

**AN INVESTIGATION INTO FACTORS HINDERING ADOPTION OF NEW  
TECHNOLOGY BY EMPLOYEES IN THE WORKPLACE**



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**requirements for the**

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**by**

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**ABSTRACT**


The study tests resistance to technological change at a workplace where resistance is conceptualised as three-dimensional (negative) construct towards a large scale organisational change. The sample consisted of at least 160 employees across the entire organization structure of Silicon Technology plant with a total staff population of 300 employees. The 165 participants issued with the survey produced a 4.8% non response rate with only two feedback scripts that could not be used because they were incompletely filled. The usable 155 feedbacks consisted of 63% men and 37% women with a mean age of 31 years. This sample comprised of 36% managers, 20% specialists, 43% general workers and 1% students. The factors influencing individuals' resistance to technological change were selectively chosen based on previous literature. Therefore not all antecedents of individual resistance to technological change are examined in this study. The study considered both personality and context as antecedents to resistance. Among the context independent variables, a further distinction was made between the anticipated change outcomes and the change process. Finally the study examined the relationships between each resistance component and some work related outcomes, namely job satisfaction, intention to quit and continuance commitment. The findings acknowledge that resistance can manifest itself in different forms and these different resistance forms can be indicative of the presence of different types of antecedents and as such different interventions could be required to alleviate different forms of resistance. Trust in management is the only studied factor that proved more likely to provoke the full spectrum of resistance forms while other factors would more likely arouse specifically only one or two forms.

**Key words:**

Employee resistance, technology, dispositional resistance to change, anticipated change outcome, process change variable, affective resistance, behavioural resistance, cognitive resistance, job satisfaction, continuance commitment.

**DECLARATION**

I declare that an investigation in to factors hindering adoption of new technology by employees at the workplace is my own work and that all the sources that I have used, quoted, have been indicated and acknowledged by means of complete references.



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## 1. CHAPTER 1

### ORIENTATION

#### 1.1 Introduction

Enterprises decide to invest in information systems (IS) for a number of reasons such as pressures to sustain cost competitiveness, improve efficiencies without increasing costs and simply to improve the quality of service or product in order to stay in business. Organizations naturally expect employees to adopt the new technologies freely without questions to achieve desired goals. The natural propensity for individuals to "defend the status quo" presents a set of challenges that management must overcome in order to bring about desired change. Management must also seriously take into account and consider the myriad of problems that may result if they are not responsive to issues of resistance in the workplace. Folger and Skarlicki (1999: 36) claim that "organizational change can generate skepticism and resistance in employees, making it sometimes difficult or impossible to implement organizational improvements".

Coetsee (1999: 204) states "any management's ability to achieve maximum benefits from change depends on how effectively they create and maintain a climate that minimizes resistant behaviours and encourages acceptance and support". Therefore factors hindering adoption of new technologies must be identified initially and then addressed. The theoretical model tested by my research has been proposed and tested by (Oreg, 2006). The author reported that both **personality** and **context** were found to be significantly associated with **employees' attitudes** (resistance) towards a large scale organizational change. The attitudes (resistance) were in turn significantly associated with employees' **job-satisfaction**, **organizational commitment** and **intention to leave** the organization. The large scale organizational changes could be in **technology**, production methods management practices or compensation systems. The study examines the resistance to change due to technological change in an organization.

## **1.2 Problem Statement**

The major research question is: What are the factors hindering adoption of new technology at workplaces by employees?

Sub-problems

- What is employee resistance or acceptance to adoption of new technology?
- What causes employee to resist or accept adoption new technology at workplaces?
- What can be done to improve levels of successful adoption of new technology at workplaces?

## **1.3 Objectives of Study**

- To Identify and explain the concepts of resistance to technological change
- To determine the causes of resistance to new technological adoption at workplaces
- To make recommendations for improving levels of successful adoption of new technologies at workplaces

## **1.4 Delimitation of study**

This study only investigates factors that lead to specific responses to change phenomenon by employees at workplaces. Resistance is conceptualized as a 'multifaceted' construct for the study. The relationships among resistance components and employees' personalities, the organizational context and some work related outcomes are examined.

## **1.5 Importance of the Study**

The shift from modernism to postmodernism era has placed greater emphasis on fluidity, speed, an information bias work environment and integration as opposed to differentiation within organisations. Therefore a leaning towards fluid, less structured, time-paced and information rich concepts of organisational change are emerging. Information is mainly driven by new technologies. Employee adaptability to new technology is critical in this digital age and this study sheds light on the factors that

influence employee resistance to technological change. The leadership challenge for South African organisations is retiring old thinking systems in parallel with creating new ones against the reality of high speed globalisation and informationalism (Unisa, SBL. 2006).

## **1.6 Summary layout of chapters**

The remaining chapters of this report are as follows:

Chapter 2 introduces the concepts used in this work and the theoretical framework. The proposed multifaceted view of resistance as a multidimensional attitude towards change, comprising of affective, cognitive and behavioural components provides a subjective and complex, three-dimensional construct is explained. This view is expected to provide a better understanding of the relationships between resistance and its antecedents and consequences.

Chapter 3 reviews previous studies related to this work and introduce the hypotheses to be tested in this case.

Chapter 4 describes the research approach and sampling design. The sample is full described and the instruments for measuring the different variables introduced. Finally, data analysis approach is explained.

Chapter 5 presents the results as obtained from this study in line with the stated hypotheses.

The results are discussed in chapter 6. The relationships observed between variables are acknowledged and explained in line previous studies and theoretical basis.

Chapter 7 acknowledges the observed limitations and suggests future study directions for the subject concepts

Chapter 8 summaries the findings and make conclusions together with some generalisations within the scope of the findings

Chapter 9 presents a draft of publishable article of the this work

## **2. CHAPTER 2**

### **FOUNDATION OF THE STUDY AND THEORETICAL FRAMEWORK**

#### **2.1 Definition of Concepts**

Concepts can be understood either in a conceptual or operational manner. Therefore the process of defining concepts is essential because it allows specific concepts to be described and explained in a context that pertains to the study.

#### **2.2 Factor**

Factor is defined by Longmans Dictionary of Contemporary English as "any of the forces, conditions, or influences that act with others to bring about a result". It is also referred to as "generally anything that has some causal influence or some effects on a phenomenon. It is therefore an antecedent condition".

In this study a factor is taken to mean any force, condition or circumstance that poses a casual influence or can contribute to hindering adoption of new technology at workplaces. The influences directly emanating from employees' personalities and the context of organizational change are considered in the study.

#### **2.3 Technology**

Technology involves people using knowledge, tools, and systems to make their lives easier and better. Johnson (1989: 3) defines technology as "the application of knowledge, tools, and systems to solve problems and extend human capacity." Larkin (1992: 23) viewed technology as a "body of knowledge and actions of applying resources, developing, producing, using, assessing and extending the human potential, controlling and modifying the environment".

The term technology often characterizes inventions and gadgets using recently discovered scientific principles and processes. However, very old inventions such as the wheel depict technology. An economic point of view, technology could mean the

current state of our knowledge about how to effectively combine available resources to produce desired products efficiently.

In this study technology is conceptualized as computer information systems and its related infrastructure and their applications to make employees' work easier and better.

## 2.4 Employee Resistance

Employee resistance is a concept that closely explains the employees' behaviours of hindering the adoption of new technologies at workplaces.

Fine (1994: 20) ascertained that every living creature, individuals and societies have highly evolved mechanisms for maintaining their homeostasis, preserving their integrity and insuring their own survival, both physical and psychological. One of the most powerful of those mechanisms has a bad press. Its name is spoken with disdain: "**Resistance to change.**" **Resistance** is shrouded with meaning; **resistance** is seen as immoral, immature, irrational, unreasonable, and unproductive. And yet, there is a time, in any society, when "**resistance**" means strength and to resist means to have courage. We have resisted against war and oppression, and we have applauded "**resistance** fighters" against the tyranny of evil in its many faces. Fine (1994:20) concludes by claiming that **resistance** exists in all of us, just waiting for the particular event that triggers its release.

Zander (1950: 9), an early researcher on the subject, defined resistance to change as "behaviour which is intended to protect an individual from the effects of real or imagined change". In Folger & Skarlicki (1999: 36)'s view, resistance is defined as "employee behaviour that seeks to challenge, disrupt, or invert prevailing assumptions, discourses, and power relations".

Piderit (2000: 785) believes that the definition of the term resistance must incorporate a much broader scope. She states that "a review of past empirical research reveals three different emphases in conceptualisations of resistance:

- as a cognitive state,
- as an emotional state &
- as a behaviour

Others attempt to define employee resistance based on the emotional factors exhibited as a result of organizational change. From their early study, (Coch and French, 1948) acknowledged aggression and frustration in employees as the emotional factors that caused undesirable behaviours and resistance to change. Argyris and Schon (1974, 1978) noted that resistance to change is a defence mechanism caused by frustration and anxiety.

The final aspect of Piderit's (2000) conceptualization focuses on individual behaviour in an attempt to define employee resistance to change. She cites Brower and Abolafia (1995) who define resistance as a particular kind of action or inaction. Ashforth and Mael (1998) define resistance as intentional acts of commission (defiance) or omission. Shapiro, Lweicki, and Devine (1995) suggest that willingness to deceive authorities constitutes resistance to change (Piderit, 2000: 789).

Piderit (2000: 790) claims that: although these conceptualizations of overlap somewhat, they diverge in important ways. Finding a way to bring together these varying emphases should deepen our understanding of how employees respond to proposed organizational changes. Each of these three conceptualizations of resistance - as a behaviour, an emotion, or a belief - has merit and represents an important part of our experience of response to change. Thus, any definition focusing on one view at the expense of the others seems incomplete.

According to Dent and Goldberg (1999: 25), individuals are not really resisting the change, but rather they may be resisting the loss of status, loss of pay, or loss of comfort. They claim that, "it is time that we dispense with the phrase resistance to change and find a more useful and appropriate models for describing what the phrase has come to mean - employees are not wholeheartedly embracing a change that management wants to implement".

In this study an attempt will be to conceptualise the term employee resistance according to Piderit (2000) 's view. Therefore the measure of resistance to change will be consistent with this view of resistance as cognitive, emotional and behavioural. Antonacopoulou and Gabriel (2001) supported this view by stating that contrary to common perception, the individual reaction to change is not simply a matter of resistance or acceptance but instead comprises of complex blend of psychological, social, emotional and cognitive factors.

#### **2.4.1 Nature of resistance**

According to Hultman (1995) it is important to distinguish between the symptoms of resistance to change, and the causes behind it. These behaviours fall into two categories

- active-resistance or
- passive-resistance.

Symptoms of active-resistance include finding fault, ridiculing, appealing to fear and manipulating. Passive-resistance symptoms include agreeing verbally but not following through, feigning ignorance and withholding information.

Hultman (1995: 16) added, "There is always a danger of identifying a symptom of resistance when you are really looking for its cause. To diagnose the causes, we must understand a person's state of mind. That means understanding individual's perceived facts, beliefs, feelings, and values".

