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Corporate culture and waste management in the computer systems industry

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CORPORATE CULTURE AND WASTE MANAGEMENT
IN THE COMPUTER SYSTEMS INDUSTRY

A Thesis

Presented to

The Faculty of the Department of Geography and Environmental Studies

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Andrea Salzman Hansen

August 1996

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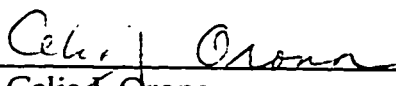
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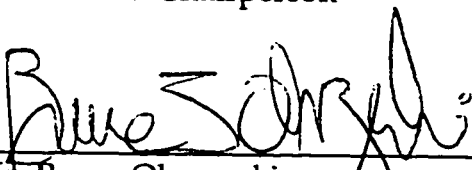
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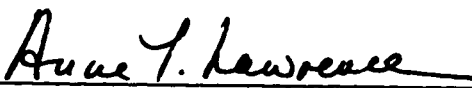
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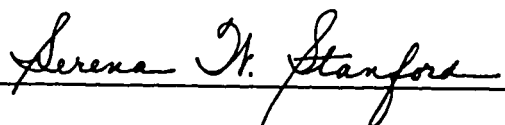


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ABSTRACT

CORPORATE CULTURE AND WASTE MANAGEMENT IN THE COMPUTER SYSTEMS INDUSTRY

by Andrea Salzman Hansen

This thesis investigates the factors that affect integrated waste management participation in the computer systems industry. The affects of corporate culture are highlighted. The purpose is to inform local governments of the issues facing this industry so that they can create more effective waste management programs.

One-on-one interviews were conducted with eight employees from four large computer systems companies in Santa Clara County. The interview data was analyzed using qualitative methods, Deal and Kennedy's definition of corporate culture, and tenets of social exchange theory.

Findings indicate that the culture's relentless drive towards positive financial performance is a pivotal factor affecting waste management participation in the computer systems industry. Other "non-cultural" factors are also briefly analyzed.

Based upon the cultural and non-cultural factors identified, recommendations are offered to local governments for increasing the effectiveness of commercial/industrial waste management programs, and suggestions are given for further research.

DEDICATIONS

To Jesus, who has cleared obstacles, provided opportunity, comfort, and encouragement, and showed His great love and concern for me every step of the way. May all glory and honor go to You, my precious Lord.

To my best friend, Eric, the love of my life. I could face each day of work because of your faithful love and patience.

To my darling Joel. Looking forward to playing with you more often has been an inspiration.

To my thesis committee: Celia, for ensuring competent qualitative research and enduring challenging battles of will; Bruce, for your irreplaceable friendship and for demanding nothing less of me than perfection; Anne, for seeing my potential and providing me opportunity; David, for providing me with an entrance into this project and for consistent industry "reality checks" along the way.

To Terri, Chris, Renee, Jerry, Madeleine, Felicia, Hans, and Alicia: Your love and encouragement has provided the basic framework supporting my work. Thank you for believing in me. I have the best family ever!

To the many others who have been wondering – "Is that girl still in school?" Let me respond by simply saying... "yahoo!"

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CHAPTER 1

INTRODUCTION

Problem Statement

Due to growing resource consumption and waste generation throughout the state, California legislators approved the Integrated Waste Management Act of 1989 (also known as Assembly Bill [AB] 939). This law recast the state's solid waste management policy from an emphasis on disposal, such as landfilling and incineration, to an emphasis on disposal alternatives, such as reducing consumption, reusing products and materials, and recycling. Furthermore, AB 939 established strict rules for local governments to achieve a 25 percent reduction in landfill disposal by January 1, 1995 and a 50 percent reduction by January 1, 2000 (California, Natural Resources Committee 1989).

To achieve the 1995 landfill diversion goal, Santa Clara County local governments have primarily focused on residential recycling programs. Indeed, curbside recycling has received notable participation and support throughout the region. Despite this success, however, local governments cannot expect to meet the 2000 landfill diversion goal through residential participation alone. In Santa Clara County, sixty percent of solid waste is generated by the commercial/industrial sector (Santa Clara County 1993, 15). Local governments, therefore, have a challenge: how to enlist the commercial/industrial sector in integrated waste management activity, rather than in solid waste disposal.¹

¹The term "integrated waste management" refers to a suite of complimentary activities for managing solid waste that emphasize alternatives to landfill disposal.

Legislation requiring commercial/industrial sector participation would achieve the desired results. Current California waste management laws, however, are indirect; they do not target the behaviors of specific waste generators, such as businesses. Creating and enforcing new laws, in turn, have their own set of problems. Without specific, targeted laws, local governments must create and support programs that encourage waste management participation in the commercial/industrial sector.

Encouraging waste management participation within the commercial/industrial sector is not an entirely new endeavor for local governments. Several Santa Clara County local governments have begun to address the needs of the commercial/industrial sector through collection programs for commonly-generated recyclable materials, such as cardboard and white paper, or through examining a company's waste stream in on-site waste audits. The most commonly-used technique for encouraging commercial/industrial sector participation is known as "outreach programs." Commercial/industrial programs consist of providing businesses with waste management education and information in a variety of different formats (e.g., written, video , in-person, etc.).

While local governments' attempts at encouraging commercial/industrial waste management participation are valuable, they are less effective than they could be. Local governments and businesses operate with two different agendas. Businesses are focused on financial objectives and do not share local government's zeal for fulfilling integrated waste management laws. Local governments, on the other hand, do not fully understand the circumstances and constraints under which businesses

operate. Only when local governments incorporate business issues into their commercial/industrial waste management programs can they expect a sizable response. This type of strategy involves integrating the requirements, personalities, and cultural ebbs and flows of businesses directly into commercial/industrial programs. First, however, local governments need to better understand the businesses operating in their communities. Providing local governments with "insider" information about their business community so that they can create more effective waste management programs is the purpose of this thesis.

In order to provide Santa Clara County local governments with a better understanding of their commercial/industrial sector, this thesis investigates the factors that affect integrated waste management participation in one business sector -- computer systems companies.² In particular, how corporate culture affects waste management participation is emphasized. One-on-one interviews were conducted with employees in four large Santa Clara County computer systems companies. The interview data was analyzed using qualitative methods and tenets of social exchange theory. Findings indicate that corporate culture has some affect on waste management activity, but that it is just one of many influential factors. An introduction and brief analysis of other non-cultural factors affecting waste management activity in the computer systems industry also are presented. Based upon the cultural and non-cultural factors identified, recommendations are offered to local

²For the purpose of this document, the terms "computer systems industry" and "computer systems companies" refer to companies that manufacture whole computer systems with both hardware and operating system software, as opposed to companies that produce specific computer elements such as applications software, network connections, or board-level components.

governments for increasing the effectiveness of commercial/industrial waste management programs, and suggestions are given for further research.

Purpose and Research Questions

The purpose of this thesis is to educate and inform Santa Clara County local governments about one industry in the commercial/industrial sector so that they can develop more effective waste management programs for this industry. Specifically, the thesis investigates the corporate culture of Santa Clara County's computer systems industry and examines the effect of the culture on integrated waste management activities. This study addresses the following research questions: 1) What is the corporate culture in Santa Clara County computer systems industry companies? 2) What integrated waste management activities are commonly practiced by companies in this industry? 3) How has the industry's corporate culture affected integrated waste management activities? 4) What does this analysis suggest to local governments, and what actions and further research are recommended?

Methodology

Ethnography

Ethnography is the research process used in this investigation (Agar 1980; Edgerton & Langness 1974; Fetterman 1989). Also known as cultural anthropology, ethnography is a study of social groups, in which elements of a group's history, environment, behaviors and beliefs are examined.

Ethnography derives its data from human subjects and uses their views to

guide the analysis of the work. It can provide insights about people's lives, behaviors, and relationships, and functions of organizations and social movements.

Unlike quantitative, scientific-method research that asks, "how many are there?", ethnography asks, "what is going on here?" Fieldwork involves observing the phenomenon in question, and relies on direct interviews or researcher participation to produce data. Artifacts such as meeting transcripts, diaries, letters, maps, and photographs are useful data sources in an ethnographical study. Analyses tend to be highly descriptive, accompanied by only moderate critique. The focus of ethnography is on telling the inside story of a selected group or culture as the subjects themselves describe it.

Human Subjects Protection and Ethics

Concern over research ethics has led several professional societies to devise strict guidelines on research conducted with human subjects. In accordance to these guidelines, social researchers agree that it is a violation of basic rights to harm people, to force them to perform actions against their will, to lie or mislead them, or to invade their privacy. Furthermore, social researchers must inform subjects that their participation is voluntary, and provide subjects with enough information about the research such that they can make an informed decision about whether or not to participate. Prior to beginning an investigation, therefore, social researchers usually obtain a signed "informed consent" from each participating subject. An informed consent is a written agreement from subjects regarding their knowledge of the study's procedures, risks, benefits, alternatives, and contact person. A copy of

the informed consent used in this research and signed by all participants is contained in Appendix A.

Methods

Procedure

The primary source of data for this research was in-depth interviews. The researcher conducted one-on-one interviews with eight employees working in four different Santa Clara County large computer systems companies. Interviews were generally 60 to 90 minutes in length, and were recorded on magnetic tape. The interviews were conducted on the respondents' sites, over a six month period in late 1993 and early 1994. One additional interview was conducted in late 1995. Interview questions focused on the company's corporate culture and their integrated waste management programs (see Appendix B). Following the interviews, the tape recordings were transcribed, verbatim, into word processed documents. The documents were formatted on the written page to provide a wide margin for "coding," a process of analysis (Strauss & Corbin 1990).

Coding was used to identify, conceptualize, and organize underlying patterns and relationships within the data. The goal of coding is to open up the inquiry and to bring seemingly unrelated data into conceptual relationships. During coding, large groups of data were broken down into discrete parts (sentence by sentence or even word by word), given conceptual labels, and compared for similarities and differences. Conceptual labels were created by asking questions such as: What is really happening in this situation? What does it represent? What is the experience faced by the

subjects? Incidents were contrasted and compared so that new labels could be created and similar incidents could be given the same labels. A sample of the coding used in this thesis is contained in Appendix C.

Similar concepts were then grouped into larger conceptual categories that in turn, were combined until an ethnographic story began to emerge. At this point, opportunities for further data collection, refinement, and analysis became evident. This process of alternating data collection and analysis proceeded until contribution from further data did not lend any new information. The final ethnography was validated by comparing and contrasting it against the original data and against small samples of new data.

Memo-writing (Strauss & Corbin 1990), the process of composing written notes on thoughts and concepts related to the data, was valuable during the coding process. Memos included broad topics such as the impact of technological progress and narrow topics such as the communication style of a particular company founder (see Appendix D for a sample memo). Ultimately, some memos held little relevance, while others inspired further field questions, solidified categories, and helped to piece together the ethnographic narrative.

Company Selection

The choice of which companies to investigate was narrowed down by two factors: industry and available contacts. First, the computer systems industry was selected because nearly one-third of all jobs in Santa Clara County are in high-tech industries such as electronics, defense, aerospace, and computer systems (Santa Clara County 1995, II-4). Investigating computer

systems companies therefore, offered a way to impact a large component of the commercial/industrial sector. Also, when names and telephone numbers of several willing respondents in this industry were made available, the selection of companies, sites, and respondents was finalized.

Four companies participated in this study. All of the target companies manufacture whole computer systems including hardware and operating system software. These companies produce other products and services as well, but it is their involvement in the computer systems industry that was analyzed in this thesis. All four target companies are considered "very large" in terms of numbers of employees (greater than 5,000) and annual revenues (greater than one billion dollars).

Respondents

A total of eight employees participated in interviews. The respondent employees were chosen for their integrated waste management knowledge and experience. All of the respondents had job responsibilities that directly related to the environment and/or integrated waste management, such as enforcing environmental regulations, establishing environmental programs, or delivering environmental communications. Collectively, respondents were between the ages of 40s to 70s, and had been with their companies between five and 40 years, although not consistently in environmentally-related positions. At the time of the interviews, one subject was working as a consultant to the company, after being employed there for many years. At the time of this writing, two respondents are no longer with their companies.

As explained in the ethics section of this chapter, the respondents were to be given anonymity in return for their candid responses to interview questions. Thus, throughout this document, actual identities of respondents and company names are protected by the use of pseudonyms. Table 1 lists fictitious company and respondent names, plus respondents' actual titles.

Table 1.--Respondent Information

<u>Company</u>	<u>Name</u>	<u>Title</u>
Analyzer Corporation	Ann	Environmental Programs Manager
	Dennis	Env. Health & Safety Engineer
	Ken	Media Communications Manager
Chromatic Systems	Frank	Maintenance Supervisor
	Mitchell	Environment and Safety Manager
Eritech Company	Alan	Recycling Business Manager
	Paul	Facilities Maintenance Manager
Terrace Computers	Carl	Corporate Environmental Engineer

CHAPTER 2

LITERATURE REVIEW

Theoretical Perspectives

Corporate Culture

The definition of corporate culture is difficult to delimit. In a common sociological definition (Johnson 1986), culture is defined as consisting of material elements (e.g., tangible, man-made products) and non-material elements (e.g., symbols, language, beliefs, attitudes, norms, and values).

"Corporate" culture, in specific, is defined several ways in academic literature (Petty et al. 1995). The academic definitions of corporate culture principally represent two broad categories: corporate culture as an overt entity, such as how an organization sets strategies, develops goals, measures progress, and defines products, and corporate culture as an underlying force, such as the unconscious assumptions and beliefs that are shared by members of an organization and expressed via symbols, ceremonies and myths.

