissions professionals began to consciously borrow concepts, ideas, and research techniques from the proprietary and not-for-profit marketing literature. Philip Kotler's (1976) book, Marketing for Nonprofit Organizations quickly became a primary resource for many admissions professionals (Hossler, 2000)

Enrollment management has been called a "rational model grounded in fairly expansively documented theory" (Graff 1986), "an umbrella term" (Kemerer, Baldridge and Green, 1982), and "a plan addressing administrative structure" (Kreutner and Godfrey, 1980-81; Hossler, 1986). The common thread through all definitions of enrollment management is that it is a coordinated, institution-wide effort. It involves a wide variety of areas within the institution. In addition to admissions, marketing, and financial aid, functions such as academic advising, retention, academic planning, career services, alumni relations, and development are integral to successful enrollment management (Penn, 1999). It was viewed as an assertive approach that would ensure a steady supply of qualified students, with the intended outcome being maintenance of institutional viability (Kemerer, Baldridge, and Green, 1982).

The population decline in the 1980s and 1990s had significant effects on the transition from admission to enrollment management (Bryant and Crockett, 1993). Their paper titled "The Admissions Office Goes Scientific" analyzed the change or transition from recruitment that included many marketing techniques that Kotler and many others recommended like advertising, direct mail, telephone, etc. New technologies were being developed in the proprietary domain and it was only a matter of time until more sophisticated marketing techniques stepped over into

college enrollment management. These new technologies ranged from geo-demographics to predictive modeling and neural systems. Data and information now mattered as never before. One example of new approaches to the use of emerging marketing technologies was summarized in a case study of the University of Hartford (Connecticut) and it details some effective techniques using data analyses to monitor marketing, recruiting, yield, financial aid packaging, first-year and transfer retention, and other key areas. The importance of teamwork and a unique collaborative approach to enrollment management were emphasized (Krotsen, 1992).

Beginning in the 1980s, the College Board started a publication that focused on recruitment and marketing activities from the perspective of admissions practitioners. The Admissions Strategist was published to be a marketing and enrollment planning information source and to "address the diverse challenges facing today's college admissions counselors. Written by admissions professionals, it covered all aspects of student recruitment (College Board, 1988). Each volume covered various topics related to admissions, recruitment and retention. Articles had the term "enrollment management" prominent in their titles.

In the 1990s, new technology allowed the availability of more data and more precise analysis. New technology was being developed in the private sector by marketing software makers to more accurately target prospects. Urban (1992) suggested that models from political science that attempted to identify "swing voters" could be usefully applied in college admissions. The notion underlying these models in political science is that it is inefficient to spend resources to gain the support of voters who are highly unlikely to be swayed by campaign efforts or highly likely to vote for the candidate anyway. Urban used multiple discriminant analysis to identify a large proportion of the total pool of admitted students (70%) at one institution who he believed to be the most susceptible to and appropriate for additional recruitment efforts.

Without experts, institutional decision makers are often ill-equipped to grapple with the complexities of enrollment management. Admissions directors often do not get the needed support from the institutional administration because of lack of knowledge at higher levels, faculty ignorance and inadequate resources. In many institutions, there was not enough factual and evaluative information pertaining to students from the perspective of marketing and recruitment.

The availability and speed of access to large prospect databases and analysis software was a reality. As early as 1988, there was a growing ability to use desktop computers to manage prospect databases and do instant analysis. John McIlquhan (1988) wrote in the Admissions Strategist of the growing ability to have a prospect database stored on a desktop computer that could be easily accessed and deliver research with analysis to any user. By 1992, colleges and universities were able to create research reports on prospects and applicants from a desktop environment. Institutional planners use the data that enrollment managers collect and report to help determine academic and nonacademic programming, building use, staff and budgets. Various aspects of enrollment management have stimulated interest in strategic marketing, planning, and quality (Hossler, 1984). Despite the availability of demographic data and the experiences of elementary and secondary schools, institutions of higher education have been weak in planning for future students (Penn, 1999).

One of the difficulties of enrollment management has been to have administrations' grasp the critical issues and then manage and keep vigil over the various aspects of enrollment fluctuations. Enrollment management is perceived as critical in difficult times of enrollment declines and financial crisis. However, enrollment management is often ignored in times of

plenty (Penn, 1999). In the face of predictions of severe decline, 42 percent of presidents of institutions in one survey in the early-1980s expected the institution's enrollments to increase, while another 32 percent expected enrollments to remain steady (Breneman 1983).

It is common for enrollment managers on many campuses to be concerned about their lack of input into major policy decisions on their campuses (Hossler and Hoezee, 2001). A frequent refrain is, "how can I have more input and influence on decisions?" Administrations often perceive admissions directors as lower level managers or salespeople in the enrollment and budget planning equation. The expertise and insights of admissions staff are often minimized at upper levels of the decision making process. This could be a hangover from an earlier era when the admissions director was accepted to be an educator first and foremost.

Enrollment management, although crucial to any institution's financial and academic well-being, is still not well understood by many decision makers in many American colleges and universities. Enrollment management is the sales and marketing department of a college or university in addition to being the gate-keeper. For many administrators with academic backgrounds, sales and marketing are difficult concepts to understand and as importantly to appreciate. College and university decision makers have not had the kind of formal training in marketing that is inherent to enrollment management. As a consequence, these administrators often are faced with difficult decisions where they lack formal training, knowledge and experience. The complexities of enrollment management have grown in ways that many administrators could not have imagined ten to 20 years ago. Empirical research and desktop computers have made fast and insightful numbers crunching possible.

3.2 ORGANIZATION THEORY AND DECISION MAKING

Organization theory refers to the formal structures, practices and processes through which organizations seek to accomplish organizational goals. Pfeffer begins his book with the opening paragraph stating that "We live in an organizational world. Virtually all of us are born in an organization - a hospital – with our very existence ratified by a state agency that issues a certificate documenting our birth." (1997, p.3). Within the first year of our life, we will be issued a social security number by an agency of the federal government. When we die, another government bureaucracy will issue a death certificate. Simon (1997) defined organizations as the communications and relations among a group of human beings, including the processes for making and implementing decisions. Organizations usually exist to pursue goals and seek to survive (Pfeffer, 1997). Organizations have boundaries (Pfeffer, 1997). Organizations are comprised of groups of individuals to attain objectives (Donaldson, 1995). Organizations are coordinated to achieve goals that could not be achieved by individual action alone (Pfeffer and Salanick, 1978). Organizations do not make decisions, people do.

One definition of a formal organization is a system of consciously coordinated activities or forces of two or more persons (Barnard, 1938). "An organization comes into being when (1) there are persons able to communicate with each other, (2) who are willing to contribute action and (3) to accomplish a common purpose. The elements of an organization are therefore: (1) communication; (2) willingness to serve; and (3) common purpose. For the continued existence of an organization either effectiveness or efficiency is necessary; and the longer the life, the more necessary both are" (Barnard, 1938: p82).

One theory interprets organizations as close or loosely-coupled systems whose individual actors create or enact the organizational environments and process information to resolve or accomplish goals from the information inputs from the environment (Choo, 1991). This perspective first was suggested by Karl Weick (1969). His view has similarities with those proposed by March (1994) and Cyert (1975) on the ambiguity and anarchy of organizational information processing.

An organization consists of various groups, each seeking to further its own interests or goals, without any single group being able to completely determine what goals the organization should pursue. Group members thus look for allies in those groups whose interests are similar, and they negotiate with those groups whose interests are divergent but whose participation is essential. Each negotiated agreement between groups places constraints on what the organization can regard as an acceptable course of action: the goals themselves become complex preference statements which summarize the multiple conditions that any acceptable choice must meet. It is not surprising then that managers spend much of their time attending to coalition building, as decisions cannot be made without taking into consideration all the diverse and often conflicting interests.

Loose coupled organizations often do not reliably display consistent decision coherence (March, 1994). They face confusing and inconsistent environments. The demands on one part of the organization are different and inconsistent with the demands on another part. The purpose of de-centralization is to allow organizational components freedom to cope and solve difficulties in their environment. Loose coupling through decentralization and delegation are designed to solve motivational and informational problems of coping with confusing and inconsistent environments. The goal of decentralization is to allow various organizational units to have the

freedom of action to attend to different demands that may be unique to different components or functions of the organization. The cost of such a strategy over time can evolve a process that can yield inconsistent actions that may be incoherent to organizational goals and functions.

Moreover, decentralization and delegation generate a long-term dynamic of differentiation that accentuates loose-coupling. Sub-units develop their own objectives, information sets, clients, and identities. They create sub-cultures of belief that are different than those in other sub-units. These forces are well-known in the literature and are usually seen as pathologies or unfortunate costs (Choo, 1991). This particular portrayal or conception of systemic inconsistency emphasizes internal coordination with a clear, shared objective rather than a flexible adaptation to the environment and conflicting demands. An alternative view interprets loosely coupled inconsistencies produced by de-centralization and delegation as essential to organizational health, rather than as a sign of organizational sickness (March, 1994).

Herbert Simon (1960) described the decision process as happening in phases over a period of time: finding occasion for making a decision, finding possible courses of action and choosing among courses of action. The decision making process itself is characterized by four concepts which together form a theory of how these decisions are arrived at: (1) quasi-resolution of conflict, (2) uncertainty avoidance, (3) problemistic search, and (4) organizational learning. Expanding on the work of Simon, Cyert and March (1963) placed their focus on the processes of organizational decision making. They seek to answer the question: how does a firm or organization behave as an information-processing and decision-making system?

Studies suggest that individuals when making decisions examine only a few alternatives and even then do not consider all of the ramifications of those alternatives (Carley and Behrens, 1999). Simon coined a term to describe the notions of how decision makers make do with a

decision that is satisfactory rather than one that is definitely optimal and individuals and organizations "satisfice" (Simon, 1959); i.e., as a result, decisions are more opportunistic than optimal.

Mintzberg (1983) identified three organizational designs: simple structure, professional bureaucracy and adhocracy. The simple structure typically is found in small organizations and is characterized by direct supervision and minimal technological systems with a dominating owner or an entrepreneur in control. The professional bureaucracy characterizes organizations that traditionally operate in relatively stable environments and use predetermined "solutions" to client problems. Examples of the professional bureaucracy are accounting firms or hospitals. Third, the adhocracy often draws upon advanced technological systems and uses innovative, multidisciplinary teams to produce novel solutions to client problems.

> "Decision making in organizations is often pictured as a coherent and rational process in which alternative interests and perspectives are considered in an orderly manner until the optimal alternative is selected. Yet, as many members of organizations have discovered from their own experience, real decision processes in organizations only seldom fit such a description." (Shapira, 1997, preface).

An organization is not monolithic, but acts like a continually shifting multiple-goal coalition. Managers, workers, shareholders, suppliers, customers, bankers, tax collectors, and so on all have a stake in the firm or organization, but their goals or preferences about what should be done differ. Organizational goals are set by a negotiation process that occurs among members of the dominant coalition. Each negotiated agreement between groups places constraints on what

the organization can regard as an acceptable course of action: the goals themselves become complex preference statements which summarize the multiple conditions that any acceptable choice must meet.

The field of organizational decision making is not easy to define. Those who engaged in a conceptual definition have usually contrasted it with individual decision-making (Shapira, 1997; Butler, 1997), as organizational decision making entails multiple individuals–where issues of communication and conflict may arise–and multiple occasions over time and matters–thereby excluding one-shot decisions among unrelated players. Also, individuals may have conflicts based on analysis, objectives and multiple actors with an individual (March and Simon, 1958; Elster, 1985). Figure 2 is a simple model of decision making. It is generally agreed that decision making involves the four activities indicated in Figure 1. Figure 2 is followed by Mintzbergs' model of the decision making process.

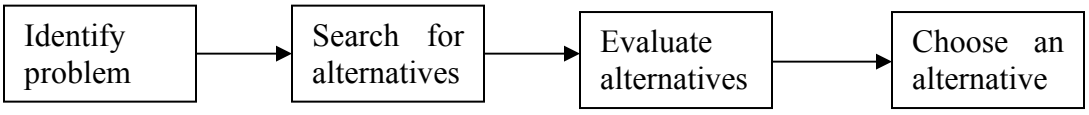

Figure 2. A Simple Model of Decision Making (Browne, 1993)

Three Phase Decision Process (Mintzberg, et al, 1976)

1) Identification
   a. Decision recognition in which opportunities, problems and crises are recognized and decisional activity initiated.
   b. Diagnosis is made and decision makers seek to understand the situation and determine cause-effect relationships.

2) Development

a. Search for fast solutions or ready-made solution design or development of custom-made or modification of the ready-made solution.

3) Selection
   a. Screening and eliminating alternatives
   b. Evaluation of choices or alternative choice to be implemented
   c. Authorization or approval to commit organization to action chosen in evaluation.

3.3 ORGANIZATION IN INSTITUTIONS OF HIGHER EDUCATION

Colleges and universities like business organizations have mission statements, employees, management systems and physical plants. Businesses are led and managed by professional administrators who have training and expertise, take a pride in their market sensitivity, customer orientation, innovativeness, and productivity. Universities are frequently led or managed by professional scholars who have received on-the-job training as amateur managers (Birnbaum, 2001).

Institutions of higher learning have a remarkable resiliency for adaptation to a changing environment. An interesting historical note and insight is that in 1980, the Carnegie Council for Policy Studies pointed out that if an observer used the year 1530 as a starting point, there are 66 institutions that still exist in a recognizable form (Cameron and Whetton, 1984). The 66 institutions are the Roman Catholic and Lutheran Churches, the Parliaments of Iceland and the Isle of Man, and 62 universities. Universities have been described as uniquely adaptive bureaucracies and hierarchical systems. These institutions have also been described as loosely coupled and fluid systems with a great capacity to survive volatile and disruptive environments (March and Cohen, 1974; Weick, 1976). At the same time, colleges and universities are not

immune to internal and external threats. The annual rate of closings and bankruptcies for institutions of higher education is higher than for business organizations and federal bureaucracies (Cameron and Whetton, 1984).

The resiliency of institutions of higher education has been threatened by an array of characteristics of academic organizational decision making (Cameron and Whetton, 1984): over expansion in times of abundance, inadequate management controls, lack of collaboration and self-protection, rigidity in problem-solving approach and weak long-range planning abilities.

Over expansion in times of abundance – In a study by Chaffee (1982) of small colleges responses to declines in enrollment, he found that administrators had difficulties responding to changes in their environment because they had significantly over-extended their resources. During the periods of abundant resources, decision makers had built more and too many residence halls, hired too many new faculty and staff, and initiated too many new degree programs based on highly optimistic projections for student demand. In a similar study of business organizations by Starbuck, et al. (1978), their findings indicated a similar pattern that was labeled "success breeds failure syndrome". A common characteristic of these organizations was a long period of growth and prosperity that fostered over-confidence and over-expansion. Business organizational decision makers became convinced that they were in a position of dominance that would allow them to withstand challenges of competition and environmental volatility. One may call this an organizational hubris. Managers tended to ignore early indications of changes in the environment and the market place. They failed to understand

technological advances, changes in consumer tastes, and they failed to appreciate and honor the loyalty of employees and other stakeholders.

Inadequate management controls – During periods of rapid growth, there are few incentives for tighter management controls. Evaluations of personnel and resources are rare because there appears to be insufficient justification for a critical assessment in a period of such prosperity and growth (Cameron and Whetton, 1984). Evaluations become intermittent, lack focus, and are often uncritical of personnel. The financial situation and controls are vague and managers often are unaware of the true situation once decline has started. Consequently, once managers are fully aware of the financial decline, their options for recovery have been greatly diminished.

Lack of collaboration and self-protection – In periods of financial decline and retrenchment, effective responses and decisions require collaboration among internal groups. However, any attempt to address staff or budget cuts causes inter-unit conflict. Various departments and units become more competitive and territorial as they vie for reduced resources. The over-extension of institutional resources in prosperous times often inhibits effective responses in periods of decline. Instead of a unified and coherent response for budget and staff reductions, individuals and departments compete in a super-charged atmosphere of turf battles for a reduced pool of resources.

Rigidity in problem solving approaches – Many decision makers in colleges and universities have little personal experience in dealing with a crisis that involves budget

and personnel retrenchments (Cameron and Whetton, 1984). They are often slow and reluctant to respond and are often very cautious. Decision makers are often slow to admit that there is a crisis and that there is a critical need to respond. Many decision makers are unwilling to entertain conflicting suggestions for change or listen to opinions that sharply diverge from their own views. These decision makers tend to rely on a small group of trusted advisers that would be supportive of their initiatives to address the need for personnel and budget retrenchment. Very often, the result is that the causes of a crisis are misdiagnosed and innovative solutions are spurned.

In one study by Cameron (1983), he found that there was a significant difference in how institutional decision makers responded to enrollment declines versus how decisions were made in institutions that did not experience enrollment declines. Institutions in crisis were internally focused, conservative in orientation and reactive in responding to change. In institutions with stable enrollments, decision making was external in outlook, innovative and proactive in responses.

Long-range planning is curtailed – A crisis causes a loss of focus and perspective. Decision makers and planners become completely absorbed by immediate problems that future direction is lost. The cumulative result is a reduction in planning and development as the least adaptive features of status quo thinking become dominant (Cameron and Whetton, 1984). The lack of innovative thinking and planning can cause morale problems as the most creative members of faculty and staff leave for better environments.

Student recruitment becomes stagnant as the campus loses enthusiasm to support the mission of the institution and its' leadership.

Often, college presidents probably have greater confidence in their interpretations of college life, college administration and their general environment than is warranted (Cohen and March, 1974). The American college and university often does not know what it is doing. The nature of the university is a loosely coupled organization populated by philosophers, football coaches, accountants, presidents, poets and managers. More recently, Birnbaum (2001) has questioned the ability of the university or even business organizations to develop strategic planning that is effective. Vroom (1984) reiterates the theoretical model of Cohen and March, that the nature of university organization and decision making is an organized anarchy. Goals are often vague and in dispute. There is an unusually high degree of task specialization. Administrators and planners cannot fully understand the wide array of skills and knowledge applied to the operation of the university. Vroom states that colleges and universities are loosely coupled systems in which actions of one unit need not be tightly integrated with the other units and departments. Universities resemble the model of organization labeled "professional bureaucracy" the term coined by Mintzberg (1979).

Most college and universities are enterprises that still lack a culture of data in the fullest sense (Zemsky et al, 2005). A large part of the problem derives from failure to resolve ambivalence about what data should tell and how data should be used in decision making. Official statements of mission and objectives are so vague and general as to be no guidance in decision making (Vroom, 1984). Universities are more participatory in decision making because

of the higher educational level of faculty and staff (Vroom, 1984). There is a need to develop shared conventions. Strategy should be developed from data instruments (Zemsky et al, 2005).

As institutions of higher education became larger and more complex, leaders and managers in higher education were being advised to understand and embrace strategic management and organizational structures similar to private enterprise (Cyert, 1975). Administrators turned to Keller's (1983) popular book, Academic Strategy on academic leadership and management as perceptive in understanding how strategic management techniques could help deal with future uncertainties and how a number of campuses creatively faced hard times. It was meant to be a handbook of discussion of the many problems facing U.S. higher education and the management strategies required to cope with them. Birnbaum (1991, 2001) holds that universities can be improved, but that many change efforts are more likely to be disruptive rather than constructive. He has recently been critical of the scholarship in the field of higher education administration as unhelpful and limited in scope. Cohen, March and Olsen (1972) have theorized that organizational decision making in institutions of higher education are best described by the "garbage can model" which is closely related to the adhocracy model of Mintzberg. In a later paper, March (1974) stated that this model was most appropriate for higher education.

3.4 THE CARNEGIE SCHOOL

The pioneering work of Herbert Simon led to a paradigmatic development in organization theory. The Carnegie School approach culminated in numerous studies that emphasized the role of information processing and decision making as the basic elements in analyzing both the process and the structural aspects of organizations (Shapira, 1997). The history of thought on organizational decision-making did have a "big bang" with the theory of Bounded Rationality developed by Herbert Simon (Grandori, 2001). The theory was developed in contrast with utility theory, the dominant model of rationality available at the time, developed especially in economics. Utility theory is characterized by rational decision making in terms of choices of alternatives to achieve maximum results and minimizing risk. In contrast, Bounded Rationality theory stated that the environment is too complex and decision makers are limited by time, cognitive abilities and the sheer volume of information to make a decision for maximum results (Dequech, 2001).

In 1958, March and Simon proposed the then novel idea that organizations can be viewed as information processing systems. They pointed out that information sources and channels affect organizations' perceptions, intra-organizational conflict, and goal coherence. They emphasized the human limitations that prevent people and organizations from acquiring and processing unlimited amounts of information. They also characterized people and organizations as using programs to process information, a direct analogy to computers. Later, Cyert and March (1963) described some programs used by business firms to make decisions about prices and quantities. Two books from the Carnegie School, March and Simon's Organizations (1958) and

Cyert and March's A Behaviorial Theory of the Firm (1963) are landmarks in the field of organization theory (Shapira, 1997).