- **Positive Resistance**

Managers often perceive resistance negatively, and employees who resist are viewed as disobedient and obstacles the organization must overcome in order to achieve the new goals. However in certain instances, employee resistance may play a positive and useful role in organizational change. Insightful and well-intended debate, criticism, or disagreement do not necessarily equate to negative resistance, but rather may be intended to produce better understanding as well as additional options and solutions. de Jager (2001: 25) claims, "the idea that anyone who questions the need for change has an attitude problem is simply wrong, not only because it discounts past achievements, but also because it makes us vulnerable to indiscriminate and ill-advised change".

## 2.5 Conclusion

Piderit (2000) pointed out that what some managers may perceive as disrespectful or unfounded resistance to change might be motivated by an individual's ethical principles or by their desire to protect what they feel is the best interests of the organization. Employee resistance may force management to rethink or re-evaluate a proposed change initiative. It also can act as a gateway or filter, which can help organizations select from all possible changes the one that is most appropriate to the current situation. According to de Jager (2001: 26), "resistance is simply a very effective, very powerful, very useful survival mechanism".

Folger and Skarlicki (1999: 37) claim "that not all interventions are appropriate as implemented -the organization might be changing the wrong thing or doing it wrong. Just as conflict can sometimes be used constructively for change, legitimate resistance might bring about additional organizational change".

Van Tonder (2004: 183) acknowledged that resistance is likely to be caused by not a single factor but multiple factors which reside in the broader context, the organisation as well as in the individual; this only serves to complicate attempts to deal with resistance. The author further acclaims that factors causing resistance such as fear of the unknown, a loss of control, and lack of confidence are unavoidably mediated by perceptions. Indeed perceptions are considered to play a fundamental role in the process of change and consequently in the creation of resistance (Marci, Tagliaventi & Bertolotti 2002).

The proposed multifaceted view of resistance as a multidimensional attitude towards change, comprising of affective, cognitive and behavioural components provides a subjective and complex, three-dimensional construct. This view is more likely to provide a better understanding of the relationships between resistance and its antecedents and consequences. The present study tests the view of resistance to change as a three-dimensional construct.

The three components reflect three different manifestations of people's evaluation of an object or situation (McGuire, 1985). The affective component regards how one

feels about the change, for example angry or anxious. The cognitive component involves what one thinks about the change for example whether the change is necessary or will it be beneficial? The behavioural component involves actions or intention to act in response to the change for example complaining about the change or trying to convince other that the change is bad. The tridimensional conceptualization of resistance enables a higher resolution that highlights that particular resistance components are associated with each of the antecedents and consequences (Oreg, 2006).

### **3. CHAPTER 3**

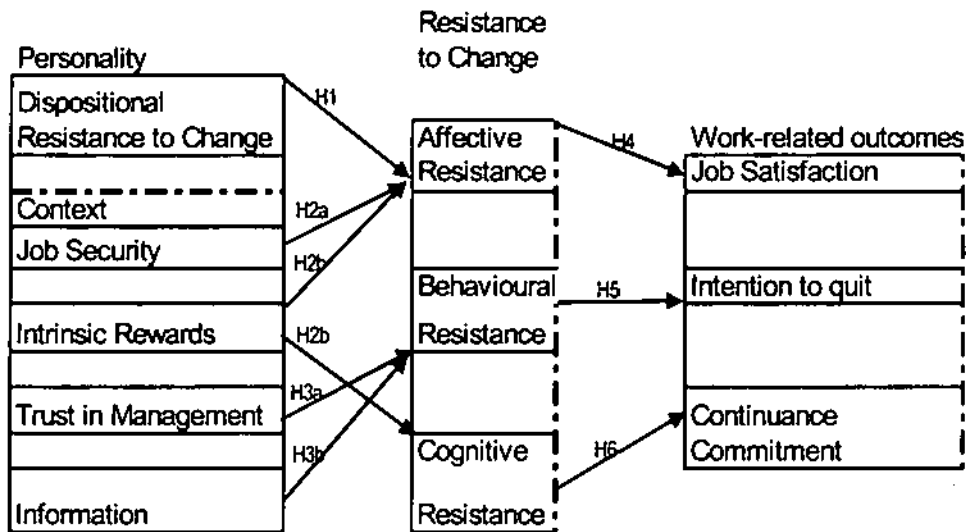
#### **LITERATURE REVIEW OF RELATED STUDIES**

##### **3.1 Introduction**

The vast majority of empirical studies (for example, Armenakis and Harris, 2002; Goltz and Hietapelto, 2002; Lines, 2004; Rosenblatt, Z., Talmud, I. & Ruvio, A., 1999; Trade-Leigh, 2002) have focused on **contextual variables** that are related to resistance such participation, personal management compacts (trust in management), managerial frames and institutional discourses of change or organizational commitment. A few empirical studies have adopted the personality perspective (for example, Judge, T.A., Thoresen, C.J., Pucik, V. & Welbourne, T.M. 1999; Cunningham, EC., Woodward, CA., Shanon, HS., MacIntosh, J., Lendrum, B., Rosenbloom, D. *et al.*, 2002) and only two empirical studies have combined the role of context and personality in predicting employees' reactions to organizational changes (Wanberg and Banas, 2000 and Oreg, 2006).

In the present study both personality and context are considered potential antecedents of resistance. Resistance to change has been correlated with a number of work related consequences such as job satisfaction, organizational commitment (Rush, M.C., Schoel, W.A & Barnard, S. M., 1995; Schweiger and Denisi, 1991).

Figure 3.1 The theoretical model with study hypotheses.



Employees' openness towards organizational changes has been predicted by various personality traits such self – esteem (Wanberg and Banas, 2000; Judge et al., 1999) and many others as follows.

Kalanda 2005 (MSC thesis) assessed the **views of students** on school-related **determinants** with respect to **liking or disliking technology**. In determining students' views, two self-report instruments, the Classroom Learning Environment Survey (CLES) and Attitudes toward Science Scale (ATSS) were used. Also, an interview schedule was conducted with a selected group. Participants were 200 first years registered for Diplomas in Primary -, Secondary -, and Technology Education. **Results** indicated a positive relationship between attitudes towards technology and each of teacher characteristics, student characteristics and the classroom environment. Regression analysis showed that attitudes toward technology were predicted by the three study variables. On the other hand, no statistically significant gender differences were established.

**Low tolerance** for change is defined as the fear that one will not be able to develop new skills and behaviours that are required in a new work setting. According to Kotter and Schlesinger (1979: 106), if an employee has a **low tolerance** for change, the increased ambiguity that results as a result of having to perform their job differently would likely cause a resistance to the new way of doing things. An employee may understand that a change is needed, but may be emotionally unable to make the transition and resist for reasons they may not consciously understand.

Folger and Skarlicki (1995: 36) investigated resistance to change as a response to the treatment employees receive in the change process. Specifically they focused on **resentment-based resistance -reactions** by disgruntled employees regarding the perceived unfairness of the change. They claimed that "resent-based resistance behaviours, which can range from subtle acts of non-cooperation to industrial sabotage, are often seen by the perpetrators as subjectively justifiable - a way to "get even" for perceived mistreatment and a way for employees to exercise their power to restore perceived injustice".

Xavier (2004: 2129) studied the relation between the age of an agent and her decisions about adopting **new technologies**. The researcher analyzed the optimal sequence of **technology** upgrades by an agent who lived for a finite period of time. Other characteristics of the environment considered were the existence of **technology**-specific learning-by-doing, **technology** growth, and **adoption** costs. A finite planning horizon implied that the **technology adoption** problem being non-stationary and the frequency of **adoptions** changing over time. This work provided results for the computation of the optimal plan and explored numerically the life-cycle pattern of **technology** switches. The results were **adoptions** may become more frequent as the agent grows older. However, the sign of the association between age and the **adoption** of **new technologies** is sensitive to variation in parameters.

Kegan and Lahey (2001: 85) describe a psychological dynamic called a "competing commitment" as the real reason for employee resistance to organizational change. The change is not challenged, but rather is it resisted, or not implemented at all because the employee faces additional issue or concerns related to the change. When an employee's hidden competing commitment is uncovered, "behaviour that

seems irrational and ineffective suddenly becomes stunningly sensible and masterful - but unfortunately, as a sacrifice of a goal both management and even the employee are trying to achieve".

Competing commitments should not be viewed as a weakness, but as a version of self-protection. If these **competing commitments** are a form of self-protection, then what are employees protecting themselves from? Kegan and Lahey (2001: 88) believed that the answer usually lied in what they called "big assumptions"-subcultures - deeply rooted beliefs people have about themselves and the world around them. Many people rarely realize they hold big assumptions because they are woven into the very fabric of people's existence, and as such they accept them as reality. "These basic assumptions put an order to the world and at the same time suggest ways in which the world can go out of order.

## **3.2 Selected Factors Influencing Individuals Resistance to Technological Change**

### **3.2.1 Personality: Dispositional resistance to change**

Oreg (2003) introduced a concept of dispositional resistance to change and designed the resistance to change scale (RTC) for measuring the personality component of resistance to change. Dispositional to change concept was defined as the individual internal inclination to resist or adopt changes. The results supported the conception that personality traits are fundamental affective in nature (Dols and Suzuki, 2002). Oreg (2003) results showed that there is a strong correlation between dispositional resistance and affective resistance and only a weak relationship between dispositional resistance and employees' behavioural reactions. It is therefore hypothesized that:

**Hypothesis 1:** Employees' dispositional resistance will have significant positive correlations with their affective resistance to a particular change at hand.

### **3.2.2 Context: Anticipated Change Outcomes & Change Process Variables**

Theories and research on resistance to change have primarily addressed the context-specific antecedents of resistance (Oreg, 2006). A large variety of contextual variables have been proposed as related to employees' resistance to change (Armenakis and Harris, 2002; Wanberg and Banas, 2000).

The multidimensional construct of resistance compared to a one-dimensional construct allows a distinction between anticipated change outcomes and change process (Oreg, 2006).

The three components of resistance (affective, behavioural and cognitive) are conceptually related to one another therefore all prospective antecedents of resistance to change can potentially influence all the three components in resistance theory (Oreg, 2006).

Robbins *et al.*, 2000 reported that both the anticipated change outcomes and the change process influence how people feel and think about organizational actions but the change process will most likely influence employees' behavioural intentions. It is therefore expected that resistance due to anticipated outcomes of the change will primarily involve the affective and cognitive components of resistance whereas resistance due to change process will be associated with the behavioural component.

- **Anticipated Change Outcomes**

These factors constitute the rational component of resistance to which Dent and Goldberg (1999) reported as the most valid reason to resist change.

This study selectively explores only two variables (job security, intrinsic rewards) for evaluations of affective and cognitive resistance components.

#### **Job security**

Several recent studies have emphasized the role of job security in its impact on employees' reactions to organizational change (Baruch and Hind, 1999; Burke and Greenglass, 2001; Probst, 2003).