The present work defines and analyzes corporate culture by adhering to key concepts as defined by Deal and Kennedy (1982). These key concepts are called businesses environment, values, heroes, and rituals, and defined in the following way (Deal & Kennedy 1982, 13):

Each industry faces a different reality in the marketplace depending upon its products, competitors, customers, technologies, and so on. This is called the *business environment*, and is the single greatest influence in shaping a corporate culture. *Values*, another element of corporate culture, are the basic concepts and beliefs held among companies within an industry. They are the essence of a company's philosophy for achieving success.

Heroes, a third element contributing to corporate culture, are the people who personify a culture's values and as such, provide tangible role models for individuals to follow. The hero is the great motivator... the person everyone will count on when things get tough. Lastly, a corporate culture consists of *rituals and ceremonies*. These are the routines of day-to-day life that exemplify the kind of behavior that is expected and provide visible examples of what the company stands for.

Deal and Kennedy apply their key concepts to define the corporate culture of individual companies. The present work uses these same key concepts to define the corporate culture of an industry.

Social Exchange Theory

Many theories have been offered to explain and predict social behavior. In particular, social exchange theory provides an explanation of social behavior based upon how individuals interact with others and adapt to various situations. Social exchange theory is not unlike basic economic theory which proposes that a person or organization will behave in a way that will maximize their financial rewards and minimize their financial costs. The tenets of social exchange theory are similar regarding behavior based upon the evaluation of rewards and costs, but expand upon economic theory's limited financial definition of rewards and costs. Instead, social exchange theory postulates that individuals will behave in ways that will maximize their rewards and minimize their costs relative to social and personal domains. Social exchange theory has been further defined in this way (Winton 1995, 129):

Exchange theorists believe that all social interaction comes at a cost. The cost is at least time and energy, but it can also include money, anger, frustration, depression, physical injury, or negative feelings, such as the sense of being exploited. Interaction also brings rewards such as fun, a

good feeling about life and self, a sense of energy and enthusiasm, a feeling of usefulness and being needed. The ratio of rewards to costs determines how we feel about others -- whether we like them or not -- and whether we are inclined to continue or to terminate our interactions with others. People subjectively assess the costs they incur in a relationship as well as the rewards they receive from it, and from this assessment, they construct their behavior relative to other people. So long as people perceive that the rewards of a relationship outweigh the costs, interactions are likely to continue.

One element of social exchange theory involves "fairness." That is, exchanges generally will occur until an optimum (or "fair") situation is reached in which no one can be made better off without making at least one person worse off (Coleman 1987, 59). There are, however, situations that fail to produce such optimums. That is, sometimes exchanges are made that benefit some individuals at the expense of others, or that burden some individuals for the benefit of others.

One such sub-optimal situation is commonly known as the "free rider" phenomenon (Coleman 1987).¹ This situation involves a public good -- that is, something that provides benefits for a number of individuals and is fully accessible to all. In the case of a public good, only a fraction of the benefits of an individual's actions actually accrue to that individual; the majority of benefits accumulate to the public at large. Thus, for an individual, the costs are perceived as greater than the benefits. This situation leads many individuals to become free riders wherein they contribute little or nothing, but derive benefits from the public good. Tax evasion is an example of free riding, as is watching public television without contributing. When many players relate to a public good in this way and prefer to free ride, little or nothing is accomplished and the public good is diminished.

¹The term "free rider" is derived from the activity of riding for free, or hitchhiking.

Coleman (1987) also explains a situation in which the circumstances predict free rider activity, but just the opposite occurs. A "zealot" phenomenon also involves a public good in which a number of people benefit. In this situation, certain individuals endure extreme costs in order to bring about a result with universal benefits, but from which they will derive only minimal personal benefits. Patriotic zeal during wartime, for instance, is a zealot situation, as is a politically-motivated hunger strike.

Social exchange theory is applied in this thesis to explain the behaviors of both corporate management and individual employees. Whether or not corporate management endorses and encourages waste management activities in their companies is shown to be based upon positive net rewards (i.e., when an activity's rewards exceed its costs). Likewise, positive net rewards are also used to explain whether or not employees will participate in corporate-sponsored waste management activities. Costs and rewards are shown to include not only money, but also time, anxiety, pressure, recognition, and feeling good about one's self, as Winton (1995) explained.

Empirical Work

To place this study in the context of other recent work in this field, a search of empirical literature was conducted. Prior studies related to corporate culture and to integrated waste management behavior were sought. Key works in these two topics are summarized here. The final section of this chapter describes how the present work differs from, and adds to, the currently-available literature, as reviewed in this section.

Corporate Culture

As previously mentioned, corporate culture is a difficult concept to define and measure. Investigations involving varied emphases, methods, and theoretical perspectives abound. Quite a few studies emphasize corporate culture within a specific company or country as case studies (Sunoo 1995; Rowlinson & Hassard 1993; Bourgault et al. 1993; Yeh 1995). Corporate culture in the computer systems industry, in particular, has been emphasized in several books or sections of books.

In Who's Afraid of Big Blue? (1989), former Santa Clara County public relations mogul Regis McKenna, focuses on IBM ("Big Blue") in the changing world of the late 1980s computer systems industry. McKenna writes an entire chapter on the topic of the changing computer systems industry -- the effects of electronic advances, personalization of the computer, the rise of networks, a new breed of user, internationalization, and so forth. Furthermore, many of McKenna's chapters profile Santa Clara County computer systems companies as examples of what was occurring in the industry.

The Coming Computer Industry Shakeout (1984) by Wall Street professional Stephen McClellan, presents a practical view of the computer systems industry in the early 1980s. McClellan's book is targeted at a business audience wanting to understand the technologies and players of the industry. The book includes an overview of the changes affecting the industry at that time, followed by in-depth assessments of major players in the industry, such as IBM, Burroughs, Digital Equipment, AT&T, and others. McClellan concludes his book with views on the future of the computer systems industry as seen from the early 1980s.

In Silicon Valley Fever: Growth of High-Technology Culture (Rogers & Larsen 1984), corporate culture in Silicon Valley's computer systems industry during the early 1980s is described. The book includes background stories of early Silicon Valley computer systems companies such as Hewlett-Packard, Fairchild Semiconductor, and Varian Associates, among others. Rogers and Larsen describe the demographics of Silicon Valley, and what typical workdays and lifestyles were like during this time.

Academic literature shows that different methods can be employed for the study of corporate culture. Descriptive, ethnographic studies of corporate culture are common (Workman 1995; Lawson & Ventriss 1992). Books describing the method are also readily available (Fetterman 1989; Agar 1980; Edgerton & Langness 1974). Many researchers choose to investigate specific elements of organizational culture using quantitative, statistical methods (Petty et al. 1995; Cooke & Rousseau 1988). Investigating corporate history (Rowlinson & Hassard 1993) or corporate stories (Hansen & Kahnweiler 1993; Meyer 1995) were other methods employed to portray corporate culture.

In addition to differences in emphasis and methods, theoretical perspective is perhaps the most variable aspect of academic research related to organizational/corporate culture. How researchers view, internalize, and understand corporate culture affects their findings. That is, in studying organizational culture, researchers approach data and analysis with different theoretical perspectives. Petty et al. (1995), for example, employ the perspective that organizational culture is a combination of short term, malleable elements, such as how an organization sets strategy or measures

progress, and long term, static elements, such as the underlying set of assumptions and beliefs that are shared by members of an organization.

Moran and Volkwein's (1992) theoretical perspective is that organizational culture contains two entities -- culture and climate. Culture, they say, represents the more implicit features of organizations, not immediately interpretable by outsiders, such as values and meanings. Climate, on the other hand, is the organization's attitudes, behaviors, and practices.

Gundry and Rousseau (1994) offer yet another theoretical perspective of corporate culture. These researchers claim that corporate culture is not an entity but a "... complex social process whose content varies from tangible artifacts (e.g., insignia and badges) and observable patterns of behavior (e.g., informality, confrontation), to implicit values (e.g., perfectionism, personal growth) and unconscious assumptions (e.g., invulnerability, insecurity), difficult for even members to articulate," (Gundry & Rousseau 1994, 1064).

The emphasis of the current work is on one industry as a case study. Analysis is performed using qualitative, ethnographic methods. The theoretical perspective of corporate culture follows the definitions offered by Deal and Kennedy (1982).

Waste Management Behavior

The majority of academic research associated with integrated waste management examines recycling behavior in the residential sector. The work of Vining and Ebreo (1990) for example, is typical. In their work on What Makes a Recycler?, these researchers examined the differences in knowledge,

motives, and demographic characteristics of recyclers versus non-recyclers. Information on these variables was obtained by calculating statistical results from surveys returned by 197 households in Illinois. Many other studies of residential recycling behaviors, collected by survey and analyzed quantitatively, have been completed also (Oskamp et al. 1991; Lansana 1993; Hopper & Nielsen 1991).

In one of the few academic studies on waste management activity in a business setting, Lee, De Young, and Marans (1995) conducted a quantitative examination of recycling behavior of office workers in Taiwan. In this study, a survey was administered to 1,788 workers in Taipei to measure household and office recycling behavior, commitment to and motives for recycling, and the convenience of carrying out recycling in their office settings. These researchers found that prior behavioral experience has a powerful effect on subsequent behavior, even when the subsequent behavior is in a new setting. That is, Taiwanese office workers are more actively involved in recycling at work when they also recycle at home.

Several resource manuals and guide books on the topic of commercial and industrial waste management have been completed by government and private organizations. While these references do not provide theoretical analyses, their data and recommendations are nonetheless valuable. In their resource manual, Encouraging Commercial Sector Participation in Waste Diversion Programs (1992), for example, the California Integrated Waste Management Board presents an overview of commercial waste management programs, suggestions for encouraging participation, case studies of waste

management in seven California businesses, and mechanisms for monitoring waste management programs.

Technical and financial details of waste management behavior are given in the Source Reduction Now (1993) guide book, produced by the Minnesota Office of Waste Management. This guide book offers steps to implementing a source reduction program in various organizations. It also provides detailed case studies of three organizations: a hospital, a community newspaper, and a county courthouse.

The Solid Waste Committee of the Santa Clara County Manufacturing Group created a valuable reference in their Guide to Commercial Recycling (1992). This guidebook provides information on specific waste management activities such as source reduction, reuse, recycling, and buying recycled-content products. Additionally, waste audit instructions, the recycling market, problems with plastics, and life cycle analysis are presented. Since this guide book is targeted at the Manufacturing Group's member companies, the local focus on city franchise agreements, recycling service providers, city contacts, and model company case studies was particularly applicable to this investigation.

Contributions of the Current Work

This thesis differs from, and adds to, the current body of literature in several ways. First, the emphasis is on organizational culture in a corporate setting. This is a case study in the computer systems industry, which has not yet been documented in academic research. Second, cultural and waste management data were collected and analyzed qualitatively, as an

ethnography. While descriptive, qualitative methods are common in the study of cultures in general, quantitative methods are more commonly used for studying waste management behavior. Thus, this thesis investigates waste management using a different research method.

Additionally, the research investigates the effects of corporate culture using a very specific definition (Deal & Kennedy 1982). Other research investigates corporate culture in terms of other definitions, such as employee attitudes, knowledge, or demographic characteristics. Also, this work is not limited to investigating recycling activities as are other studies, but examines an integrated suite of waste management activities.

Finally, the theoretical perspective of this thesis -- a combination of Deal and Kennedy's (1982) definition of corporate culture with behavior explained by social exchange theory -- has not yet been documented. This unique combination of emphases, methods, and perspectives will add to the body of research in both corporate culture and integrated waste management.

CHAPTER 3

BACKGROUND: CORPORATE CULTURE

Original Corporate Culture: 1980s

Santa Clara County computer systems companies shared a unique corporate culture during much of the 1980s. The work pace was intense, incurring significant personal costs upon employees and management alike, but the rewards were great -- much money was made, employment was up, and companies were like families with employees generally happy and well taken care of. "Our credo is work hard, play hard, and don't worry about the difference between work and play. There isn't any," one executive told authors Rogers and Larsen (Rogers & Larsen 1984, 29).

This section describes the corporate culture of Santa Clara County's computer systems industry during much of the 1980s,¹ organized and analyzed according to Deal and Kennedy's (1982) definitions of corporate culture.² This look at the industry's original corporate culture is given as a predecessor to the description of the industry's current culture, which is described in the following section.

Business Environment

With the introduction of personal computers in the early 1980s, computing power was extended to individual users. As users began to understand computers' capabilities, they began to create a great demand for

¹For the purpose of this document, this period is identified as the "original" culture because respondents frequently referred to it as "the way it used to be."

² See definition of corporate culture in Chapter 2.

computer systems. In response to increasing opportunities, many new companies joined the computer systems industry during the early 1980s, initiating a competitive force that would later control the industry. Many existing companies experienced their first wave of significant financial growth during this time, and many founders, investors, and employees became millionaires with publicly traded stock. Cash almost seemed to shower down upon many companies. "We grew up in a high profit-margin environment," Paul recalled fondly. Mitchell similarly reminisced,

There was an entrepreneurial feeling back at the beginning because you're growing like mad: you're bringing people in, product sales are growing, and the profit margin allows you to continue to invest in the company. There was a feeling of "invest in growth; don't worry about the little things, they'll take care of themselves."

Technology, creeping comparatively slowly during the 1960s and 1970s, soared during the 1980s. "Who could have predicted that vacuum tube circuitry would become transistorized and put on microchips, enabling the entire contents of a computer processor to be placed on a component the size of a paper clip?" asked author Stephen McClellan during the early 1980s (McClellan 1984, 3).