March extended his analyses in several directions and suggested that often decisions are random processes with the most well known being the "garbage can model of organizational choice" (Shapira, 1997). The garbage can model (or anarchic model) of decision making theorized that organizations that are loose alignments as most colleges and universities are, do not have orderly decision making processes (Cohen, March, and Olsen, 1972; March, 1974). One of the prime stimulants for information is dissatisfaction within the organization. Features of the communication structure within the organization will affect the kinds of information made available (Cyert and March, 1963). In a garbage can model process, there are exogenous, time-dependent arrivals of decision opportunities, problems, solutions, and decision makers. The logic of ordering is temporal rather than hierarchical or consequential. Problems and solutions are attached to choices, in large part because of simultaneity (Cyert and March, 1963).

3.5 BOUNDED RATIONALITY THEORY

Herbert Simon (1955) developed his theory of bounded rationality to explain what he perceived to be the current decision-making reality of modern information-age corporations and institutions. Simon stated it in this way:

> "The capacity of the human mind for formulating and solving complex problems is very small compared with the size of the problems whose

solution is required for objectively rational behavior in the real world –

or even for a reasonable approximation to such objective rationality." (1957: 198)

The concept of bounded rationality included several components and sub-models. First, it pointed out that actors (either individual or composite) on most problems cannot acquire the information required for utility (value or solution) maximizing calculations, either because it is too costly or because it is cognitively unfeasible to do so. Simon then distinguished 'structured' from 'unstructured' problems. In a structured problem, the actor knows what the relevant alternatives and the possible 'states of the world' are, is able to foresee the consequences of each combination of the two, knows what the value (or utility) of these consequences is for him. As in the game of chess, the number of possibilities to be taken into account may be too high for the human (and computer) information processing capacity. In unstructured problems, the lack of knowledge–hence the state of uncertainty–is more radical. The actor does not know not only what the probabilities of payoffs are but even what the relevant alternatives, or the relevant consequences, or even the relevant objectives are.

Simon outlined especially one of these possible models, the "satisficing model" of search and choice. The simplest basic version of that model states that actors will accept the first encountered alternative or solution superior to a given aspiration level, ending a search at that point. If it is difficult to find acceptable alternatives, aspiration levels fall, if it is easy they rise. In that version "satisficing" would describe primarily a decision behavior capable of generating "good" solutions while reducing the costs of search (Grandori 1984).

Simon proposed that human rationality is bounded by both internal (mental) and external (environmental) constraints (Todd and Gigerenzer, 2003). One of Simon's major propositions is that the organization influences its member's behaviors by controlling the decision premises (time, place, participants, environment, conditions, resources and parameters) upon which decisions are made, rather than controlling the actual decisions themselves (Choo, 1991). A fundamental problem of organizing then is in defining the decision premises that form the organizational environment: "The task of administration is so to design this environment that the individual will approach as close as practicable to rationality (judged in terms of the organization's goals) in his decisions." (Simon 1976: 240-241).

What precisely constitute the bounds that limit the capacity of the human mind? Simon defines a "triangle of limits": the individual is limited by skills, habits, and reflexes; by values or conceptions of purpose which may diverge from organizational goals; and by the extent of knowledge and information possessed (Simon 1976, 40-41, 241). As a result, the individual of limited rationality, or the administrative man, behaves in two distinctive ways when making decisions. First, the administrative man satisfices - looks for a course of action that is satisfactory or good enough. Second, the administrative man constructs a simplified model of the real world in order to deal with it - the simplification is acceptable because most of the facts of the real world have no bearing on the particular situation being faced. (Simon, 1976; Choo, 1991). There is a larger consequence of the administrative man's bounded rationality:

> "It is only because individual human beings are limited in knowledge, foresight, skill, and time that organizations are useful instruments for the achievement of human purpose; and it is only because organized groups of human beings are limited in ability to agree on

goals, to communicate, and to cooperate that organizing becomes for them a 'problem'."

(Simon 1957:199)

Traditionally, these constraints have been seen as independent, leading to a notion of Bounded Rationality that is either the attempt to do as well as possible given the demands of the world – the notion of optimization under constraints – or as the suboptimal outcome of the limited cognitive system – the realm of cognitive illusions. In the arena of academic administration, Birnbaum (1991) put it a little differently in his example of Huxley College in How Colleges Work. In his example, the purpose of decision making is to make maximum value decisions that will include all of the information, include all possible alternatives, evaluate and compare all sets of consequences and then select the best alternative. But, in the real world, decisions are difficult because knowledge is never complete. It is limited or bounded in some way. Huxley College is exceptionally complex, and there are many potential variables to permit any single person or persons to give enough attention to all of them. Information that administrators receive through the various channels of communication at Huxley is filtered and distorted by individual perceptions of the transmitters. Interactions between the various internal and external variables are often intricate and loosely coupled with potential outcomes or courses of action that are often uncertain. Finally, the number of possible alternative courses of action for a given situation, are so numerous that they cannot all be examined.

Cyert and March's A Behavioral Theory of the Firm (1963) is a landmark text for organizational theorists studying formal models. They demonstrated the impact of Bounded Rationality on organizational decision making and the value of process models for decision making (Carley and Behrens, 1999). With this work, a tradition began in which the organization

is modeled as a collection of agents (who are at least boundedly rational), organizational behavior emerges from the concurrent interactions among these agents, and decisions are constrained by both agent capabilities and the social structure in which the agents are placed.

Bounded Rationality theory is considered descriptive of non-routine decisions and purports, therefore to describe what actually happens in organizational decision making rather than what someone thinks should happen (Browne, 1993). Problems are often so complex that only a limited number of aspects of each problem can be attended to at any one time. Because of this complexity, maximizing outcomes or solutions may not be possible and is replaced by "satisficing" of outcomes or "good enough" rather than the best outcome or solution (Browne,1993).

3.6 DECISION MAKING MODELS

The four most commonly described models of the decision making process are listed below (Browne ,1993; Grandori, 2001). These four models have various aspects or elements that are often unique and contribute to the decision making dynamics. However, there are more models than these but are less common in the literature.

3.6.1 Rational Model

The organization has common goals and objectives (March and Olsen, 1978). Decisions are seen simply as the result of purposive choices made by consistent actors, and thus behavior reflects purpose. The rational model portrays the decision-process as 'intentional, consequential and optimizing' and assumes that an organization knows all alternatives, the probability distribution of consequences conditional on each alternative, and the subjective value of each possible consequence (March, 1988).

3.6.2 Political Model

The political model is characterized by organizational conflict and sub-unit coalition. The model has been developed largely from work by Cyert and March (1963), they argue that most organizations most of the time exist and thrive with considerable latent conflict of goals. The organization is therefore viewed as an arena of conflict, populated with “multiple actors with inconsistent preferences” (March, 1988), and divided or organized into “collective interest groups and sub-units” (Baldridge, 1971). Management scientists have favored the political model in that it appears to mirror the decisional reality for the majority of businesses.

3.6.3 Bureaucratic Model

The bureaucratic model of decision-making dismisses some of the assumptions of the rational model as unrealistic. The bureaucratic model thus views goals as systems of constraints that

decisions must satisfy, with decisions seen “less as deliberate choices and more as outputs of large organizations functioning according to standard patterns of behavior” (Allison, 1971, 79).

3.6.4 Garbage Can or Anarchic Model

The anarchic model departs significantly from the previous two perspectives in that the central assumption is that there are no clear organizational goals or objectives being maximized (or satisfied) through choice; and also, no powerful actors with defined or historic preferences who possess resources through which to seek to obtain these preferences. In simple terms, the anarchic model presents the decision-process as a virtual 'free-for-all', characterized more by randomness than rationality.

Browne (1993) and Grandori (2001).

1. Appropriate for judgment tasks in organizations where technologies are not clear.
2. Involvement of participants fluctuates in amount of time and effort given.
3. Choices are inconsistent and not well defined.
4. Decision-making involves many types of problems and solutions and may be independent of each other.
5. Problem, solution and decision-makers are not necessarily related to each other.
6. A reliance on chance alignment of components of a problem, options available, solution, time, and external demands on decision-makers.
7. Real world representation of non-rational manner in which decisions are made within organizations. Many of these types of decision processes are ad hoc.
8. This model is supposed to be most relevant under ambiguity or highly unpredictable consequences.
9. Problems are worked on in given situations, but choices are made only when the combination of problems, solutions and individuals allow the decision to happen (i.e., are in alignment). Consequently, the alignment of problems, solutions, and individuals often occurs after the opportunity to make a decision has passed or occurs before the problem is discovered.

3.7 ANARCHIC OR GARBAGE CAN MODEL OF DECISION MAKING

In a departure from more orderly models of organizational decision making, Cohen, March and Olsen (1972) suggested a more radical interpretation of organizations as organized anarchies. The anarchic model is also known as the "Garbage Can" model. The garbage can model of organizational decision making was developed in reference to "ambiguous behaviors", i.e. explanations/interpretations of behaviors which at least appear to contradict classical theory. This model was greatly influenced by the realization that extreme cases of collective uncertainty in decision environments would trigger behavioral responses which, at least from a distance, appear "irrational" or at least not in compliance with the global rationality of "economic man" (e.g. "act first, think later").

The "Garbage Can" model was originally formulated in the context of the operation of universities and their many inter-departmental communications problems. The garbage can model tried to expand organizational decision theory into the then uncharted field of organizational anarchy which is characterized by "problematic preferences", "unclear technology" and "fluid participation". The theoretical breakthrough of the garbage can model is that it disconnects problems, solutions and decision makers from each other, unlike traditional decision theory. Specific decisions do not follow an orderly process from problem to solution, but are outcomes of several relatively independent stream of events within the organization (Daft, 1982).

The term "garbage cans" suggested that organizations tend to produce many "solutions" which are discarded due to a lack of appropriate problems. However problems may eventually arise for which a search of the garbage might yield fitting solutions. Organizations operate on the

basis of inconsistent and ill-defined preferences; their own processes are not understood by their members; they operate by trial and error; their boundaries are uncertain and changing; decision-makers for any particular choice capriciously change. To understand organizational processes, one can view choice opportunities as garbage cans into which various kinds of problems and solutions are dumped. The mix of garbage depends on the mix of labeled cans available, on what garbage is currently produced and the speed with which garbage and garbage cans are removed.

The notable advantage of the garbage can model is that it provides a real-world representation of the non-rational manner in which decisions are often made within an organization (Choo, 1998). Not all decisions are made in a logical, political, or even standard fashion. Occasionally, decisions are made on an ad hoc basis or by "flying by the seat of the pants" when the solutions, problems and individuals involved in the task happen to align.

There are organizations or decision situations characterized by three general properties: problematic preferences, unclear technology and fluid participation. These are the characteristics of the anarchic organization and according to Cohen and March (1974), colleges and universities belong to this class of organizations.

Problematic preferences- Organizations make choices without consistent, shared goals. Goal ambiguity is common. Decision structure is often unclear.

Unclear technology- organizations often do not understand their own processes. Instead it operates on a set of trial and error procedures.

Fluid participation- Participation varies in amount of time and effort devoted to different domains. Boundaries of the organization are uncertain and changing. Audience and decision makers change capriciously.

Four streams were identified in Cohen, March & Olsen's original conceptualization:

1. Problems require attention. They are the result of performance gaps or the inability to predict the future. Thus, problems may originate inside or outside the organization. Traditionally, it has been assumed that problems trigger decision processes; if they are sufficiently grave, this may happen. Usually, however, organization man goes through the "garbage" and looks for a suitable fix called a "solution".

2. Solutions have a life of their own. They are distinct from problems which they might be called on to solve. Solutions are answers (more or less actively) looking for a question. Participants may have ideas for solutions; they may be attracted to specific solutions and volunteer to play the advocate. Only trivial solutions do not require advocacy and preparations. Significant solutions have to be prepared without knowledge of the problems they might have to solve.

3. Choice opportunities are occasions when organizations are expected (or think they are expected) to produce behavior that can be called a decision (or an "initiative"). Just like politicians cherish “photo opportunities”, organization man needs occasional "decision opportunities" for reasons unrelated to the decision itself.

4. Participants come and go; participation varies between problems and solutions. Participation may vary depending on the other time demands of participants

(independent from the particular "decision" situation under study). Participants may have favorite problems or favorite solutions which they carry around with them.

Despite its representation of the non-rational, real-world manner in which decisions are often made, the garbage can model describes a less efficient means of making a decision. Decision making is considered a procedure for finding solutions to problems. Unfortunately, this often does not happen if the garbage can model represents the manner in which decisions are made within an organization. Problems are worked on in given situations, but choices are made only when the combination of problems, solutions and individuals allow the decision to happen (i.e., are in alignment). Consequently, the alignment of the problems, solutions, and individuals often occurs after the opportunity to make a decision regarding a problem has passed or occurs even before the problem has been discovered (Cohen, March & Olsen, 1972).

Some researchers following Cohen, March and Olsen argued that the early model was insufficient to capture actual organizational behavior. It ignored the role of organizational design and the limits on individual behavior, dictated by organizational procedures such as those for data handling, and personnel hiring (Carley and Behrens, 1999). Information processing theorists (March and Simon, 1958; Cyert and March, 1963) have argued that individual, and hence organizational, decisions depend on what information they have which in turn is constrained by the individual's position in the social structure (Carley and Behrens, 1999). Structure influences individual decision making because it constrains access to information and because the decisions, attitudes, and actions of those to whom one is structurally connected have a strong influence on behavior. Further, the structure of the organization and the task limits

access to information, determines the order of processing, and enables certain efficiencies. Moreover, the organizational structure can be viewed as a coordination scheme whose cost and performance depends on the network of connections and procedures within the organization (Carley and Behrens, 1999). Organizational costs as well as performance is thus a function of these information processing constraints.

3.8 INFORMATION MANAGEMENT

Information acquisition and transmission in organizational decision making is an important and timely issue. As organizations entered into the 1990s, knowledge became one of the most important strategic resources. Knowledge production has become critical to sustaining organizational or institutional stability and success. The ability to respond to current and future changes in the internal and external environment requires constant knowledge flow within and outside the organization and a continuously updated knowledge base. These new demands inevitably raise new challenges for organizational structure. The new focus is on developing new types of organizational forms to facilitate knowledge management, particularly knowledge flow.

Wilensky's (1967) focus was on the development of intelligence or information that would guide decision making in organizations. His view was that the more organizations developed in these terms, the greater would be the need for and existence of organizational intelligence, embodied in specific types of functions, such as “contact men”, “internal communications specialists,” and “facts-and-figures men.” In particular, he was concerned with the way that organization routines, embedded in discursive patterns, would often dictate policy

long after it should have been evident that it was failing. Even where strategic intelligence is available, it may be unattended to or, if it is, not understood. Thus, organizational intelligence involves more than merely information: it involves also its application.

New information and communication technologies are crucial to innovation processes and speed up the diffusion of intelligence. Information technology is a major contributor to transforming organizational concepts of time and space. The convergence of computing power and telecommunications reach is providing new technological and information resources in a global, digital world. The development of information and communication technologies not only provides the means to process and transmit vast amounts of information but also determines the shape of organizational intelligence. If information and knowledge are to be used productively and intelligently by organizations then organizational intelligence must translate into knowledge management rather than contacts, internal communications, and facts-and-figures (Wilensky,1967). Too much information is too easily available so that the key issue is not gaining information but being able to manage available knowledge (Clegg, 1989).

Information is data that have meaning. Meaning arises as data are interpreted by sense-making frameworks (Bruner et al., 1956). This sense making depends on what is already known as well as what data are available. Knowledge is an accumulation of information. Whereas information comprises a flow that changes rapidly, knowledge is a stock that changes only incrementally. Some knowledge is explicit; other knowledge is tacit (Polanyi, 1966; Baumard, 1999). Tacit knowledge is singular to the organization.

Organizations can acquire data by scanning environmental data sources, by adding new members, or through internal activities, such as accounting and research. Most organizations include personnel who specialize in various forms of data acquisition or information processing,

and large organizations have departments that focus on such specialties. Organizations convert data into information and knowledge by discussing the implications of data, by adding to databases, or by feeding data into decision processes. They process information by altering it, integrating it, disseminating it internally, and interpreting its implications. Nearly all organizations incorporate rules and procedures that cause personnel to initiate actions or to halt actions when they receive information that satisfies certain conditions (March and Simon, 1958; Starbuck, 1983).

Decision makers in organizations are often biased in their selection of information media. Many studies have shown that managers have a strong preference for oral, human sources of information rather than written or formal sources. Mintzberg (1973) found in his study of managers in five diverse corporations that verbal media (ie. meetings, telephone calls, and tours) accounted for 78% of the managers' time and 67% of their activities. Managers prefer face-to-face meetings and the telephone as information sources because they provide a high level of information richness the managers need to understand the social and hidden aspects of the problem, and to negotiate or persuade others with differing points of view (Daft and Lengel 1984).

Another integral element of decision making with implications for information management is the communication process. Some research shows that communications in organizations reflect the statuses and aspirations of an organization's members. People in hierarchies talk upward and listen upward (Porter and Roberts, 1976). People also shape their upward messages to enhance good news and to suppress bad news. Other research indicates that formal communications in organizations are generally problematic. Organizations slant their formal reports to win the support of employees, customers, stakeholders, and the general public;

and the members of organizations use formal reports to promote their careers or other interests. As a result, formal reports are permeated with misrepresentations and biases, and the organizations that take formal reports seriously are prone to run into trouble (Hopwood 1972, Altheide and Johnson, 1980). Such issues make informal communication important. For instance, Grinyer and Norburn (1975) found that more effective organizations pay less attention to the information transmitted via formal reports and rely more strongly on informal communication channels, and that more profitable firms base their analyses on information drawn from diverse sources. One of the prime stimulants for information search is dissatisfaction within the organization. Features of the communication structure within the organization will affect the kinds of information made available (Cyert and March, 1963).

It is agreed that despite the perceived importance of information, it is not always used. More accurately, evidence indicates that even when information is provided through information systems in organizations it is not always used even when available. Henry Mintzberg (1975) wrote the classic study on this topic. "Why do managers not use information when they apparently should?" Mintzberg identified three reasons:

1. Weakness in the information systems
2. Structure and nature of the organization
3. Limitations on the human brain

He generalized about the non-use of information in decision making:

1. Formal information systems are too limited in the type of information they provide in light of managers preferences for face to face and telephone.

2. Information systems tend to summarize information and lose the richness to the point where it becomes bland and unconvincing.
3. There often is a time lag in providing information through formal systems that is too great given the speed of action required in most decision making.
4. Power and politics in an organization may cause a manager to ignore or distort information received.
5. Workloads may encourage decision makers to be action oriented and to use very current, informal and unreliable information.
6. There are limitations on the amount of information that a manager can process in the brain.
7. The brain filters information it receives and tends to screen out information that is at odds with past experience or that creates a cognitive dissonance.

Mintzberg theorized further that the lack of information use is the fault of the manager or the organization and that organizational structures contribute to underutilization of information systems. The decisional reality for many businesses, as March (1991) summarizes, is that they: (1) gather information but do not use it; (2) ask for more and ignore it; and, (3) gather and process a great deal of information that has little or no relevance to decisions. Information and knowledge must have forecasting abilities (Stinchcombe, 1990). Organizations have limited resources, and there is a plethora of knowledge domains in which expertise can be developed. Effective knowledge management demands a flow of knowledge, rather than a stock of it (Perez-Bustamante, 1999).

It is now widely accepted that data and information have strategic significance to the sustainable competitive position of an organization or firm. An increasing number of publications in the current literature explain the value of information and knowledge and effective knowledge management to organizational specific performance. Research articles describing different strategies for the management of information and knowledge are also beginning to appear in present day journals. Although knowledge management, as an area of study within business and organizations, is relatively new, it stems from a number of mature business disciplines including strategy, information systems, the decision sciences, human resources management, and even from the more concrete finance, accounting and marketing disciplines. Computer-based management information, decision support, and knowledge-based systems are increasingly relied upon to improve organizational decision-making. The advent of electronic media based upon computer and tele-communication technologies has recently increased interest in the acquisition and transmission of information (Starbuck and Porrini, 2001).

Technological development has been accelerating. Some of the current trends appear to be as follows: organizations are gaining access to more data more quickly. This has implications for decision making and for the participants in decision making. The amount of information and the management of information are changing the landscape of organizational structure and decision making. Institutions and organizations now have the ability to develop organizational memory. Organizations must retain and remember important facts and develop internal (tacit) knowledge to stay competitive and ensure the well-being of the organization (De Holan,, Phillips and Lawrence, 2004).

3.9 A SHORT HISTORY OF DARWIN UNIVERSITY AND THE COMMONWEALTH EDUCATION SYSTEM

Darwin University was founded in the mid-1800s as a publicly supported agricultural institution. It is a large, public, research university with 20 satellite campuses located throughout the state. The student body is approximately 67,000 undergraduate students and 8,000 graduate students. The university is composed of ten academic colleges and schools at the flagship campus. There was also a medical school and hospital. The operating budget in the early 1990s was approximately 1.3 billion dollars. The university is a member of the Association of American Universities (AAU).

In the 1930s, Darwin University created a series of centers throughout the state for students who, because of Depression-era economics, could not afford to leave home to attend college. The centers offered the first year or two of undergraduate studies and were the predecessors of today's system of 20 Darwin University campuses located throughout the state with the Darwin campus as flagship and the administrative hub.

The curriculum offered at the undergraduate centers consisted of courses in English, history, mathematics, chemistry, foreign languages, and other subjects that comprised first- and second-year studies at the main campus. Ostensibly these centers were to serve other colleges and universities as much as Darwin University. In practice, they did act as feeders almost from the very beginning.