Based on employees' positions and occupations within an organization, different employees would have varying levels of concerns regarding the possibility of losing

their jobs. The source of resistance due to job security threat is driven by strong emotional factors (Burke and Greenglass, 2001). Therefore the perceived threat to job security is particularly expected to yield a significant correlation with employees' affective reactions to change.

### Intrinsic Rewards

Organizational change can also threaten the intrinsic satisfaction that employees gain from their jobs. The reason being organizational change often involves changing positions and even redefining tasks. For many people, the expectation of being transferred to a less interesting, less autonomous and less challenging job would create negative evaluations of the change (Oreg, 2006: 80). In addition to cognitively resisting decrease in autonomy and challenges in jobs Ryan and Deci (2000) reported that individuals' well-being is to a great degree dependent on their ability to satisfy intrinsic needs such as the need for autonomy and self-determination. In the organizational context, the ability to satisfy these needs was shown to influence employees' affective responses in the workplace.

The connection between each of these variables and resistance to change may seem undisputed, but their selection is warranted by that most of these relationships have not been tested empirically. Secondly, the perceived relationships may be straightforward with a unidimensional construct of resistance not necessarily with a multidimensional construct (Oreg, 2006).

The employees' reactions to anticipated change outcomes is expected to be internal (i.e. affective and cognitive) but not behavioural. It is therefore hypothesized that:

**Hypothesis 2a:** Perceived threats to job security will be positively associated with the employees' affective resistance to change.

**Hypothesis 2b:** Perceived threats to intrinsic motivation will be positively associated with both employees' affective and cognitive resistance to change.

- **The Change Process**

The change process variables certainly have influence on all resistance components. Chreim (2006: 1261) proposed that the notions of frame and frame appropriation are useful tools for the study of control in organizations, as well as for the analysis of the connection between micro-level discursive activities and wider discourses that enable and constrain such activities. The author conducted an empirical study of bank employees' accounts of their responses to two different **changes** introduced by management. The **results** indicated that employees frame their responses in part according to their individual capabilities and experiences. The employees' frames show an alignment with managerial frames and institutional discourses that are unified and reified; and that employee frames exhibit both alignment and misalignment with managerial frames that are open to contestation. The study also indicated that institutional discourses can both constrain and enable employee **resistance** to managerial frames.

Strebel (1996: 85), professor and director of the Change Program for international managers at the International Institute for Management Development (IMD), attributed resistance as a violation of "personal compacts" management has with their employees. Personal compacts are the essence of the relationship between employees and organizations defined by reciprocal obligations and mutual commitments that are both stated and implied. Any change initiatives proposed by the organization would alter their current terms.

Personal compacts are comprised of formal, psychological, and social dimensions. The formal dimension is the most familiar. It is the aspect of the relationship that addresses the basic tasks and performance requirements of the job, and is defined by job descriptions, employee contracts, and performance agreements. Management, in return, agree to supply the employee the resources needed to perform their job. The psychological dimension addresses aspects of the employment relationship that incorporate the elements of mutual trust, loyalty and commitment. The social dimension of the personal compact deals with organizational culture. This includes mission statement, values, ethics and business practices.

Strebel (1996: 87) pointed out that when these personal compacts are disrupted it upsets the balance, and increases the likelihood of resistance. He suggests that

management view how change looks from the employees' perspective, and to examine the terms of the personal compacts currently in place. Strebel (1996: 87) asserts that 'Unless managers define new terms and persuade employees to accept them, it is unrealistic for managers to expect employees to fully buy into changes that alter the status quo'.

The literature concerning the change process variables (ie trust: Kotter, 1995; Gomez and Rosen, 2001; Simons, 1999; Stanley, D.J., Meyer, J.P. & Topolnystky, L., 2005 Munduate and Dorado, 1998; and information: Wanberg and Banas, 2000) highlighted significant impact of these process factors on employees' behavioural intentions in response to change initiatives at workplaces.

### Trust in management

A recurring recommendation made by organizational changes specialists is to convey an atmosphere of trust and a general feeling that employees can count on their supervisors to do what's best for the organization and its members (Kotter, 1995; Zander, 1950). Various authors have supported these original findings (Simons, 1999; Gomez and Rosen, 2001).

Munduate and Dorado (1998) examined the influence of different power bases on employee cooperation in the context of an organisational change; referent power appeared to yield the most cooperation.

### Information

A number of authors have advocated that the quality and amount of information that is provided can also influence how organizational members react to change. Management sometimes provides information to increase employee involvement in organization decision making processes to influence employees' resistance to change. Wanberg and Banas (2000) examined the influence of providing detailed information about the change on resistance to change. The results revealed that employees that were provided with timely, informative and useful information about an organizational change presented a more positive evaluation of the change and increased willingness to cooperate.

The findings concerning the relationship between procedural justice and employee behaviours (Skarlicki and Folger, 1997) implied that factors involving the process through which change is implemented would be particularly meaningful with respect to employees' behavioural responses. Therefore the hypotheses on the two selected change process factors are as follows:

**Hypothesis 3a:** Employees' trust in management will be negatively associated with employees' behavioural resistance to change.

**Hypothesis 3b:** The amount and quality of information that is provided about the change will negatively correlate with employees' behavioural resistance to change.

### **3.3 Work Related Outcomes Due to Resistance to Technological Change**

Rush *et al.*, 1995 found that the following conditions of change predicted organizational outcomes for example, job satisfaction, organizational commitment and intention to leave the organization. Wanberg and Banas (2000) also found that the conditions of change predicted employees' resistance to change and that, in turn, resistance was associated with lower levels of job satisfaction and greater intention to quit. There is not much work that has been done to assess how multifaceted conceptualization of resistance that allows for ambivalence towards the change (Piderit, 2000) would relate to work related outcomes.

The three components of resistance (affective, behavioural and cognitive) are conceptually related to one another therefore all prospective antecedents of resistance to change can potentially influence all the three components in resistance theory (Oreg, 2006).

This study presumes that the different components of resistance would have varying relationships with different types of work related outcomes. Specifically, affective is most likely to associate with affective outcomes, cognitive resistance with cognitively based outcomes and behavioural resistance with behavioural outcomes. Job satisfaction represents an outcome with a strong affective affinity (Spector, 1997) and is therefore expected to correlate strongly with affective component of resistance.

The behavioural component of resistance involves both behaviour and an intention to behave. Therefore an intention to leave the organisation seems an appropriate outcome that would tap the behavioural component of resistance.

According to Meyer & Allen (1991) continuance commitment involves a calculative approach with which organisational members evaluate whether or not it is worth their while to remain in the organisation. The cognitive process that is involved in that construct is explicit.

It is not disputed that all three components of resistance could correlate with employees' job satisfaction, intention to quit and continuance commitment based on the previous empirical studies it is hypothesised that:

**Hypothesis 4:** Employees' affective resistance will be negatively related to their job satisfaction.

**Hypothesis 5:** Employees' behavioural resistance will be positively related to their intention to leave the organisation.

**Hypothesis 6:** Employees' cognitive resistance will be negatively related to their organisational continuance commitment.

### **3.4 Conclusion of literature review**

From the extant literature on resistance to change as it relates to adoption of new technology, it is first clear that very little research has been done that specially examines resistance to technology change. However, there is sufficient research on the concept of resistance to change in different contexts and some well known instruments for measuring resistance have proven high robustness by sustaining reliability and validity in different change contents (Oreg, 2003: 680)

### **3.5 Summary of study hypotheses**

This research study will consider a number of the factors that are perceived to influence employees' adoption of technology for the multifaceted view of resistance.

An attempt to investigate the factors' relative weights of influence in hindering adoption of new technology will be done for the specific workplace.

The proposed hypotheses that the present study tested relationships between each personality and context independent variables of each dependent variable of resistance components are as follows:

**Hypothesis 1:** Employees' dispositional resistance will have significant positive correlations with their affective resistance to technological change at workplace.

**Hypothesis 2a:** Perceived threats to job security will be positively associated with the employees' affective resistance to technological change.

**Hypothesis 2b:** Perceived threats to intrinsic motivation will be positively associated with both employees' affective and cognitive resistance to technological change.

**Hypothesis 3a:** Employees' trust in management will be negatively associated with employees' behavioural resistance to technological change.

**Hypothesis 3b:** The amount and quality of information that is provided about the change will negatively correlate with employees' behavioural resistance to change.

The hypotheses for testing the relationships between each component of multifaceted construct of resistance (affective, behavioural and cognitive) and selected work related outcomes are summarised as follows:

**Hypothesis 4:** Employees' affective resistance will be negatively related to their job satisfaction.

**Hypothesis 5:** Employees' behavioural resistance will be positively related to their intention to leave the organisation.

**Hypothesis 6:** Employees' cognitive resistance will be negatively related to their organisational continuance commitment.

## **4. CHAPTER 4**

### **RESEARCH METHODOLOGY**

#### **4.1 Research Approach**

This offers an empirical test of resistance to the adoption of new technology. Quantitative research approach considered to be nomothetic, dealing with abstraction of reality based on probability derived from studies of large numbers of randomly selected cases (Welman, Kruger & Mitchell, 2006: 8) is considered suitable for the present study. Unlike quantitative research methods, the qualitative research approach seeks to establish the socially constructed nature of reality by stressing the relationship between the researcher and the object of study as well as placing emphasis on the value-laden nature of the enquiry (Denzin and Lincoln, 1994). Contrarily, quantitative approach emphasizes on measurement and analysis of casual relationships between variables within a value-free context. The present research is conducive to a quantitative approach because it seeks to test well defined constructs with existing measurement instruments.

#### **4.2 Sampling Design**

The sample consists of at least 160 employees across the entire organization structure of Silicon Technology plant with a total staff population of 300 employees. The level of education is high, with 95% of workforce having a minimum of high school education. The organization can be considered to be relatively mechanistic in its structure (Morgan, 1997), with distinct hierarchical levels and clear line chain of command. The organizational change comprised of two information systems introduced to aid communication and data transmission within the organization when traditionally employees used hand written notes and telephonic means of communication.

A stratified random sampling approach is adopted in the present study because of the heterogeneous nature of the sample. The hierarchical feature of the organizational structure provides explicit strata namely the students, general worker,

specialist and manager. The sampling approach is such that members of identified strata are randomly given questionnaire to sufficient represent each group. The advantage of stratified random sampling design is that the researcher is able to reduce the sampling error without having to resort to large sample sizes (Babbie, 2001).

The 165 participants issued with the survey produced a 4.8% non response rate with only two feedback scripts that could not be used because they were incompletely filled. The usable 155 feedbacks consisted of 63% men and 37% women with a mean age of 31 years. This sample comprised of 36% managers, 20% specialists, 43% general workers and 1% students.

#### **4.3 Data Collection Method**

The data collection method is in the form of self administered structured questionnaire as a survey. The survey instrument captures all the variables required to be measured to test each hypothesis. The answers to each item use a Likert-type point response scale.

The questionnaires were administered after the organizational change has been initiated. Therefore, questions about the **anticipated outcomes** of the change and about the **change process** are phrased in the past tense such that participants are asked to report on what they expected from the change and how they experienced the change when it was first initiated. Questions regarding the **work related outcomes** (job satisfaction, intention to quit and continuance commitment) are phrased in the present tense.