The work pace was intense and demanding during these years. Work days were often long -- fifteen-hour days and/or seven-day work weeks were not uncommon. Many commitments, families and marriages were put on hold while employees completed critical work projects. Employees were well compensated and well cared for, however, and the work was stimulating and challenging.

Values

Throughout much of the 1980s, employee satisfaction and well-being were high priorities for companies in the computer systems industry. Management espoused values such as integrity, trust, candor, dignity, and credibility. Paul said that Eritech's management values, for example, included employees' rights to be treated fairly and with respect, and employees' freedom to be individuals. Similarly, Ken said that Analyzer's founding philosophies were based upon, "the underlying theme of respect for the individual... a good place to work..., taking care of its employees..., employees treated fairly and equally." In a recipe for successful management during this time period, author Stephen McClellan (1984, 45) offered the following advice: "It is up to management to plant the seed. Team spirit, enthusiasm, common goals, and a feeling of identity are all encouraged. Management really has to care about its people and show an interest."

Management's high value on employees in the early 1980s created a "win-win" situation with many rewards. Management, on the one hand, found that satisfied employees were productive employees, or as Ken summarized, "If you take care of the people, the work gets done." Similarly, employees benefited from management's dedicated focus on their well-being. While they worked hard with long hours, they felt supported and part of the company family. They were given respect, training and a many personal benefits.

Heroes

The values of a company are personified in their heroes, and many heroes are the company founders. In a commonly recognized example of Santa Clara County computer systems company founders as heroes, Bill Hewlett and Dave Packard were models of company dedication in their decades of service at the company they founded, the Hewlett Packard Company. Based on their strong company values, HP's corporate culture has been rooted in concern and respect for employees. Authors Rogers and Larsen wrote, "Hewlett Packard pioneered in the formation of the distinctive Silicon Valley management style, which in essence, consists of showing employees that management cares and treating them as family members" (Rogers & Larsen 1984, 34).

Another example of a Santa Clara County computer systems company founder who personified the value of employee importance was James ("Jimmy") Treybig, founder of Tandem Computers Incorporated. Author Regis McKenna said that Treybig went out of his way to stay in touch with Tandem employees – meeting new employees, encouraging employees to come to him with suggestions and complaints, responding to electronic mail from employees (McKenna 1989, 83). Author Stephen McClellan agreed (McClellan 1984, 274):

Tandem can be summarized on one word: Treybig. Treybig's Texas drawl and self-assuredness, combined with his sincere care for and trust in his employees, is renowned in Silicon Valley. Treybig is both the gospel and the keeper of the creed. Treybig's office is no different from that of the lowest-paid programmer – small and unassuming. There is an atmosphere of trust at Tandem. Everyone is in it together. Friday afternoon beer busts include everyone from the president to the plant janitor. Everyone communicates, from the highest to the lowest level.

Respondents agreed that the founders of their companies were instrumental in shaping corporate values, philosophies, and culture. Alan expressed his experiences of Eritech's founders this way:

In those days, [they] were able to come down to the divisions. They were able to get out a lot. They were very people-oriented. At that time, they were more concerned about the individual. [They have had a] major, major influence. I don't think this corporation would have been around as long or been as strong if it weren't for their influence. They were always there, willing to listen to the employees.

Mitchell described Chromatic's founder this way,

[He's] a very fun guy –greatly respected by the other executives. He's fun, relaxed, at-home -- appeals to people's values. He bonds with everybody. He makes friends. He knows tons of people; totally open-door kind of guy. Loves the beer busts and drinking beer and having fun with people. It's partly because of that friendly style that so many people have stayed with him. [Chromatic's] one of the best places to work from a familial point of view.

Rituals and Celebrations

Rituals are commonly observed practices and procedures, consistent with the corporate business environment and corporate values. Training, for example, was one ritual wherein management demonstrated its high value on employees. In the original culture, management prioritized thorough training in order to prepare new employees for the work ahead and to carefully usher them into the corporate family. Despite the significant resources required to offer trainings, management believed in their value to employees and to company cohesiveness. Paul recalled trainings at Eritech:

When you first got to [Eritech], there was a two day class; basically, it introduced people to [Eritech]. There was about two or three core classes that you were required to take within a six month to a one year period, as a new employee. That's when you would get exposed to the company's

basic philosophies. This is where the [Eritech] culture was passed from employee to employee and built up.

Hiring new employees is another ritual in the corporate culture. High product demand throughout most of the 1980s meant corporate management sought many new employees during this time. In order to attract needed personnel, companies frequently offered sky-high salaries topped off with magnificent stock options, relocation allowances, comprehensive benefits, and advancement opportunities. While management incurred significant financial costs of hiring so many new employees, the costs of losing pace in the technology race were even greater. The lure of financial incentives were so attractive to employees during these years that a trend of job-hopping was created -- staying with a company two years or less, before seeking greener pastures. The reward for job-hopping was enticing -- often a raise of ten to fifteen percent or a move up the management ladder.

In the original culture, firing or layoffs were uncommon, another indication of the high value management placed on employees. During this period, great lengths were taken to preserve jobs. Layoffs were rare and slow financial times were handled in creative ways. Alan recounted what happened at Eritech,

In the middle 80s, we had a crunch where the economy was down and we could easily have laid off a lot of people. [Eritech] totally refused, and that was the philosophy at that time -- there were no layoffs. What we did, we went to a four day/five day week. All certain-level managers and up took a 5%, and other levels, some took a 10% [pay cut].

Ken recalled his company's creative actions,

[Analyzer] recognized that it was too large, too big, too many people in the mid-eighties. In 1984, it began to bring the population down. It did that through a no-layoff practice. The numbers came down through various

incentive programs encouraging [Analyzer] employees who were eligible to retire, to go off and take academic leaves and all those kind of things.

Sometimes, "no layoff" policies caused management to become zealots, accepting the costs of inefficiency in the name of allegiance to employees.

Mitchell elaborated, "[Chromatic] didn't fire enough people. We tolerated inefficiencies from certain people because there was a feeling that they would learn from their mistakes and be better employees long term."

Alan agreed:

One of the weaknesses I've felt of [Eritech] over the years is we do not eliminate our poor employees. A poor employee can be somebody who comes in everyday and doesn't perform his or her job. I think we've always had a weakness of not eliminating those type of people. I think the commitment [of the company] has been so strong that we've overlooked a lot of that.

The rituals of the hard-working, day-to-day life of the early 1980s, were rewarded with big celebrations. Parties, complete with food, drinks, and entertainment, were given regularly on company time to commemorate successes and to encourage camaraderie. Executive staff were involved, presenting short state-of-affairs speeches and shaking hands of employees. During these gatherings, employees could relax and visit, and get caught up with one another. Such celebrations exemplified management's focus on employee well-being, and fostered familial bonds among employees. Paul described a celebration at Eritech, typical of those held throughout the industry during the 1980s:

[Eritech] has traditionally celebrated its successes with beer busts. We enjoyed that! Basically, a beer bust is a celebration for a division or a function or a group for their successes, like a family celebrates. Like I said, five years ago we had 5000 employees here and we had beer busts once a year, maybe twice a year in the patio area, just a big celebration. You talk to people, you get out of the office environment into a very social, mingling

of the employees, "what are you doing? how's your career?" kind of a family environment. I think the biggest celebration on this site was when we surpassed the one million mark of [our] computers. We had a mega-beer bust. Basically, the company provided beer and food. They started at twelve o'clock with lunch – hot dogs, hamburgers, steaks, shrimp. We all got together to drink, party, socialize... That went on until about nine or ten. People mingled around. With 5000 people, you got the opportunity to visit with most of them. That was pretty neat.

Summary

The Santa Clara County computer systems industry's corporate culture during much of the 1980s can be characterized through a few of the slogans of the times: *Life in the fast lane. Work hard, play hard. You've got to spend lots of money to make lots of money. The company will take care of you.* The business environment could be harsh, but was not without its rewards. Management highly valued its employees, and regularly demonstrated its concern. Founders were heroes, exemplifying corporate values and providing tangible role models for employees. Finally, through the rituals and celebrations they experienced together, employees and management alike were knit together in close familial bonds. The end of the decade, however, brought an end to this culture, and a new corporate culture emerged in its place.

New Corporate Culture: Late 1980s to Present

The computer systems industry corporate culture has experienced some significant changes since the late 1980s. "Our corporate culture is in flux; there is dramatic change that [Analyzer] is undergoing," Ann noted. "The company today is different than it was a few years ago," her colleague,

Ken added. This section describes the corporate culture of Santa Clara County's computer systems industry as it exists today, with an emphasis on cultural changes since the early 1980s.

Business Environment

The magnificent financial opportunities and growth available during the 1980s enticed multitudes of new companies to join the computer systems industry. The marketplace today is intense and aggressive; competitors are numerous. Ken reflected on his company's marketplace:

Today, there's hundreds of thousands of companies involved in the very dynamic business of the computer industry, which covers everything from CD-ROMS to large mainframe computers to personal workstations. It's an entirely different business today than it used to be.

While competition has always characterized the computer systems industry business environment, at no other time has it been as relentless and bloodthirsty as it has been since the late 1980s. Indeed, fierce competition is arguably the single most impactful element of today's computer systems industry business environment, affecting all other aspects of the industry's corporate culture. "I think it's [former culture] slowly going away. The competition has changed it," Alan lamented.

Competition has encouraged rapid evolution of technology. Every product release seems to encompass yet another pivotal technological advancement -- smaller, more efficient circuitry, faster response times, easier connections, and so forth. In turn, users seem almost insatiable. They endlessly want more, faster, better. In order to survive in an industry with demanding customers who may choose from a variety of vendors, companies have had to responded with new technology in lightening fast speed. "If

you're not out there pushing the fore-front, you fall behind very fast. Getting a product out in the market place in a fairly short time frame can mean life or death," Carl explained. Lou Gerstner, CEO of IBM Corporation, wrote in his letter to investors (IBM Corporation Annual Report 1993, 3):

1993 was the worst in IBM's history... At the heart of the turmoil is one simple fact: IBM failed to keep pace with significant change in the industry. We have been way too slow getting new things to the market. We had all this great technology coming out of our labs, but time and again someone else beat us to the marketplace... There is real value to speed, to being first -- perhaps more than in any other industry.

Values

Intense competition in the computer systems industry has affected corporate values. Whereas formerly, management highly valued employee well-being and the "company-as-family" philosophy, today's computer systems companies value efficiency, productivity, timeliness, quality, and basic survival above other things. Financial performance governs and controls every action. Every product created, every supply purchased, every employee benefit offered, are closely scrutinized in terms of their impact on the financial bottom line. Alan reported:

I think we're getting more managers that are concerned about shareholders and profit bases and what they can do to get that. We are very competitive right now, and that's all that I believe is the main objective of the corporation is the profit base, and how do we get to that profit base.

Paul agreed, "It's been, 'we need to be competitive, we need to get our orders in.' Basically, [management's] immediate impact has been to stay competitive in this very highly competitive and changing market."

Related to the competitive environment, a new value that has surfaced is the "visibility" factor -- that is, looking good. Because the choices among companies and products are so numerous, companies want to (even need to) look good in order to maintain loyalties with employees, customers, stockholders, and the community.

Heroes

Company founders have all but disappeared. With them, they have carried away the founding priorities and values of the original culture. Replacing outgoing founders have been a new breed of executives, hired for their knowledge and experience with the new competitive market. Ann gave this report regarding Analyzer's new leader:

Now you also probably know, because of the recent business conditions in the computer industry, [Analyzer] has changed some of their practices. They've had to revamp themselves as a company because it's simply a matter of the old system no longer working and we were no longer profitable. So we have a new executive; one of the first executives who ever came in from outside [the company]. One of the things that [he] is trying to do is he's trying to redefine [Analyzer].

One of the last of the early founders, Jim Treybig of Tandem Computers Incorporated, also recently left his founding company. A news article announcing Treybig's departure as Tandem's CEO reported (Gomes 1995, 1D):

Tandem ends an era... James Treybig, founder of Tandem Computers Inc. and one of Silicon Valley's best-known and most respected executives, will be stepping down as Tandem's chief executive... It is one of several efforts... that the Cupertino company is undertaking to bring in new blood.

Knowing the significant impact that a company hero can make, author Stephen McClellan concluded his early acclaim of Tandem's successes and

unique culture by saying: "... as long as Jim Treybig is still around, this company will hold together" (McClellan 1984, 276).

Rituals and Celebrations

Corporate rituals, commonly observed practices and procedures, have experienced changes consistent with the new business environment and corporate values. Maintaining profitability has forced many companies to recognize low product prices as a way of life. Slashed product prices, in turn, have had a chain reaction resulting in reduced profits and reduced spending. In his letter to stockholders, Lou Gerstner, CEO of IBM Corporation described how his company intended to fix their financial woes (IBM Corporation Annual Report 1993, 4):

We believe we can fix these problems... We began cutting costs aggressively. We reduced our worldwide work force last year by 45,000 people... We are looking at every process, every piece of property, eliminating what's not necessary or fundamental to our business.

As Gerstner indicated, in a tight financial situation, all spending is subject to cutbacks, even those areas which were formerly sacred, like employment. Hiring, for example, has changed dramatically. In contrast to the lavish salaries and benefits formerly used to entice a plethora of new employees, hiring freezes are now the ritual.

Established employees are not immune from spending cutbacks. Scaled back annual performance raises and benefits are now commonplace. According to the U.S. Labor Department, "For the sixth consecutive year, the raises the U.S. workers received in 1995 were equal to or less than those of the year before... The 2.9 percent increase in overall compensation last year... was the skimpiest since at least 1980" (U.S. Labor Department 1996). Jobs are now

viewed as precious commodities. Job-hopping, once the darling pastime of upwardly mobile workers, has become a distant memory.