Toward the end of the 1950s, these satellite campuses were reorganized to prepare them to cope more effectively with the heavier demands expected in the 1960s and beyond. A new plan was formulated and approved by the trustees in 1959. The branches were more closely

integrated into the academic mainstream of the University. The campuses were then administered by a central coordinator who reported directly to the president. The central coordinator position evolved into the position of dean and vice president of the Commonwealth Education System.

The Commonwealth Education System (CES) was administered from the flagship campus with a dean and vice president. Each campus had a campus executive officer (CEO) and campus directors over various units in academic affairs, student affairs, business and financial operations, and university relations. The campus executive officer reported to the CES dean and vice president. Also, each campus had a campus admissions officer responsible for recruitment in the service area. Each satellite campus was responsible for a geographic service area. The campus service area included communities, organizations, employers and high schools. The campuses offered academic and training programs for service area constituents. The admissions officers were responsible for recruitment and providing information to the high schools about Darwin University academic programs and admission requirements.

3.9.1 The Enrollment Crisis Affecting Darwin University and the Commonwealth Education System 1990-1995

Even with optimal promotion and recruitment effort and results, the campuses may still have fallen short of their enrollment goals because of the Darwin applicant pool size, demographics, economic conditions and other higher education alternatives. When the undergraduate admissions office recruits for Darwin University, they recruit for all of the University. During the early 1990's, there really was no University-wide marketing and recruitment plan that could

effectively promote campuses to prospective students about all of Darwin University and especially the CES campuses (B. Snyder, personal communication, February 13, 2006; J. Wayne, personal communication, June 16, 2006). Few resources were available to underwrite such a concerted effort. Also, the University enrollment management plan is predicated on the enrollment needs of the academic colleges at the Darwin campus (T. Jacobson, personal communication, August 29, 2005). Primary consideration for admission and enrollment are the colleges at the Darwin flagship campus. All other campuses in the Darwin University system are given second priority. The Undergraduate Admissions Office adjusted the admission criteria so enough students were offered admission to the colleges at the Darwin campus to meet enrollment needs each semester.

At a meeting of the University Council on Enrollment Policies and Planning (UCEPP) in 1991, the vice-president of the Commonwealth Education System (CES) advised council members that a number of CES campuses were experiencing large enrollment swings which he stated should be "on a more even keel" (Shaw, personal communication, October 27, 1991). At this same meeting, Jeffrey Rochester, the director of undergraduate admissions informed the council members that there had been a decrease in Northern high school graduates. He reported that enrollments were declining in the areas surrounding the campuses. His comments were based on a variety of informational sources and an annual report from the Office of Budget and Resource Analysis. This report predicted high school enrollments and graduation rates were in for a downturn that would last into the mid 1990's. The report was researched and reported each year from an office in Old Main at Darwin (Newton, 1979, 1987; Holsworth, 1989). The authors reported that the decline started in 1977 was expected to be worse in Northern than for the nation as a whole (Newton, 1979). The 1987 report stated that the decline in Northern high school

graduates was 24 percent (Althouse, personal communications, September 22, 1987, Newton, 1987). The 1989 report predicted that the decline would be most severe in northeastern, northwestern and southwestern Northern (Holsworth).

Some of the first indications of application and enrollment declines were evidenced in the associate degree programs as early as 1989 (C. Walker, personal communication, February 22, 1989). A senior administrator announced at the University Council on Enrollment Policies and Planning meeting that associate degree applications and enrollments had shown little increase and in most of the colleges and campuses had actually declined. With the exception of the college of agriculture, each academic college had satisfactory enrollments and adults made up a significant proportion of the CES campus enrollments.

Table 2 lists the annual baccalaureate freshmen admission targets and the actual enrolled freshmen for CES campuses from fall 1990 to 1995.

Table 2 . Summary of Approved Baccalaureate Admissions Targets 1990-1995: Final Paid Accepts (Commonwealth Education System)

CES Campuses		**Fall 1990**	**Fall 1991**	**Fall 1992**	**Fall 1993**	**Fall 1994**	**Fall 1995**
Allentown	Target			190	160	155	175
	Actual	153	148	122	146	162	175
Alexander	Target			880	900	915	900
	Actual	810	839	888	878	837	1105
Bennett	Target			300	300	275	280
	Actual	266	265	271	242	295	337
Brunswick	Target			550	500	500	535
	Actual	362	312	479	447	507	582
Dunmore	Target			435	400	300	300
	Actual	331	345	313	263	286	456
Doyletown	Target			190	140	135	110
	Actual	131	139	122	102	101	133
Flagler	Target			160	130	105	115
	Actual	106	117	123	88	96	160
Hamilton	Target			500	500	500	475
	Actual	488	418	408	413	433	545
Mechanicsville	Target			300	260	250	250
	Actual	254	198	221	226	210	278
Mount Royal	Target			280	235	235	235
	Actual	260	212	198	217	227	274
North	Target			220	175	170	170
	Actual	15	134	145	148	151	182
Orrville	Target			850	750	670	650
	Actual		693	668	561	511	820
Scottsville	Target			225	175	165	165
	Actual	191	168	129	133	154	201
Scarborough	Target			120	80	75	70
	Actual			64	65	61	86
Wyoming	Target			240	210	225	210
	Actual	187	142	177	186	178	191
Wadsworth	Target			250	220	200	190
	Actual	226	165	181	175	172	225
York	Target			315	275	250	275
	Actual	277	218	251	219	236	264
Commonwealth Campuses	Target	0	0	3310	2925	2720	2680
	Actual	2757	2437	2474	2344	2446	3131
Total Campuses	Target	0	0	6005	5410	5125	5105
	Actual	4917	4597	4760	4509	4617	6014

Tables 3, 4 and 5 list the applications, admission offers and paid accept totals by campus from fall 1990 to 1995.

Table 3. Freshmen Baccalaureate and Associate Applications Fall Semester 1990 – 1995

(Undergraduate Admissions Office, Darwin University)

Campus	**Total Apps 1990**	**Total Apps 1991**	**Total Apps 1992***	**Total Apps 1993**	**Total Apps 1994**	**Total Apps 1995**
Alexander	2873	2,706	3,123	2,703	2,451	3,366
Allentown	467	513	467	459	448	477
Brunswick	1175	1,017	1,529	1,331	1,408	1,707
Bennett	915	697	927	703	730	809
Dunmore	1152	1169	1093	928	952	1328
Doyletown	352	392	352	306	353	402
Flagler	260	281	291	246	249	358
Hamilton	1,535	1,272	1,368	1,295	1,286	1,689
Mount Royal	788	590	912	655	701	824
Mechanicsville	772	588	813	519	506	618
North	464	434	474	451	426	481
Orrville	2111	2,216	2,266	1,964	1,847	2,304
Scottsville	597	542	601	403	453	526
Scarborough Valley	191	240	203	201	201	226
Wyoming	516	489	542	600	580	520
Wadsworth	674	573	595	603	526	609
York	688	673	674	625	642	662
CWC Total	15,530	14,392	16,230	13,992	13,759	16,906
Monroe	2,407	2,361	2,664	2,302	2,533	3,373
CWC+ Monroe	17,937	16,753	18,894	16.294	16,292	18,210
Darwin	11,523	12,653	11,280	12,641	12,830	13,602
No Location	27	40	36	27	1	4
Grand Total	29487	29,446	30,210	28,962	29,123	31,816

Table 4. Freshmen Baccalaureate Offers Fall Semester 1990 – 1995

Campus	Total Offers 1990	Total Offers 1991	Total Offers 1992	Total Offers 1993	Total Offers 1994	Total Offers 1995
Alexander	2,650	2,526	2,925	2,533	No Records	2,968
Allentown	426	461	414	399	Available	425
Brunswick	1,061	924	1,362	1,163		1,428
Bennett	846	651	877	641		713
Dunmore	976	994	93	780		1,051
Doyletown	324	342	303	261		225
Flagler	233	244	261	211		262
Hamilton	1,430	1,181	1256	1.168		1,468
Mount Royal	717	549	826	538		550
Mechanicsville	714	544	742	464		525
North	413	388	444	391		363
Orrville	1,780	1,908	1,914	1,636		1,914
Schuyllkill	538	499	554	348		412
Scarborough Valley	159	205	165	163		138
Wyoming	464	439	489	517		415
Wadsworth	589	495	488	453		471
York	636	621	624	571		542
CWC Total	13,956	12,971	14,537	12,237		13,870
Monroe	2,113	2,060	2,447	2,049		2,870
CWC+Monroe	16,069	15,031	16984	14,286		16,740
Darwin	9,200	10,377	9,806	10,382		11,306
No Location						
Grand Total	**25,269**	**25,408**	**26,190**	**24,668**		**28,046**

Table 5. Freshmen Baccalaureate Paid Accepts Fall Semester 1990 – 1995

Campus	Total Pdacc 1990	Total Pdacc 1991	Total Pdacc 1992	Total Pdacc 1993	Total Pdacc 1994	Total Pdacc 1995
Alexander	921	938	1063	1024	899	1157
Allentown	175	176	153	160	171	184
Brunswick	425	361	600	558	568	627
Bennett	297	287	312	292	311	349
Dunmore	391	402	393	319	306	485
Doyletown	197	213	183	164	108	137
Flagler	134	156	178	131	101	163
Hamilton	548	486	488	520	469	584
Mount Royal	337	283	284	299	237	285
Mechanicsville	281	209	270	259	218	291
North	222	185	222	216	160	190
Orrville	701	741	824	673	548	873
Schuyllkill	252	224	177	186	165	206
Scarborough Valley	97	119	105	105	64	89
Wyoming	229	170	226	239	191	204
Wadsworth	280	217	244	235	187	247
York	322	269	309	297	254	275
CWC Total	5,809	5,436	6,031	5,677	4,957	6,346
Monroe	505	514	593	574	598	699
CWC+Monroe	6,314	5950	6,031	6,251	5,555	7,045
Darwin	3,416	3,629	3,481	3,575	3,780	4,360
No Location						
Grand Total	**9,730**	**9,579**	**10,105**	**9,826**	**9,335**	**11,405**

Source: Undergraduate Admissions Office

Table 6 illustrates the enrollments at CES campuses for the academic years from 1990-91 to 1994-95.

Table 6. Final Distribution of Enrollment Fall Semester 1994

(Office of the University Registrar)

CES Campuses	Fall 1990	Fall 1991	Fall 1992	Fall 1993	Fall 1994	Four Year Number	Change Percent	1993 to 1994 Number	Change Percent
Allentown	697	714	607	480	811	-86	-12.3%	131	27.3%
Alexander	2,509	2,446	2,502	2,470	2,468	-41	-1.6%	-2	-0.1%
Bennett	1,030	936	933	765	839	-191	-18.5%	74	9.7%
Brunswick	1,665	1,702	1,773	1,726	1,723	58	3.5%	-3	-0.2%
Dunmore	1,811	1,670	1,565	1,389	1,416	-395	-21.8%	27	1.9%
Doyletown	1,045	940	1,047	981	973	-72	-6.9%	0.8	-0.8%
Flagler	945	916	991	872	903	-42	-4.4%	31	3.6%
Hamilton	1,308	1,257	1,248	1,220	1,211	-97	7.4%	-9	-0.7%
Mechanicsville	1,343	1,106	1,015	939	837	-506	-37.7%	-102	-10.9%
Mount Royal	900	938	910	990	1,111	211	23.4%	121	12:2%
North	1,144	1,095	1,088	1,126	1,040	-104	-9.1%	-86	.7.6%
Orrville	3,207	3,381	3,455	3,088	2,958	-249	-7.8%	-130	-4.2%
Scottsville	1,139	1,085	1,140	1,110	1,018	-121	-10.6%	-92	-8.3%
Scarborough	1,192	1,086	1,118	1,099	1,103	-89	-7.5%	4	0.4%
Wyoming	990	856	893	888	769	-221	-22.3%	-119	-13.4%
Wadsworth	1,364	1,257	1,270	1,299	1,268	-96	7.0%	-31	-2.4%
York	1,920	2,029	2,052	1,913	1,868	-52	-2.7%	-45	-2.4%
Commonwealth Campuses	24,209	23,414	23,607	22,355	22,116	-2,093	-8.6%	-239	-1.1%

3.9.2 Demographics

Since World War II, the state of Northern population growth was very small compared to other states and regions. For some regions of Northern there was a steady decline in the population. The Plainfield metropolitan region was the most hard hit in population loss. This out-migration accelerated in the late 1970's and continued into the early 1990's (Arnold, 1993). In the 1990's, the population of the United States grew by 9.8%. The Northern population grew by 0.1%.

Population change in Western Northern was very different. The Plainfield metropolitan region lost 7.31%. Other areas of Western Northern state experienced similar population losses (Holsworth, 1995).

The college age sub-groups significantly changed from 1980 to 1990. The Plainfield area saw the age group 17 years old or younger sub-population decline by 17.8%. The age group 18 to 24 years-old declined 28.2%. The age-group of 25 to 29 year-olds decreased by 13.8%. The exodus of younger demographic groups left a population that included 30-44 year-olds, 17.3 % of which worked in the service area occupations (Arnold, 1993).

In a summer of 1990 memo, the director of the division of marketing and recruitment in the undergraduate admissions office reported to the campus admissions officers that there would be a decline in applications and enrollments for fall of 1990 for the Commonwealth Education System (McCoy, personal communication, August 2, 1990). Although an unpleasant fact, he stated that it was not totally surprising given the high school graduation rates in the Commonwealth. In fact, he perceived the Darwin University admissions staff had increased market share in a dwindling market cohort, and despite that fact the decreases at some campuses were dramatic. Table 7 lists the projected enrollments by campus and college from 1990 to 1995.

Table 7. Projections of Enrollment by Campus and College 1990-1995

(Office of Budget and Resource Analysis, 1990)

Campus or College	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
Darwin – Associate Degrees	144	128	122	120	119	122
Commonwealth Campuses	3,272	2,953	2,863	2,859	2,858	2,922
Monroe	250	214	202	198	197	200
Olympia	18	18	17	15	15	16
ASSOCIATE TOTAL	**3,684**	**3,313**	**3,202**	**3,193**	**3,189**	**3,259**
Darwin: Agriculture	1,400	1,401	1,386	1,386	1,404	1,441
Arts & Arch	1,309	1,353	1,384	1,407	1,437	1,477
Business Admin	4,921	4,675	4,455	4,358	4,337	4,330
Earth Sciences	730	710	699	700	700	707
Education	2,416	2,487	2,487	2,491	2,521	2,584
Engineering	5,075	5,043	4,940	4,932	4,943	4,971
Health Professions	3,163	3,005	2,826	2,727	2,684	2,669
Liberal Arts	5,435	5,338	5,179	5,076	5,023	5,005
Communications	1,500	1,339	1,255	1,208	1,180	1,158
Science	2,490	2,439	2,373	2,315	2,272	2,244
Undergrad Studies	1,901	1,746	1,723	1,725	1,734	1,747
Monroe	4	1	1	0	0	0
Capital	1	0	0	0	0	0
Intercollege	0	1	0	1	0	0
Subtotal Baccalaureate	30,345	29,536	28,708	28,326	28,235	28,333
Commonwealth Campuses	11,395	10,908	10,879	11,023	11,192	11,626
Monroe	2,042	1,835	1,693	1,621	1,592	1,589
Olympia	1,589	1,613	1,747	1,822	1,861	1,906
BACCALAUREATE	45,371	43,892	43,026	42,792	42,879	43,453
UNDERGRADUATE	49,055	47,205	46,228	45,985	46,069	46,713

One neighboring state was the largest feeder of out of state students for Darwin University than any other state in the nation (Arnold, 1993). Until 1993, this state allowed students to take their state financial aid grants to any state in the country. For many years, it had the greatest out-migration of students to other states to pursue higher education than any other state in the country (Chronicle of Higher Education, June 2, 1988). In 1990, a new administration stopped the exodus.

Students receiving financial aid from the state agency could no longer take their aid to any state that they chose. The loss of these students had a very direct effect on the enrollment of Darwin University CES campuses with residence halls.

In 1994, Darwin University lowered out of state tuition for CES campuses. The table below illustrates the increase in out of state enrollments beginning in the fall of 1994.

Table 8. Out of State Freshmen Enrolled at Darwin University 1990-1995

(Undergraduate Admissions Office)

	Fall 1990			**Fall 1991**			**Fall 1992**		
	Total	OOS	% OOS	Total	OOS	% OOS	Total	OOS	% OOS
Darwin	4333	1172	27%	4559	1273	28%	4263	1171	27%
CES	4929	442	9%	4612	371	8%	4775	323	7%
Monroe	527	74	14%	518	74	14%	581	64	11%
TOTAL	9789	1688	17%	9689	1718	16%	9619	1558	16%
	Fall 1993			Fall 1994			Fall 1995		
Location	Total	OOS	% OOS	Total	OOS	% OOS	Total	OOS	% OOS
Darwin	4336	1158	27%	4692	1221	26%	5424	1451	27%
CES	4528	289	6%	4629	392	8%	6038	510	8%
Monroe	544	70	13%	595	89	15%	722	74	10%
TOTAL	9408	1517	16%	9916	1702	17%	12184	2035	17%

3.9.3 Service Area High Schools

During this period, many of the service area high schools experienced significant declines in their enrollments. Most would never recover to 1988 levels over the next six to eight years

(Holsworth 1989, 1995). All colleges and universities that depend on a regional population for applications and enrollments have what are called feeder high schools that consistently send students in large numbers to the institution. Declines in the size of the senior class of feeder high schools greatly hindered recruitment efforts. Table 9 lists the total number of high school graduates by each campus service area from 1991 to 1994.

Table 9. Northern High School Graduates by Service Area 1991-1994

	1991	**1992**	**1993**	**1994**
Alexander	5,254	5,357	5,173	5,119
Allentown	6,473	6,283	6,369	6,372
Brunswick	5,071	4,850	4,791	4,708
Monroe	6,645	6,649	6,596	6,218
Bennett	6,415	6,294	6,403	6,186
Dunmore	13,605	13,322	13,392	13,197
Doyletown	3,797	3,668	3,399	3,439
Flagler	4,417	4,315	4,096	4,023
Hamilton	4,084	4,069	4,164	4,067
Mount Royal	2,478	2,397	2,510	2,384
Mechanicsville	9,550	9,073	9,085	8,717
North	6,872	6,797	6,711	6,648
Orrville	20,086	20,151	20,166	20,256
Scottsville	1,629	1,539	1,620	1,591
Scarborough Valley	2,811	2,695	2,694	2,675
Darwin	5,168	5,074	4,882	4,711
Wyoming	3,344	3,414	3,516	3,298
Scarborough	4,051	4,183	4,204	4,127
York	11,337	11,192	11,104	10,904
Total	**123,087**	**121,322**	**120,875**	**118,640**

3.9.4 College Going Rates

Another important statistic for admission analysts at Darwin University was the post-secondary education rate or college going rate. This statistic indicates the number of high school seniors who enroll in higher education after high school. Northern had always ranked low among all of the northern industrial states. In 1989, the Northern college-going rate was 60.8%. The rate was 69.7 in 1998. The table below was produced annually by the Office of Budget and Resources Analysis illustrating the college going rates by service areas.

In a memo to CES admissions officers, (M. Rubinstein, personal communication, September 25, 1991) summarized the just completed recruitment year for each campus. The highlights included prominent mention of the decline of the high school graduation cohort in the state, increase in college-going rate of state high school seniors, these new college goers were from lower achieving academic and lower socio-economic strata. These lower achieving students may have found the community college as a more attractive choice to begin college for both academic and financial reasons. The summary for each campus indicated the seriousness of the enrollment situation. Table 10 is a summary of the college-going rates in the Darwin CES service areas.

Table 10. Essential particles Northern High School Graduates and Portions to College by Darwin Service Area Ranked by Percent to College 1994
(University Budget Office, 1995)

Service Areas Equaling or Exceeding State Average						
High School Graduates				**Graduates to College**		
Service Area	Number	% of Total		Number	% of Total	% to College
Mechanicsville	8,717	7.3%		6,844	8.3%	78.5%
Bennett	6,186	5.2%		4,777	5.8%	77.2%
Dunmore	13,197	11.1%		10,019	12.2%	75.9%
Orrville	20,256	17.1%		15,134	18.4%	74.7%
North	6,648	5.6%		4,916	6.0%	73.9%
Allentown	6,372	5.4%		4,687	5.7%	73.6%
Wadsworth	4,127	3.5%		2,937	3.6%	71.2%
Wyoming	3,298	2.8%		2,303	2.8%	69.8%
Subtotal	68,801	58.0%		51,617	62.9%	75.0%
Service Areas Below State Average						
High School Graduates				**Graduates to College**		
Service Area	Number	% of Total		Number	% of Total	% to College
Monroe	4,708	4.0%		3,003	3.7%	63.8%
York	10,904	9.2%		6,944	8.5%	63.7%
Hamilton	4,067	3.4%		2,572	3.1%	63.2%
Scarborough	2,675	2.3%		1,691	2.1%	63.2%
Scottsville	1,591	1.3%		992	1.2%	62.4%
Brunswick	6,218	5.2%		3,875	4.7%	62.3%
Darwin	4,711	4.0%		2,813	3.4%	59.7%
Alexander	5,119	4.3%		3,001	3.7%	58.6%
Doyletown	3,439	2.9%		1,967	2.4%	57.2%
Flagler	4,023	3.4%		2,275	2.8%	56.5%
Mount Royal	2,384	2.0%		1,287	1.6%	54.0%
Subtotal	49,839	42.0%		30,420	37.1%	61.0%
State Total	118,640	100.0%		82,037	100.0%	69.1%

Beginning in early 1990's there was a dramatic and steady increase in the number of high school graduates from the Commonwealth entering college (M. Rubinstein, personal communication, September 21, 1991).