##### **4.3.1 Measurement Instruments**

- Dispositional resistance to change

The use of 17-item resistance to change (RTC) scale (Oreg, 2003: 680) was adopted for present study to examine dispositional resistance to change towards the affective components of resistance to adoption of new technology. The scale has been validated in a variety of contexts and has consistently demonstrated high structural

stability and reliability (Oreg, 2003: 690). The total RTC score for all 5 items (Appendix A) is used to assess employees' dispositional resistance to change. The present study examines dispositional resistance to change towards affective resistance to individuals' adoption of new technology only. The scale's reliability coefficient (Cronbach's alpha) was reported as 0.79.

- Measures for perceived outcomes of change

The evaluation is done using items that ask employees whether they had believed when the change was first introduced that outcomes would improve, stay the same or get worse. Items use a 4 point response scale ranging 'would significantly get worse to would significantly improve'.

#### Job Security

Threat to job security will be assessed using one item. The assessment asked whether the employees believed there will be change in the chances they would have to look for a new job the next year (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.72.

#### Intrinsic rewards

The items for intrinsic rewards measure are based on factors from Hackman and Oldham's model (1976). Intrinsic rewards involve the extent to which employees believe there would be change in the amount of challenge, autonomy, and personal interests that they have on their jobs. Three items were used (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.84.

- Measures for change process variables

The change process variables are measured using three item for each on a four point response scale varying from strongly disagree, disagree, agree, to strongly agree. The scale's alpha coefficient is reported for each variable.

## Trust in Management

The items aim to assess the general faith employees have concerning management's ability to successfully implement or manage change (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.90.

## Information about the change

The measure is based on Miller, V.D., Johnson, J.R. & Grau, J. (1994) scale. Three items were adopted to assess usefulness of information about change (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.72.

- Measures of work related outcomes

The Likert-type point response scale is used to assess the selected work related outcomes on the tridimensional resistance concept ranging from strongly disagree, agree, to strongly agree. The reliability coefficients were reported.

## Job Satisfaction

This is measured using Cammann, C., Fichman, F., Jenkins, DG. & klesh, JR., (1983) 3-item overall job-satisfaction scale. Participants were asked to reflect on the extent to which they present agree or disagree on the each item (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.75.

## Intention to Quit

This is measured using Cammann *et al.*'s (1983) 3-item intention to turnover scale (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.73.

## Continuance Commitment

This is measured using modified Meyer, J.P., Allen, N.J. & Smith, C.A., (1993)'s 6 item-scale. Only four items are used (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.76.

## 4.4 Data Analysis Approach

The aim of data analysis is to understand the various constituent elements of one's data through an inspection of relationships between concepts, constructs or variables and to establish whether there are any patterns or trends that can be identified, isolated or established in the data (Mouton 2006: 108). The use of descriptive statistics is used and inferential statistics is applied. Correlation coefficients calculated. The Structural Equations Modelling (SEM), with the AMOS (Arbuckle, 1999) software was used to test the study's path model (Figure 3.1).

Structural equation modeling (SEM) has grown out of and serves purposes similar to multiple regression, but in a more powerful way which takes into account the modeling of interactions, nonlinearities, correlated independents, measurement error, correlated error terms, multiple latent independents each measured by multiple indicators, and one or more latent dependents also each with multiple indicators (Barbara, 2001). The following advantages of SEM in comparison with multiple regressions have been cited by Barbara (2001). SEM is viewed as more flexible assumptions (particularly allowing interpretation even in the face of multicollinearity), being capable of using confirmatory factor analysis to reduce measurement error by having multiple indicators per latent variable, possessing the desirability of testing models overall rather than coefficients individually, the ability to test models with multiple dependents, the ability to model mediating variables, the ability to model error terms, the ability to test coefficients across multiple between-subjects groups, and ability to handle difficult data.

## 5. CHAPTER 5

### RESEARCH RESULTS

The two different statistical approaches used were a separate regression analysis and SEM path modeling. The two approaches yielded results that were very similar to each other.

Descriptive statistics and inter-correlations of the variables of the study are presented in Table 5.1

Table 5.1

Descriptive statistics and correlations for the variables in the study ( N=155)															
Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age group	31	5	1												
2. Work position	2.80	1.16	-.15*	1											
3. Sex	0.52	0.50	.02	.01	1										
4. Dispositional resistance to change	3.28	0.86	.21*	-.03	.01	1									
5. Threat to job security	2.66	0.89	.26*	.45	-.01	-.16	1								
6. Threat to intrinsic rewards	3.16	0.77	.13	.18	.04	.21*	.73**	1							
7. Trust in management	3.21	1.26	-.02	.07	.01	-.04	.36**	.32**	1						
8. Usefulness of information	3.16	1.12	.16	.21*	.03	.02	.16	.03	.06	1					
9. Affective resistance	2.90	1.16	-.10	-.03	.06	.41**	.36**	.39**	-.35	-.04	1				
10. Behavioural resistance	2.60	1.05	.02	.2*	-.01	.36**	.16*	-.0	-.41**	.01	.68**	1			
11. Cognitive resistance	3.10	0.98	.02	-.05	-.03	-.02	.28*	.63**	-.56**	-.07	.51**	.55**	1		
12. Job satisfaction	3.89	0.93	.16	-.03	.02	.01	.04	.25**	.19*	.21*	-.18*	-.19*	-.03	1	
13. Intention to quit	2.47	1.30	-.13	.05	-.01	-.02	-.18*	-.18*	-.28**	-.23*	.25**	.16	.18*	-.55**	1
14. Continuance commitment	3.50	0.89	-.04	-.17	.06	.36**	.03	.12	.01	-.03	-.01	.12	.10	-.13	.08

The analysis of the study results has been based on the SEM path Model results. The advantage of testing the path model using SEM is that it enables one to test two sets of relationships (e.g. antecedents-resistance components and resistance components- work related outcomes) simultaneously. The SEM path model results for the study are presented in Tables 5.2 and 5.3.

Table 5.2 represents regression weights for the antecedents to resistance components.

Table 5.2

SEM results for paths from antecedents to resistance components (N=155)

Variable	Affective resistance (β)	Behavioural resistance (β)	Cognitive resistance (β)
<b>Control</b>			
Age	-.13*	.03	.03
Management sex (0=no,1= yes)	.15*	.29**	.01
Personality	.04	-.08	-.03
<b>RTC</b>			
Context- anticipated change outcomes	.42***	.10*	.00
Threat to job security	.34**	.05	-.07
Threat to intrinsic rewards	.39**	.18	.21**
<b>Context- change process</b>			
Trust in management	-.25**	-.32***	-.47***
Usefulness of information	.06	.10*	.16*
R <sup>2</sup>	.46	.38	.54

\*p<.05, \*\*p<.01, \*\*\*p<.001.

Because of the many possible paths contained within the model, for clarity and simplicity, Figure 5.2 presents the SEM results only for the hypothesized paths.

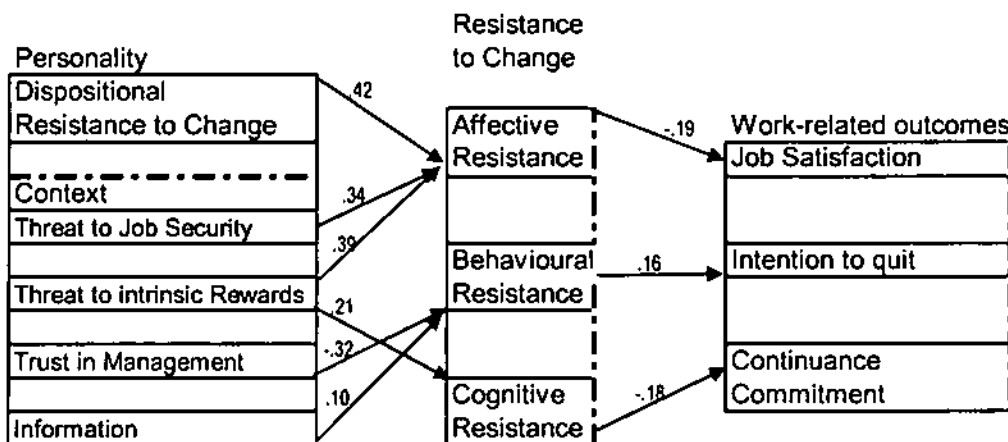


Figure 5.2 SEM path model results, only for paths that achieved significance at the .05 level or lower

The hypothesis 1, that employees' dispositional resistance to technological change will positively relate to employees' affective resistance at a workplace environment was strongly supported. The correlation coefficient of .42 was observed as expected.

Hypotheses 2a-2b suggested that anticipated threats would positively correlate to change outcomes yielding employees' affective and cognitive resistance to technological change and not behavioural resistance were both supported. Hypothesis 2a predicted that threats to job security will be positively associated with the employees' affective resistance to technological change. This hypothesis 2a was strongly supported as observed by a .34 correlation coefficient. Insignificant relationship was observed between threat to job security and both behavioural and cognitive resistance components. Hypothesis 2b predicted that perceived threats to intrinsic motivation will be positively associated with both employees' affective and cognitive resistance to technological change. The hypotheses were both supported with correlation coefficients of .39 and .21. None of these anticipated change outcomes antecedents were significantly related to behavioural resistance.

Hypotheses 3a-3b suggested that the manner in which the change was implemented would significantly influence how employees react to the change. Hypothesis 3a suggested that employees' trust in management will be negatively associated with employees' behavioural resistance to change. This hypothesis was strongly supported with affective, cognitive resistance and more strongly with behavioural resistance. Participants with less trust in management presented increased behavioural, affective and cognitive resistance to technological change (Table 5.2 and Figure 5.2).

Hypothesis 3b suggested that the amount and quality of information that is provided about the change will negatively correlate with employees' behavioural resistance to change. This hypothesis was not supported although it yielded significant correlation with behavioural resistance. The observed correlation coefficient was 0.10 for  $p < .05$ . A more significant correlation with cognitive resistance was also observed even though this was not hypothesised (Table 5.2). Possible reasons for the opposite direction of the relationship will be discussed in the next chapter.

The relationships between each resistance component and the three work-related outcome variables (job satisfaction, intention to quit and continuance commitment) were tested (Table 5.3). The relationships that were hypothesised to meaningful turned out significant. The three hypotheses 4, 5 and 6 were all supported.

Table 5.3 represents regression weights for the resistance components to work-related outcomes.

SEM results for paths from resistance components to work-related outcomes (N=155)

Variable	Job-satisfaction ( $\beta$ )	Intention to quit ( $\beta$ )	Continuance Commitment ( $\beta$ )
Affective resistance	-.19*	.00	-.05
Behavioural resistance	-.06	.16*	-.03
Cognitive resistance	.04	.04	-.18*
$R^2$	.03	.05	.04

\* $p < .05$ .