Employee cutbacks, once rarely executed, are now a potential part of every employees' reality. Gone are the days where slow financial times were met with creativity in order to retain employees. "Out placement" authority James Challenger said simply (Ross 1995, 1PC):

We live in an age when every employee has good reason to worry about being laid off. No one is immune from the job-cutting ax. One day you're a member of a team and the next day your entire division is being dismantled. Clearly employers have the upper hand.

Alan elaborated further, "Management now says, 'No, we are not going to go to the four day/five day or take a wage cut; we're just going to eliminate jobs.'" Ken sees the same thing happening, "In order to be competitive today, you have to cut your costs. Then you say to yourself, 'how many ways can I cut the cost?' You finally get down to a bottom line that says – to cut the costs, you've got to have fewer people."

Layoffs (euphemistically called "downsizing" or "right-sizing"), are rewarding to cost-conscious companies because they eliminate salaries, benefits, and management overhead. Downsizing has intangible costs, however, such as the technical and cultural experiences that dismissed employees take with them.

A new ritual that has evolved in the current corporate culture is the replacement of permanent employees with contingent workers, such as part-timers and independent contractors. Temporary employment, for example, grew by 48 percent in Santa Clara County between 1990 and 1994, while overall employment fell by 1.6 percent (Stuchinsky 1996, 10). Contingent workers provide attractive benefits for corporate management. They offer

flexibility to increase or decrease a work force in short notice, and eliminate management's commitment to long-term, full-time salaries and benefits.

There is a dark side to this trend, however, as noted by William Jiang, San Jose State University business management professor (Stuchinsky 1996, 11):

The phenomenon [temporary-heavy workforce] tends to erode the traditional relationship of employee loyalty to employer. On both sides there is much less commitment. This may backfire. The costs of having employees not as committed to your company may or may not be offset by the labor savings. It may impact productivity as well.

Another new ritual that has emerged in today's computer systems industry is reorganization. As companies scramble to produce products with faster response times and more features in increasingly smaller slices of time, the stable organizational structure of the original culture has become a thing of the past. Reorganization, also called "re-engineering," is not unlike the children's game of musical chairs. In a reorganization, employees are shifted into new positions in order to find optimal functional structures according to current market conditions. Following the shift, most employees get new positions (chairs), but the positions of a few employees are eliminated, and so are the associated employees. Because the marketplace is so volatile, employees can expect to work for a new boss, with new co-workers, on a new project, with new objectives, multiple times in their company tenure. Carl described the situation this way:

You're constantly changing your organization to meet the new technology and marketing requirements. Reorganizing, forming new work groups, products teams, etc. entails a lot of constant change in the organization, and even the people and the skill requirements that you need. You're constantly meeting a new challenge. If you're thinking of continuity as doing the same thing every day year in and year out, it doesn't exist. Because the technology is constantly changing, your skill requirements

and your product requirements are constantly changing. So you're constantly adjusting the organization to meet those new requirements.

Cultural Costs

Today's computer systems industry corporate culture has inflicted significant costs on employees at all levels. Employees no longer see management's commitment and loyalty as they once did. "A lot of people lack confidence and trust in upper management," Alan reflected. Instead, employees see management making financial decisions at their expense -- less hiring and more firing, fewer benefits and more responsibilities. Today's corporate culture is spotted with stress, apathy, skepticism, and fear.

Instead of looking to management for support and security, employees now believe that they must look out for themselves and their own best interests, in what's become a "survival of the fittest" atmosphere. Journalist Sherwood Ross observed (Ross 1995, 1PC):

Almost half of all employees worry about losing their jobs, and this fear is breeding a 'me-first' attitude. People more so than ever are looking out for themselves and focus on what they want out of their career as the old social contract is broken.

Spokesperson for the National Association of Temporary and Staffing Services, Bruce Steinberg added, "The concept of 'cradle to grave' employment doesn't exist anymore... Job security is not within the company, it's within the individual and the individual's ability to update their skills" (Stuchinsky 1996, 11).

Respondents from all companies made note of these same cultural changes. "It's becoming a much more roll up your sleeves kind of company," Ann pointed out. "The name of the game today is that you've got to pull

your own oar... If you thought you had a job for life, that's probably not true," Ken added. "As we've gone to downsizing," Mitchell explained, "employees are now trying to make sure they're protecting their own security, so they're less loyal to companies in general. There is a movement away from the fun and relaxed atmosphere." Alan sadly reflected on his experiences at Eritech:

I don't think the company is as close as it was in past years. I think there is more inter-fighting – people do not cooperate or work together because everybody's so concerned about holding their own jobs and staying with [Eritech] that they're not concerned about teamwork as much. Employee and employer are growing further apart now. They're not as loyal, they're not as trustworthy as they were in the past. I don't think anybody's totally happy.

Carl elaborated further about Terrace,

The trend is that employees are more and more responsible for their own career development. They have to expect changes in their career path -- changing skill requirements, changing of employment within a company, and also moving outside the company. I believe that employees these days, regardless of what field they're in, have got to figure that they're going to have five or six different employers during their career and will probably change career fields three or four times during that time, as well as hold multiple different positions within the various companies they get into. The "hiring-onto-a-company-and-staying-there-twenty-years-and-retiring" days are gone.

The formerly cohesive, integrated environment has been further splintered on the basis of employment status. Temporary or contractors are treated like outcasts and never fully integrated into the corporate "family".

Paul offered this story when asked whether contractors are treated differently at Eritech:

Yes, they are. They don't have a name badge. So it's like, 'oh you don't have a name badge, so you're not an employee.' The last beer bust we had (which was this summer), was kind of interesting. It was kind of sparse. Nobody really could understand why or how come. Yeah, the site had gone down to half. But then people said, "gee, there aren't as many people

here; we didn't need as much space." But as we looked back toward the building, and we're out here, we still see people working. "Gee, I wonder who they are?? Oh yeah! Those are the contractors." They're not invited to the beer busts because it's an "employee" function.

Summary

The original computer systems industry corporate culture could be likened to an intense, but rich and happy family. The industry's new corporate culture, on the other hand, could be likened to a disconnected set of individuals, grateful for their coveted jobs, but nonetheless anxious, mistrustful, and self-preserving. The business environment with its multitudes of competing firms and fast changing technology has revolutionized the computer systems corporate culture. Corporate values, once balanced between employee well-being and financial performance, now lean heavily towards strictly business issues. The rituals of everyday corporate life exemplify these new values.

How today's computer systems industry corporate culture affects waste management activities will be presented in a succeeding chapter. First, however, will be a brief detour away from cultural examination in order to reveal some background information on waste management activities in Santa Clara County's computer systems companies.

CHAPTER 4

BACKGROUND: INTEGRATED WASTE MANAGEMENT ACTIVITY

Introduction

In order to evaluate the effects of the computer systems industry's new corporate culture on integrated waste management activities, it is necessary to examine what activities are practiced within the industry. This chapter, therefore, uses respondents' information to create a profile of common integrated waste management activities in Santa Clara County's large computer systems companies.

Program Elements

Within computer systems companies, waste management programs contain certain basic elements, as identified repeatedly by respondents. These basic elements are listed in this section.

Source Reduction

Source reduction refers to any activity that reduces, avoids, or eliminates the consumption of products or materials in order to reduce their associated wastes. It focuses on preventing waste generation as opposed to controlling, treating, or managing waste after it has already been generated. The basic concept is that the best way to manage solid waste is not to produce it in the first place.

While there are many source reduction activities in which businesses can engage, only a few respondents gave any depth or details. Dennis

described how Analyzer has restructured their supply areas in order to expose use, delegate responsibility, and reduce consumption:

In office supply areas, we've eliminated open office supplies. Before, we used to have rooms where people could go in and pick up whatever they wanted. We had tablets and pens and pencils and everything sitting in these rooms. And they disappeared; they just disappeared. They did away with those. So at a department level, we all now carry stationary stores budgets. As we order floppy disks or tablets of paper, or anything, our department budget gets hit with it.

Frank mentioned how his company reduces paper waste (and consumption) through the use of electronic media such as electronic mail, bulletin boards, and printer preview screens:

We're probably using less paper now than we did five years ago. I know that I use the computer more. I do less printouts. I am more apt to do things on my screen rather than to print out something, and I read it here. I think overall, people at [Chromatic] do a lot of that; there's an effort to making this a paperless society. As an example, my little box [pointing to IN box, on his desk] would have been a stack of papers that would have probably filled that kind of a thing. Five years ago, that would have been a library and now its just a stack of diskettes that I hide in the corner. I think that's got a lot to do with source reduction, so to speak.

One reason why respondents didn't often refer to source reduction activities or offer much information might be because source reduction is a somewhat misunderstood activity. That is, individuals have a difficult time recognizing how avoiding the purchase or use of a product could help to reduce waste. Management, too, has difficulty in quantifying and justifying the time and effort required for this intangible activity. Practicing source reduction requires a deeper understanding and level of commitment than other waste diversion activities, and as such, is not always given the same support.

Reuse

Reuse is the practice of using a product or packaging repeatedly in its original form before discarding it. Not only is this activity valuable for reducing disposal, but refillable containers, reusable pallets and packaging, and refurbished machines can save virtually 100% of the energy, pollution and materials required to make them in the first place (Santa Clara County Manufacturing Group 1992, 43). Reuse can appeal to a company because products and materials are consumed more slowly and need replacement less frequently when they are reused. Respondents identified the following reuse activities as common in their companies:

- mailing internal paperwork using reusable inter-office envelopes
- circulating magazines and newspapers within a department
- making double-sided photocopies
- using the backside of a used page for notes and scratch paper
- repairing shipping pallets
- donating used furniture, equipment, and office supplies to charitable organizations

Recycling

In its complete form, recycling involves an actual cycle. First, recyclable materials are collected and sorted.^{1,2} These recyclable materials are then put back into the manufacturing process in order to create new "recycled-content"

¹For the purpose of this document, the term "recyclable materials" refers to waste materials for which a demand exists in the recycling market (see discussion of recycling market in Chapter 6).

²Recyclable materials can originate from scraps in the manufacturing process (called "pre-consumer" materials) or from consumer discards (called "post-consumer" materials).

products. Consumers then purchase recycled-content products. The purchase of these products creates a demand from the manufacturer for more recyclable materials that consumers can again collect and sort. Thus, the recycling cycle (or "loop") continues in this way (Figure 1).

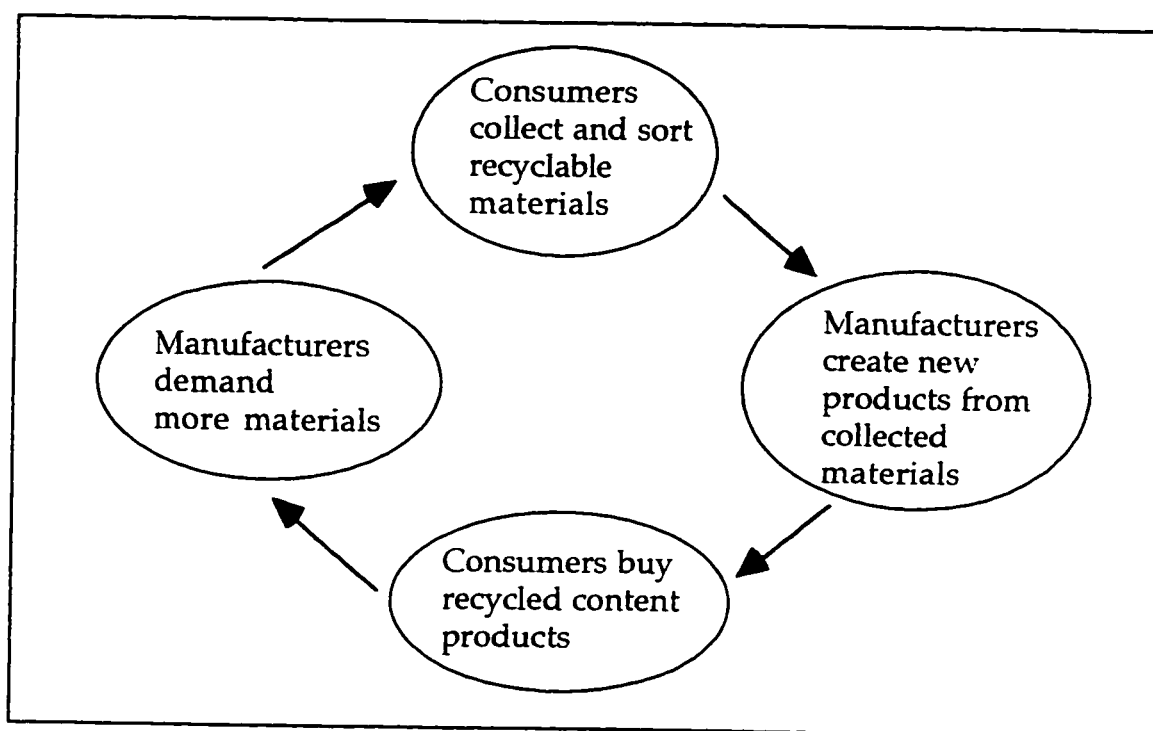


Figure 1.--The Recycling Loop

While recycling often receives the greatest amount of attention among waste management activities, what is called "recycling" generally refers only to the collection of recyclable materials. Buying recycled-content products or materials is viewed as a separate activity and performed less frequently. Table 2 lists the materials most commonly collected and sorted at respondents' companies.