3.9.5 Market Forces- Economics

Darwin University CES needed to be program and market competitive. It could do neither effectively. In the early 1990's, Darwin University was confronted by two powerful market forces: declining demographics and an economic recession. These conditions left Darwin and CES with limited resources.

A growing number of families were dependent on financial aid from federal, state and institutional sources. Darwin University CES competed with other less expensive community colleges, public universities in the State System of Higher Education and the local private institutions. Public higher education had traditionally fared well in the recruitment of traditional-age students in great part because of affordability. Many private colleges and universities were relatively successful by offering creative financial aid packages and scholarships to compete with the public sector (M. Rubinstein, personal communication, October 19, 1993). The proportion of financial aid that could cover tuition and other education-related fees began to decline in the late 1980's and continued into the mid 1990's (College Board, 2000). Darwin University had very little institutional aid available, forcing many middle-income students to borrow. The cost of public higher education in Northern was among the highest in the country (Murphy, 1991).

The amount of grant aid was slowly supplanted by loan aid during this period. The declining funding of government aid made less expensive public institutions and private institutions able to discount more attractive alternatives to the CES campuses of Darwin University. Table 11 was created by the Northern Department of Education and illustrates the tuition and fees of private and public institutions from fall 1990 to fall 1995. Table 12 was

created by the Darwin Office of Budget with in-state and out-of-state tuition fees from 1991-92 to 1995-96.

Table 11. Undergraduate In-State Tuition and Required Fees by Institutional Category 1990-91 through 1995-96 (Northern State Department of Education, 2000)

	1990- 91	**1991- 92**	**1992- 93**	**1993- 94**	**1994- 95**	**1995- 96**
State Universities	$2,569	$3,028	$3,236	$3,571	$3,755	$3,945
State-Related Commonwealth Universities	3,807	4,134	4,483	4,594	4,853	5,091
Community Colleges	1,398	1,478	1,578	1,626	1,685	1,797
Private State- Aided Institutions	10,021	11,000	11,905	12,835	13,522	14,194
Private Colleges and Universities	9,357	10,167	10,811	11,572	12,264	12,937
Private Two-Year Colleges	6,229	6,733	7,284	7,915	8,348	8,371
College of Technology	3,250	3,420	3,645	3,845	4,095	4,295

Table 12. Darwin University Tuition and Fees by Semester 1991-1995

(University Budget Office, 2006)

Fall Semester	**In State Residents - Full-Time Darwin**	**In State Residents-CES Campuses**	**Non-Northern Residents - Darwin**	**Non-Northern Residents - CES Campuses**
1991-92	$2,401	$2,329	$4,794	$4,794
1992-93	2,509	2,437	5,022	5,022
1993-94	2,611	2,536	5,285	5,285
1994-95	2,718	2,639	5,562	3,935
1995-96	2,829	2,747	5,855	4,139

A second response to market conditions is product development or new academic programs. During this period, only three campuses were allowed to offer baccalaureate degrees in the Darwin University system. There were attempts to offer new associate degree programs but this had limited success and some had actually failed (M. E. Bayuk, personal communication, August, 1995). Darwin University did not do market analysis to learn the market needs for an academic program (J. Wayne, personal communication, June 16, 2006, B. Snyder, Personal communication June 7, 2006).

The decrease in the pool of high school graduates created a more competitive situation for colleges and universities throughout Northern. The associate director of market planning and research for Darwin University's undergraduate admissions office, reported that the smaller pool resulted in increased "intrusions" by more selective private institutions into what had traditionally been regarded as a market for the public sector colleges and universities (Arnold, 1993). These "intrusions" created new options for Northern high school seniors. Both Darwin University internal admission reports and reports from the Northern State Department of Education indicated that private institutions of higher education were able to sustain and even increase enrollments during the recession years of 1991 to 1995 (Khanna, McCormick and Polliard, 2000). Table 13 illustrates the fluctuation in Northern undergraduate enrollments at private, public and community colleges during the period of fall 1990 through 1996.

Table 13. Fall Enrollments by Institutional Category and Level 1990 through 1996

(Northern Department of Education)

Total	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
Undergraduate	566,027	579,553	587,977	580,693	571,887	571,355	568,222
State Universities	99,082	99,850	98,624	95,962	94,660	94,370	93,711
Undergraduate	87,839	88,398	87,460	85,019	83,586	83,210	82,839
State- related Research Universities	140,928	141,938	141,524	138,656	137,045	139,362	138,855
Undergraduate	110,885	111,191	110,225	107,101	105,763	108,142	108,437
Community Colleges							
Undergraduate	104,292	112,518	119,730	118,885	114,425	111,353	109,164
Private State-Aided Institutions	46,437	47,591	47,818	41,811	41,659	40,542	40,702
Undergraduate	27,500	27,758	27,535	22,257	21,479	21,313	21,682
Private Colleges And Universities	165,665	167,713	172,086	177,194	176,190	177,092	176,669
Undergraduate	138,513	138,746	141,224	144,763	143,163	143,655	143,012
PRIVATE TWO- YEAR COLLEGES							
Undergraduate	6,233	6,433	4,583	4,660	4,356	5,092	5,590

Other factors contributed to enrollment declines at Darwin University and other colleges and universities:

1. Surplus capacity – Northern had more seats for undergraduate students than there were students available.
2. Changing buyer needs- Darwin University campuses were heavily dependent on students choosing associate degree programs for enrollment. Associate degree programs were very popular for adult students. This began to change in the late 1980s. These majors became obsolete.
3. Trade Re-adjustment Act- The federal government made educational financial aid available for workers who were forced from their jobs because of foreign trade competition. The funds were intended to finance post-secondary education for programs that could be completed in two calendar years. Funding began in the early 1980s and continued into the 1990s. However, by the early 1990s, the number of adult students had significantly decreased to a small handful each semester.
4. More residence halls were built at campuses at Alexander, Monroe and Brunswick. These on-campus housing increases negatively impacted on other CES campuses.

3.9.6 Darwin University Responds

Darwin University was not well equipped to easily turn resources toward the problems of enrollment deficits. Solutions encompassed institutional management, possible restructuring, resource development and reallocation, strategic planning and most of all a financial

commitment. All of these prescriptions either implicitly or explicitly called for an expansion of university resources for marketing and recruitment. Options and resources were weak, as decision makers worked to orchestrate various initiatives to confront the enrollment crisis.

The response to the enrollment crisis may have been slow at some campuses as well as the central administration at the undergraduate admissions office and Commonwealth Education System. The hope and thought was that the application decline was a one-year glitch and a recovery was imminent. However, the recovery did not come the next year as expected. The declines in applications continued, and enrollments declined as a result of the decline in freshmen applications. As the enrollment crisis deepened and widened throughout the Darwin University campus system, administrators and enrollment planners responded in a variety of ways.

3.9.7 Recruitment Initiatives

There were discussions at different times and at different levels of the University about the possible impact of the high school enrollment declines (H. Wallace, personal communication, December 12 2006). As early as October 1989, the vice president of the Commonwealth Education System (CES) forwarded a memo to all campus executive officers that summarized an analysis of issues that CEOs believed to be strategic concerns for the 1990s. Three of the 13 issues were directly related to recruitment of students. CEOs asked how CES will recruit and retain students, development of recruitment strategies for traditional-age, adult and minority students. Another issue identified was the development of new academic programs at CES campuses to meet the needs of local business and industry, and location-bound adults. Although

not mentioned in the 13 item Delphi, there was an item at the end of the memo mentioning the need to increase public awareness of CES campuses in major Northern markets. Six CEOs voted for students as the number one issue for the CES strategic planning process for 1990. There was no specific mention of traditional age student recruitment as a critical issue or concern. More mention and emphasis were on adults and minority student recruitment. The CEOs did not mention the recruitment of traditional-age students at or near the top of critical issues facing the administration of the CES and the campuses in the near future.

Over the next four years, campus executive officers and the Vice President of CES had variety of meetings to discuss enrollment declines. These meetings were meant to develop tactics to address the enrollment shortfalls. At each meeting, CEOs discussed the enrollment declines in CES and made a number of recommendations.

The outcomes of these meetings generated recommendations and included a variety of initiatives. There were increases in advertising. Some campuses hired advertising agencies. Campus decision makers complained that the office of university relations was inattentive and slow to react to CES campus needs. The CES deans and staff were able to bring a force to bear on university relations activities that would be more responsive in both speed and project management of advertising and promotion for CES.

Campus admissions offices formed geographic consortia. Campuses met to discuss the enrollment crisis and possible initiatives and make recommendations to Darwin decision makers. The consortium identified three areas of critical concern for recruitment at Darwin University: traditional age students, minority students and adult students.

The admissions officers and the directors of student affairs from the southwest Darwin University campuses drafted a joint memo addressed to the vice president of the Commonwealth Education System and the director of undergraduate admissions stating the need for dramatic action to remedy the application and enrollment declines (R. Boston, personal communication, June 30, 1993). The authors reported continuing application and enrollment declines university-wide and at the southwest campuses. It emphasized the critical need to understand the issues involved and to make additional resources available to increase and enhance current marketing and recruitment efforts. The memo made eight recommendations to improve marketing and recruitment efforts. In addition, it included recommendations that were short term and long term and the specific resources needed. The number one listed long-term recommendation from the southwest group was the need for a regional comprehensive marketing plan.

Out of state tuition was reduced at CES campuses. One attempt to lure out of state students to the Commonwealth campuses was a reduction of the out of state tuition from 200% of in state tuition to 150% of in state tuition.

More admissions staff were hired. The CES Vice President urged campuses to add more staff and hire directors of enrollment management. A number of campuses created a position and hired a director of enrollment management.

New admissions positions were created at the undergraduate admissions office at Darwin. In 1993, a director of admissions for the Commonwealth Education System was hired. The CES Vice President Wayne searched for and hired a director of admissions for the CES. The mission of this director was to bring greater attention to CES campus issues and to coordinate the recruitment efforts at the CES campuses. Upper level decision makers believed that this individual could better serve the needs of the CES campuses.

This director was housed in the undergraduate admissions office. The thinking was that CES lacked a presence and influence in the decisions of the undergraduate admissions office and university relations. Curiously, the CES admissions director had no undergraduate admissions experience nor had ever worked with traditional-age student recruitment. Her professional background was in adult and continuing education. These limitations proved to be an impediment to timely action and decisions. However, it must be said that the CES admissions director was a very fast learner and became a very knowledgeable admissions practitioner.

Also in 1993, a marketing director was appointed. The director of marketing was expected to direct all marketing efforts for the campuses as well as Darwin. Although, the marketing director was housed in the undergraduate admissions office, there was no separate budget or dedicated staff made available to the marketing director.

Regular meetings and workshops were scheduled. In June of 1993, the recently appointed director of CES admissions convened a workshop at Darwin (R. Jefferson, personal communication, June 18, 1993). The outcome of the meeting was a statement of future plans and recruitment initiatives to be shared with relevant enrollment decision makers. Participants were asked to evaluate the workshop and share comments about the current CES application and enrollment situations. A number of comments were critical of the CES leadership and the lack of system-wide resources available for recruitment.

In 1994 and 1995, the CES vice president requested that campuses begin an admissions self-study (T. Pierce, personal communication, November, 9, 1995). The self study involved CEOs, CEPOs and admissions officers at campuses near New Town and Plainfield. The charge from the CES vice president was to examine and improve the recruitment process and enroll

more qualified students at the CES campuses. One outside consultant had recently completed reviews or made assessments for these same campuses. The Gallup Organization (1995) conducted surveys for Bennett and Plainfield and was studying Scarborough Valley. There was criticism of the Gallup study results (R. Boston, personal communication, August 8, 2006). A Plainfield area advertising agency was contracted to develop advertising and communication plans as well as marketing assessments for Bennett, Mechanicsville and North campuses. The task force report made a number of recommendations and points for further discussion. One important point addressed inconsistent funding for more regionalized marketing efforts.

In December of 1993, campuses were directed to establish a marketing team as part of the strategic planning process (J. Wayne, personal communication, December, 16, 1993). They were then expected to develop a marketing and recruitment plan that would grow out of the campus marketing teams. The marketing and recruitment plans would be an integrated effort of the admissions, continuing education and university relations offices. The goals of the teams and the integrated marketing plans were as follows: development of planning and integration teams to support campus strategic and enrollment plans, maximize campus marketing efforts, raise staff and faculty awareness of new approaches to marketing, create a network for sharing ideas among campuses, develop collaborative marketing approaches within regions and across the University and CES. CES leadership emphasized that strategic marketing was a key component of the strategic planning process.

3.9.8 Problems and Shortcomings

Little marketing research and analysis were ever done on a consistent and regular basis (B. Snyder, personal communication, June 6, 2006 and H. Wallace, personal communication, December 12, 2006). There was an analysis of the service areas and counties each year in the Newton and Holsworth reports out of the office of budget and analysis. However, there was minimal investment in recruitment technology (B. Cooper, personal communication, November 9, 2006). Darwin University remained wedded to main frame and other campus home-grown technologies.

Financial aid data were never considered or evaluated as an intrinsic part of the recruitment to enrollment process (R. Owens, personal communication, August 10, 2006). Aid was awarded on need eligibility and a fist come-first served basis. Many CES campuses had a history of late application activity in their service area. The award cycle at Darwin University disproportionately favored Darwin flagship campus applicants and disadvantaged CES campus applicants.

Associate degree applications began a precipitous decline starting in the late 1980s. This decline was never altered. One early memo (R. Owens, personal communication, April 29, 1989) made prominent mention of the dilemma of associate degree applications. In February, Dr. Gene Greskovich, Assistant VP and Director of the Division of Technology, CES was asked to address the University Council Enrollment Planning and Policies (S. L. Walker, personal communication, February 22, 1989) and stated there was a need to increase recruitment for the engineering technology programs. The concluding statement of the UCEPP meeting was a suggestion that CES campuses increase academic quality and quantity.

Unfortunately, there was a perception that blame was placed on people rather than an analysis of the overall campus situation (R. Jefferson, personal communication, December 3, 1993). Darwin University decision makers did not fully grasp or understand the market place and interplay of demographics, economics, and various other factors and the implications for Darwin University recruitment and enrollment management.

3.9.9 Data and Information

There were attempts within the enrollment management structure of CES to develop data and information management systems to better serve decision makers needs (R. Owens, personal communication, April 28, 1991). One such attempt was by the Undergraduate Admissions Office to develop a report that incorporated facets of a couple of different admission reports into one more detailed report accessible to all admissions officers and decision makers.

CES wanted each campus admissions officer and enrollment planning officer to develop a "home-grown" data report function that would generate data reports that would have a forecast ability and meet specific campus needs. CES decision makers wanted campuses to look at enrollments in smaller detail with an eye toward pinpointing shortfalls (J. Beatty, personal communication, September 18, 1994).

A report generator capability was developed from the Darwin University Administrative Information Services office. The report generator was known as administrative information decision aid for admissions (AIDAA). Users could customize reports and save the report parameters for repetition as needed by a user. Interview respondents reported difficulties. One difficulty was getting these reports into the hands of enrollment planners and decision makers.

The second difficulty was having the decision makers understand the various reports. Many of these reports seemed to lack insight to an untrained analyst. Even admissions officers did not make full use of the AIDAA report generator. These data modules were specifically developed for admissions officers. AIDAA was expected to be an indispensable data tool for admissions officers and enrollment planning officers. AIDAA would generate weekly or ad hoc reports as needed to clarify the admission application and enrollment picture for decision makers and planners.

4.0 RESEARCH METHODOLOGY

4.1 SURVEY AND INTERVIEW SAMPLES

Potential participants were identified based on the roster of campus and university staff and administration. This annual directory was published each fall listing undergraduate admissions officers, directors of student affairs, and campus executive officers at Commonwealth Education System campuses, members of both the upper administration of the Commonwealth Education System and those of the undergraduate admissions office at Darwin. This was a convenience sample based on the years from 1990-91 to 1995-96.

In responding to some of these limitations, this study relied upon the high degree of stability in these respective offices where many participants are still employed at Darwin University. These offices and members include: campus admissions officers, campus executive officers, campus directors of student affairs, Commonwealth Education System administrators and Undergraduate Admissions Office administrators at the flagship campus.

4.2 PROCEDURES

Recruitment - The investigator e-mailed or telephoned potential informants inviting participation. A summary of the dissertation proposal was mailed or e-mailed to these prospective participants. All participants were asked to read and sign a consent form developed by the Darwin University Office for Research Protections and the University of Pittsburgh Research Conduct and Compliance Office.

A coded survey for identification was sent to members of the Darwin University undergraduate admissions office staff and campus and central administrators having admissions and enrollment management responsibilities at Darwin University from 1990-91 to 1995-96. Those who consented to participate were given the choice of a paper or electronic version of the survey. Non-respondents were contacted after a 30 day hiatus with a communication seeking their participation.

After the survey data were tabulated, those who completed the survey were asked to participate in an audio tape recorded interview, recorded face to face or by telephone. A session lasted from 60 minutes to two hours.

4.3 SURVEY DESIGN AND OBJECTIVES

The case study approach has long been an important method for investigating organizational behavior. Grounded in the study of history, it has considerably enriched our understanding of American foreign policy and business decision making in the last 30 years (George and

McKeown, 1985). However, it is not and cannot be merely good story telling. The development and use of a survey instrument has added an element of quantification to the anecdotal observations and testimony. Also, an interview questionnaire has helped to obtain information from participants.

The use of a survey instrument and an interview questionnaire measures observations both quantitatively and qualitatively and make causal inferences possible (George and McKeown, 1985).

In this study, these two instruments were designed to collect historical information directly from participants about their knowledge, recollections and perceptions of the events that occurred in the organizations' recent past. The instrument surveyed admissions officers, campus enrollment officers, campus executive officers in the Commonwealth Education System, and administrators and enrollment planners at Darwin. Their responses addressed their perceptions concerning information management and the decision making processes occurring at their campuses and administrative units in the period 1990-91 to 1995-96.

The purpose of a survey in this study was to produce an historical description that was quantifiable. This survey allowed the researcher to quantify the various administrators and decision makers responses highlighting their knowledge and perceptions about a series of events occurring between 1990-91 and 1995-96. The survey questionnaire was designed based on the case study approach formulated by Chun Wei Choo (1998). Choo's design is divided into topic segments for a case study. It addressed the following topics in information management and organizational theory: (1) problem recognition, (2) communications, (3) information seeking and (4) decision making.

4.3.1 Problem Recognition

The first section of the survey focused on key campus decision makers perceptions relative to the gravity of the campus enrollment problems. Responses to the eight survey questions in this section helped determine the availability and amount of information available to decision makers, and the value of that information.

4.3.2 Communications

Researchers (Wilensky, 1967; Choo, 1998; Wang and Ahmed, 2003) indicate that communications in organizations reflect the statuses and aspirations of its members. Often communication in organizations is bottom up; that is, members of organizational hierarchies tend to talk upward and listen upward. At times though, these members tend to shape their upward messages to enhance good news and suppress bad. Status and risk have implications that shape information seeking.

Choo (1998) has stated that issues of quantity and quality in communications have implications for decision making. The second section sought to illustrate better the communications process by determining if communications were open and constructive. That is to say was there a constant flow and exchange of information that fostered meaningful discussion between the various staff levels of participation in the decision making process?

One aspect of Bounded Rationality theory is that affective factors can play a pivotal role in information seeking and decision making (Simon, 1997). In some decision making environments, individual personalities can overwhelm information and the communication

process. Individuals have their own preferences, values and aspirations that will influence communication and information seeking. The survey respondents in this case study evaluated the communication process from the top of the organizational hierarchy to bottom.

In the light of Choo's interpretation of the decision making process, survey questions in this section will address research questions pertaining to the communication process. Was the communication process cooperative and constructive or was communication inhibited and stymied the exchange of critical information from essential participants, and the primacy of individual personalities over information in the decision making process? Were decisions the outcomes of actions committed by autonomous actors or were they the actions of team members comprising an organizational culture? In the case of the university system, were decisions made based on the goals of the organization or were certain individuals able to influence the decision making process in ways that excluded pertinent information and observations from line staff? The participation of line staff could yield essential information to the enrollment problem and possible solutions. According to Wang and Ahmed (2003), another aspect or outcome of the influence of personalities could be the loss of trust among participants to be candid and ensure that frank communication and consequent insights would benefit the organization.

4.3.3 Information Search

The third section addresses the search for information that might have influenced administrators and enrollment planners in their decision making. The questions asked for responses that pertain to the quantity of the information available to the decision makers and their access to this information. Survey questions in this section sought to determine the extent to which decision

makers may have been overwhelmed by information and the complexities of the decision making processes in large organizations such as a multi-campus university system. The quality of information is important. It is useful therefore to discern what information was perceived valuable and how it influenced the decision making process. Was decision making typified more by clarity and consistency or by ambiguity and inconsistency? Did decision makers have a clear idea of the crisis, its gravity, and of the information for decision making? Did they have a time frame for a discussion of the information and the decision options? The survey questions in this section considered the extent to which decision makers may have misread or misunderstood the information needed for their decision making.