## 6. CHAPTER 6

### DISCUSSION

The study tests resistance to technological change at a workplace where resistance is conceptualised as three-dimensional (negative) construct towards a large scale organisational change.

The factors influencing individuals' resistance to technological change were selectively chosen based on previous literature. Therefore not all antecedents of individual resistance to technological change are examined in this study. The study considered both personality and context as antecedents to resistance. Among the context independent variables, a further distinction was made between the anticipated change outcomes and the change process. Finally the study examined the relationships between each resistance component and some work related outcomes, namely job satisfaction, intention to quit and continuance commitment.

In agreement with previous work (Oreg, 2003), individuals' dispositional resistance to change showed a strong positive association with affective component of resistance and a relatively less significant but still positive association with behavioural resistance component. This suggested that some employees that more likely experience negative emotions and will more likely act against the change but not all. This could happen due to their personality in terms of their dispositional inclination to change independent of the nature of change at hand.

Threat to job satisfaction showed a positive association ( $\beta = .34$  for  $p < .01$ ) with affective resistance as predicted and absolutely no association with behavioural and cognitive resistance components. This clearly shows that the emotional laden factor of job security has its strongest relationship with employees' affective reaction to change.

Threat to intrinsic rewards showed significant positive correlation to both affective and cognitive resistance ( $\beta = .39$  for  $p < .01$  and  $\beta = .21$  for  $p < .01$ ), respectively. None of the anticipated change outcome factors were significantly associated with

behavioural resistance component. The psychological perspective of organisational paradigms that brings in the presence of emotions or affect at workplaces is supported (Van Tonder, 2004).

The factors involved in the change process such as trust in management showed significant associations with all the three resistance components and a particularly strong effect ( $\beta = -.47$  for  $p < .001$ ) on employees' cognitive evaluation of the change. Therefore lack of faith in the organisation's leadership could be ascribed to participants' responses that expressed anger, frustration and anxiety with respect to the change and increased actions against the change.

Interestingly though was the observed relationship between information and resistance that was opposite in direction to the hypothesis. Information showed a positive significant relationship to behavioural resistance component, opposite but significant as hypothesised and also a significant association with cognitive resistance but no association with affective resistance component. The results reveal that the higher the amount of information about the change would more likely lead to worse evaluation of it and with increased willingness to act against the change. The previous work (Wanberg & Banas, 2000) observed that then more information employees received about the change less likely they will act against it. Wanberg & Banas, 2000 findings are based on the assumption that resistance is irrational and is due to employees' unfamiliarity with the details of the change and therefore lacks the appreciation that employees sometimes resist change for good reasons. For instance in this study, introduction of new technology at the studied organisation implied reduced job security to employees, therefore employees more likely needed assurance that they will not be replaced by the new system due to automation of the processes. The relationship between information and resistance would therefore appear to depend not only on amount of the information (Wanberg & Banas, 2000) but also on the quality of information (Oreg, 2006). The relationship between information and resistance is seemingly nonlinear. Not enough information as well as too much information may be detrimental and would both lead to increased employees resistance to change. Therefore moderate amount of information with appropriate content would be optimum.

The different patterns of relationships for anticipated change outcomes and factors involved the change process with resistance components correspond with the findings on the reactions to distributive versus procedural justice, according to which procedural justice that is concerned with the processes through which organisational decisions are reached was found to more likely arouse behavioural responses than affective and cognitive reactions that would more likely arise in response to distributive justice which deals with outcomes (Robbins et al., 2000; Skarlicki and Folger, 1997).

The potential outcomes of resistance to technological change studied in this work against the three-dimensional conceptualisation of resistance proved meaningful (Table 3) in line with (Oreg, 2006). The results showed the affective resistance negatively correlated with job satisfaction ( $\beta = -.19$  for  $p < .05$ ), behavioural resistance positively correlated with intention to quit ( $\beta = .16$  for  $p < .05$ ) and cognitive resistance negatively correlated with continuance commitment ( $\beta = -.18$  for  $p < .05$ ). Participants whose responses showed feelings of being stressed, angry or anxious because of the change also reported less satisfied with their job and those participants whose responses showed they have acted against the change also reported greater intention to leave the organisation while those whose responses showed negative cognitive evaluations of the change when the change was first initiated also showed willingness to still remain with the organisation.

## **7. CHAPTER 7**

### **LIMITATIONS AND SUGGESTED FUTURE RESEARCH DIRECTIONS**

The nonlinear relationship between information and resistance could not be explained fully in this study. Future researchers should attempt to identify the specific contexts and processes in which information could alleviate resistance and investigate what could be considered appropriate manner through which information should be communicated and ways to optimise both the amount and content of information about change at workplaces.

The other limitation of the study is the fact that survey data were collected only once after the organisational change had already been underway. Therefore no claims can be made regarding causality in the relationships found between the study variables. Future research would be encouraged to access the change process several times over time allowing a longitudinal research design that could address such a limitation.

## CONCLUSIONS

There is no reason to believe that the survey responses were influenced by retrospective sense making since the respondents were not aware of the hypotheses.

The study's findings have a number of implications to managers and change agents in successfully engaging change in organisations. Relative to other antecedents of resistance, individual personality measured by dispositional resistance to change, threat to job security, threat to intrinsic rewards and trust in management were the most meaningful antecedents of resistance to technological change at the work place. Therefore change agents should pay attention to possible ramifications that the change may have on employees' ability to actualise themselves in their job. Trust in management proved to be a dominant variable in its associations with all the three resistance components and therefore both managers and change agents would be encouraged to make a basic habit of building and maintaining the trust of their employees.

The findings acknowledge that resistance can manifest itself in different forms and these different resistance forms can be indicative of the presence of different types of antecedents and as such different interventions could be required to alleviate different forms of resistance. Trust in management is the only studied factor that proved more likely to provoke the full spectrum of resistance forms while other factors would more likely arouse specifically only one or two forms.

Conceptualisation of resistance as a three-dimensional construct showed that the relationships between resistance to change and work related outcomes are not as simple as most previous work has perceived when resistance to change was viewed as a one-dimensional concept. For example, being anxious because of the organisational change may decrease job satisfaction but does not necessarily imply increased intentions to quit the job.

## List of References

- Armenakis, A.A. and Harris, S.G.** 2002. Crafting a change message to create transformational readiness. *Journal of Organisational Change Management*. 15 (2) 169 -183.
- Babbie,E. and Mouton, J.** 2001. *The practice of Social research*. Cape Town: Oxford University Press.
- Barbara N. Byrne** (2001). *Structural Equation Modeling with AMOS*. Rahwah, NJ: Lawrence Erlbaum Associates, 2001. Datasets downloadable from the publisher.
- Baruch, Y & Hind, P.** 1999. Perceptual motion in organisations. Effective management and Impact of the new psychological contracts on survivor syndrome. *European. Journal of Work and Organisational Psychology.*, 8(2) 295-306.
- Burke, R.J and Greenglass, E.R.** 2001. Hospital Restructuring and nursing staff well being. The role of perceived hospital and union support. Anxiety, stress and Coping. *An International Journal*, 14 (1) 93-115.
- Camman, C., Fichman, F., Jenkins, DG. & klesh, JR.** 1983. *assessing the attitudes and perceptions of organisational members*. In S .E. Seashore, E.E Lawler, P.H. Mirvis. & C. Camman Eds., *Assessing organisational change; A-guide to methods, measures & practices*. 77-138. NY: John Wiley.
- Chreim, S.** 2006. Managerial frames and institutional discourses of change. Employee appropriation and resistance. *Organisational Studies*. 27(9). 1261.
- Coetsee, L.** (Summer, 1999). From resistance to commitment. *Public Administration Quarterly*, 204-222.
- Cunningham, EC., Woodward, CA., Shanon, HS., MacIntosh, J., Lendrum, B.,Rosenbloom, D. et al.,** 2002. Readiness for organisational change. A

longitudinal study for workplace, psychological & behavioural correlates. *Journal of occupational & Organisational Psychology*. 75 (4) 377-392.

**de Jager, P.** (2001, May/Jun). Resistance to change: a new view of an old problem. *The Futurist*, 24-27.

**Dent, E. & Goldberg, S.** (1999). Challenging "resistance to change." *Journal of Applied Behavioral Science* 25-41.

**Denzin, N.K & Lincoln, Y.S.** (1994). *Handbook of Qualitative Research*. California: SAGE Publications.

**Fine, S.** (1994) . A Psychologist's response. *Journal of Academic Librarianship*, 00901333, vol.20, issue 3, Academic Search Premier.

**Folger, R. & Skarlicki, D.** (1999). Unfairness and resistance to change: hardship as mistreatment, *Journal of Organizational Change Management*, 35-50.

**Goltz, S.M & Hietapelto, A.** (2002). Using the operant and strategic contingencies models of power to understand resistance to change. *Journal of Organisational Behaviour Management*, 22(3) 3-22.

**Gomez, C. & Rosen, B.** (2001). The leader-member exchange is a link between managerial trust and employment empowerment. *Group and Organisational management*, 26 (1) 53-69.

**Hackman, J 7 Oldman, G.R** (1976). Motivation through the design of work. Test of a theory. *Organisational Behaviour and human Performance*, 16(2) 250-279.

**Hultman, K.** (1995). *Scaling the wall of resistance*. *Training & Development*, 15-22.

**Johnson J.R.** (1989). Technology report of Project 2061 Phase one technology panel. Washington D.C : *American Association for Advancement of Science*.

- Judge, T.A., Thoresen, C.J., Pucik, V. & Welbourne, T.M. (1999).** Managerial Coping with Organisational change. A Dispositional perspective. *Journal of Applied Psychology*, 84 (1) 107-122.
- Kalanda K. 2005.** MSC (MATHS, SCIENCE OR T/EDU). *Factors influencing College students attitudes towards technology*. Pretoria: University of South Africa.
- Kegan, R. and Lahey, L. (2001, Nov).** The real reason people won't change. *Harvard Business Review*. 85-92.
- Kirkman, B. (2000).** Why do employees resist teams? examining the "resistance barrier" to work team effectiveness. *International Journal of Conflict Management*. 74-93.
- Kotter, J. P. and Schlesinger, L.A. (1979).** Choosing strategies for change. *Harvard Business Review*. 57 (4) 106-114.
- Larkin, J.C. (1992).** The Technology Enhancement Centre Program. *The technology teacher*. 52,(3).23-24.
- Lines, R. (2004).** Influence of Participation in strategic change. Resistance, organisational commitment and change goal achievement. *Journal of Change Management*, 4 (3) 193-215.
- Macri, D.M., Tagliaventi, M.R. & Bertolotti, F. (2002).** A grounded Theory to resistance to change in small a organisation. *Journal Of Organisational Change Management*, 15(3) 292-310.
- McGuire, W.J (1985).** *Attitudes and attitude change*. In G. Lindzey & E. Aronson (eds). *Hand Book of Social psychology*. 3<sup>rd</sup> ed. Vol.2. 233- 346. NY: Random House.
- Meyer, J.P., Allen, N.J. & Smith, C.A., (1993).** Commitment to organisations and occupations. Extension and test of a three-component conceptualisation. *Journal Of Applied Psychology*, 78 (4) 538-551.