Table 2.--Commonly Collected Recyclable Materials

Materials	Primary Location
Paper (including white, mixed, magazines, and newspaper)	Offices
Beverage containers (glass, aluminum and plastic)	Vending Areas
Polystyrene beverage cups and plates	Cafeterias
Scrap metals (including aluminum, precious metals, and electronic sub-assemblies) and non-reusable equipment and tools	Manufacturing Areas
Corrugated cardboard, polystyrene packaging, and wood pallets	Shipping and Receiving
Landscape debris	Exterior Facilities

The collection of various types of paper by individual employees in deskside or desktop bins was mentioned by almost every respondent. Frank's description of Chromatic's program was typical:

The basic program we have here at [Chromatic] is the deskside recycle box. They come in multiple sizes. People just tuck their pages and papers in there. From this point, you take your the recycle box out to the mixed and white paper recycling stations and dump it off.

Buying Recycled-Content Products

It is not enough to just pull materials out of the waste stream through recycling, something must be done with the collected materials. If not, the materials could flood the market,³ causing their price to drop to the point

³See discussion of recycling market in Chapter 6.

where the cost of collecting them exceeds their value. At this point, processors could no longer afford to collect materials and the whole recycling market infrastructure could collapse (Santa Clara County Manufacturing Group 1992, 49). The purchase of recycled-content products creates manufacturer demand for recycled materials, and diminishes this gloomy forecast.

Despite its significance in the recycling loop, however, buying recycled-content products has not received the same attention as collecting and sorting recyclable materials and was mentioned by only a few respondents. Those who offered details most commonly noted their companies' use of recycled-content paper products, such as photocopy papers and stationery, restroom papers, and packaging cardboard. Respondents didn't refer to recycled-content products very often or offer much detail possibly because buying recycled-content products is normally performed by the Purchasing Department and respondents may not have known the details. Or, the lack of information on buying recycled-content products might indicate that this is an activity not widely promoted or practiced.

Design For Environment

Many companies are becoming increasingly aware of the environmental issues related to their products. Variously called "Design for Environment," "Green Design," or "Environmentally Conscious Products" -- the process refers to environmental sensitivity built into a product, both in its design and in its packaging. A common Design for Environment program, for example, might focus on the use of recycled or recyclable materials in new

products, or the use of fewer parts altogether, or the use of recycled-content materials in product packaging.

Green Teams

At many companies, employees sharing environmental concerns have united together to establish groups commonly known as "Green Teams." Mitchell said that Chromatic's Green Team is made up of interested employees from throughout the company, including development people, the education group, and administration groups. His description of Chromatic's Green Team fairly well sums up such groups at the other companies as well:

[One] advocate group is the "do-gooder" Green Team. They want to see recycling done because it's the right thing to do from an environmental point of view. They're willing to pitch in and have committee meetings to figure out ways to design a logo, to set up boxes, to set up advocates within each building to be the resource to help make sure it goes well, to put in some volunteer effort to make sure that the recycling program gets off the ground. They all have "real" jobs; this is something that happens at lunch times and after hours. The Green Team's probably got over two dozen members on the distribution list, and yet it probably comes down to eight or ten core people who attend meetings when they can.

Communication

The elements of a company's waste management program will sit idle and unused if employees don't know they exist or don't understand them. Environmental staff at most companies, therefore, try to communicate to employees about waste management issues and activities. Methods of communicating include environmental awareness fairs, newsletters, and posters or memos posted on bulletin boards. Using electronic mail ("e-mail")

to communicate information also is a popular technique. Frank described how Chromatic's top executives have encouraged participation by communicating with this medium:

There is an official program that we have here at [Chromatic]. That program started off with a mail message from the president of the company saying that we have a recycle program, and he wants everyone to participate. There was a description of the type of program that we had at the time. It wasn't a big description, but the president of the company asked that we recycle; that it was good for the environment and good for the company.

In addition to communicating to employees, receiving communications from employees is also important. One communication method that was mentioned several times was a corporate e-mail address to which employees could send questions or offer suggestions about various environmental or waste management programs.

Participants

Even if a company establishes a myriad of different waste management activities and promotes them thoroughly, actual participation follows the proverb, "You can lead a horse to water..." According to respondents, waste management program success is not necessarily guaranteed based upon adequate activities and promotion. Individual employees are also a key, albeit unpredictable element in successful waste management programs.

Respondents tended to believe that employee participation in waste management programs varies with the specific individual and his or her job. Dennis, at Analyzer, theorized that employees have varying levels of environmental motivation:

We have those that are basically the hard-core environmental type people, and they will do things for an environmental bent just because it's the right thing to do for the environment. They will chastise fellow employees for not recycling paper, for throwing the wrong things out, or putting the wrong things in the wrong containers and messing up loads. They're few and far between. Most of the people, I think, fall in the middle of the road. People will usually, when you're trying to cut back expenses everywhere, will generally try to do a good job. Then you've got the people on the bottom end of it that they couldn't be bothered no matter what. I'm not sure there's ever a way to get to those people.

Mitchell, at Chromatic, believed that job function has an effect:

Our manufacturing department might be busier than heck and they don't want to play. Or a development department might spend too much time trying to set up a recycling program and their manager might get mad that they're putting the time on peripheral issues rather than getting their projects done. So you've got differing perspectives within a company, differences in how they do things. Different attitudes and different approaches to the day-day business of doing their jobs affect the way that they're going to receive a suggestion to recycle, for instance, and to reduce solid waste.

Program History

In the computer systems industry, some integrated waste management activities have been operating for a long time, while other activities have been established more recently. The collection of recyclable materials for resale, in particular, is an activity that most companies have been practicing for a long time. Dennis said that Analyzer started to address solid waste issues in the mid 1980s and set up a goal to have all of their major manufacturing sites at a 50% recycling rate by 1992. Alan reported that Eritech employees created a small recyclable material collection program in the late 1980s and with management's later support, the program has expanded considerably. On the other hand, respondents at Eritech, Terrace, and

Chromatic noted that their establishment of Green Teams and Design for Environment programs in the early 1990s are relatively recent additions to their corporate waste management programs.

Summary

This chapter has presented some background information on integrated waste management activities in Santa Clara County computer systems companies. Program elements such as source reduction, reuse, recycling, buying recycled-content products, Design for Environment and Green Teams were examined. Communications, likely participants, and program establishment were also presented. The next step in this investigation is to analyze the effects of corporate culture on the waste management activities identified in this chapter.

CHAPTER 5

FINDINGS: EFFECTS OF CORPORATE CULTURE

Introduction

Santa Clara County's computer systems industry has experienced significant changes in corporate culture over the past fifteen years. How the industry's new corporate culture affects integrated waste management activity is presented in this chapter.¹

Economics

The computer systems industry business environment has become fiercely competitive. Every action a company takes is closely scrutinized in terms of its impact on the financial bottom line. For companies in this industry, economics has become the single most significant factor affecting waste management participation. The general rule-of-thumb is that a company will only support a waste management practice if it makes "good business sense". Or, as Ann stated, "What you do is you look for the items that will not only protect the environment, but will give you cost savings, and make your business run more efficiently. You try and combine the two."

Many waste management activities positively affect the financial bottom line in that they decrease operating costs. That is, when solid waste disposal is diminished, so too, are disposal costs (e.g., frequency of garbage pickup, size of garbage collection vessel, landfill fees, etc.). In many cases, avoiding disposal costs is the driving factor for waste management

¹Corporate culture defined by Deal and Kennedy (1982). See Chapter 2.

participation. Carl explained how collecting materials for recycling has reduced Terrace's disposal costs:

We're probably saving in the neighborhood of two to two hundred and fifty thousand a year in disposal fees out at the dump (that's in tip fees²). That's because for every pound of trash we can put into the Recyclery, we don't have to pay the tip fee or we get a reduced disposal fee.

Collecting materials for recycling has reduced disposal costs at Analyzer also, as Ann explained:

See that box there [pointing to the corrugated box next to her desk in which to collect recyclable paper]? Those boxes are distributed throughout the site. Everybody has a box like that in their office. You put all of your recyclables in that box and you carry that down to the waste bins **and** put that in the bin. As a result of that, we've been able to cut back on janitorial service to once a week because there's so much less volume.

Like collecting recyclable materials, reusing products and materials also reduces disposal costs. Product and material reuse also reduces the costs of frequently re-purchasing new products or materials. In one case example (Minnesota Office of Waste Management 1993, 80), an office encouraged their employees to reuse paper by using both sides in the photocopy machine. In this reuse activity, the office reduced their waste stream by five percent and avoided the associated disposal costs. Furthermore, this office was able to reduce their costs of re-purchasing paper by 212 reams per year.

Source reduction (reducing consumption) can also reduce costs. In another case study (Minnesota Office of Waste Management 1993, 69), a community newspaper was able to cut expenses by practicing source reduction activities. In this case, the organization switched from wide-ruled to narrow-

²The term "tip fee" is a waste management industry term. It refers to the fee charged to a waste hauler (and passed along to the generator) to overturn (or "tip") garbage from a hauling truck into the disposal site.

ruled notebooks for employee use, which resulted in the slower consumption of notebooks. The newspaper reduced its waste stream by fifty percent and avoided the associated disposal costs. Furthermore, they were able to cut in half the costs of re-purchasing notebooks.

In addition to reducing disposal costs, collecting recyclable materials for resale can generate revenue, which provides further incentive for corporate management support. "I'd say that the real driving force for a lot of the [recyclable materials collection] programs," Dennis noted, "is the money coming back from the commodity."

Not all waste management activities reduce costs or provide revenue, however. The purchase of recycled-content products, for instance, is one example. "Closing the recycling loop" by purchasing recycled-content products can make logical sense, but in practice can be costly. Certain recycled-content products are in limited supply; prices can be high and products difficult to acquire. Procuring recycled-content products, therefore, can cost a company more money and more time than buying a product made from virgin materials. In this case, the costs outweigh the benefits, and corporate management often finds this activity difficult to justify. Dennis elaborated on this issue further:

I would say that up until the last year or two, we've had really favorable rates from our suppliers such that purchase of new products was a lot more efficient than [buying] recycled products in virtually every line. The primary one being paper. We could buy copier paper and paper for printing brand new much cheaper than we could pay for the recycled materials.

Frank agreed,

We've got a problem where it is cheaper to buy what we call "virgin" product than it is to buy a recycled product. I know that's right because I

have talked with the people that buy the paper for [Chromatic]. It's very simple -- if it's cheaper to buy the virgin product over the recycled product, what are you going to buy? Why would I buy 50 pallets of recycled paper for a million dollars? (That's an exaggeration of course.) Why would I, when I could go out and buy some brand new stuff for 80 thousand dollars? As company, it doesn't make sense.

Looking Good

Another cultural factor affecting waste management activity is corporate management's new value on "looking good." Because of the tireless competition, a company wants to look good and to maintain the loyalty of key supporters. If an activity makes a company look good, it will invite management support. Participation in waste management activities, for example, can make a company look good to their employees, customers, stockholders, and the community.

When a company provides a safe place in which to work and live, the company looks good to their employees, and can build morale and pride. In turn, employees with positive dispositions tend to be more loyal and committed to their work. This ripple effect on employees can encourage corporate management to support environmentally-responsible activities.

Winning the approval of customers helps to maintain and increase sales which encourages corporate managers to support environmentally-responsible activities. "As more and more [environmental] issues come to the forefront, they'll become marketing issues for companies. In a lot of cases, if a company can say they're 'green', they can use that as a marketing advantage over competitors who are 'not green'," Carl noted. Mitchell agreed, "It's becoming a marketing advantage. Our customers are now

beginning to expect a report on how we are performing in a positive fashion on environmental issues."

Stockholders are key to the financial success of a company. In turn, stockholders want to make wise investments. In their quest to invest in healthy companies, stockholders scrutinize all types of company information, including environmental achievements. In order to attract and maintain stockholder loyalty, corporate management is likely to support activities that contribute to a clean environmental record.

Looking good in the community in which a company does business (often referred to as being a "good corporate citizen") motivates corporate management to support environmentally responsible behavior. "It's important to all businesses that we're good neighbors within the community," Frank declared. Academic researchers elaborate on this issue (Vining & Ebreo 1992, 1585):

Societal concerns can affect recycling behavior by evoking a sense of obligation, as individuals engage in recycling because they believe it is expected of them as responsible community members, or because they have altruistic concerns toward their community and its future welfare. Merely considering oneself as a member of the global community may evoke concerns about adhering to social norms.

Layoffs and Work Pace

The culture's propensity for layoffs, coupled with an increasingly pressured and harried work pace tends to discourage employee participation in waste management activities. Layoff survivors can become suspicious, resentful, and protective. With this disposition, many employees view participation in activities other than their primary tasks as too costly (i.e., take

too much time, cause too much distraction), returning negligible personal rewards. Because of this view, the "free-rider" principle applies to employee participation in waste management activities. That is, while many employees applaud their company's endorsement of integrated waste management programs, they view the individual costs of participation as greater than any personal benefit they might receive. This translates into limited employee participation in waste management activities.

Several organizational experts confirm this conclusion. Director of the University of Tennessee's Center for Advancement of Organizational Effectiveness, William Parr, stated (Ross 1995, 1PC):

Fears of downsizing cause employees to view each other with suspicion, as they want to be the ones to survive. The knives come out. You might not have sabotage but you won't go out of your way to help others.

Likewise, Craig Dreilinger, president of a Bethesda, Md.-based firm that advises companies on downsizing agreed (Ross 1995, 1PC):

Employees who feel insecure can become suspicious about others including their manager. Such employees concentrate on looking out for No. 1 rather than cooperating with the team. Employees who feel an injustice has been done, can reduce their contributions in very subtle ways that they feel won't get them fired. They may avoid helping others or distance themselves from the organization. They're focusing on "I'd better take care of myself" and when we take care of ourselves, we don't focus on taking care of the organization.