4.3.4 Decision Making

Finally, the fourth section addressed the actual decision making process. Respondents were asked to answer a series of questions rating their own participation in the decision making process and then to evaluate the overall process. Survey questions in this section sought to determine how the decision making proceeded. The survey questions being asked in this section determine whether this was a classic illustration of the anarchic or garbage can decision making model common in a university environment. In the garbage can decision model, the organization operates on the basis of inconsistent and ill-defined decision making processes (Cohen, March and Olsen, 1972). The decision making process lacks a coherent or formal structure. Relevant participants are often not aligned or closely coupled to understand fully their role and the goals of the organization. One example of this type of loose coupled alignment could be the admissions and university relations officers that have little contact with one another. Moreover,

they made no coordinated marketing plan to promote advertising and recruitment. At times, participants may have neither access to pertinent information nor do they discuss alternatives in a coordinated time frame. Participants vary in the amount of time and effort devoted to the decision process. Often participants are unsure of their role and are unsure of the organizational goals. Decision participants often come together in irregular time frames, information sharing is inconsistent, and the process is by trial and error.

4.4 INTERVIEW OBJECTIVES

The second instrument to be used in this study was an interview with a convenience sample of the survey respondents. In a follow-up to the survey, the investigator requested interviews with participants whose roles on their respective campuses, and whose decision making positions made their insights especially valuable to the case study. These prospective interview participants were identified by the investigator's knowledge of the historical data which are at the center of this study. Also, the investigator asked participants to recommend additional informants for interviews. Non-respondents received a second request for an interview approximately thirty days after the first request. Others required three to six months of requests.

The qualitative data supplemented the quantitative data collected through the interviews. Fifteen interview questions were developed. Questions were open-ended to elicit in-depth responses. These qualitative data validated, framed and illustrated the case study. Interviews were on-site or by telephone at the convenience of informants. Informants could review the script of responses and were allowed, if desired, to respond or modify their original responses.

Interviews draw out the assessment of the enrollment situation and the overall quality of the decision making process. Responses identify strengths and limitations and suggest ways of improving enrollment management with effective application of information management principles in organizational decision making.

4.5 METHODS FOR DATA ANALYSIS

Responses were based on a Likert scale and one response per question. Survey participants were asked to give a single numerical response with one choice and ten options (1–10) ranging from strongly disagree (1) to strongly agree (10) in the section. Using the broad scale of 1 through 10 allows for finer distinctions for the responses. Survey responses were analyzed using descriptive statistics. One example would be the availability and quantity of information for decision making. A survey question was developed to ask participants if they believed they had a sufficient quantity of information for effective decision making with a scale of one, strongly disagree to ten, strongly agree.

These data were used to collect responses and gain information from the overall population to answer the research questions. The data from the survey were analyzed using means and standard deviations to collect information about the total population. The survey population was divided into sub-groups of campus admissions officers, campus executive officers (CEO), campus enrollment planning officers (CEPO), Commonwealth Education System administrators and Darwin admissions personnel. These sub-groups were compared to

each other to see if there are different responses to the survey questions. The investigator presented the findings as they relate to each of the four research questions.

Data from the completed survey were analyzed using The Statistical Package for the Social Sciences (SPSS) computer software. Because the sample size was only 28, it was decided that the most appropriate statistical analysis that was needed was a t test of significance on selected questions. It was determined in a comparison of the survey question results, there was a statistically significant difference in the mean responses to 8 survey questions that involved the campus admissions officers and the campus executive officers. Also, there was a similar difference in mean responses in two survey questions by the campus admissions officers and the Darwin decision makers.

A t-test was used to test the significance of the differences of the means of the two groups. A 2-tailed t-test with independent samples with $\alpha = .05$ was used to determine differences between the perception of the admissions officers and campus executive officers, and Darwin decision makers. Appendix I shows the results of the t-tests.

Interview data were grouped by organization memberships as campus admissions officers, campus enrollment planning officers, campus executive officers and members of the undergraduate admissions office and the CES central administration at the flagship campus of Darwin University. The interview responses were then further grouped into tables by the case study topics or categories of problem recognition, communication, information search and decision making. The analysis of the interview data aimed at delineating themes and perspectives of the events. These themes or concepts were then added to the case study categories. The interview data were used to add qualitative detail and insights to the survey responses.

4.6 FINDINGS AND ANALYSIS

This chapter presents the findings of the study. The purpose of the chapter is to review the data from the survey questions and describe the results by the demographic groups. Also, the interview and written responses of the organization members have been included in the findings to add narrative substance to the various survey responses. The uses of the interviews were to inform and add substantive depth to the survey responses.

In the abstract, we often assume there is a perfect or orderly rationality in decision making. The theoretical framework are Herbert Simon's theory of Bounded Rationality and the anarchic (or garbage can) decision making model created by James March, Michael Cohen and Johan Olsen. How were decisions made? What were the mechanics of the process? The focus of the study was an assessment of the decision making process and the four components of problem recognition, communications, information search and the actual decision making.

4.7 THE SURVEY RESPONDENT POPULATION DESCRIPTION

The survey subjects of this study were participants at various levels of the enrollment management hierarchy. The first group was the campus admission officers. There were 17 possible participants and eleven did participate and take the survey. Four of the admissions officers were interviewed. The second population group was the campus enrollment planning officers. Of a potential group of 17, six participated in the survey and three were interviewed. The third group was the campus executive officers. Of the seventeen potential CEOs, six

participated in the survey and three were interviewed. The fourth group of enrollment management participants was decision makers at Darwin. There were five potential participants contacted in the undergraduate admissions office. Two chose to participate in the surveys and interviews. In the Office of the Vice President and Dean of the Commonwealth Education System, three participants were invited to participate and all three did participate in the survey and interview. Each interview informant was given an alias and code number of AO # 1 for admissions officers, CEPO #2 campus enrollment planning officers, CEO #3 for campus executive officers and DM #4 for Darwin decision makers. Also, interview respondents were give pseudonyms to ensure anonymity and confidentiality. Table 14 lists the survey and interview respondents by organization membership.

Table 14. Survey and Interview Respondents

	Population	**Survey Respondents**	**Interview Respondents**
Admissions Officers	17	11	3
Campus Enrollment Planning Officer	17	6	3
Campus Executive Officers	17	6	3
Flagship Decision Maker - CES Central Administration	4	3	3
Flagship Decision Maker - UAO Administration	6	2	2
Totals	61	28	14

4.7.1 Problem Recognition and Defining Problem

Different campuses were experiencing varying degrees of enrollment fluctuation. The enrollment declines were uneven among the campuses and the causes of the decline were not fully understood. Analysis of the enrollment declines was complicated by the question of availability of information to key members of the enrollment management organization. The number of campuses involved and the number of sources of information complicated problem recognition. The multiple problems of campus and information sources as problematic adheres to anarchic or garbage can decision model (Daft, 1982). The many campuses and layers of organizational departments and members complicated communication and information sharing. Because campus and CES decision makers did not fully comprehend the situation, this influenced both diagnosis and the search for solutions.

Problem recognition and diagnosis that would lead to decisions are constrained by organization member's capabilities and the social structure of the enrollment management hierarchy (Cyert and March, 1963). Based on interview reports, there were both social and cognitive limitations to information processing and analysis of the problem. The training and expertise of organization members may have been insufficient to interpret data and information to diagnose the problem.

Admissions officers as a group indicated (4.67) that campus decision makers did not quickly recognize and respond to the enrollment declines at the campus level. Darwin decision makers agreed (5.00) with the campus admissions officers. Campus executive officers gave themselves high marks (8.67) on the question of campus response to the problem recognition and

the enrollment declines. This is a significant disparity in how the two groups viewed the recognition and response of the campus enrollment declines.

Campus admissions officers as a group did not believe (3.70) that Darwin decision makers quickly recognized and responded to the enrollment declines. This score is even lower than the score given to the campus decision makers on this topic.

The responses to question 7 indicates (4.64) admissions officers did not believe that campus enrollment decision makers understood the available data and information for decision making. Campus executive officers disagreed (9.33) indicating a high level of confidence in their understanding of the information for decision making. Darwin respondents had a similar level of confidence (8.50) to appropriately understand the data and information for decision making. Once again, admissions officers did not agree and gave lower (3.90) scores on question number 8.

Interview reports confirmed the admissions officers belief that the campus leadership did not fully understand the dimensions of the enrollment declines. The interview comments are certainly supportive data for the interpretation of Bounded Rationality in this case study in the area of problem recognition. A campus enrollment planning officer reported the North campus executive officer never seemed concerned about the enrollment situation. Another example from a Darwin decision maker was the comment that campus CEOs may have been out of their element. These are two examples that indicate the degree of limited capabilities to comprehend and act in the realm of problem recognition and decision making. It is very possible that campus leaders were distracted by a variety of other problems on campus that seemed more pressing at the time. O'Reilly (1982) has pointed out that problem recognition and decision making

performance are often decreased by various distractions caused by time pressures and pursuing multiple objectives.

Table 15

Problem Recognition	Representative Interview Data
Admissions Officers	
Information and Reports • "There was not a lot of discussion or analysis of the demographic projections reports at Dunmore in the late 1980s. The CEO did not believe that the projected declines would greatly affect Dunmore. A new CEO at Dunmore did voice greater concern" (AO #6, 2006). **Expertise** • "My campus administration never saw the enrollment declines coming and we were not positioned to react in a market responsive way. We had no programs to take to the market place to benefit the campus" (AO #1, 2006). • "Enrollments at Wyoming went flat first and then started a long term decline. The Wyoming CEO was not fully aware and involved with the crisis" (AO #5, 2006). • Two admissions officers stated that they were not trained or experienced to be marketing knowledgeable admissions recruiters (AO #1 and AO #6, 2006). • "I had a masters in counseling and not in marketing" (AO #6, 2006).	
Campus Enrollment Planning Offers	
• "No CEO ever seemed to be very concerned about the enrollment situation" (CEPO #4, 2006).	
Campus Executive Officers	
Information and Reports • "We had sufficient data and reports pertaining to enrollments. The difficulty was that Darwin undergraduate admissions office had to capture 3,200 new freshmen each year and the campuses were a secondary concern. This was always an internal struggle that was never resolved. The campuses had to work to convert referral offers into enrollments each year with very limited resources" (CEO #5, 2005).	
Darwin Decision Makers **Information and Reports** • "The high school demographic reports were widely distributed but were not widely discussed or understood" (DM #4, 2006).	

Problem Recognition	Representative Interview Data
• "It was also possible and likely that a number of the campus executive officers were unaware of the data reports and predicted decline in Northern high school graduates" (DM #5, 2006 and DM #1, 2006). • "The prediction of large demographic declines predicted in the 1970s did not happen in a number of universities. This may have lead Darwin and CES campus leaders to believe the 1990s would be like the 70s and 80s again" (DM #1, 2006).	
Expertise • "Many CES CEOs did not react or appropriately respond to the campus enrollment declines because they were either out of their element or had little control to affect enrollments" (DM #1, 2006). • "In the beginning, I did not have as complete an understanding of the individual campuses as I initially believed" (DM #5, 2006).	

Analysis of the enrollment declines was complicated by the availability of information to key members of the enrollment management organization. Based on interview reports, there were both social and cognitive limitations to information processing and analysis. The organizational structure influences access to information and consequently influences decision making (Carley and Behrens, 1999). As some members reported, data and information access were a question and concerns. One interview respondent reported that the demographic reports were not shared with her. This lack of access hindered the ability to analyze and recognize the impending enrollment declines at the campus. Two admissions officers commented they did not believe they had sufficient training and knowledge to interpret the data and information. Another interview report indicated that the high school demographic reports were widely distributed but were not widely discussed or understood.

4.7.2 Communications

The purpose of communications is to influence decision making. Each member of the organization possesses information that is relevant to the particular decision that must be made. In an organization structure like a multi-campus university with multiple layers, decision making is made more complex because decision makers must absorb and interpret a large volume of information and advice from a wide-array of organization members in a relatively short amount of time prior to a decision. From the interviews and surveys of organization members there is consensus that the two-way flow of communications was problematic at a number of campuses. The lack of communication fragments information flow and advice relevant to decision making (Simon, 1997). According to Bounded Rationality theory, this is an example of "satsficing". The search for essential information through communication channels is truncated at both the campus levels and university-wide.

Organization decision makers often choose information sources and communication channels even though the sources and channels are not optimal or are less productive (Simon and March, 1958). O'Reilly (1982) uses the example of physicians learning of innovations in drugs from pharmaceutical sales representatives rather than reading the medical journal literature. It is a communications shortcut to information. These biases influence communications volume and value.

In organization hierarchies judgments are made of members opinions based on their location and perceived status (Wang and Ahmed, 2003). One fact of organizational decision making is that personalities are essential ingredients to the process. Decision makers are influenced by one individual or individuals versus another individual(s).

The admissions officers reported more often than other groups a belief that personalities were more important than they should have been in the communications process. The CEPOs agreed with the admissions officers on this survey topic. In interview reports, there was mention of the influence of certain personalities in the communications process.

Organization members reported that the communication channels had difficulties. In such a complex layered organization, this was not surprising. The formal communication channels were only a small part of the information flow. Organization members will choose channels that are more easily accessible even if quality of communication is lower (O'Reilly, 1982). The informal communications flow needed to be more robust.

In fact, organization members reported there were other communication channels and forums available to discuss the enrollment declines. These members reported that communications channels were available and effective. They reported satisfaction with the formal and informal channels of communication. Those organization members may have had positions in different points of the hierarchy and the communications channels that gave them a different vantage point and perception of communication quantity and quality (O'Reilly, 1982).

Three survey questions on the topic of communications evidenced the most disagreement among admissions officers and campus executive officers.

Based on the responses of admissions officers and the campus executive officers communications survey question three (3), there was a difference in responses about the flow of communications that facilitated discussion and insight between admissions officer and CEO. Admissions officers disagreed (4.80) and campus executive officers strongly believed (9.00) that there was a constant flow of communications between the two campus groups.

On Communications survey question 5, there was a difference in responses between the admissions officers and the CEOs. Admissions officers believed (6.55) that personalities were more important than information and data in influencing enrollment planning decision making. Campus executive officers strongly disagreed (1.83).

On survey question #10, campus admissions officers indicated (7.70) that personalities in the office of the dean of the Commonwealth Education System were more important than data and information in influencing decision making. Campus executive officers (4.00) and Darwin decision makers (3.50) disagreed.

Table 16

Communications	**Representative Interview Data**
Campus Admissions Officers	
Communications at Campus Level • "Relationships and communications with CEPO and CEO were just adequate at best. Better communication was very needed at Wyoming. Communication was filtered and this was not positive. Communication went through a chain" (AO #5, 2006). • The admissions officer at Wyoming reported he had little contact with the CEO. The campus executive officer was the main communicator with Darwin and Commonwealth Education System about the enrollment declines at the campus (AO #6, 2006). • "As the enrollment declines worsened at Dunmore, communications deteriorated and became difficult" (AO #5, 2006). • "More communication was very needed" (AO #5, 2006). • "After 1992, communications became closed at the Dunmore campus" (AO #5, 2006). **Communications with Undergraduate Admissions Office** • "Support from the Undergraduate Admissions Office was not good. I often felt like I was alone contending with my campus' enrollment declines" (AO #6, 2006). **Personalities in Communications** • "The personalities of some decision makers became more influential than their actual expertise" (AO #5, 2006).	

Communications	Representative Interview Data

Campus Enrollment Planning Officers

Communications at Campus Level

- "Campus level communication was very good at Brunswick. At Darwin University, you could always contact someone in the administration to ask questions and offer opinions" (CEPO #2, 2006).
- "Communications did not flow both ways enough. It was more one-sided. Admissions officers were often isolated by the communications process" (CEPO #2, 2006).

Communications with Darwin Decision Makers

- "UAO was not responsive enough" (CEPO #2, 2006).
- "Communication was not always effective. UAO and CES had turmoil that created dysfunction for effective communication. CES and UAO had serious communication and cooperation difficulties that resulted in disrespect for one another" (CEPO #2, 2006).
- "Communication channels were readily available at campus and Darwin" (CEPO #2, 2006).

Personalities in Communications

- "Some people in CES and the UAO were more influential than others but that is normal" (CEPO #2, 2006).

Campus Executive Officers

Communications with Darwin Decision Makers

- "Communications with Darwin was never very good. Each campus had to fend for itself" (CEO #4, 2006).

Darwin Central Administration

Communications Networks

- "Communications networks at CES and throughout Darwin University may have hindered information inputs and decision making" (DM #4, 2006).
- "I believe that there was an organizational communications problem rather than a data and information problem" (DM #4, 2006).
- A Darwin decision maker reported, the limitations of the communication networks may have had a very significant impact on appropriate knowledge creation to aid better decision making (DM #4, 2006).
- "Communications were good from top to bottom. Admissions officers were unhappy because their problems were not solved. More forums were needed for the campus admissions officers to listen to them. Morale lessons could have been learned here" (DM #2, 2006).

Communications	Representative Interview Data
Communications Volume and Membership • "There was not enough dialogue regarding the implications of the data and reports. The communications process was not good enough" (DM #4, 2006). • "Communication was open and timely at certain levels. However, some people involved in the enrollment crisis were not included enough in the discussions" (DM #3, 2006). **Personalities in Communications** • "Liked Dr. Wayne but understood those who believed that he did not listen or often listened to some more than others" (DM #2, 2006).	

4.7.3 Information Search

Based on the reports of organization members, the development of data and information for decision making was problematic. All survey respondents agreed that there was not too much data and information for effective decision making purposes.

Members reported that information sharing was not complete among all relevant enrollment management organization members. This is not uncommon in organizations (O'Reilly, 1982). Organization members will have varying judgments of the quality of data and information. The size of the organization, technology usage, time constraints and the pursuit of multiple objectives would influence information search, dissemination and evaluation by organization members (satisficing). Also, organization members use information that is more easily accessible even though the information may not be as relevant. Organization decision

makers give a higher value to verbal sources of information versus reports, external information sources or other written media.

Many organization members reported a lack of external information and need for more primary market information. Some campus decision makers expected the CES to develop market information. There was no real central marketing unit to develop marketing information. Similar to Simon's theory of satisficing, the search for more external and primary information was truncated. The implication of this satisficing was incomplete knowledge for effective decision making. One of the reasons cited for the lack of more external information was cost. This is a common thread in organizational decision making information searches. The curtailment of information search is a feature of bounded rationality. Its effect is to limit the choices of alternatives or possible solutions.

All survey respondents agreed that there was not too much data and information for effective decision making purposes. Admissions officers score was 2.90, CEPOs was 4.50, campus executive officers had an average 2.33 and Darwin respondents gave an average score of 4.60 to this survey question 16.

On survey question 18 pertaining to availability of appropriate information, admissions officers had the lowest score of all respondents (5.60).

Admissions officers scored a low of 5.45 on the question on appropriate training to obtain and analyze data for admissions and enrollment planning purposes. The other three groups were more confident in their training and abilities to obtain and analyze data. The CEOs had the highest score of the groups at 8.67.

Both admissions officers (4.36) and CEPOs (4.70) did not believe that external sources of information were actively sought. Campus executive officers (8.17) and Darwin decision makers (7.20) disagreed on average.

On the question of different individuals having access to different information and its effect on decision making, both admissions officers (6.73) and CEPOs (6.30) believed that there were differences in access. Darwin decision makers (5.40) moderately agreed that there were differences in access by individuals and information. Campus executive officers (4.83) disagreed.

Admissions officers (5.73), CEPOs (5.80) and Darwin decision makers (5.40) agreed that enrollment decision makers made appropriate interpretations of the data and information. Campus executive officers scores on average were much higher at 7.83.

Table 17

Information Search	**Representative Interview Data**
Admissions Officers	
Reports and Access • "These (high school) demographic reports went to the campus executive officers and not the admissions officer. It was expected that the report would be shared with other campus enrollment planners including the admissions officer. This may not have happened at every campus" (AO #5, 2006). **Analysis and Expertise** • "We simply did not do the essential primary market research and analysis that was needed to develop solutions" (AO #5, 2006). • "Dunmore attempted to do a marketing analysis of its service area. It was a weak effort" (AO #5, 2006). • Three interview informants reported there was no marketing expertise at UAO or CES until it was far too late (AO #1, 2006, CEPO #1, 2006 and CEPO #4, 2006).	
Campus Enrollment Planning Officers	

Information Search	Representative Interview Data

Analysis and Expertise

- "There was not a real discussion or action to acquire external expertise or knowledge" (CEPO #2, 2006).
- "There was little expertise at the UAO. The marketing unit did not contribute much to the development of analysis and possible solutions for better marketing and recruitment initiatives" (CEPO #2, 2006).

External Search for Information

- "There was not a real discussion or action to acquire external expertise or knowledge" (CEPO #2, 2006).