- Meyer, J.P. and Allen, N.J. (1991).** A three-component conceptualisation of organisational commitment. *Human Resource Management Review*, 1 (1) 61-89.
- Miller, V.D., Johnson, J.R. & Grau, J. (1994).** Antecedents to willingness to participate in planned organisational change. *Journal of Applied Communication Research*, 22 (1) 59-80.
- Morgan, G. (1997).** *Images of organization*. (2<sup>nd</sup> ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Mouton, J. 2006.** *How to succeed in your Masters and Doctorate studies*. A South African Guide And Resource Book. 10<sup>th</sup> ed. Van Schaik.
- Munduate, L and Dorado, M.A. (1998).** Supervisor power bases, co-operative behaviour and organisational commitment. *European Work and Organisational Psychology*, 7 (2) 163- 177.
- Neumann, W.L. 1997.** *Social Research Methods. Quantitative & Qualitative Approaches*. 3<sup>rd</sup> ed. Boston, MA: Allyn & Bacon.
- Oreg, S. 2006.** Personality, Context and resistance to organisational change. *European Journal of Work and Organisational Psychology*. 15 (1) 73-101.
- Oreg, S. 2003.** Resistance to change. Developing an Individual difference Measure. *Journal of Applied Psychology*, 88 (4) 680-690.
- Piderit, S.K. (2000).** Rethinking resistance and recognizing ambivalence: a multidimensional view of attitudes toward an organizational change. *Academy of Management*, 25 (4) 785 – 793.
- Probst, T.M. (2003).** Exploring employee outcomes of organisational restructuring: A Solomon four group study. *Group and Organisation Management*, 28 (3) 416-439.

- Robbins, T.L., Summers, T.P. & Miller, J.L. (2000).** Intra and inter- justice relationships: Assessing the direction. *Human Relations*, 53 (10) 1329-1355.
- Rosenblatt, Z., Talmud, I. & Ruvio, A. (1999).** A gender based Framework of the experience of job insecurity and effects on work attitudes. *European Journal of Work and Organisational Psychology*, 8 (2) 197- 217.
- Rush, M.C., Schoel, W.A & Barnard, S. M. (1995).** Psychology Resiliency on the Public Sector."Hardness" and pressure for change. *Journal of Vocational Behaviour*, 46 (1) 17- 39.
- Rylan, R.M. and Deci, E.L. (2000).** Self determination and the facilitation of intrinsic motivation, social development and well-being. *The American Psychologist*. 55 (1) 68- 78.
- Schweiger, D.M. and DeNisi, A.S. (1991).** Communication with employees after a merger. A longitude. *Academy of Management Journal*, 34 (1) 110- 135.
- Simons, T.L. (1999).** Behavioural integrity as an ingredient for transformational leadership. *Journal of Organisational change Management*, 12 (2) 89-104.
- Skarlicki, D.P. and Folger, R. (1997).** Retaliation in the workplace. The role of distributive, procedural, and interact ional justice. *Journal of Applied Psychology*, 82 (3) 434-443.
- Spector, P.E. (1997).** *Job satisfaction; application, assessment, cause and consequences*. Thousand Oaks, CA; Sages Publications.
- Stanley, D.J., Meyer, J.P. & Topolnystky, L (2005).** Employee cynicism and resistance to organisational change. *Journal of Business and Psychology*, 19(4) 429- 459.
- Strebels, P. (1996).** Why do employees resist change? *Harvard Business Review*, 13 (4) 86-92.

**University of South Africa. Graduate School of Business leadership, 2006.**  
**Leadership & Organisational Dynamics: Study Guide for MBL921-M. Pretoria.**

**Van Tonder C.L. (2004). *Organisational Change. Theory and Practice.* Van Schaik Publishers. 183.**

**Xavier, M.P. 2004. Technology adoption with finite horizons. *Journal of Economic Dynamics & Control.* 28(11). 2129-2154.**

**Wanberg, C.R and Banas, J.T (2000). Predictors and outcomes of openness to changes in a reorganising workplace. *Journal of Applied Psychology,* 85 (1) 132- 142.**

**Welman, Kruger and Mitchell. 2006. *Research methodology.* 3<sup>rd</sup> ed. Oxford University Press.**

**Zander, A. (1950). Resistance to change. Its analysis and prevention. *Advanced Management Journal,* 155 (1) 9-11.**

**Appendix A**

**WORKPLACE ENVIRONMENT, INDIVIDUALS RESISTANCE TO TECHNOLOGICAL CHANGE SURVEY**

**Directions**

1. The questionnaire is confidential and answered anonymously.
2. It is for academic research purposes only.
3. There is no right or wrong answer. Please be honest. Your opinion is what is wanted.
4. Mark with a √ or X the number of your answer that corresponds to your response for each question.
5. Past tense phrased questions require how you experienced change when it was initiated or started.
6. Present tense phrased questions require how you consider your current job after the change has been initiated or occurred.

**Example**

Questions	Rating			
My present position in the company	Manager	specialist	General employee	student
	√			

Please answer all the following questions from 1 to 28

**Section A**

Questions	Rating			
1. My present position in the company	Manager	specialist	General employee	student
2. My sex	male	female		
3. I am aged	< 25	25 - < 35	35 - < 45	≥ 45 years

**Section B**

Note: The following past tense phrased questions require you to express how you experienced the change when it was initiated or started.

**Dispositional resistance to change**

Questions	Rating			
4. I was excited about the change to new computer system*	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
5. I was worried about the use of new system	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
6. I was really sad that we were changing the computer system	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
7. I was afraid of the new system	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
8. I had a bad feeling about the change	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree

Note: The following past tense phrased questions require you to express how you experienced the change when it was initiated or started

Change Process variables

Questions	Rating			
9. I trusted management that the new system would be more effective	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
10. I believed in management's judgement in implementing the new system	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
11. I supported management's idea of implementing the new system	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
12. The information I received about the new computer system was useful	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
13. The amount of information provided concerning the new system was enough	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
14. Enough time was provided for me to understand the new system before using it	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree

Note: The following presence tense phrased questions require you to express how you consider your current job after the change

Work related outcomes

Questions	Rating			
15. All in all, I am satisfied with my current job	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
16. In general, I like working here	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
17. In general, I don't like my job*	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
18. It is likely I will actively look for a new job in the next year	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree

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19. I often think about quitting	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
20. I will certainly look for a new job in the next year	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
21. One of the few negative consequences of leaving this company would be the scarcity of alternative jobs	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
22. Too much of my life would be disrupted if I decided to leave my organization now	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
23. My family is satisfied with social life around this place	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree
24. I owe my organization a lot of what am I can't just leave now	1. Strongly disagree	2. Disagree	3. Agree	4. Strongly agree

Note: The following past tense phrased questions require you to express how you experienced the change when it was initiated or started

Anticipated change outcomes

Questions	Rating			
25. I believed my interest in my job, because the new computer system, would.....	1. Significantly get worse	2. Stay the same	3. Improve	4. Significantly improve
26. I believed the amount of challenge on my job, because of the new computer system, would.....	1. Significantly get worse	2. Stay the same	3. Improve	4. Significantly improve
27. I believed the number of work problems on my job, because of the new system, would.....	1. Significantly get worse	2. Stay the same	3. Improve	4. Significantly improve
28. I believed the chances of me keeping my job because of the new system would.....	1. Significantly get worse	2. Stay the same	3. Improve	4. Significantly improve

reverse scoring\*

## 9. CHAPTER 9

### A DRAFT OF PUBLISHABLE ARTICLE

An investigation in to factors hindering adoption of new technology by employees at the workplace

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#### Abstract

The study tests resistance to technological change at a workplace where resistance is conceptualised as three-dimensional (negative) construct towards a large scale organisational change. The sample consisted of at least 160 employees across the entire organization structure of Silicon Technology plant with a total staff population of 300 employees. The 165 participants issued with the survey produced a 4.8% non response rate with only two feedback scripts that could not be used because they were incompletely filled. The usable 155 feedbacks consisted of 63% men and 37% women with a mean age of 31 years. This sample comprised of 36% managers, 20% specialists, 43% general workers and 1% students. The factors influencing individuals' resistance to technological change were selectively chosen based on previous literature. Therefore not all antecedents of individual resistance to technological change are examined in this study. The study considered both personality and context as antecedents to resistance. Among the context

independent variables, a further distinction was made between the anticipated change outcomes and the change process. Finally the study examined the relationships between each resistance component and some work related outcomes, namely job satisfaction, intention to quit and continuance commitment. The findings acknowledge that resistance can manifest itself in different forms and these different resistance forms can be indicative of the presence of different types of antecedents and as such different interventions could be required to alleviate different forms of resistance. Trust in management is the only studied factor that proved more likely to provoke the full spectrum of resistance forms while other factors would more likely arouse specifically only one or two forms.

**Key words:**

Employee resistance, technology, dispositional resistance to change, anticipated change outcome, process change variable, affective resistance, behavioural resistance, cognitive resistance, job satisfaction, continuance commitment.

The shift from modernism to postmodernism era has placed greater emphasis on fluidity, speed, an information bias work environment and integration as opposed to differentiation within organisations. Therefore a leaning towards fluid, less structured, time-paced and information rich concepts of organisational change are emerging. Information is mainly driven by new technologies. Employee adaptability to new technology is critical in this digital age and this study sheds light on the factors that influence employee resistance to technological change. The leadership challenge for South African organisations is retiring old thinking systems in parallel with creating

new ones against the reality of high speed globalisation and informationalism (Unisa, SBL. 2006).

Enterprises decide to invest in information systems (IS) for a number of reasons such as pressures to sustain cost competitiveness, improve efficiencies without increasing costs and simply to improve the quality of service or product in order to stay in business. Organizations naturally expect employees to adopt the new technologies freely without questions to achieve desired goals. The natural propensity for individuals to "defend the status quo" presents a set of challenges that management must overcome in order to bring about desired change. Management must also seriously take into account and consider the myriad of problems that may result if they are not responsive to issues of resistance in the workplace.

Coetsee (1999: 204) states "any management's ability to achieve maximum benefits from change depends on how effectively they create and maintain a climate that minimizes resistant behaviours and encourages acceptance and support". Therefore factors hindering adoption of new technologies must be identified initially and then addressed. The theoretical model tested by my research has been proposed and tested by (Oreg, 2006). The author reported that both **personality** and **context** were found to be significantly associated with **employees' attitudes** (resistance) towards a large scale organizational change. The attitudes (resistance) were in turn significantly associated with employees' **job-satisfaction, organizational commitment and intention to leave** the organization. The large scale organizational changes could be in **technology**, production methods management practices or compensation systems. The study examines the resistance to change due to technological change in an organization.

In this study an attempt will be to conceptualise the term employee resistance according to Piderit (2000) 's view. Therefore the measure of resistance to change

will be consistent with this view of resistance as cognitive, emotional and behavioural. Antonacopoulou and Gabriel (2001) supported this view by stating that contrary to common perception, the individual reaction to change is not simply a matter of resistance or acceptance but instead comprises of complex blend of psychological, social, emotional and cognitive factors.