One layoff in particular, the corporate recycling coordinator, has caused acute pressure on remaining employees and further eroded employee disposition. The recycling coordinator is a corporate "zealot," contributing significant time, thought and energy towards a cause with widespread benefits. A summary of the recycling coordinator's contribution to a

company helps to understand why the elimination of this position is so costly (Brown University 1992, 2):

Within companies, the position and enthusiasm of the recycling coordinator is the most important factor contributing to the likelihood of success of a recycling program. An enthusiastic attitude on the part of a well-liked, powerful coordinator carries over to the rest of the company. Skilled coordinators also devise ways to make the recycling program easy to understand... Perhaps most importantly, skilled coordinators are able to strike favorable contractual arrangements with their haulers.

Even though the recycling coordinator is gone, the associated tasks are often transferred to remaining employees, as Frank described:

We had an individual here for, I guess, about the last seven or so years, who was responsible for the recycling program. About eight or nine months ago, he got laid off, and it became one of those duties that I quickly assumed because it needs managing.

While reassigning tasks to surviving employees has its rewards for cost-conscious management, such actions are costly to employees working at an already frantic pace. The recycling tasks that Frank referred to, for example, were added to his other full-time responsibilities -- "... to maintain and operate all of [Chromatic's] buildings... ...the landscaping, janitorial, pest control, parking lot sweeping, maintenance and repair of all the air conditioning and electrical equipment, and buying all of the parts for support services."

When new (and sometimes unrelated) tasks are delegated to an already-busy employee, the employee tends to see the new tasks as a liability to their precious current position. If anything must be compromised, it will be the newly assigned tasks. Again, it's not that employees don't admire their companies' efforts towards waste management, it's just that they view the costs of participation as greater than the direct personal rewards.

The new culture's hectic, pressured workplace and suspicious, protective employee dispositions has also affected corporate Green Teams. Formerly environmental zealots investing great personal resources and receiving minimal personal rewards, many Green Team members have been transformed into free-riders. That is, like other employees throughout their companies, Green Team members, regular employees volunteering their time, have become very protective of their time and energies. They still agree with corporate participation in environmental causes, but are less willing to participate directly. Mitchell observed, "Right now we're in a quiet period. Since the layoff problem started, they've been trying to get their own projects done, so we haven't had a meeting in a while." Since Green Team members serve as environmental visionaries and cheerleaders, their decreased participation has a ripple effect, translating into decreased waste management participation company-wide.

Summary

This chapter has examined the effects of corporate culture on waste management activities in the computer systems industry. Since extreme competition has forced companies into financial "survival mode," economics has become the most significant factor affecting waste management participation. Favorable economics, wherein benefits (reduced costs or increased revenues) exceed costs (in time or money), encourages management support of waste management activities. Unfavorable economics, wherein costs exceed benefits, discourages management support. The culture's value on looking good encourages management support, but

layoffs, the hectic work pace, and down-trodden dispositions discourage employee participation.

The findings presented in this chapter show that certain cultural factors encourage and other cultural factors discourage waste management activity in the computer systems industry. Because this investigation was conducted qualitatively ("what is going on here?" not "how many are there?"), the findings do not chronicle which cultural factors are more influential or by how much. Respondents indicated that their companies have consistently maintained waste management activities since before the new culture emerged; many companies have even created new waste management programs in recent years. This information implies that the cultural factors encouraging waste management participation (especially favorable economics) are more influential than the cultural factors discouraging participation. Intuitively, it is easy to believe that favorable economics would drive corporate behavior. This conclusion, however, does not explain Dennis' reference to Analyzer's recycling participation "even when it doesn't necessarily make financial sense." If it doesn't make financial sense, then what factors are encouraging Analyzer to support recycling? It turns out that corporate culture, with its emphasis on competition, survival, and economics, is not the only factor affecting waste management activity. In order to fully understand what affects waste management behavior in the computer systems industry, non-cultural factors must be also considered.

CHAPTER 6

FINDINGS: EFFECTS OF NON-CULTURAL FACTORS

Introduction

While corporate culture is one factor affecting integrated waste management activity in the computer systems industry, other non-cultural factors are also influential.¹ Indeed, in order to fully understand waste management behavior in the computer systems industry, both cultural and non-cultural factors must be identified.² This chapter presents an overview of non-cultural factors affecting waste management activity. The analysis separates non-cultural factors into "internal" (i.e., originate or are controllable within the company) and "external" (i.e., occur in part or in whole beyond a company's control) factors. The complete text of Dennis' remarks, abbreviated in the previous chapter, provides a good introduction to this chapter:

We continue to go out and look for different things to recycle when it makes sense from a financial standpoint. And in some cases, we still do it even when it doesn't necessarily make financial sense. Again, it basically falls back on if it's a "good thing to do" for the environment. Also, there's some public visibility that you get from it. And there's also an intangible when you apply for awards from the County, or the City, or from other environmental organizations. It looks good, it does. ... there are some intangible aspects of doing a lot of these programs. Like you said, there's no driver for it, there's no requirement for us to do diddley on it. Yet we're still doing it.

¹For the purpose of this document, the term "non-cultural factors" refers to elements that do not fit Deal and Kennedy's (1982) definition of corporate culture. See Chapter 2.

²The terms "waste management" and "environmentally-responsible behavior" are sometimes used interchangeably in this chapter. Environmentally-responsible behavior refers to actions that maintain or improve any aspect of the earth's condition. This term will be used only when such global actions also encompass the proper management of solid waste.

Internal Factors

The Right Thing to Do

Altruism or "doing the right thing" (i.e., what one "should" do morally, socially, politically, or emotionally) is a factor that encourages management support of waste management activities. Apparently, many companies accept and prioritize their personal responsibilities towards the environment. Dennis believes that this is a strong motivator for Analyzer: "That's the way they want to run their business. Just the underlying fact of the environmental programs and how far back they go within the corporation as a whole, tell you that there's someone sitting at a CEO level who wants to run the business that way. Somebody just decided that's what they wanted to do."

The "right thing to do" also encourages individual employee participation, as Ann noted regarding Analyzer's desktop recycling program:

At our site, everybody has those boxes, but you're not required to use it. For example, if you're the type of person who doesn't think that's important, you can still throw it in your waste basket. But I would say, if you looked around, you'll find most people using them. We can achieve a very successful program just because 99% of the people think this is the right thing to do and will do it.

Myths

Myths tend to discourage corporate management support of waste management activity. Myths exist because waste management concepts and practices are not adequately defined, illustrated, or updated. Without

regularly updated information and training, myths tend to depress a company's involvement in integrated waste management.

One common myth, for example, is that it is less expensive to discard materials than it is to collect, sort, and sell them. For example, Frank made this comment:

The commodity of the recycling product is going downhill slowly. I mean, the cost per ton. Aluminum isn't what it once was. Cardboard isn't what it once was... We have well over 600 stations here at [Chromatic]. It got to the point where it became so labor intensive, that they were spending more on the labor than they were getting on return on the commodity. When you see that the price of the commodity is spiraling downhill, then you end up with a problem because you've got companies that are in business to make money saying, "I can't make any money, I'm out of here."

The "recycling-is-too-costly" myth does not take into account avoidance of disposal costs. Most of the benefits of recycling do not result from revenue from the sale of recyclable materials; avoided disposal cost is a more significant factor. This myth is further aggravated by outdated information based upon a fluctuating recycling market.³ Author Lynn Scarlett acknowledged these fluctuations in her review of the recycling market (Scarlett 1996, 51):

A chart of recent recycling prices looks like blueprints for a Coney Island roller coaster. Around 1991 came the Big Fall. A "basket" of recyclables that garnered \$70/ton in 1989 earned the recycler a meager \$25 or so by 1992. What a difference a year makes. By mid 1994 the Big Climb was well underway. OCC (old corrugated cardboard) prices jumped from \$25/ton to \$150/ton during the first six months of 1994. Mixed paper prices advanced 10-fold from \$5/ton to more than \$200/ton. The Big Climb is, however, not the end of the story. By mid-June 1995, one paper broker exclaimed in *Recycling Times*, "It's plummeting," referring to the price for recycled

³See discussion of the recycling market in this chapter.

white ledger paper. HDPE [plastic] prices for baled natural bottles dropped 35% in a single month.

While it is true that collecting and sorting some sets of materials at some times are difficult to justify financially, this is not true for all materials at all times. Cost avoidance of disposal fees often justifies the efforts of collecting materials. In addition, the recycling market has expanded to the point where many commonly-generated recyclable materials can be sold for enough money to at least support the effort, if not return a profit.

Another common myth says that recycled-content products and materials are of lower quality than virgin products and materials.⁴ Mitchell made this comment:

The recycled kind [of paper] is kind of dusty, and that throws off the sensors in the reproducing machine. If the copy machine is broken all the time because the sensors are clogged, then everybody's gonna hate recycled paper, so it's unwise to bring it in.

The Santa Clara County Manufacturing Group's Solid Waste Committee offered the following remarks in direct response to the "poor quality" myth (Santa Clara County Manufacturing Group 1992, 19):

Business consumers cite poor quality as the reason they won't purchase recycle stock for their reprographics departments. They may be remembering the recycled paper of the 1970s, when growing environmental concerns prompted paper mills to rush-produce low quality recycled paper. Currently, recycled paper is virtually indistinguishable from virgin paper.

⁴The term "virgin" is a waste management industry reference to products and materials manufactured from new, unused feed stocks.

Nay-sayers

"Nay-sayers," a small but vocal segment of the corporate population who argue against environmental programs, is another factor discouraging corporate management support of waste management activity. Nay-sayers can obstruct environmental policy by creating a cloud of conflict interfering with and slowing the approval process of activities. Mitchell elaborated,

There is a good portion of the population who don't like this. They don't like environmental stuff. They see everything environmental with a broad brush -- "Environmentalists are stopping good business processes with oil companies, and they're gonna be just as much trouble here in the computer company, so I don't like 'em... and I don't want 'em to do anything here at [Chromatic]." ...Whenever I do an Earth Day message or a general distribution message, I get a few knee-jerk reactions saying, "environmentalism is bad for business, and this function should not be supported by our executives."

Trendiness

"Trendiness" or the desire to "keep up with the Joneses" is a factor that encourages management support of waste management activities. Following the 1990 celebration of Earth Day, for example, heeding environmental issues has become popular and trendy. "It's become in vogue now with Earth Day and all these kinds of things," Ken pointed out.

Program Characteristics

The characteristics of waste management activities implemented by corporate management affect employee participation. If an activity is simple, convenient and visible, participation is more likely than if an activity is complex, inconvenient, or scarcely noticeable. Visibility in particular "may increase the perceived social pressure to recycle, and also serve as a reminder

to participate" (Vining & Ebreo 1992, 1604). Carl commented about making activities easy:

I think that in just about all cases, if you make it easy for the employee, you'll get their buy-in and cooperation. If you don't make it easy, your program's going to have a real tough time surviving, because you're depending upon each one of them to do their little part, even though it's small. If they don't do it, you essentially contaminate the program.

Dennis concurred regarding simplicity,

The real key is to try to make whatever we're doing as simple as possible for people. The simpler the better. The KISS [Keep It Simple, Sweetheart] principle really kind of runs the program. If they've got a convenient place to put paper to recycle, they'll do it. If they don't they won't. At one time our paper program was set up to separate colored paper from white paper. So we basically had a mixed paper bin and a white paper bin. We couldn't get employees to separate those two. If the mixed paper bin happened to be full and they're standing there with mixed paper, where's it going to go? Well, they're there, they're at the containers, it'll go with the white paper. So trying to control that was almost impossible.

Recognition

Recognition, such as civic honors, encourages corporate support of waste management activities. Companies enjoy the prestige and recognition gained from receiving public awards. "We've got a number of programs in the solid waste field where we've received some awards from the Peninsula Conservation [Center] for the successes we've had in those programs," Carl beamed proudly. Several state and local governments, and local business organizations offer corporate award recognition programs such as the California Integrated Waste Management Board's "WRAP" (Waste Reduction Awards Program), and Peninsula Conservation Center's Business Environmental Awards.

Recognition also encourages employees. Awards offer employees honor among their peers and superiors. Some awards provide cash incentives. Analyzer, for example, offers an award program to recognize employees for achievements in environmental, energy, and safety and health programs. Ann described an example of this award,

One example is about a particular group of engineers. They completely leapfrogged corporate requirements for using recyclable materials in packaging. It's really nice because that group has gotten recognized. They've gotten recognized both internally and externally. Most recently, [those] engineers won a [cash] award from [Analyzer] in recognition of their environmental packaging program.

External Factors

Legislation

Because it requires compliance, legislation is the single most impactful factor influencing corporate behavior. That is, when government mandates conduct, companies must respond or face the consequences. One might conclude therefore, that if the commercial/industrial sector were required by law to reduce solid waste disposal, local governments could easily achieve their waste diversion objectives. The situation, however, is not quite so simple.

Current California waste management laws (such as AB 939 and subsequent legislation) are indirect; they do not target the behaviors of specific waste generators, such as businesses. Likewise, neither do local governments single out individual generators. Instead, the commercial/industrial sector has been asked to voluntarily curtail their waste disposal. Without obligatory

legislation, however, the business community has responded on a limited basis.

A few computer systems companies are motivated by state laws, "We're getting ready for [Assembly] Bill 939, and corporate management is beginning to show more interest; they think it's a field that we should expand and be more involved in," noted Alan. On the other hand, many companies have little incentive to respond to local government "requests" for participation, and tend to be free-riders regarding waste management issues. Mitchell concurred, "A lot of companies will say, 'I am here to run a business and try to employ as many people as I can. I don't want to get in there and be a person that's leading the way on that'."