Campus Executive Officers

Reports and Access

- "Data and reports were plentiful and helpful for planning and decision making" (CEO #4, 2006).
- "Information flow did take place but the CES Office, which had the capacity to interpret the information, did not do so except when asked a specific question by a specific campus. The question and the answer did not get shared across all campuses. If this sharing took place, a lot of redundant work could have been eliminated. Each campus did its own work. Information also flowed from the UAO but with little if any interpretation" (CEO #2, 2005).

Analysis and Expertise

- "There were appropriate measures needed to meet enrollment needs. We did market research studies to gauge our service area needs. Mount Royal went out and wrote grant applications and got funds to do market research" (CEO #4, 2006).

Darwin Central Administration

Reports and Access

- "There was plenty of data and reports, more was not needed" (DM #4, 2006).

Analysis and Expertise

- "Reports were needed to be formatted in new more insightful ways" (DM #4, 2006).
- "The information people controlled the format of the data and information reports. The format of the information could have the effect of influencing the interpretation of the various reports" (DM #5, 2006).
- "Statistical reports were helpful but lacked evaluative properties to measure remedial actions" (DM #4, 2006).
- "We had plenty of data. But we didn't have enough expertise and analysis" (DM #2,

Information Search	Representative Interview Data
	2006). • "Not enough organizational memory to try and avoid past mistakes again" (DM #4, 2006). • "Enrollment decision makers tried to make appropriate interpretations of data but the discussion was at too high of a level. It needed to include other members closer to the market place" (DM #3, 2006). • "Information expertise was there but was never harnessed and brought to task" (DM #4, 2006). **External Search for Information** • "Recommendations to seek and use external sources of information were not approved by key decision makers" (DM #3, 2006). • "Although information was available, external information and sophisticated analysis was not used or available" (DM #3, 2006). • "We did not do enough external scanning and looking toward future and possible changes and developments" (DM#5, 2006). • "External sources of information were sought at CES central" (DM #4, 2006).

Darwin University did not possess the kind of marketing expertise to successfully solve its enrollment crisis. The campus admissions officers lacked marketing expertise as did other campus enrollment planners. Organization members reported that analysis was lacking. This shortcoming extended to the decision makers in the undergraduate admissions office and at the Commonwealth Education System.

When organizations are dissatisfied with the search for solutions to a problem, they usually continue the search for information and acquire appropriate expertise until a solution is found (Cyert and March, 1963). Decision makers did attempt to address the need for greater expertise. Two personnel additions were made in marketing and admissions for CES. They were added to the enrollment management hierarchy in 1993. Even with their additional expertise, interview respondents at the campus level reported dissatisfaction with the degree of expertise and the quality of analysis for subsequent decision making. Inexplicably, the expertise of the

marketing director was often ignored by decision makers in the undergraduate admissions office and in the Commonwealth Education System office. Some organization members expressed dissatisfaction with the lack of inclusion of more organization members who may have been able to contribute meaningful advice for knowledge development. Organizational learning is more robust when embedded in relationships between organization members (Carley and Behrens, 1999).

4.7.4 Decision Making

This was a textbook illustration of the anarchic or garbage can decision making model. The ultimate goal was to solve the enrollment declines of the campuses and the enrollment needs of the entire university. The ambiguity was in the means of solution. The solution would require a series of decisions and actions to address the enrollment crisis. Complicating the decision making was the enrollment needs of the colleges at Darwin. Their needs were always the first priority in enrollment planning. This fact created a problematic decision making environment.

The organization had to deal with a new and unique situation that was never encountered by the organization members before. The enrollment planning decision makers did not have sufficient expertise to remedy the crisis. The search and acquisition of external information or expertise was not further or completely explored. In some cases expertise or advice was ignored or not utilized. Available resources limited decision making latitude. Expertise is based on extensive and expanding knowledge (Simon, 1991).

In the realm of Bounded Rationality theory, the decision makers involved did not fully understand the structure or dimensions of the problem and consequences of the decisions (Simon, 1957). The decision makers did not fully understand the "state of the world" and the consequences of any possible decision(s). This lack of knowledge implies that any possible solution can succeed or fail but decision makers do not know what decision or series of decisions will bring a solution to the enrollment crisis. They were in uncharted waters. And as one Darwin decision maker related in the interview, there was never a final decision made to solve the enrollment declines.

Both admissions officers (4.91) and Darwin decision makers (4.00) did not believe that decisions were made to appropriately address the enrollment declines.

The CEPOs (7.00) and campus executive officers (8.83) believed on average that decisions made did appropriately address the enrollment declines. Four of the five Darwin decision makers did not believe that decisions were made that appropriately addressed the crisis.

On the question of individual influence or input in the decision making for enrollment planning, admissions officers had the lowest scores (5.64). Darwin decision makers had the second lowest average score at 6.00. Both the CEPOs and campus executive officers had much higher average scores at 7.50 and 8.33 respectively.

Campus admissions officers did not believe that they had much influence on the decision makers at the Commonwealth Education System office of the dean. Of the three groups who responded to this question, admissions officers had the lowest average score of 3.44. CEPOs had a score of 4.80 and campus executive officers gave this survey question 5.33.

Darwin decision makers did not believe that the campus enrollment decision makers had much influence in the office of the dean at the Commonwealth Education System. The average score was 5.00.

On the question of CEO influence in the office of the dean at the Commonwealth Education System, campus admissions officers on average (4.44) did not believe that the CEO had influence on decision makers. All other groups disagreed. The CEPOs (6.70) and CEOs (7.50) had the highest average scores for this question. The Darwin decision makers slightly agreed (5.50) that the campus executive officers had influence.

Was the decision making process logical and orderly? Campus admission officers did not believe (4.27) the process was logical and orderly. Of the four groups, admissions officers gave this survey question the lowest score. The CEPOs had the second lowest score (5.00). Campus executive offices (6.17) and Darwin decision makers (5.80) agreed that the decision making process was orderly and logical. Interview reports illustrate a higher degree of dissatisfaction with the decision making process that is not as apparent from the survey results.

Table 18

Decision making-	**Representative Interview Data**
Admissions Officers **Limited Capabilities or Resources** • "There was no change in academic offerings based on data and marketing analysis. We continued to offer the same academic programs as if there was no enrollment decline and crisis" (AO #1, 2006). • "We lacked resources" (AO #5, 2006). • The admissions officer at Wyoming responded do more with less was the command. More support from UAO was needed but never happened. Campuses were under-resourced and could not successfully respond to the enrollment declines (AO #6, 2006).	

Decision making-	Representative Interview Data

Decision Making Environment or Expertise

- "The director of marketing and director of admissions for CES tried to help. There was not enough expertise or resources at CES or UAO to make a difference" (AO #5, 2006).
- "Darwin University, CES and UAO were too decentralized and lacked cohesion to accomplish goals. We are too insular and inbred in management outlook" (AO #5, 2007).

Campus Enrollment Planning Officer

Limited Capabilities or Resources

- "Darwin University hired or promoted people to positions in marketing and recruitment and then gave them few resources or staff to reach needed goals" (CEPO #1, 2006).

Decision Making Environment or Expertise

- "No one in the university had the experience to turn this around and we were not permitted to bring in anyone external to try to fix the problems" (CEPO #1, 2006).
- "No one wanted to make the hard decisions needed to remedy the enrollment crisis in CES" (CEPO #2, 2006).
- A CEPO related Darwin muddled through hoping next year would be better. The degree and quality of expertise and decision making varied at different levels of the administration in this time frame (CEPO #4, 2006).
- "Because of the decision making at the campus level there was much bad morale because of a lack of ideas, candor and a close-minded mentality" (CEPO #1, 2006).
- "Leadership at UAO became a revolving door" (CEPO #4, 2006).
- "CES and UAO did not have an effective connection to work together in concerted ways that would impact enrollment goals" (CEPO #2, 2006).

Campus Executive Officer

Limited Capabilities or Resources

- "The budget was a dreaded factor in management decisions at Darwin University. It greatly limited decision latitude. Darwin University was always exploring different budget models that complicated the decision making process" (CEO #4, 2006).

Decision Making Environment or Expertise

- "The problem, vis-a-vis, campus administration and CES Office seemed to be one of the CES Office 'interfering' with the campus's administration. This issue was discussed by the CEOs and the Dean but nothing was corrected: that is, the issue persisted" (CEO #2, 2005).

Darwin Decision Maker

Limited Capabilities and Resources

- "Decision making and solution options were very limited. Campuses and CES were between a rock and a hard place" (DM #2, 2006).

Decision making-	Representative Interview Data
Decision Making Environment or Expertise • "The colleges and departments controlled the academic program offerings and they did not want to share with the campuses" (DM #5, 2006). • "There was more crisis management rather than strategic planning" (DM #3, 2006). • "Evaluation was done but the information was not analyzed and then "go to" steps to possible solutions. This is a Darwin University problem. Often a solution is suggested but is often ignored" (DM #4, 2006). • "CES and UAO understood the situation to a significant degree but they did not know how to effectively respond. These were academics as administrators and not marketing professionals" (DM #3, 2006). • "There was never a final decision made for a remedy to the crisis" (DM #4, 2006). • "Decision making did not use enough primary data and research to guide decision making" (DM #3, 2006). • "Decision making was not logical or orderly. It was really poor for a major university" (DM #3, 2006).	

Loose coupling was another factor that influenced the decision making environment. The various members participated in decision making at various times and locations. Participation was more fluid and irregular because participants were located throughout the state and their involvement was not always requested or available. Some of the most important participants in the routine decision making process were completely uninvolved with the new problem. The ability to offer academic programs was in the hands of the academic colleges at Darwin. Only the departments and colleges had the authority to create new programs or allow the campuses to offer degree programs. This did not happen.

Similar to Birnbaum's (1991) Huxley College example, the enrollment planners were confronted with such an array of decision alternatives that a solution may not have been possible given the time, expertise and resources available. As a consequence, Darwin University

enrollment decision makers seemed to have muddled along until the crisis resolved itself by an upturn in both the economy and the demographics.

4.8 RESULTS RESEARCH QUESTION 1

Research question 1 asked: was the information relevant to aid and support decision making? All four groups agreed that data and information were crucial for enrollment planning decision making. All four groups agreed that appropriate information was available for decision making.

All respondent groups reported there was an abundance of data and information for decision making. Respondents did not agree that access to data and information was an impediment for decision making. However, survey respondents did agree different organization members had access to different information and this did affect decision making. Interviews indicated that some reports that went to campus executive officers may not have been routinely shared with other campus decision makers including the admissions officers.

Two survey groups did not agree that there was an active search for external sources of information. The survey data revealed the admissions officers (4.36) and CEPOs (4.67) did not agree there was an active search for external information. Individual interview reports support findings that organization members agreed that more external sources of information were needed. This need included more primary market research.

Results For Research Question 1	Admissions Officer Mean	CEPO Mean	CEO Mean	Darwin Mean	Overall Mean	Standard Deviation
Information was incomplete for effective decision making.	5.80	5.83	4.50	5.00	5.37	2.79
There were too much data and information for effective decision making.	2.90	4.50	2.33	4.60	3.44	2.45
Access to information was difficult.	5.10	5.67	4.50	4.20	4.93	2.64
External sources of information were actively sought.	4.36	4.67	8.17	6.00	5.54	2.81
Different individuals had access to different information and this affected decision making.	6.73	6.33	4.83	5.40	6.00	2.60
Appropriate information was available for effective decision making.	5.60	6.83	7.00	7.20	6.48	2.14

4.9 RESULTS RESEARCH QUESTION 2

Research question 2 asked: Were the decision makers overwhelmed by information and the complexity of the decision situation? It was believed that the most effective way to answer this question was through the interview data. The comments from interview respondents strongly indicate a decision making environment and process that involved high volumes of data and information, and substantial complexity. Decisions were made in crisis mode rather than as part of a strategic plan. Examining the definition of the anarchic or garbage can model of decision making and comparing the survey responses and interview data, this case study fits the model very well. Data, time, loose coupling, irregular participation, availability and most of all the

ambiguity of the problem and the solutions are all components of a complex decision making process.

4.10 RESULTS RESEARCH QUESTION 3

Research question 3 asked: Was decision making typified more by clarity and consistency or by ambiguity and inconsistency? What was the degree of coordination and structure in the organization for decision making? This is a university system with multiple campuses and multiple levels of participation and decision making, a loose coupled organization in an enrollment crisis. On the survey question pertaining to the logic and orderliness of the decision making, four of the five Darwin decision makers agreed the process was logical and orderly. Two campus executive officers gave this survey question a five or lower score, indicating disagreement. All other campus executive officers responses were more in agreement that the process had order and logic. The CEPOs and admissions officers had a different perspective. Four of the six CEPOs did not find logic and order in the decision making process. Only three of the 11 admissions officers indicated they agreed there was logic and order to the decision making process.

Table 19

Results For Research Question 3	Admissions Officer Mean	CEPO Mean	CEO Mean	Darwin Mean	Overall Mean	Standard Deviation
Decision makers in the Office of the Dean of the Commonwealth Education System at Darwin had sufficient evidence of the possibility of enrollment declines through internal and external reports.	8.45	8.17	8.67	9.60	8.64	1.66
Campus decision makers fully understood the dimensions of the enrollment problems (economic recession, declining demographics, etc.).	7.45	8.17	9.33	7.40	8.00	2.04
The admission and enrollment management decision makers considered various alternatives prior to a decision.	6.10	6.83	8.83	7.00	7.04	1.93
Decisions were made that appropriately addressed the enrollment situation.	4.91	7.00	8.83	4.00	6.04	2.74
The decision making process was logical and orderly?	4.27	5.00	6.17	5.80	5.11	2.64

4.11 RESULTS RESEARCH QUESTION 4

Research question 4 asked: Since one or more individuals may monopolize the decision making process, were individual personalities more influential than information in the decision making process?

The influence of personalities may have had an important impact on the decision making process. Mean scores of the campus executive officers and Darwin decision makers reveal these two groups did not perceive that personalities were more influential than data and information in the decision process. Interestingly, the individual responses to the survey questions about the influence of personalities shed light on the decision makers interpretation of personalities and decisions. Two Darwin decision makers indicated in their survey responses that one or more campus executive officers may have been more influential than data and information. Two campus executive officers out of six reported that personalities in the CES office were more influential than data and information for decision making.

The admissions officers mean score on the question of personalities and influence on the campus was 6.55 in agreement that personalities were more influential than data at the campus level. CEPOs agreed (6.83). Their responses may suggest that faculty members played a role in enrollment planning decisions at the campus level. Interviews did report that admissions officers and CEPOs mentioned faculty comments had influence at the campus level.

Table 20

	Admissions Officer Mean	CEPO Mean	CEO Mean	Darwin Mean	Overall Mean	Standard Deviation
Personalities were more important than information or data in influencing decision making on your campus pertaining to enrollment declines and planning.	6.55	6.83	1.83	NR	5.39	3.04
Personalities of campus executive officers were more important than information or data in influencing decision making pertaining to enrollment declines and planning.	NR	NR	NR	5.75	5.75	1.50
Personalities of decision makers in the Office of the Dean of the CES were more important than information or data in influencing decision making pertaining to university-wide enrollment issues and planning.	7.70	7.50	4.00	3.50	6.15	2.84

5.0 SUMMARY AND ANALYSIS

5.1 LESSONS LEARNED

The development of the decision making process in enrollment management that most effectively address institutional goals and needs is still in a transitional phase at many large public research universities. Enrollment management in the environment of a large public research university is growing in complexity. Information management in the decision making process is a growing concern as sources, amounts and the rapidity of data and information increase. New organizational structures are evolving as decision making tools are developed and become more sophisticated. This research examined one university's model of enrollment management and decision making process: how decisions were made; who were the decision makers and how was information used in the decision making process? It went beyond analysis of functionalism and outcomes to examine the process from the perspective of the Carnegie School with its emphasis on information processing in organizational decision making. It contributes to contemporary decision making theory in higher education administration and enrollment management.

The results of this study offer some insights and direction on the considerable difficulties involved in university decision making that involves multiple participations and time constraints. The use of the anarchic or garbage can decision making model and Bounded Rationality theory

provide a theoretical framework for understanding the real world circumstances of problems and solutions in the university by the literature and findings. A review of the organizational decision making literature identified the Garbage Can Decision Making model as the most appropriate framework to critically analyze the Darwin University enrollment management decision process.

The mechanics of organizational decision making are often times obvious. In some instances though, it is a black box. Decision participants often wonder how or why a particular decision or decisions are made. What were the dynamics, decision inputs, data analysis and communications channels that informed decisions. The elements of the black box are what stimulate observer and participants alike to want to learn more. The many academic departments, administrative offices, missions and goals are often in conflict with one another for resources, participation and organization priority.

The theory and model go a long way to explain the events of 1991 – 1995 at Darwin University. Universities are organized anarchies. At the same time, the models lend themselves to recommendations for change in organizational structure and decision making.

5.1.1 Information and Knowledge Management

The events of this case study actually begin prior to 1990. Demographic reports were being produced both in-house and at the state department of education that predicting a decline in high school graduates in the state until 1995. The first report this researcher was able to locate was dated 1979 (Newton). The report was published each year into the 1990s. The search for and sharing of information are basic components of knowledge creation that all organizations require for understanding their environments and reaching organizational goals (Cyert and March,

1963). Interview data indicates that essential reports and information were not being shared at all levels of the enrollment management hierarchy. The circulation and discussions of information through both formal and informal communications channels were not evident at Darwin University in 1991.

Because there was no early discussion of the demographic projections, there was no early warning. Other than the campus admissions officer, there really was no other enrollment expert at the individual campuses. There were organization members communicating the information about demographic declines and the implications for Darwin University. In the loose coupled environment of the university, the message was unheard. Various units pursued their assigned responsibilities and duties. Decision makers were not devoting enough time and effort in this area because of multiple duties in other areas of organizational activities. In the garbage can decision model, this is not surprising.

The importance of knowledge development and management is crucial to potential problem recognition and subsequent decision making. In the garbage can model, the many levels and loose couplings of the organization lack a cohesion that in the case of enrollment management is imperative. It is recommended that the enrollment management structure develop information systems that are shared and available to a wide range of organizational members both within the enrollment management administration and outside to related offices. The enrollment management process engages the questions fundamental to bringing together effective communications channels, information management linked to effective decision making.

At all levels, enrollment management decision makers reported that there was sufficient information and knowledge of the possibility of enrollment declines. Of course, there were other factors that were not known or fully understood by enrollment decision makers. Some of the academic degree programs had become obsolete. Associate degree programs which had been a backbone of the CES campus enrollments, declined in popularity with no new academic programs to replace them. At many campuses, adult enrollments declined for a variety of reasons.

The undergraduate admissions office at Darwin University was not designed to market and recruit as much as to manage applications and admit new students to meet enrollment goals. The office lacked expertise to do actual marketing data collection and analysis. Also, the office did not purchase external data and information that would have better informed forecasting and decision making for enrollment planning. Primary research for marketing was not an intrinsic duty of the undergraduate admissions office. And the university did not have an office dedicated to university-wide marketing initiatives. Primary data collection and analysis would develop and incubate tacit knowledge.

5.1.2 Recognition and Definition of Problem

Most large universities lack the sophisticated mechanisms to do early recognition of problems related to enrollment declines. Trends are often times difficult to pinpoint in a short time frame. At a multi-campus and multi-college university like Darwin University, the ability to accomplish early problem recognition was extremely difficult given the numbers, resources, time frame and expertise involved. In addition, there was no organizational memory to rely on for guidance.

The enrollment declines were not uniform. Some campuses started to experience declines prior to 1990, while others did not experience a decline until 1993. And some campuses never experienced an enrollment drop at all in this time period. So, there was not a clear system-wide recognition of the impending enrollment declines. Various members of the enrollment management hierarchy were not fully aware of the coming declines nor did they comprehend the dimensions of the possible declines. In addition, not everyone was in possession of the relevant data and information prior to 1990 predicting declines in traditional-age high school graduates in Northern. In the time frame leading up to 1990, there was not very much in-depth discussion of the demographics and enrollment reports. In retrospect, this was a pivotal failure in information and knowledge building that is essential to organizational decision making.

In most cases, the early warnings about the campus enrollment declines was either ignored or not given sufficient attention because campus decision makers had never encountered a decline at Darwin University. Also, campus decision makers may well have perceived as one Darwin enrollment management decision maker stated to me, declines had been predicted before but never materialized. The prevailing sentiment may have been that someone was crying wolf again (V. Adams, personal communication, June 16, 2006).

The next phase of problem recognition is the diagnosis of the problem. This proved to be even more problematic than recognition. The enrollment declines had a variety of causes that made diagnosis difficult. Campus decision makers each faced unique situations that obscured a university-wide enrollment decline and Darwin University enrollment planners heard different reasons and intuited their own diagnosis. Relevant decision makers may not have been watching the enrollment trends or the essential reports predicting possible declines.

5.1.3 Communications

Probably, the most important aspect of an organization is communications. We all need to listen or be heard. According to Simon (1991), the communications process is also part of the information development process in decision making. Channels of communication start at the local level. Dialogue between the admissions officer and campus executive officer in a number of cases was lacking. The causes included poor relationships or ineffective channels of communication. Another often mentioned influence was the voice of the faculty. Campus admissions officers and enrollment planning officers mentioned faculty were not sympathetic to the plight of the admissions officers. Campus executive officers may have listened to faculty more than admissions officers. In organizational hierarchies, lower status members are listened to less than other higher status members in the hierarchy. Admissions officers believed that lack of respect on the part of faculty and the leadership of the campus hindered their effectiveness and influence at higher levels of the enrollment planning hierarchy. The addition of the campus enrollment planning officers did not appreciably improve the quantity and quality of essential communication. Admissions officers truly believed that they were not respected on their campuses or at the Commonwealth Education System central office at Darwin.