The vast majority of empirical studies (for example, Armenakis and Harris, 2002; Goltz and Hietapelto, 2002; Lines, 2004; Rosenblatt, Z., Talmud, I. & Ruvio, A., 1999; Trade-Leigh, 2002) have focused on **contextual variables** that are related to resistance such participation, personal management compacts (trust in management), managerial frames and institutional discourses of change or organizational commitment. A few empirical studies have adopted the personality perspective (for example, Judge, T.A., Thoresen, C.J., Pucik, V. & Welbourne, T.M. 1999; Cunningham, EC., Woodward, CA., Shanon, HS., MacIntosh, J., Lendrum, B., Rosenbloom, D. *et al.*, 2002) and only two empirical studies have combined the role of context and personality in predicting employees' reactions to organizational changes (Wanberg and Banas, 2000 and Oreg, 2006).

Therefore in the present study both personality and context are considered potential antecedents of resistance. Resistance to change has been correlated with a number of work related consequences such as job satisfaction, organizational commitment (Rush, M.C., Schoel, W.A & Barnard, S. M., 1995; Schweiger and Denisi, 1991).

Oreg (2003) introduced a concept of dispositional resistance to change and designed the resistance to change scale (RTC) for measuring the personality component of resistance to change. Dispositional to change concept was defined as the individual internal inclination to resist or adopt changes. The results supported the conception

that personality traits are fundamental affective in nature (Dols and Suzuki, 2002). Oreg (2003) results showed that there is a strong correlation between dispositional resistance and affective resistance and only a weak relationship between dispositional resistance and employees' behavioural reactions. It is therefore hypothesized that:

**Hypothesis 1:** Employees' dispositional resistance will have significant positive correlations with their affective resistance to a particular change at hand.

Organizational change can also threaten the intrinsic satisfaction that employees gain from their jobs. The reason being organizational change often involves changing positions and even redefining tasks. For many people, the expectation of being transferred to a less interesting, less autonomous and less challenging job would create negative evaluations of the change (Oreg, 2006: 80). In addition to cognitively resisting decrease in autonomy and challenges in jobs Ryan and Deci (2000) reported that individuals' well-being is to a great degree dependent on their ability to satisfy intrinsic needs such as the need for autonomy and self-determination. In the organizational context, the ability to satisfy these needs was shown to influence employees' affective responses in the workplace.

The connection between each of these variables and resistance to change may seem undisputed, but their selection is warranted by that most of these relationships have not been tested empirically. Secondly, the perceived relationships may be straightforward with a unidimensional construct of resistance not necessarily with a multidimensional construct (Oreg, 2006).

The employees' reactions to anticipated change outcomes is expected to be internal (i.e. affective and cognitive) but not behavioural. It is therefore hypothesized that:

**Hypothesis 2a:** Perceived threats to job security will be positively associated with the employees' affective resistance to change.

**Hypothesis 2b:** Perceived threats to intrinsic motivation will be positively associated with both employees' affective and cognitive resistance to change.

The findings concerning the relationship between procedural justice and employee behaviours (Skarlicki and Folger, 1997) implied that factors involving the process through which change is implemented would be particularly meaningful with respect to employees' behavioural responses. Therefore the hypotheses on the two selected change process factors are as follows:

**Hypothesis 3a:** Employees' trust in management will be negatively associated with employees' behavioural resistance to change.

**Hypothesis 3b:** The amount and quality of information that is provided about the change will negatively correlate with employees' behavioural resistance to change.

This study presumes that the different components of resistance would have varying relationships with different types of work related outcomes. Specifically, affective is most likely to associate with affective outcomes, cognitive resistance with cognitively based outcomes and behavioural resistance with behavioural outcomes. Job satisfaction represents an outcome with a strong affective affinity (Spector, 1997) and is therefore expected to correlate strongly with affective component of resistance. The behavioural component of resistance involves both behaviour and an intention to

behave. Therefore an intention to leave the organisation seems an appropriate outcome that would tap the behavioural component of resistance.

According to Meyer & Allen (1991) continuance commitment involves a calculative approach with which organisational members evaluate whether or not it is worth their while to remain in the organisation. The cognitive process that is involved in that construct is explicit.

It is not disputed that all three components of resistance could correlate with employees' job satisfaction, intention to quit and continuance commitment based on the previous empirical studies it is hypothesised that:

**Hypothesis 4:** Employees' affective resistance will be negatively related to their job satisfaction.

**Hypothesis 5:** Employees' behavioural resistance will be positively related to their intention to leave the organisation.

**Hypothesis 6:** Employees' cognitive resistance will be negatively related to their organisational continuance commitment.

## Method

The sample consists of at least 160 employees across the entire organization structure of Silicon Technology plant with a total staff population of 300 employees. The level of education is high, with 95% of workforce having a minimum of high school education. The organization can be considered to be relatively mechanistic in its structure (Morgan, 1997), with distinct hierarchical levels and clear line chain of

command. The organizational change comprised of two information systems introduced to aid communication and data transmission within the organization when traditionally employees used hand written notes and telephonic means of communication.

A stratified random sampling approach is adopted in the present study because of the heterogeneous nature of the sample. The hierarchical feature of the organizational structure provides explicit strata namely the students, general worker, specialist and manager. The sampling approach is such that members of identified strata are randomly given questionnaire to sufficient represent each group. The advantage of stratified random sampling design is that the researcher is able to reduce the sampling error without having to resort to large sample sizes (Babbie, 2001).

The data collection method is in the form of self administered structured questionnaire as a survey. The survey instrument captures all the variables required to be measured to test each hypothesis. The answers to each item use a Likert-type point response scale.

The 165 participants issued with the survey produced a 4.8% non response rate with only two feedback scripts that could not be used because they were incompletely filled. The usable 155 feedbacks consisted of 63% men and 37% women with a mean age of 31 years. This sample comprised of 36% managers, 20% specialists, 43% general workers and 1% students.

#### Instruments

- Dispositional resistance to change

The use of 17-item resistance to change (RTC) scale (Oreg, 2003: 680) was adopted for present study to examine dispositional resistance to change towards the affective components of resistance to adoption of new technology. The scale has been validated in a variety of contexts and has consistently demonstrated high structural stability and reliability (Oreg, 2003: 690). The total RTC score for all 5 items (Appendix A) is used to assess employees' dispositional resistance to change. The present study examines dispositional resistance to change towards affective resistance to individuals' adoption of new technology only. The scale's reliability coefficient (Cronbach's alpha) was reported as 0.79.

- Measures for perceived outcomes of change

The evaluation is done using items that ask employees whether they had believed when the change was first introduced that outcomes would improve, stay the same or get worse. Items use a 4 point response scale ranging 'would significantly get worse to would significantly improve'.

### Job Security

Threat to job security will be assessed using one item. The assessment asked whether the employees believed there will be change in the chances they would have to look for a new job the next year (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.72.

## Intrinsic rewards

The items for intrinsic rewards measure are based on factors from Hackman and Oldham's model (1976). Intrinsic rewards involve the extent to which employees believe there would be change in the amount of challenge, autonomy, and personal interests that they have on their jobs. Three items were used (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.84.

- Measures for change process variables

The change process variables are measured using three item for each on a four point response scale varying from strongly disagree, disagree, agree, to strongly agree. The scale's alpha coefficient is reported for each variable.

## Trust in Management

The items aim to assess the general faith employees have concerning management's ability to successfully implement or manage change (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.90.

## Information about the change

The measure is based on Miller, V.D., Johnson, J.R. & Grau, J. (1994) scale. Three items were adopted to assess usefulness of information about change (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.72.

- Measures of work related outcomes

The Likert-type point response scale is used to assess the selected work related outcomes on the tridimensional resistance concept ranging from strongly disagree, agree, to strongly agree. The reliability coefficients were reported.

#### Job Satisfaction

This is measured using Cammann, C., Fichman, F., Jenkins, DG. & klesh, JR., (1983) 3-item overall job-satisfaction scale. Participants were asked to reflect on the extent to which they present agree or disagree on the each item (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.75.

#### Intention to Quit

This is measured using Cammann *et al.*'s (1983) 3-item intention to turnover scale (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.73.

## Continuance Commitment

This is measured using modified Meyer, J.P., Allen, N.J. & Smith, C.A., (1993)'s 6 item-scale. Only four items are used (Appendix A). The scale's reliability coefficient (Cronbach's alpha) was reported as 0.76.

## Data Analysis Approach

The aim of data analysis is to understand the various constituent elements of one's data through an inspection of relationships between concepts, constructs or variables and to establish whether there are any patterns or trends that can be identified, isolated or established in the data (Mouton 2006: 108). The use of descriptive statistics is used and inferential statistics is applied. Correlation coefficients calculated. The Structural Equations Modelling (SEM), with the AMOS (Arbuckle, 1999) software was used to test the study's path model

## RESEARCH RESULTS

The two different statistical approaches used were a separate regression analysis and SEM path modeling. The two approaches yielded results that were very similar to each other.

Descriptive statistics and inter-correlations of the variables of the study are presented in Table 1

Table 1

Descriptive statistics and correlations for the variables in the study ( N=155)

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age group	31	5	1												
2. Work position	2.80	1.16	-.15*	1											
3. Sex	0.52	0.50	.02	.01	1										
4. Dispositional resistance to change	3.28	0.86	.21*	-.03	.01	1									
5. Threat to job security	2.66	0.89	.26*	.45	-.01	-.16	1								
6. Threat to intrinsic rewards	3.16	0.77	.13	.18	.04	.21*	.73**	1							
7. Trust in management	3.21	1.26	-.02	.07	.01	-.04	.36**	.32**	1						
8. Usefulness of information	3.16	1.12	.16	.21*	.03	.02	.16	.03	.06	1					
9. Affective resistance	2.90	1.16	-.10	-.03	.06	.41**	.36**	.39**	-.35	-.04	1				
10. Behavioural resistance	2.60	1.05	.02	.2*	-.01	.36**	.16*	-.0	-.41**	.01	.68**	1			
11. Cognitive resistance	3.10	0.98	.02	-.05	-.03	-.02	-.28*	-.63**	-.56**	-.07	.51**	.55**	1		
12. Job satisfaction	3.89	0.93	.16	-.03	.02	.01	.04	.25**	.19*	.21*	-.18*	-.19*	-.03	1	
13. Intention to quit	2.47	1.30	-.13	.05	-.01	-.02	-.18*	-.18*	-.28**	-.23*	.25**	.16	.18*	-.55**	1
14. Continuance commitment	3.50	0.89	-.04	-.17	.06	.36**	.03	.12	.01	-.03	-.01	.12	.10	-.13	.08

The analysis of the study results has been based on the SEM path Model results. The advantage of testing the path model using SEM is that it enables one to test two sets of relationships (e.g. antecedents-resistance components and resistance components- work related outcomes) simultaneously. The SEM path model results for the study are presented in Tables 2 and 3.