Since current state waste management laws have resulted in limited corporate response, one might conclude that more legislation would generate greater participation. New laws can be costly, however. For local governments, creating and enforcing laws require human resources and finances that might otherwise be allocated to other activities.

Furthermore, regulations are costly to businesses, as Ken at Analyzer noted:

One of the problems that industry has is that there are regulations on top of regulations. You have federal regulations, you have state regulations, you probably have county regulations. To be sure you're in compliance with all those regulations, you've got to have a staff of people to be able to cope with all that. One, they've got to understand what the law of the land is, and two, how does that affect me and my operation? That's a costly thing to do.

Also, business often view legislation as yet another interference, and many large companies prefer to be left alone, as colleague Dennis explained:

Most of the large companies that I know of have pretty good programs in place and have been doing it for a long period of time. I don't think that

an IBM or an Intel or a National or any of the rest of them need any more focus to tell us to do what we're already doing. I really don't think they do. I know we don't. I don't need the City in here to help me run my program. We don't need it. We all have our programs going, and I think they're working pretty doggone well.

The Recycling Market

Collecting and sorting recyclable materials for resale is probably the most widely practiced waste management activity in the computer systems industry. Recyclable materials, however, are commodities that are bought and sold in a dynamic market. Like pork bellies or soy beans, their "value" as measured by price, depends on how much supply is available relative to demand, and neither supply nor demand are fixed quantities. Thus, the fluctuations of the recycling market can greatly affect corporate management support for collecting and sorting recyclable materials.

The recycling market operates such that processors will only pay for that portion of a company's collected materials that they, in turn, can resell.⁵ What materials processors will buy, and what price they will pay, are directly related to the demand for materials, which is very specific. Politics, economic conditions, new technologies, and even the weather can influence which materials are in demand and which are not. Generally, the materials processors want must be generated in large quantities on a continuous basis, and uncontaminated by other materials. Even when fulfilling these requirements, many materials have little or no demand. Processors must be

⁵The term "processor" is used in this chapter to loosely refer to any intermediary between those who collect recyclable materials and those who use the recovered materials as input to manufacturing.

selective -- sometimes paying very little for a material, or even charging or refusing to collect materials.

If a company generates large enough quantities of high-demand recyclable materials on a regular basis, collecting and sorting can be a lucrative endeavor, motivating corporate management to support these activities. On the other hand, failure to meet the recycling market requirements regarding quantity or quality of materials can result in no revenue or even charges, thus discouraging corporate management from supporting these activities. Dennis explained how Analyzer would be willing to collect many different materials, but the materials don't meet the market's quantity criteria:

A lot of cases where we are now revolve around plastics and plastics recycling. And this is one of those bottom ends. We're [recycling] all the major [materials] that we can; we're doing those relatively cost effectively. Then you start getting into what materials we have left. You've taken the low-hanging fruit off the trees, and now anything you do begins to cost more. It's really driven by a cost-effective nature of it from that end of it. We're still looking at where we have to deal with sizable quantities and continued flow of materials for a long period of time out of this facility before a recycler wants to get involved with it.

Paul reported the same problem with low volumes of materials:

The only glass we generate here is in the cafeteria. But this glass is taken away throughout this site of a hundred acres. How do you invest labor to get it back to one recycling point? The volume is not there. If 3500 people bought glass every day, that'd be fine for volume. But maybe 200 pieces of glass are purchased per day. How do you get those back? ...Glass recycling on this site is just not profitable.

Carl noted problems with contaminants:

In most cases, in most of these waste streams, you have to maintain a certain purity factor in it. If you start to contaminate it, the people you're sending the stuff to are going to reject it because their process is not set up to deal with foreign contaminants. Those contaminants can be cans in your white paper stream, or too many apple cores in your white paper or

in your corrugated. Those kinds of things, they'll kill those types of programs because the people you're sending your white paper or your corrugated to are going to say, "no, I can't deal with it; there's too much trash or debris or whatever in there", and they'll send it out to a landfill or whatever. They'll just quit taking your stuff.

Global Standards

The saturation of the domestic market and the impetus to expand business has urged most large computer systems companies towards international sales. Companies doing business abroad, however, must comply with international environmental standards. The ISO 14000 standard, in particular, stands to greatly encourage corporate environmental practices, including integrated waste management.⁶ One author summarized ISO 14000 this way (Powers 1995):

ISO 14000 is a set of specifications and guidelines for assuring a uniform approach to environmental protection worldwide. To gain ISO 14000 certification, companies would have to establish procedures to identify environmental aspects of all activities in order to determine which have significant impacts. Firms would have to document environmental objectives and targets, and include a commitment to the prevention of pollution. They would also have to train all personnel whose work may significantly affect the environment, and create an auditing system to ensure the program is properly implemented and maintained.

Determining the environmental impact of products, as per ISO 14000, is one of the objectives of corporate Design For Environment (DFE) programs.⁷ DFE programs incorporate environmental criteria at every level of a product, including design, packaging, use, and disposal. Design for easy disassembly, use of recyclable materials, and packaging in recycled-content containers are all DFE elements related to integrated waste management and

⁶ISO 14000 is predicted to be adopted in 1996 (Powers 1995).

⁷See discussion of Design for Environment in Chapter 4.

consistent with ISO 14000. ISO 14000 stands to make such DFE programs ubiquitous.

While conformance to ISO 14000 specifications and guidelines will be voluntary, increasing expectations from investors, business partners, and customers will inevitably demand corporate compliance. This will ultimately have the effect of creating worldwide environmental conformity, including solid waste management.

Logistics

Logistics -- the details, tactics, and maneuvers of waste management activities, can affect corporate management support. If logistics are simple, support is more likely; if logistics are complex, support is less likely. In the case of large computer systems companies, logistics can be very convoluted. Terrace Computers, for example, is typical of many large computer systems companies. Carl explained how Terrace has buildings in multiple sites throughout Santa Clara County. Many of Terrace's sites are in different cities with separate solid waste programs, haulers and hauling sites. Coordinating waste management operations in this commonly-occurring scenario is a logistical nightmare, discouraging management's support of waste management programs. Analyzer Corporation considered holding individual departments accountable for their solid waste generation, but quickly abandoned the idea because of complex logistics:

We've looked at trying to do some charge back of our disposal activities. I'd like to be able to do that with the solid waste. But our system right now is not anywhere near set up to do that. Our hazardous waste -- we know when a container leaves our chemical distribution center, we know who ordered it, we know who signed for it and who has it, we know that in

sixty days we're going to get that thing back into the chemical distribution center or we're going to go looking for it. For solid waste, we don't have that, and there is no driving force to do it... Our logistics here probably control most of that. If we had a building that was set aside for say, our manufacturing organization... If they were in one building and I could guarantee that all the waste coming from that building was from that organization, I'd charge them back. But logistics just won't allow us to do it cost-effectively.

General Environmentalism

Many people view the proper management of solid waste as one element in the general scope of "environmentalism". Into this broad category also falls such diverse topics as water pollution, toxic waste disposal, population control, and wildlife habitat preservation. It is tempting to think that an employee who is aware of general environmental issues would be motivated towards proper waste management, but research findings are inconclusive. On the one hand, research findings show that individuals select different means for showing their environmental concern, and become involved with certain environmental issues and not with others (Vining & Ebreo 1992, 1581). Applying this conclusion, an employee might be observed turning off a restroom faucet to conserve water, but throwing a magazine into the waste basket.

In contrast, however, other research proposes that broad attitudes indirectly affect conservation behavior through their influence on generalized beliefs (Vining & Ebreo 1992, 1581). If these findings apply, then an employee would be encouraged to properly manage solid waste with any environmental message offered by the company.

The search for which research conclusions are more applicable may be irrelevant, however, because apparently, there is a tenuous link between global environmental attitudes and behavior: "It is easier to be concerned about the environment than it is to act on one's convictions" (Vining & Ebreo 1992, 1604).

Local Government Support

In the not-too-distant past, haulers made their living by transporting fixed quantities of garbage to landfills. With increasing volumes of recyclable materials being pulled out of the solid waste stream, haulers saw a corresponding drop in the tonnage of garbage they hauled and in the revenues generated by this tonnage. With hauler contracts also providing revenue to cities' general funds, cities also saw similar reductions. At that time, local governments tended to discourage integrated waste management activities. Mitchell recounted his experience:

There were regulatory problems. The trash people did not like reduced trash. They're making money on their trash dumpsters. We're only using half as many dumpsters as before. They got mad and went to the City. The City said, "you can't recycle anymore." So then a coalition of companies got together and said, "Bull! We want to recycle and we should be able to!" So then there was this big argument over – are you allowed to recycle? You see, we have a contract with the waste hauler. Our contract says that they're supposed to get a certain amount so that they can fulfill their promise and they can stay in business. It was a very difficult period.

More recently, as state-mandated time limits for landfill diversion approach their expiration, local governments have begun to increase their support of corporate waste management activities. While distributing "outreach" materials is still their principal tactic, some local governments have become more creative. Several Santa Clara County cities, for example,

offer on-site waste audits to raise companies' awareness of their waste streams. Other cities facilitate meetings among environmental staff from multiple companies in order to encourage information exchange.

Knowledge from External Sources

Another factor encouraging employee participation in waste management activity is knowledge acquired from sources external to the company. To investigate this factor, the researcher conducted a brief and informal survey (see Appendix E) among randomly-selected employees at the target companies. When asked about the source of their waste management knowledge, surveyed employees responded with the following locations:

- close acquaintances such as spouse, child, other family member, or friend
- college or other school
- discussions at meetings of environmental organizations
- formerly living in a different city, county, or state
- informational inserts included with bills sent to homes
- Internet news groups
- media: newspapers, magazines, television, or radio

The most frequently cited source of waste management information was at home. These findings concur with research on recycling in offices (Lee, De Young, & Marans 1995, 390) which found that "Those who actively engage in recycling at home are more likely to actively recycle at work than are their co-workers who do little home recycling." Interview respondents also noted that the home was a significant information source. Dennis said:

One of the reasons why [the City] instituted the home recycling activity before they addressed the commercial end of it, was because they thought

the home behavior was more transferable to a work location, than a work activity transferable to a home location. I don't think I could agree with them more. I think that is definitely true. People here tend to know about those programs at home.

Frank noted a similar situation, "You can't go home at night and throw anything in the dumpster without it costing you an arm and a leg. You are [almost] forced economically to recycle. Essentially, that particular home-type of atmosphere is translated here, too, at work: we have to recycle."

Summary

As shown in this chapter, there are many "non-cultural" factors affecting waste management activity in the computer systems industry. Certain factors are internal to the company (originate or are controllable within the company) and other factors are external (occur in part or in whole beyond a company's control). Some factors encourage waste management participation and other factors discourage participation. Table 3 summarizes the non-cultural factors affecting waste management activity, as presented in this chapter.

Table 3.--Non-Cultural Factors Affecting Waste Management Behavior

Type	Factor	General Effect
Internal	"Right thing to do"	Encouraging
	Myths	Discouraging
	Nay-sayers	Discouraging
	Trendiness	Encouraging
	Program Characteristics	Either
	Recognition	Encouraging
	External	Recycling Market
Legislation		Encouraging
Global Standards		Encouraging
Logistics		Discouraging
General Environmentalism		Inconclusive
Local Government Support		Encouraging
External Knowledge		Encouraging

CHAPTER 7

IMPLICATIONS AND RECOMMENDATIONS

Introduction

This thesis has examined the factors affecting integrated waste management participation in Santa Clara County's computer systems industry. The study addressed these research questions: 1) What is the corporate culture in Santa Clara County computer systems industry companies? 2) What integrated waste management activities are commonly practiced by companies in this industry? 3) How has the industry's corporate culture affected integrated waste management activities? In the course of investigating corporate culture, non-cultural factors affecting waste management participation were also identified and analyzed.

In this final chapter, implications of the research and recommendations are presented, in order to address the final research question: 4) What does this analysis suggest to local governments, and what actions and further studies are recommended? This chapter is organized by recommendation, and targeted at local governments because ultimately, fulfilling state-mandated waste diversion goals is their responsibility^{1,2}.

¹Despite its position as the most influential factor affecting corporate waste management behavior, legislation is not analyzed in this chapter. Accurate legislative recommendations require in-depth analyses that are beyond the scope of this cultural investigation.

²The recommendations offered in this chapter do not necessarily consider the limitations under which local governments operate, such as limited resources, legislative constraints and public scrutiny.

The Recycling Market

Fluctuations in the recycling market and the resultant misinformation, encourage myths, equip nay-sayers, and cause confusion. This, in turn, discourages participation in collecting recyclable materials. To counteract this trend, it is necessary to stabilize the recycling market and to correct misinformation. Market stabilization can be achieved by expanding secondary markets and by increasing the purchase of recycled-content products. Correcting market misinformation can be achieved through establishing direct communications with key industry representatives.

Expand Secondary Markets

Market stabilization can be achieved by expanding secondary markets. That is, by encouraging new and existing businesses to use recycled feedstock in their manufacturing processes. The City of San Jose's designation as an RMDZ provides local secondary markets for recycled materials collected throughout Santa Clara County.³ The support of this local recycling market by all County local governments would go a long way towards ensuring its success. It would be valuable to encourage the use of recycled feedstock in businesses outside the Zone as well.

- It is recommended that local governments work with their business communities to ensure a reliable stream of key, high-quality recovered materials into San Jose's RMDZ.

³The California Integrated Waste Management Board has established a Recycling Market Development Zone (RMDZ) program to stimulate the development of technologies needed to use recovered materials as a feedstock for manufacturing. Businesses located in an RMDZ may be eligible for low-interest loans from the State of up to \$1 million. The City of San Jose was designated as an RMDZ in June 1994 (Santa Clara County 1995, III-4).