Communications in organizations is a two-way process. More effective forums or channels for communication were needed within hierarchy. The size and structure of a multi-campus university affected the upward flow of information and advice to decision makers within the hierarchy. The downward flow of decisions and orders was likewise affected. One area of communications flow that many enrollment management decision makers agreed was available and open was informal channels of communication: The campus enrollment planning officer

had access to one or more members of the CES central staff at Darwin; admissions officers did have access to decision maker(s) in the undergraduate admissions office; and campus executive officers had regular access to a variety of forums through committee memberships and councils.

Lines of communication were seriously frayed. The relationship between the undergraduate admissions office and the Commonwealth Education System decision makers was not good. More than one decision maker interviewed indicated there were serious issues of respect and confidence involved. Some decision makers at CES questioned the marketing and recruitment expertise of the undergraduate admissions office. Members of the undergraduate admissions office staff believed that the CES decision makers were unfair in their judgments and actions. This impeded the essential two-way communication flow. Distrust built up in this time period that hindered an essential exchange of information, knowledge and advice that could aid in formulating tactics and strategies to remedy the enrollment declines. Because of personality conflicts that involved other units, there were communications problems related to the advertising and promotion functions of recruitment. Unfortunately, the leadership in the undergraduate admissions office was experiencing turmoil.

Decisions are usually time sensitive. The longer a delay between decision and action the greater the costs in time and personnel. These delays could have hindered possible remedies to the enrollment declines that were affecting the campuses.

Communication could overload decision maker's ability to process and comprehend information and advice. At the upper levels of the enrollment planning hierarchy, some decision makers indicated that they were not overwhelmed by data, information and communications. It is not hard to believe that some decision makers filtered out information that was "bad news" or

did not fit with pre-conceptions of the dynamics of the enrollment landscape and their possible remedies.

However, there were individuals aware of the shortcomings in the communications matrix. One enrollment planner reported that the campus admissions officers needed more forums for communications and advice giving. A secondary reason for this recommendation pertained to organizational morale. Other interview respondents reported the need for more involvement and better communications.

5.1.4 Information Search

Most participants agreed that there was plenty of information and data available to aid the decision making process. However, there was not complete agreement that the data and information was able to inform decision making. Some respondents indicated that access and formatting of the information was difficult. Campus admissions officers were split on the value of the information available for decision making. Campus enrollment planning officers were in unanimous agreement that available information was valuable for decision making. A majority of campus executive officers reported that there was appropriate information for effective decision making. All of the decision makers at the Darwin flagship campus in CES and the undergraduate admissions office indicated the information available was valuable for decision making purposes.

Importantly, there was a range of responses to the questions of difficulty of access, the completeness of the information, volume of information and the question of external information. The questions pertaining to access and the formatting of information reports are

important. The amount of data and information was quite extensive. However, the information was located in a variety of places both in paper form as well as electronic sources. This almost certainly presented difficulties for decision makers. The question of how information reports were formatted influences how the reports are read and interpreted by a reader (Drucker, 1999 and Mintzberg, 1975). Data and information reports are most often created by main frame programmers who are less concerned with interpretation than with a format that is concise and easy to read. More than one interviewed decision maker felt the formatting of the data and information was inadequate or influenced their interpretation of the data.

Campus admissions officers and at least one CES decision maker said there was a lack of external information available that could have influenced decision making. The College Board and ACT produce reports that use test taker information that colleges and universities across the country use for marketing and enrollment planning purposes. Financial aid data could have been more helpful if collected and used to provide a better picture of applicants to Darwin University.

5.1.5 Decision Making

Human behavior is an intrinsic element of organizations and decision making. Objective rationality is not possible. Bounded Rationality theory is predicated on this inescapable fact. People make the decisions. The difficulties that were encountered involved ambiguity, limited capabilities, biases, limited rationality, incomplete knowledge and quasi-resolution.

The decision making process in a university is often complicated by the nature of the decision making process itself. The multi channels of communication, departments and participants involved and their availability for decisions, information and knowledge all are

major determinants for decisions. Because of the loose coupling of pertinent organization units and the availability of information, decision makers frequently have fragmentary knowledge of the problem and because of time constraints cannot devote the needed time for the decision making process. The result is the principle of "satisficing", i.e., making due rather than an optimal decision.

Goals are often ambiguous as in this case study. The problem was a prolonged period of enrollment declines that affected the university and many campuses. The possible solutions and decisions involved were much more ambiguous. There was no one solution or decision that would have remedied the enrollment declines. Not every campus had the exact same cause of enrollment decline. Not all of the decision makers had expertise in the areas of marketing, recruitment and enrollment management to be able to make an appropriate decision to affect enrollments. Also, in this case the academic colleges that controlled and authorized new academic programs were not part of the decision making process.

5.1.6 Conclusion

Using the lens of Bounded Rationality Theory and the Anarchic or Garbage Can model of decision making can be a useful way to examine the way university organizational units approach problems involving uncertainty and ambiguity.

This case study highlights the difficulties involved in decision making at a major university. Darwin University faced a turbulent environment and had little experience and internal knowledge for crafting an appropriate response to try and remedy enrollment declines that caused multi-million dollar losses.

The interplay of the personalities is a very powerful influence. The topic of personalities in decision making needs further exploration. It is a sensitive subject and requires knowledge of organizational behavior and group dynamics, and other branches of psychology.

A second area for future research would be the realm of decision making support systems. If desktop computers with greater power to process data and information were more accessible and ubiquitous, decision makers may have been able to make faster problem recognition and possibly better decisions. The development of more powerful data and information processors continues unabated. Universities spend great amounts each year to remain state-of-the-art in technology. Yet in the realm of institutional decision making, there is little development or spending to develop forecasting or decision support systems.

The other area of organizational decision making in higher education that is most interesting but ancillary to this case study: is the belief that administration and decision making is more about process than expertise. Darwin University placed people into decision making positions with little or no expertise or knowledge in enrollment planning and management. Darwin is not unique. This seems to be more true at large public research universities. These same universities would not think of hiring an athletic coach without an impressive resume of coaching experience and significant accomplishment over a number of years on the athletic field. The implications are obvious.

EPILOGUE

The 1994-1997 strategic plan for the Commonwealth Education System emphasized the need to do more marketing research and collaborate with the academic colleges to develop degree programs most needed by state residents close to their homes. The plan emphasized the need to work more closely with the undergraduate admissions office to obtain and utilize market research and data. In 1998, the Darwin University administration formed an office of marketing and advertising within the university relations unit. Its stated mission was to function like a market research and advertising agency.

Beginning in 2001, the nation experienced an economic recession. Many public institutions of higher education were adversely affected by severe cuts in state appropriations from 2002 to 2005. Darwin University raised tuition 7.8 percent in 2001, 13.5 percent in 2002, 9.8 percent in 2003 and 6.6 percent in 2004 (Elizabeth, July 2004). Darwin's enrollment declined from 83,038 in 2002 to 80,124 in 2005 (Horan, November 2006). The Commonwealth Education System lost over 2,500 students. In 2003, the Commonwealth Education System hired a director of marketing. Enrollments rebounded in the fall of 2006. Projections of high school graduates indicate the number of graduates in the state will peak in 2009. Predicted declines in high school graduates will continue through 2016.

APPENDIX A

MEAN SCORES OF ALL SURVEY RESPONDENTS BY GROUP

		Admissions Officer Mean	CEPO Mean	CEO Mean	Central Admin. Mean	Overall Mean	Standard Deviation
	Problem Recognition and Defining Problem						
1	Were the enrollment declines that your campus experienced significant in the early 1990s?	5.40	5.50	3.67	7.25	5.31	3.11
2	Campus decision makers had sufficient evidence of the possibility of enrollment declines through internal and external reports.	7.55	8.33	8.67	9.00	8.19	2.11
3	Decision makers in the Office of the Dean of the Commonwealth Education System at Darwin had sufficient evidence of the possibility of enrollment declines through internal and external reports.	8.45	8.17	8.67	9.60	8.64	1.66
4	Campus decision makers fully understood the dimensions of the enrollment problems (economic recession, declining demographics, etc.).	7.45	8.17	9.33	7.40	8.00	2.04
5	There was timely recognition and response by campus decision makers to the downward trend in enrollments.	4.73	6.00	8.67	5.00	5.93	3.02
6	There was timely recognition and response by decision makers in the Office of the Dean of the CES to the downward trend in enrollments.	3.70	5.00	5.83	5.60	4.81	2.72
7	The response of campus decision makers was based on an	4.64	6.50	9.33	6.00	6.29	3.13

		Admissions Officer Mean	CEPO Mean	CEO Mean	Central Admin. Mean	Overall Mean	Standard Deviation
	understanding of the available data and information to support decision making.						
8	The response of the decision makers in the Office of the Dean of the CES at Darwin was based on an understanding of the available data and information to support decision making.	3.90	5.00	6.00	8.50	5.35	2.71
	Communications						
1	The communication process between admissions officers and campus executive officers was open and timely in quantity and quality.	6.20	8.17	9.33	NR	7.59	2.59
2	The communication process between campus admissions officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.	4.56	4.50	7.00	NR	5.24	2.74
3	There was a constant flow of communications that facilitated discussion and insight between the campus admissions officer and the campus executive officer.	4.80	7.33	9.00	NR	6.64	3.00
4	Communication process from campus admissions officers to campus executive officers was frank and candid.	8.20	9.00	9.17	NR	8.68	2.01
5	Personalities were more important than information or data in influencing decision making on your campus pertaining to enrollment declines and planning.	6.55	6.83	1.83	NR	5.39	3.04
6	The communication process between campus enrollment officers and executive officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.	NR	NR	NR	5.40	5.40	2.88
7	There was a constant flow of communications that facilitated discussion and insight between the campus executive officer and decision makers in the Office of the Dean of the CES.	NR	NR	NR	4.75	4.75	3.50
8	The communication process from campus admissions and	NR	NR	NR	4.67	4.67	3.51

		Admissions Officer Mean	CEPO Mean	CEO Mean	Central Admin. Mean	Overall Mean	Standard Deviation
	enrollment officers to campus executive officers was an important source of information for CES decision makers.						
9	Personalities of campus executive officers were more important than information or data in influencing decision making pertaining to enrollment declines and planning.	NR	NR	NR	5.75	5.75	1.50
10	Personalities of decision makers in the Office of the Dean of the CES were more important than information or data in influencing decision making pertaining to university-wide enrollment issues and planning.	7.70	7.50	4.00	3.50	6.15	2.84
	Information Search						
1	Information was incomplete for effective decision making.	5.80	5.83	4.50	5.00	5.37	2.79
2	There were too much data and information for effective decision making.	2.90	4.50	2.33	4.60	3.44	2.45
3	Access to information was difficult.	5.10	5.67	4.50	4.20	4.93	2.64
4	Appropriate information was available for effective decision making.	5.60	6.83	7.00	7.20	6.48	2.14
5	You believed that you were well trained to obtain and analyze data for admission and recruitment decision making.	5.45	7.00	8.67	7.20	6.79	2.71
6	External sources of information were actively sought.	4.36	4.67	8.17	6.00	5.54	2.81
7	Different individuals had access to different information and this affected decision making.	6.73	6.33	4.83	5.40	6.00	2.60
8	The prospect and application AIDAA report generator was an important source of information.	7.64	7.17	6.20	7.40	7.22	2.12
9	Data and information were crucial for enrollment and recruitment decisions.	8.64	7.83	8.67	8.00	8.36	1.57
10	There was a need for the development of information reports that could be used for forecasting purposes.	9.55	8.33	8.17	6.20	8.39	1.81
11	Enrollment decision makers made appropriate	5.73	5.83	7.83	5.40	6.14	2.19

		Admissions Officer Mean	CEPO Mean	CEO Mean	Central Admin. Mean	Overall Mean	Standard Deviation
	interpretations of the data and information.						
	Decision Making						
1	The admission and enrollment management decision makers considered various alternatives prior to a decision.	6.10	6.83	8.83	7.00	7.04	1.93
2	Decisions were made that appropriately addressed the enrollment situation.	4.91	7.00	8.83	4.00	6.04	2.74
3	You believed that you had input or influence in the decision making processes of enrollment planning.	5.64	7.50	8.33	6.00	6.68	2.84
4	Campus admissions officers did have influence on decision makers in the Office of the Dean of the CES?	3.44	4.83	5.33	NA	4.38	2.54
5	Campus enrollment planners did have influence on decision makers in the Office of the Dean of the CES?	NA	NA	NA	5.00	5.00	1.41
6	Campus executive officers did have influence on decision makers in the Office of the Dean of the CES?	4.44	5.00	7.5	5.50	5.52	2.41
7	The decision making process was logical and orderly?	4.27	5.00	6.17	5.80	5.11	2.64

APPENDIX B

CAMPUS ADMISSIONS OFFICERS SURVEY RESULTS

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.
	Problem Recognition and Defining Problem													
1	Were the enrollment declines that your campus experienced significant in the early 1990s?	10	3	10	1	3	1	9	NR	5	9	3	3.72	3.82
2	Campus decision makers had sufficient evidence of the possibility of enrollment declines through internal and external reports.	1	9	9	10	10	7	6	10	9	8	4	2.88	.27

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.
3	Decision makers in the Office of the Dean of the Commonwealth Education System at Darwin had a sufficient evidence of the possibility of enrollment declines through internal and external reports.	3	10	9	9	10	9	8	10	9	8	8	1.97	.87
4	Campus decision makers fully understood the dimensions of the enrollment problems (economic recession, declining demographics, etc.).	9	8	7	10	10	6	9	10	3	6	4	2.46	.07
5	There was timely recognition and response by campus decision makers to the downward trend in enrollments.	2	3	4	9	7	9	3	1	4	6	4	2.69	.22
6	There was timely recognition and response by decision makers in the Office of the Dean of the	2	3	3	NR	5	8	2	1	5	6	2	2.21	.90

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.
	CES to the downward trend in enrollments.													
7	The response of campus decision makers was based on an understanding of the available data and information to support decision making.	2	3	4	10	7	8	3	1	4	6	3	2.77	.65
8	The response of the decision makers in the Office of the Dean of the CES at Darwin was based on an understanding of the available data and information to support decision making.	2	3	3	NR	5	8	2	1	5	6	4	2.13	.54
	Communications Process													
1	The communication process between admissions officers and campus executive officers was open and timely in quantity and quality.	9	3	6	10	7	10	4	NR	4	3	6	2.74	.51
2	The	9	3	3	NR	5	8	2	NR	5	3	3	2.46	

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.
	communication process between campus admissions officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.													.03
3	There was a constant flow of communications that facilitated discussion and insight between the campus admissions officer and the campus executive officer.	2	4	3	9	7	9	4	NR	4	2	4	2.62	.84
4	Communication process from campus admissions officers to campus executive officers was frank and candid.	9	9	9	10	9	8	8	NR	10	2	8	2.30	.29
5	Personalities were more important than information or data in influencing	9	9	8	1	8	3	9	9	5	6	5	2.77	.67

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.
	decision making on your campus pertaining to enrollment declines and planning.													
6	The communication process between campus enrollment officers and executive officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.00	
7	There was a constant flow of communications that facilitated discussion and insight between the campus executive officer and decision makers in the Office of the Dean of the CES.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.00	
8	The communication process from campus admissions and	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.00	

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.
	enrollment officers to campus executive officers was an important source of information for CES decision makers.													
9	Personalities of campus executive officers were more important than information or data in influencing decision making pertaining to enrollment declines and planning.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.00	
10	Personalities of decision makers in the Office of the Dean of the CES were more important than information or data in influencing decision making pertaining to university-wide enrollment issues and planning.	9	9	10	NR	8	8	9	9	2	5	8	2.41	.79
	Information Seeking													

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.
1	Information was incomplete for effective decision making.	8	5	9	1	8	4	9	NR	1	4	9	3.22	0.4
2	There were too much data and information for effective decision making.	1	8	5	1	3	4	2	NR	1	2	2	2.23	.99
3	Access to information was difficult.	2	3	6	5	8	4	9	NR	1	4	9	2.85	.10
4	Appropriate information was available for effective decision making.	6	9	3	5	4	8	6	NR	10	3	2	2.72	.38
5	You believed that you were well trained to obtain and analyze data for admission and recruitment decision making.	9	6	2	6	8	8	5	1	9	4	2	2.91	.47
6	External sources of information were actively sought.	1	5	4	5	6	7	2	1	9	2	6	2.62	.85
7	Different individuals had access to different information and this affected decision making.	1	8	10	4	9	4	9	10	3	8	8	3.13	.82
8	The prospect and application	10	6	6	10	7	6	7	10	7	9	6	1.75	.05

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.
	AIDAA report generator was an important source of information.													
9	Data and information were crucial for enrollment and recruitment decisions.	5	9	10	9	10	6	9	10	8	9	10	1.69	.85
10	There was a need for the development of information reports that could be used for forecasting purposes.	10	10	10	9	9	8	10	10	10	9	10	0.69	.47
11	Enrollment decision makers made appropriate interpretations of the data and information.	8	3	3	8	7	6	4	5	9	6	4	2.10	.42
	Decision Making Process													
1	The admission and enrollment management decision makers considered various alternatives prior to a decision.	9	4	4	9	7	8	NR	6	5	5	4	2.02	.10
2	Decisions were made that appropriately addressed the	1	3	3	9	6	8	3	6	4	8	3	2.63	.89

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.
	enrollment situation.													
3	You believed that you had input or influence in the decision making processes of enrollment planning.	1	2	3	10	8	8	5	6	5	9	5	2.91	.45
4	Campus admissions officers did have influence on decision makers in the Office of the Dean of the CES?	1	2	1	NR	6	4	2	NR	6	8	1	2.65	.03
5	Campus enrollment officers did have influence on decision makers in the Office of the Dean of the CES?	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
6	Campus executive officers did have influence on decision makers in the Office of the Dean of the CES?	2	2	5	NR	6	6	5	NR	5	6	3	1.67	.78
7	The decision making process was logical and orderly?	1	2	3	9	6	7	2	3	3	7	4	2.57	.62

		Brunswick	Capital	Dunmore	Monroe	Flagler	Mount Royal	North	PCRC	Scarborough	Wyoming	Young	Mean	S. D.