Table 2 represents regression weights for the antecedents to resistance components.

SEM results for paths from antecedents to resistance components (N=155)

Variable	Affective resistance (β)	Behavioural resistance (β)	Cognitive resistance (β)
<b>Control</b>			
Age	-.13*	.03	.03
Management sex (0=no,1= yes)	.15*	.29**	.01
Personality	.04	-.08	-.03
<b>RTC</b>			
Context- anticipated change outcomes	.42***	.10*	.00
Threat to job security	.34**	.05	-.07
Threat to intrinsic rewards	.39**	.18	.21**
<b>Context- change process</b>			
Trust in management	-.25**	-.32***	-.47***
Usefulness of information	.06	.10*	.16*
R <sup>2</sup>	.46	.38	.54

\*p<.05, \*\*p<.01, \*\*\*p<.001.

Because of the many possible paths contained within the model, for clarity and simplicity, Figure 2 presents the SEM results only for the hypothesized paths.

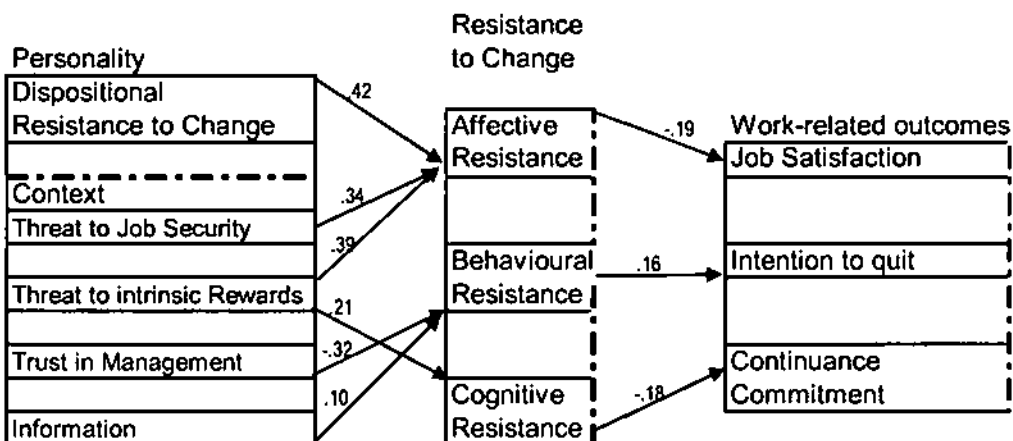


Figure 2 SEM path model results, only for paths that achieved significance at the .05 level or lower

The hypothesis 1, that employees' dispositional resistance to technological change will positively relate to employees' affective resistance at a workplace environment was strongly supported. The correlation coefficient of .42 was observed as expected.

Hypotheses 2a-2b suggested that anticipated threats would positively correlate to change outcomes yielding employees' affective and cognitive resistance to technological change and not behavioural resistance were both supported. Hypothesis 2a predicted that threats to job security will be positively associated with the employees' affective resistance to technological change. This hypothesis 2a was strongly supported as observed by a .34 correlation coefficient. Insignificant relationship was observed between threat to job security and both behavioural and cognitive resistance components. Hypothesis 2b predicted that perceived threats to intrinsic motivation will be positively associated with both employees' affective and cognitive resistance to technological change. The hypotheses were both supported with correlation coefficients of .39 and .21. None of these anticipated change outcomes antecedents were significantly related to behavioural resistance.

Hypotheses 3a-3b suggested that the manner in which the change was implemented would significantly influence how employees react to the change. Hypothesis 3a suggested that employees' trust in management will be negatively associated with employees' behavioural resistance to change. This hypothesis was strongly supported with affective, cognitive resistance and more strongly with behavioural resistance. Participants with less trust in management presented increased

behavioural, affective and cognitive resistance to technological change (Table 2 and Figure 2).

Hypothesis 3b suggested that the amount and quality of information that is provided about the change will negatively correlate with employees' behavioural resistance to change. This hypothesis was not supported although it yielded significant correlation with behavioural resistance. The observed correlation coefficient was 0.10 for  $p < .05$ . A more significant correlation with cognitive resistance was also observed even though this was not hypothesised (Table 5.2). Possible reasons for the opposite direction of the relationship will be discussed in the next chapter.

The relationships between each resistance component and the three work-related outcome variables (job satisfaction, intention to quit and continuance commitment) were tested (Table 5.3). The relationships that were hypothesised to meaningful turned out significant. The three hypotheses 4, 5 and 6 were all supported.

Table 5.3 represents regression weights for the resistance components to work-related outcomes.

SEM results for paths from resistance components to work-related outcomes (N=155)

Variable	Job-satisfaction ( $\beta$ )	Intention to quit ( $\beta$ )	Continuance Commitment ( $\beta$ )
Affective resistance	-.19*	.00	-.05
Behavioural resistance	-.06	.16*	-.03
Cognitive resistance	.04	.04	-.18*
$R^2$	.03	.05	.04

\* $p < .05$ .

## Discussion

The study tests resistance to technological change at a workplace where resistance is conceptualised as three-dimensional (negative) construct towards a large scale organisational change.

The factors influencing individuals' resistance to technological change were selectively chosen based on previous literature. Therefore not all antecedents of individual resistance to technological change are examined in this study. The study considered both personality and context as antecedents to resistance. Among the context independent variables, a further distinction was made between the anticipated change outcomes and the change process. Finally the study examined the relationships between each resistance component and some work related outcomes, namely job satisfaction, intention to quit and continuance commitment.

In agreement with previous work (Oreg, 2003), individuals' dispositional resistance to change showed a strong positive association with affective component of resistance and a relatively less significant but still positive association with behavioural resistance component. This suggested that some employees that more likely experience negative emotions and will more likely act against the change but not all. This could happen due to their personality in terms of their dispositional inclination to change independent of the nature of change at hand.

Threat to job satisfaction showed a positive association ( $\beta = .34$  for  $p < .01$ ) with affective resistance as predicted and absolutely no association with behavioural and cognitive resistance components. This clearly shows that the emotional laden factor

of job security has its strongest relationship with employees' affective reaction to change.

Threat to intrinsic rewards showed significant positive correlation to both affective and cognitive resistance ( $\beta = .39$  for  $p < .01$  and  $\beta = .21$  for  $p < .01$ ), respectively. None of the anticipated change outcome factors were significantly associated with behavioural resistance component. The psychological perspective of organisational paradigms that brings in the presence of emotions or affect at workplaces is supported (Van Tonder, 2004).

The factors involved in the change process such as trust in management showed significant associations with all the three resistance components and a particularly strong effect ( $\beta = -.47$  for  $p < .001$ ) on employees' cognitive evaluation of the change. Therefore lack of faith in the organisation's leadership could be ascribed to participants' responses that expressed anger, frustration and anxiety with respect to the change and increased actions against the change.

Interestingly though was the observed relationship between information and resistance that was opposite in direction to the hypothesis. Information showed a positive significant relationship to behavioural resistance component, opposite but significant as hypothesised and also a significant association with cognitive resistance but no association with affective resistance component. The results reveal that the higher the amount of information about the change would more likely lead to worse evaluation of it and with increased willingness to act against the change. The previous work (Wanberg & Banas, 2000) observed that then more information employees received about the change less likely they will act against it. Wanberg &

Banas, 2000 findings are based on the assumption that resistance is irrational and is due to employees' unfamiliarity with the details of the change and therefore lacks the appreciation that employees sometimes resist change for good reasons. For instance in this study, introduction of new technology at the studied organisation implied reduced job security to employees, therefore employees more likely needed assurance that they will not be replaced by the new system due to automation of the processes. The relationship between information and resistance would therefore appear to depend not only on amount of the information (Wanberg & Banas, 2000) but also on the quality of information (Oreg, 2006). The relationship between information and resistance is seemingly nonlinear. Not enough information as well as too much information may be detrimental and would both lead to increased employees resistance to change. Therefore moderate amount of information with appropriate content would be optimum.

The different patterns of relationships for anticipated change outcomes and factors involved the change process with resistance components correspond with the findings on the reactions to distributive versus procedural justice, according to which procedural justice that is concerned with the processes through which organisational decisions are reached was found to more likely arouse behavioural responses than affective and cognitive reactions that would more likely arise in response to distributive justice which deals with outcomes (Robbins et al., 2000; Skarlicki and Folger, 1997).

The potential outcomes of resistance to technological change studied in this work against the three-dimensional conceptualisation of resistance proved meaningful (Table 3) in line with (Oreg, 2006). The results showed the affective resistance

negatively correlated with job satisfaction ( $\beta = -.19$  for  $p < .05$ ), behavioural resistance positively correlated with intention to quit ( $\beta = .16$  for  $p < .05$ ) and cognitive resistance negatively correlated with continuance commitment ( $\beta = -.18$  for  $p < .05$ ). Participants whose responses showed feelings of being stressed, angry or anxious because of the change also reported less satisfied with their job and those participants whose responses showed they have acted against the change also reported greater intention to leave the organisation while those whose responses showed negative cognitive evaluations of the change when the change was first initiated also showed willingness to still remain with the organisation.

## Conclusion

There is no reason to believe that the survey responses were influenced by retrospective sense making since the respondents were not aware of the hypotheses.

The study's findings have a number of implications to managers and change agents in successfully engaging change in organisations. Relative to other antecedents of resistance, individual personality measured by dispositional resistance to change, threat to job security, threat to intrinsic rewards and trust in management were the most meaningful antecedents of resistance to technological change at the work place. Therefore change agents should pay attention to possible ramifications that the change may have on employees' ability to actualise themselves in their job. Trust in management proved to be a dominant variable in its associations with all the three resistance components and therefore both managers and change agents would be

encouraged to make a basic habit of building and maintaining the trust of their employees.

The findings acknowledge that resistance can manifest itself in different forms and these different resistance forms can be indicative of the presence of different types of antecedents and as such different interventions could be required to alleviate different forms of resistance. Trust in management is the only studied factor that proved more likely to provoke the full spectrum of resistance forms while other factors would more likely arouse specifically only one or two forms.

Conceptualisation of resistance as a three-dimensional construct showed that the relationships between resistance to change and work related outcomes are not as simple as most previous work has perceived when resistance to change was viewed as a one-dimensional concept. For example, being anxious because of the organisational change may decrease job satisfaction but does not necessarily imply increased intentions to quit the job.

## LIMITATIONS AND SUGGESTED FUTURE RESEARCH DIRECTIONS

The nonlinear relationship between information and resistance could not be explained fully in this study. Future researchers should attempt to identify the specific contexts and processes in which information could alleviate resistance and investigate what could be considered appropriate manner through which information should be communicated and ways to optimise both the amount and content of information about change at workplaces.

The other limitation of the study is the fact that survey data were collected only once after the organisational change had already been underway. Therefore no claims can be made regarding causality in the relationships found between the study variables. Future research would be encouraged to access the change process several times over time allowing a longitudinal research design that could address such a limitation.

List of references: above