- It is recommended that local governments research or fund research for investigations of the obstacles to using recycled feedstocks in manufacturing companies in their cities.

Purchase Recycled-Content Products

Purchasing products made from recycled materials is another activity that can help to stabilize the recycling market. The purchase of recycled-content products creates a demand for the manufacturer to acquire more recycled feedstock to create more products. Local governments can be role models for this activity.

- It is recommended that local governments expand internal procurement practices beyond the purchase of recycled-content paper.
- It is recommended that local governments require contractors to use recycled-content materials when bidding and performing city jobs.

Establish Direct Communications

Direct communications with key industry representatives would be an effective way to correct recycling market misinformation. Representatives could further distribute market information such as names of brokers, materials collected, prices paid, and services provided to individual companies and/or employees. Electronic mail or a centralized World Wide Web Home Page would provide a perfect paperless, "insider" media to use for regular recycling market updates to computer systems industry representatives.⁴

⁴See "Communicate Like an Industry Insider" later in this chapter.

- It is recommended that local governments establish direct and regular communications with key industry representatives regarding the recycling market.

Outreach Programs

As part of an overall waste management strategy, outreach programs provide a valuable tool for educating and increasing awareness about waste management issues. Local government's commercial/industrial outreach programs could be made more effective for the computer systems industry if they focused on business benefits, communicated like an industry "insider," emphasized "integrated" waste management, and provided specific details.

Focus on Business Benefits

Commercial/industrial outreach programs often highlight benefits to the environment or to local government such as saving resources, extending landfill life, or helping local government meet state waste diversion goals. Furthermore, some outreach doesn't address benefits at all, but instead focuses on tactics such as how to separate recyclable materials, what is the cost for bin rental, or where to locate a hauler. With these types of messages, it is difficult for a computer systems company, focused on financial and performance issues, to be motivated to participate.

Outreach programs would be more effective if they focused on the benefits businesses receive from waste management participation. An emphasis on "why participate?" rather than "how to participate?" would be more motivating. Highlighting economic benefits such as reduced costs or increased efficiency would be the most valuable perspective for computer

systems companies. Featuring non-economic benefits such as looking good (to employees, customers, stockholders and the community), keeping "in vogue," and "doing the right thing" would also be effective for this industry.

- It is recommended that local governments reposition their outreach programs to emphasize how businesses can benefit from integrated waste management participation.

Communicate Like an Industry "Insider"

Commercial/industrial outreach programs often communicate like an industry "outsider" without respect to what is happening "inside" the computer systems industry. For example, outreach often contains specialized waste management industry language such as, "tip fees," "co-mingled recyclables," or "exclusive franchise agreement." This language is foreign to computer systems companies, and largely falls upon deaf ears. Additionally, outreach materials are commonly distributed in written format via U. S. postal mail, unlike the "hi-tech" communications used inside computer systems companies.

Outreach programs would be more effective if they communicated like an industry "insider." For the computer systems industry, for example, using terminology such as "innovation," "productivity," and "seamless access," and distributing information via electronic mail or the World Wide Web would increase the impact of outreach programs.

- It is recommended that local governments communicate with computer systems companies like industry "insiders" by employing the language and media of their industry.

Emphasize "Integrated" Waste Management

Commercial/industrial outreach programs often focus on recyclable materials collection such as bin sizes, service providers, and acceptable materials. Topics such as source reduction, reusing materials, or buying recycled-content product are less frequently mentioned. Such communication limits full appreciation of the "integrated" approach to waste management. Outreach programs would invite greater participation if they presented the benefits of the entire suite of integrated waste management activities.

- It is recommended that local governments reposition their outreach programs to emphasize the benefits of an integrated approach to waste management.

Provide Specific Details

Commercial/industrial outreach programs often attempt to reach as many businesses as possible. In doing so, they provide generalized information that may not apply to a specific industry or business. Outreach programs would be more effective if they offered industry-specific details and examples that companies could identify with, such as successful local case studies.

- It is recommended that local governments include local, industry-specific details in their outreach programs.

Global Standards

While many large computer systems companies call Santa Clara County their headquarters, design, manufacturing, sales and marketing teams

are often located abroad. Soon, these multi-national companies will be affected by the forthcoming ISO 14000 environmental management standards. Adherence to ISO environmental guidelines will increase waste management participation as companies strive to achieve comprehensive environmental excellence. Local governments would be wise to understand and to support corporate efforts towards these international environmental standards.

- It is recommended that local governments become educated on the ISO 14000 standard and support companies during their ISO 14000 implementation processes.

Program Characteristics

Because of the computer systems industry corporate culture, it is unrealistic to expect that management or employees will go out of their way to participate in waste management activities. Complex, inconvenient, or inconspicuous activities, for example, hold little chance of receiving management support or employee participation. Furthermore, managers and employees have little time or incentive to read, watch, or listen to complex, lengthy, or lifeless communications. Attention to simplicity, convenience, and visibility can increase the effectiveness of waste management activities and outreach programs.

- It is recommended that local governments apply simplicity, convenience, and visibility as guiding principles in the creation of all waste management activities and outreach programs.

Increasing Employee Participation

In general, increasing waste management participation of individual employees is beyond the scope of local government responsibility. Rather,

convincing non-believers of the value of proper waste management is the direct responsibility of corporate management. However since successful waste management programs depend upon individual employees, it is wise for local governments to bear in mind the factors that encourage employee participation.

For example, findings showed that computer systems industry employees are motivated towards corporate waste management participation due to information they obtain outside of the company. In particular, employees frequently reported obtaining waste management awareness from information received at their homes.

- It is recommended that local government expand the garbage and recycling information currently mailed to residents, to include suggestions for waste management activities in the workplace.

Summary

The purpose of this thesis has been to inform Santa Clara County local governments of the factors affecting waste management participation in one commercial/industrial sector – the computer systems industry. In particular, the affects of corporate culture were highlighted. The presentation of cultural and non-cultural factors were intended to educate local governments about "reality" in this industry. As local governments better understand their business communities, they will begin to think and talk like their business counterparts – on their terms, using their language, tools, and media. From this knowledge, local governments can create more effective commercial/industrial waste management programs. The ultimate goal is to

fulfill waste management objectives while also addressing the needs of businesses.

Recommendations for Further Research

This thesis provided information about one segment of the Santa Clara County commercial/industrial sector -- large companies in the computer systems industry. While the information provided here is a valuable start, it is only a beginning. Much more information could be gathered and analyzed.

For example, an in-depth analysis of potential commercial/industrial waste management legislation is noticeably missing. A cost/benefit analysis of local ordinances such as mandatory business recycling and mandatory waste management reporting would be valuable.

The computer systems industry corporate culture could be examined further in order to uncover additional details regarding the effects of language, artifacts, subcultures, and chains of power. The cultural and non-cultural factors affecting small or medium sized computer systems industry companies could be compared and contrasted to what has been presented here. Cultural research could also be conducted regarding other Santa Clara County industries.

Based upon the same data collected and analyzed in this investigation, it would be valuable to offer recommendations targeted at corporate management. That is, to explain how corporate management is also accountable for ensuring the success of commercial/industrial waste management programs. Similarly, the entire investigation could be repeated from the perspective of local government. That is, an investigation could be

conducted examining the factors affecting local government's creation and support of commercial/industrial waste management programs.

Finally, several quantitative studies are possible. For example, a statistical investigation could be useful in determining what type of employee is likely (or unlikely) to participate in corporate waste management activities and why. Furthermore, a survey could be employed to weigh and compare the factors affecting waste management participation as identified in this investigation.

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APPENDIX A

AGREEMENT TO PARTICIPATE IN RESEARCH

Investigator: Andrea Hansen
 Graduate student, Environmental Studies
 San Jose State University

1. I have been asked to participate in a research study investigating the relationship between corporate culture and integrated waste management activities in commercial businesses.
2. I may refuse to participate in any part of the research, and I am free to withdraw at any time without prejudice to my or my company's relationship with San Jose State University or any other participating institutions.
3. I will be asked on one or more occasions to respond to interview questions, to freely speak on related topics, and to show examples of materials used in my place of business. My responses will be recorded on magnetic tape, with my approval.
4. The risks or discomforts associated with this research will be minimal.
5. While there may be benefits from future research findings, there is no stated or implicit guarantee of benefit for me or my company.
6. While the results of this study may be published, my identity will not be disclosed. Aliases will be used at all times to maintain confidentiality. I am encouraged to use alias names whenever I refer to any colleague.
7. There is no compensation for participation in this study.
8. Questions about this research may be addressed to Andrea Hansen, at (408) 281-4441. Complaints about this research may be presented to Dr. Gary Klee, Ph.D., San Jose State University Environmental Studies Department Chair, at (408) 924-5455. Questions or complaints about research, subjects' rights, or research-related injury may be presented to Dr. Serena Stanford, Ph.D., San Jose State University Associate Academic Vice President for Graduate Studies and Research, at (408) 924-2480.
9. My signature below indicates that I voluntarily agree to participate in this study and that I will receive a signed and dated copy of this consent form.

 Subject's Signature

 Date

 Investigator's Signature

 Date

APPENDIX B

INTERVIEW QUESTIONS

Introductory Questions

- Products/services at this location?
- Is manufacturing done here?
- Number and location of buildings in Santa Clara County?
- Number of employees at this site/ total? Maximum number, when?
- Title/responsibilities; differences among this and other similar positions?
- Specific Department in which you work (# employees? responsibilities?)
- Time in this position? Time at this company?

Corporate Culture Questions

- Tell me about the company's history. What were its beginnings? Who have been the significant players? Who are significant players now?
- In what ways do you notice the effects of top management (e.g., their philosophies) on daily routines and regular work functions? That is, how is your company an extension of top management's philosophies and practices?
- Why has your company been successful? What distinguishes it from the competition?
- Tell me about a typical day. What is enjoyable? What is frustrating?
- Tell me about a crisis the company has faced; what happened and what was the solution?
- Tell me about a recent company celebration; what was the occasion and how was it celebrated?
- What changes have you observed in the computer system manufacturing industry over time? How have industry changes affected your company in specific? In your opinion, what does the future hold for this industry?

Environmental/Waste Prevention Questions

- Tell me about the company's environmental policies and goals. Have they been established, and what are they? How are they created? How have they changed over time? Are there specific waste reduction goals?
- As you see it, how does a company benefit by exercising sound environmental practices? What are the disadvantages?
- What elements are required to create and maintain successful environmental programs at your company?

APPENDIX C
CODE SAMPLE

Data from Mitchell	Label	Category	Category
"There was an entrepreneurial feeling back at the beginning because you're growing like mad..."	growth	Characteristics of early growth	Business Environment (orig. culture)
"He's [founder] is a very fun guy -- greatly respected by the other executives."	founders	Qualities of the company founder	Founders (orig. culture)
Data from Paul	Label	Category	Category
"We grew up in a high profit-margin environment"	growth	Characteristics of early growth	Business Environment (orig. culture)
"When you first got to [Eritech], there was a two day class; basically, it introduced people to [Eritech]."	training	Employee programs (training)	Rituals (orig. culture)
"[Eritech] has traditionally celebrated its successes with beer busts."	parties	Employee celebrations	Rituals (orig. culture)
Data from Ken	Label	Category	Category
"We were founded on the underlying theme of respect for the individual..., a good place to work..."	values	Corporate values	Values (orig. culture)
"In 1984 [Analyzer] began to bring the population down. It did that through a no-layoff practice."	layoffs	Layoff philosophies in the early days	Rituals (orig. culture)
Data from Alan	Label	Category	Category
"They [founders] were very people-oriented. At that time, they were more concerned about the individual."	founders	Qualities of the company founder	Founders (orig. culture)
"In the middle 80s..., we could have easily laid off a lot of people. [Eritech] totally refused..."	layoffs	Layoff philosophies in the early days	Rituals (orig. culture)
"One of the weaknesses I've felt of [Eritech] over the years is we do not eliminate our poor employees."	layoffs	Layoff philosophies in the early days	Rituals (orig. culture)

APPENDIX D
MEMO SAMPLE

[ERICTECH'S] FORMER CORPORATE CULTURE AND PHILOSOPHIES

Eritech Family. Ahhhh... all those touchy-feely words: closeness, familiarity, openness. People talked, mingled, got caught up. This sounds like a big family! People in a family, love each other. Love inspires one to support the betterment of the beloved, to do good things for them. People in a family are committed to one another. Willing to sacrifice for each other, to come through when times are hard, to work hard to reach group goals. To celebrate joyous occasions. Family relationships are not always perfect; conflicts do arise. But hopefully family members will attempt to achieve a win-win conclusion. No one wants to hurt the other. A family is where you feel the most comfortable, the most safe and secure. As much as you give, you can count on reciprocal loyalty.

Leisurely pace. The pace used to be leisurely. There was not a lot of pressure or heavy time constraints. People were able to work their jobs, but also to connect with the other members of the [Eritech] family. With a leisurely pace, people were able to keep up, not feel as though they can't keep up.

[The founders] used to come to visit. Kind of like, "Daddy's here!". I can imagine the level of excitement, awe, and pride inspired by visits of the company heroes-founders. Alan said he was "fortunate" to hear [founder] speak, and "actually" shook hands with [founder]. These men added a patriarch to the culture.

APPENDIX E
SURVEY QUESTIONS

1. On a scale from 1 to 10, how would you rank your level of awareness and knowledge on the topic of garbage, landfills, recycling, and so forth?
2. On a scale from 1 to 10, how would you rank your level of active participation in recycling-related activities?
3. Regarding your level of awareness and knowledge on this topic, where do you get your information and exposure; what are the sources?
4. How many years have you been with the company?
5. What is your position/job function?