APPENDIX C

CAMPUS ENROLLMENT PLANNING OFFICERS SURVEY RESULTS

		Bennett	Brunswick	Hamilton	North	Wyoming	Young	Mean	Standard Deviation
	Problem Recognition and Defining Problem								
	Were the enrollment declines that your campus experienced significant in the early 1990s?	8	3	2	7	7	6	5.50	2.43
	Campus decision makers had sufficient evidence of the possibility of enrollment declines through internal and external reports.	9	8	8	7	9	9	8.33	0.82
	Decision makers in the Office of the Dean of the Commonwealth Education System at Darwin had a sufficient evidence of the possibility of enrollment declines through internal and external reports.	10	8	8	8	6	9	8.17	1.33
	Campus decision makers fully understood the dimensions of the	9	8	9	9	8	6	8.17	1.17

		Bennett	Brunswick	Hamilton	North	Wyoming	Young	Mean	Standard Deviation
	enrollment problems (economic recession, declining demographics, etc.).								
	There was timely recognition and response by campus decision makers to the downward trend in enrollments.	1	9	7	8	3	8	6.00	3.22
	There was timely recognition and response by decision makers in the Office of the Dean of the CES to the downward trend in enrollments.	1	4	7	7	2	9	5.00	3.16
	The response of campus decision makers was based on an understanding of the available data and information to support decision making.	1	9	8	8	5	8	6.50	3.02
	The response of the decision makers in the Office of the Dean of the CES at Darwin was based on an understanding of the available data and information to support decision making.	1	6	6	6	2	9	5.00	2.97
	Communications								
	The communication process between admissions officers and campus executive officers was open and timely in quantity and quality.	4	10	10	7	9	9	8.17	2.32
	The communication process between campus admissions officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.	1	2	6	6	3	9	4.50	3.02
	There was a constant flow of communications that facilitated discussion and insight between the campus admissions officer and the campus executive officer.	3	10	9	5	8	9	7.33	2.73

		Bennett	Brunswick	Hamilton	North	Wyoming	Young	Mean	Standard Deviation
	Communication process from campus admissions officers to campus executive officers was frank and candid.	10	10	9	6	10	9	9.00	1.55
	Personalities were more important than information or data in influencing decision making on your campus pertaining to enrollment declines and planning.	7	5	9	8	8	4	6.83	1.94
	The communication process between campus enrollment officers and executive officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.	NR	NR	NR	NR	NR	NR		
	There was a constant flow of communications that facilitated discussion and insight between the campus executive officer and decision makers in the Office of the Dean of the CES.	NR	NR	NR	NR	NR	NR		
	The communication process from campus admissions and enrollment officers to campus executive officers was an important source of information for CES decision makers.	NR	NR	NR	NR	NR	NR		
	Personalities of campus executive officers were more important than information or data in influencing decision making pertaining to enrollment declines and planning.	NR	NR	NR	NR	NR	NR		
0	Personalities of decision makers in the Office of the Dean of the CES were more important than information or data in influencing decision making	9	8	9	8	8	3	7.50	2.26

		Bennett	Brunswick	Hamilton	North	Wyoming	Young	Mean	Standard Deviation
	pertaining to university-wide enrollment issues and planning.								
	Information Seeking								
	Information was incomplete for effective decision making.	4	5	8	8	8	2	5.83	2.56
	There were too much data and information for effective decision making.	5	1	9	7	3	2	4.50	3.08
	Access to information was difficult.	8	4	6	8	4	4	5.67	1.97
	Appropriate information was available for effective decision making.	6	8	6	6	6	9	6.83	1.33
	You believed that you were well trained to obtain and analyze data for admission and recruitment decision making.	9	9	4	6	5	9	7.00	2.28
	External sources of information were actively sought.	1	9	5	4	3	6	4.67	2.73
	Different individuals had access to different information and this affected decision making.	3	6	7	8	8	6	6.33	1.86
	The prospect and application AIDAA report generator was an important source of information.	5	9	5	6	8	10	7.17	2.14
	Data and information were crucial for enrollment and recruitment decisions.	6	8	6	7	10	10	7.83	1.83
0	There was a need for the development of information reports that could be used for forecasting purposes.	5	10	8	9	9	9	8.33	1.75
1	Enrollment decision makers made appropriate interpretations of the data and information.	3	6	7	6	4	9	5.83	2.14
	Decision Making								
	The admission and enrollment	4	7	9	6	6	9	6.83	1.94

		Bennett	Brunswick	Hamilton	North	Wyoming	Young	Mean	Standard Deviation
	management decision makers considered various alternatives prior to a decision.								
	Decisions were made that appropriately addressed the enrollment situation.	2	8	9	7	7	9	7.00	2.61
	You believed that you had input or influence in the decision making processes of enrollment planning.	4	9	9	4	9	10	7.50	2.74
	Campus admissions officers did have influence on decision makers in the Office of the Dean of the CES?	3	5	5	3	4	9	4.83	2.23
	Campus enrollment officers did have influence on decision makers in the Office of the Dean of the CES?	NR	NR	NR	NR	NR	NR		
	Campus executive officers did have influence on decision makers in the Office of the Dean of the CES?	4	NR	NR	3	4	9	6.67	3.33
	The decision making process was logical and orderly?	2	3	10	4	2	9	5.00	3.58

APPENDIX D

CAMPUS EXECUTIVE OFFICERS SURVEY RESULTS

		Bennett	Dunmore	Mount Royal	Scarborough	Wadsworth	York	Mean	Standard Deviation
	Problem Recognition and Defining Problem								
1	Were the enrollment declines that your campus experienced significant in the early 1990s?	4	1	1	3	7	6	3.67	2.50
2	Campus decision makers had sufficient evidence of the possibility of enrollment declines through internal and external reports.	9	5	10	9	10	9	8.67	1.86
3	Decision makers in the Office of the Dean of the Commonwealth Education System at Darwin had a sufficient evidence of the possibility of enrollment declines through internal and external reports.	10	5	10	9	9	9	8.67	1.86
4	Campus decision makers fully understood the dimensions of the enrollment problems (economic	9	10	10	8	9	10	9.33	0.82

		Bennett	Dunmore	Mount Royal	Scarborough	Wadsworth	York	Mean	Standard Deviation
	recession, declining demographics, etc.).								
5	There was timely recognition and response by campus decision makers to the downward trend in enrollments.	6	8	10	9	10	9	8.67	1.51
6	There was timely recognition and response by decision makers in the Office of the Dean of the CES to the downward trend in enrollments.	2	3	6	6	9	9	5.83	2.93
7	The response of campus decision makers was based on an understanding of the available data and information to support decision making.	8	10	10	8	10	10	9.33	1.03
8	The response of the decision makers in the Office of the Dean of the CES at Darwin was based on an understanding of the available data and information to support decision making.	4	3	5	6	9	9	6.00	2.53
	Communications								
1	The communication process between admissions officers and campus executive officers was open and timely in quantity and quality.	7	10	10	9	10	10	9.33	1.21
2	The communication process between campus admissions officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.	7	4	4	9	9	9	7.00	2.45
3	There was a constant flow of communications that facilitated discussion and insight between the campus admissions officer and the	5	10	10	8	10	10	8.83	2.04

		Bennett	Dunmore	Mount Royal	Scarborough	Wadsworth	York	Mean	Standard Deviation
	campus executive officer.								
4	Communication process from campus admissions officers to campus executive officers was frank and candid.	5	10	10	10	10	10	9.17	2.04
5	Personalities were more important than information or data in influencing decision making on your campus pertaining to enrollment declines and planning.	1	1	3	2	1	3	1.83	0.98
6	The communication process between campus enrollment officers and executive officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.	NR	NR	NR	NR	NR	NR		0.00
7	There was a constant flow of communications that facilitated discussion and insight between the campus executive officer and decision makers in the Office of the Dean of the CES.	NR	NR	NR	NR	NR	NR		0.00
8	The communication process from campus admissions and enrollment officers to campus executive officers was an important source of information for CES decision makers.	NR	NR	NR	NR	NR	NR		0.00
9	Personalities of campus executive officers were more important than information or data in influencing decision making pertaining to enrollment declines and planning.	NR	NR	NR	NR	NR	NR		0.00
10	Personalities of decision makers in the Office of the Dean of the CES	1	7	2	4	7	3	4.00	2.53

		Bennett	Dunmore	Mount Royal	Scarborough	Wadsworth	York	Mean	Standard Deviation
	were more important than information or data in influencing decision making pertaining to university-wide enrollment issues and planning.								
	Information Seeking								
1	Information was incomplete for effective decision making.	7	6	2	7	2	3	4.50	2.43
2	There were too much data and information for effective decision making.	1	4	1	4	1	3	2.33	1.51
3	Access to information was difficult.	8	7	1	7	1	3	4.50	3.21
4	Appropriate information was available for effective decision making.	4	6	10	5	9	8	7.00	2.37
5	You believed that you were well trained to obtain and analyze data for admission and recruitment decision making.	6	10	10	7	10	9	8.67	1.75
6	External sources of information were actively sought.	5	9	10	9	8	8	8.17	1.72
7	Different individuals had access to different information and this affected decision making.	9	5	2	3	2	8	4.83	3.06
8	The prospect and application AIDAA report generator was an important source of information.	1	10	4	7	NA	9	6.20	4.17
9	Data and information were crucial for enrollment and recruitment decisions.	6	10	9	8	10	9	8.67	1.51
10	There was a need for the development of information reports that could be used for forecasting purposes.	9	10	6	7	10	7	8.17	1.72
11	Enrollment decision makers made appropriate interpretations of the data and information.	5	6	10	8	9	9	7.83	1.94

		Bennett	Dunmore	Mount Royal	Scarborough	Wadsworth	York	Mean	Standard Deviation
	Decision Making								
1	The admission and enrollment management decision makers considered various alternatives prior to a decision.	7	9	10	8	10	9	8.83	1.17
2	Decisions were made that appropriately addressed the enrollment situation.	7	9	10	8	10	9	8.83	1.17
3	You believed that you had input or influence in the decision making processes of enrollment planning.	7	9	10	5	9	10	8.33	1.97
4	Campus admissions officers did have influence on decision makers in the Office of the Dean of the CES?	7	2	3	5	6	9	5.33	2.58
5	Campus enrollment officers did have influence on decision makers in the Office of the Dean of the CES?	NR	NR	NR	NR	NR	NR		
6	Campus executive officers did have influence on decision makers in the Office of the Dean of the CES?	5	5	9	7	9	10	7.50	2.17
7	The decision making process was logical and orderly?	5	2	6	7	9	8	6.17	2.48

APPENDIX E

DARWIN – COMMONWEALTH EDUCATION SYSTEM AND UNDERGRADUATE ADMISSIONS OFFICE

SURVEY RESULTS

		Darwin DM #1	Darwin DM #2	Darwin DM#3	Darwin DM#4	Darwin DM#5	Mean	Standard Deviation
	Problem Recognition and Defining Problem							
1	Were the enrollment declines that your campus experienced significant in the early 1990s?	9	8	9	3	NR	7.25	2.87
2	Campus decision makers had sufficient evidence of the possibility of enrollment declines through internal and external reports.	10	NR	10	8	8	9.00	1.15

		Darwin DM #1	Darwin DM #2	Darwin DM#3	Darwin DM#4	Darwin DM#5	Mean	Standard Deviation
3	Decision makers in the Office of the Dean of the Commonwealth Education System at Darwin had a sufficient evidence of the possibility of enrollment declines through internal and external reports.	10	10	10	10	8	9.60	0.89
4	Campus decision makers fully understood the dimensions of the enrollment problems (economic recession, declining demographics, etc.).	8	3	9	9	8	7.40	2.51
5	There was timely recognition and response by campus decision makers to the downward trend in enrollments	2	3	10	NR	5	5.00	3.56
6	There was timely recognition and response by decision makers in the Office of the Dean of the CES to the downward trend in enrollments.	8	3	8	2	7	5.60	2.88
7	The response of campus decision makers was based on an understanding of the available data and information to support	3	2	10	9	6	6.00	3.54

		Darwin DM #1	Darwin DM #2	Darwin DM#3	Darwin DM#4	Darwin DM#5	Mean	Standard Deviation
	decision making.							
8	The response of the decision makers in the Office of the Dean of the CES at Darwin was based on an understanding of the available data and information to support decision making.	8	NR	10	8	8	8.50	1.00
	Communications Process							
1	The communication process between admissions officers and campus executive officers was open and timely in quantity and quality.	NR	NR	NR	NR	NR		
2	The communication process between campus admissions officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.	NR	NR	NR	NR	NR		
3	There was a constant flow of communications that facilitated discussion and insight between the campus admissions officer and	NA	NA	NA	NA	NA		0.00

		Darwin DM #1	Darwin DM #2	Darwin DM#3	Darwin DM#4	Darwin DM#5	Mean	Standard Deviation
	the campus executive officer.							
4	Communication process from campus admissions officers to campus executive officers was frank and candid.	NR	NR	NR	NR	NR		
5	Personalities were more important than information or data in influencing decision making on your campus pertaining to enrollment declines and planning.	NR	NR	NR	NR	NR		
6	The communication process between campus enrollment officers and executive officers and decision makers in the Office of the Dean of the CES was open and timely in quantity and quality.	3	2	7	9	6	5.40	2.88
7	There was a constant flow of communications that facilitated discussion and insight between the campus executive officer and decision makers in the Office of the Dean of the CES.	3	1	9	NR	6	4.75	3.50
8	The communication process from campus	1	NR	8	NR	5	4.67	3.51

		Darwin DM #1	Darwin DM #2	Darwin DM#3	Darwin DM#4	Darwin DM#5	Mean	Standard Deviation
	admissions and enrollment officers to campus executive officers was an important source of information for CES decision makers.							
9	Personalities of campus executive officers were more important than information or data in influencing decision making pertaining to enrollment declines and planning.	7	4	5	NR	7	5.75	1.50
10	Personalities of decision makers in the Office of the Dean of the CES were more important than information or data in influencing decision making pertaining to university-wide enrollment issues and planning.	3	4	4	NR	3	3.50	0.58
	Information Seeking							
1	Information was incomplete for effective decision making.	1	6	3	9	6	5.00	3.08
2	There were too much data and information for effective decision making.	1	6	8	5	3	4.60	2.70
3	Access to information	1	3	3	8	6	4.20	2.77

		Darwin DM #1	Darwin DM #2	Darwin DM#3	Darwin DM#4	Darwin DM#5	Mean	Standard Deviation
	was difficult.							
4	Appropriate information was available for effective decision making.	8	6	8	7	7	7.20	0.84
5	You believed that you were well trained to obtain and analyze data for admission and recruitment decision making.	9	6	8	3	10	7.20	2.77
6	External sources of information were actively sought.	6	2	9	5	8	6.00	2.74
7	Different individuals had access to different information and this affected decision making.	5	5	5	7	5	5.40	0.89
8	The prospect and application AIDAA report generator was an important source of information.	8	7	8	7	7	7.40	0.55
9	Data and information were crucial for enrollment and recruitment decisions.	7	7	8	8	10	8.00	1.22
10	There was a need for the development of information reports that could be used for forecasting purposes.	3	7	6	8	7	6.20	1.92
11	Enrollment decision	3	3	8	6	7	5.40	2.30

		Darwin DM #1	Darwin DM #2	Darwin DM#3	Darwin DM#4	Darwin DM#5	Mean	Standard Deviation
	makers made appropriate interpretations of the data and information.							
	Decision Making Process							
1	The admission and enrollment management decision makers considered various alternatives prior to a decision.	6	7	9	7	6	7.00	1.22
2	Decisions were made that appropriately addressed the enrollment situation.	3	4	4	3	6	4.00	1.22
3	You believed that you had input or influence in the decision making processes of enrollment planning.	8	2	8	3	9	6.00	3.24
4	Campus admissions officers did have influence on decision makers in the Office of the Dean of the CES?	NR	NR	NR	NR	NR		
5	Campus enrollment officers did have influence on decision makers in the Office of the Dean of the CES?	3	5	6	NR	6	5.00	1.41
6	Campus executive officers did have influence on decision makers in the Office of	3	3	8	NR	8	5.50	2.89

		Darwin DM #1	Darwin DM #2	Darwin DM#3	Darwin DM#4	Darwin DM#5	Mean	Standard Deviation
	the Dean of the CES?							
7	The decision making process was logical and orderly?	6	7	6	3	7	5.80	1.64

APPENDIX F

T TEST OF SURVEY RESULTS

Survey Question Item #	Item Text	Group	n	Mean	Stand Dev.	t	p
Problem Question 5	There was timely recognition and response by campus decision makers to the downward trend in enrollments.	Admission Officers	10	4.73	2.69	-3.29	.005
		CEO's	6	8.67	1.51	-3.87	.002
Problem Question 7	The response of campus decision makers was based on an understanding of the available data and information to support decision making.	Admissions Officers	11	4.64	2.76	-3.96	.001
		CEO's	6	9.33	1.03	-5.02	.000
Communications Question 3	There was a constant flow of communications	Admissions Officers	10	4.80	2.62	-3.34	.005
		CEO's	6	9.00	2.00	-3.61	.003

Survey Question Item #	Item Text	Group	n	Mean	Stand Dev.	t	p
	that facilitated discussion and insight between the campus admissions officer and the campus executive officer.						
Communications Question 5	Personalities were more important than information or data in influencing decision making on your campus pertaining to enrollment declines and planning.	Admissions Officers	11	6.55	2.77	3.98	.001
		CEO's	6	1.83	.983	5.08	.000
Communications Question 10	Personalities of decision makers in the Office of the Dean of the CES were more important than information or data in influencing decision making pertaining to university-wide enrollment issues and planning.	Admissions Officers	10	7.70	2.41	2.93	.011
		CEO's	6	4.00	2.53	2.88	.016

Survey Question Item #	Item Text	Group	n	Mean	Stand Dev.	t	p
Information Question 6	External sources of information were actively sought.	Admissions Officers	11	4.36	2.62	-3.18	.006
Decision making Question #2	Decisions were made that appropriately addressed the enrollment situation.	Admissions Officers	11	4.91	2.62	-3.44	.004
		CEO's	6	8.83	1.17	-4.25	.001
Decision making Question #3	You believed that you had input or influence in the decision making processes of enrollment planning.	Admissions Officers	11	5.64	2.91	-2.02	.062
		CEO's	6	8.33	1.96	-2.27	.040
Problem Question #8	The response of the decision makers in the Office of the Dean of the CES at Darwin was based on an understanding of the available data and information to support decision making.	Admissions Officers	10	3.90	2.13	-4.06	.002
		Darwin	4	8.50	1.00	-5.48	.000
Communications Question #10	Personalities of decision makers in the Office of the Dean of the CES were more	Admissions Officers	10	7.70	2.41	3.37	.006
		Darwin	4	3.50	.577	5.16	.000

Survey Question Item #	Item Text	Group	n	Mean	Stand Dev.	t	p
	important than information or data in influencing decision making pertaining to university-wide enrollment issues and planning.						

APPENDIX G

INTERVIEW QUESTIONS

The interview questions were based on the survey questionnaire and topics and were meant to be as open-ended as possible. The enrollment management position of the interview respondent and the flow of the interview process influenced the questions that were ultimately asked of the organization members. Listed below are some of the questions that were asked. This list is not inclusive of all questions asked of the enrollment management organization member.

1. Was the decision making process random or structured?
2. Was communication open or closed?
3. What information was available to inform decision making?
4. Was the information valuable?
5. Was there too much or too little information?
6. What was the degree of coordination in the organization structure for decision making?
7. Did decision making achieve coherence and reduce equivocation?
8. Was decision making typified more by clarity and consistency or by ambiguity and inconsistency?

9. Were decisions the outcomes of actions committed by individual actors or to the actions of a team or an organizational culture?
10. Were the decision makers overwhelmed by information and the complexity of the decision situation?

APPENDIX H

SURVEY COVER LETTERS

Greetings, my name is Tom Riley. I am conducting a study for a doctoral dissertation, titled "Information, Decision Making and Enrollment Management in a Public Research University: A Case Study Analysis Using Bounded Rationality Theory." The purpose of my communication is to invite you to be a participant and agree to take a survey and possibly be interviewed. You must be 18 years of age or older.

The dissertation topic will be an examination of the enrollment dilemma at Darwin University in the time period of 1990 to 1995. The focus will be on how information was managed, communicated and used to make organizational decisions for enrollment planning and management.

It will take you approximately 15 to 20 minutes to complete the survey. The length of the interview will be approximately 30 to 60 minutes. The survey can be returned to me via e-mail or U.S. Mail. If you would prefer the U.S. Mail, I can forward a self-addressed postage-paid envelope.

The interview will be audio recorded. The recordings will be stored at the residence of the principal investigator. The recordings will be destroyed by 2010. Only the principal investigator will have access to the recordings. Only the principal investigator will know your identity. If this research is published, no information that would identify you will be written. If using internet technology, confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.

Your participation is voluntary. You can end your participation at any time. You do not have to answer any questions you do not want to answer. Your name and identity will not be associated with your answers in any way, and your responses will be confidentially treated. There are no known risks to participating in this research study.

If you have questions, contact me (412-XXX-XXXX/ tjr3@darwin.edu) or my dissertation adviser, Dr. William B. Thomas (412-648-7173/ wbt@pitt.edu). This survey was reviewed and approved by the Darwin University Office for Research Protections on 08/02/04 and the

University of Pittsburgh Institutional Review Board. If you have questions about your rights as a research participant, you can all the Darwin University Office for Research Protections (XXX-XXX-XXXX).

If receiving this via email, please print off this form for your records. Would you be willing to participate?

Thank you,

Thomas J. Riley
University of Pittsburgh
School of Education
Administrative and Policy Studies

January 31, 2006

John M. Doe, Ph.D.
100 Main Street
Frostbite Falls, MN 99999

Dear Dr. Doe:

This is a follow-up to our e-mail exchange and my request for your participation in my dissertation research. I had informed you that I had designed a survey instrument and requested that you complete the survey and possibly be interviewed as well.

I am sending the essential documents for your participation in my dissertation survey. The documents include a cover letter, the survey and a consent form. The consent form is required by both the Darwin University Office of Research Protections and the University of Pittsburgh Institutional Review Board. The use of a survey and possible interview are considered human participation in a social science research study. Therefore, you must be a voluntary participant and you may withdraw at any time. Your signature is required on the Informed Consent for Social Science Research form. The various documents can be e-mailed to you. The e-mailing includes two MS Word file attachments.

If you would like to know more about the dissertation topic, I would be happy to send the overview document to you.

Thank you for your participation.

Thomas J. Riley
University of Pittsburgh
School of Education
Administrative and Policy Studies

encl.

APPENDIX I

University IRB Approval

University of Pittsburgh
Institutional Review Board

Exempt and Expedited Reviews
Christopher M. Ryan, Ph.D., Vice Chair

3500 Fifth Avenue
Suite 105
Pittsburgh, PA 15213
Phone: 412.383.1480
Fax: 412.383.1146
e-mail: irbexempt@msx.upmc.edu

TO: Thomas Riley

FROM: Christopher M. Ryan, Ph.D., Vice Chair

DATE: August 5, 2004

PROTOCOL: Decision Making Models and Information Management in Enrollment Management at a Major Public Research University

IRB Number: 0406183

The above-referenced protocol has been reviewed by the University of Pittsburgh Institutional Review Board. Based on the information provided in the IRB protocol, this project meets all the necessary criteria for an exemption, and is hereby designated as "exempt" under section 45 CFR 46.101(b)(2).

The regulations of the University of Pittsburgh IRB require that exempt protocols be re-reviewed every three years. If you wish to continue the research after that time, a new application must be submitted.

- If any modifications are made to this project, please submit an 'exempt modification' form to the IRB.
- Please advise the IRB when your project has been completed so that it may be officially terminated in the IRB database.
- This research study may be audited by the University of Pittsburgh Research Conduct and Compliance Office.

Approval Date: August 4, 2004
Renewal Date: August 4, 2007

CR:ky

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