

# CHANGING THE WORK BEHAVIOUR OF CHINESE EMPLOYEES USING A CONTINUOUS PROCESS IMPROVEMENT PROGRAM AND ACTION RESEARCH: A CASE STUDY OF AN INTERNATIONAL ELEVATOR COMPANY LOCATED IN CHINA

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## Abstract

The management of workplace change takes place in many industry contexts and micro-settings using a variety of approaches, all of which are widely reported in the academic and professional literature. There is less known about workplace change management in the context of an international company employing large numbers of Mainland Chinese employees. The company needed to

improve its delivery of service quality; in this case to the maintenance of elevators and escalators, especially where breakdowns occur and customers get frustrated. It was imperative to change the mindset and work behaviour of the Chinese workforce. This case study reports the design, implementation and evaluation of a process improvement program 'custom built' for the Chinese employees of the international company.

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## **INTRODUCTION**

This case study tells the story of introducing a change management agenda into the Chinese workforce of an international elevator and escalator company. The change driver was the need to have Chinese employees in the maintenance department recognize the importance of having higher-level competence and commitment to providing service quality for the customers. A related need for management was to induce in staff the importance of creating value to the company, that is to say, caring about learning and upholding its best practices. Not only was service maintenance a considerable source of revenue, more importantly, service quality was considered a practical means of staying competitive in a business environment crowded with excellent rivals. The rapidly developing marketplace of China, with its huge potential for the goods and services of international companies, had already moved beyond products and pricing into the competitive edge of service quality. The weak link in the chain was the work behaviour of the Chinese employees, with no tradition of taking initiative and even less understanding about the value of providing high standards of workmanship and remaining loyal to the company.

Specifically, the case study reports on the change management strategy of introducing a key element of Total

Quality Management (TQM), that is to say, the practical tool of continuous process improvement (CPI). The strategy was concentrated on the Chinese workers in the maintenance department, located across the border from Hong Kong, where the company has its regional headquarters. The process improvement strategy was conceived and driven by the manager responsible for service maintenance (the co-author). An action research design entailing two distinct stages was used to facilitate the change agenda. The paper reports on these aspects of the case study, together with the main findings and it concludes by posing a key general question about the choice of strategy as a basis for further reflection.

### **The case study company**

The company originates from Finland and is still one of the largest family controlled enterprises in the country. It is a truly international business with over 150 subsidiaries serving 50 countries. Its main business is the manufacture, installation, modernisation and maintenance of elevators and escalators, accounting for about 97% of sales revenue. It employs 21,550 people worldwide. Only in the past decade has the company established a presence in Mainland China, with the setting up of regional centres in Beijing, Shenzhen and Shanghai, although it first started

exporting its products into the country in 1985.

The company deals with two main kinds of customers, with broadly similar needs but different purchase strategies. The first is the government or public sector, which is characterised by the purchase of large volume sales but with a long timeframe for decision-making and complicated documentation requirements. By contrast the private sector is more cost conscious but easier to deal with in terms of turnaround times for purchase.

The internal organisation of the company is based on three main areas of activity. The first deals with new products and technical designs of elevators and escalators, covering the range of installation in high-rise residential, hotel and office accommodation. The second activity area specialises in the modernisation of existing systems, involving the replacement of old for new parts and the installation of new elevators into existing shafts. The third area, and the focus of the case study, is the contractual regular service maintenance of existing installations. This is a very profitable side of the business. Regular servicing is relatively simple but dealing with customers when systems break down requires maintenance staff with both competence and coping skills under intense pressure. The margin for error is virtually zero. To get things right requires not only a high level of technical competence but also a certain

attitude mindset. Within the cultural context of a tradition-minded Chinese workforce this is a big task and challenge to the company.

Within the context of Mainland China the third area of activity was considered something of a problem with plenty of room for improvement for delivering an efficient and effective service in the maintenance function. The breakdown of moving equipment always frustrates customers and, in a competitive environment, bad news travels far and wide fast. Therefore the company had to take steps to ensure reputable service quality, not only with routine maintenance but also urgent repairs. This entailed changing the mindset and work behaviour of the Chinese employees in the service maintenance department. A 'do nothing' strategy was not an effective option. The first step was to better understand in conceptual terms the nature and cultural characteristics of the Chinese workforce, before a change management could be designed. As a feature of the change management strategy it was decided to base action plans on at least a general comprehension of the cultural aspect and to show sensitivity towards the Chinese workforce.

### **Chinese culture and the workforce**

Basically, the problem with the Chinese workforce employed by the company is work behaviour that is

over-compliant and prone to the old authoritarian management style response in the workplace, a by-product of the many years of communist leadership and cultural upheaval. What the company needed were workers who understood the need to think and take initiative, especially when emergencies arose, such as dealing with equipment breakdowns and other problems to the operations of elevators and escalators. Company philosophy emphasises the importance of customer satisfaction through quality service. Moreover, the company aspires to the ideals of the learning organisation, in which employees not only share common vision and values but also have the opportunity to continuously improve their own work-related knowledge and performance.

The company has the good sense to recognise that it is not enough to expect Chinese employees to simply follow the corporate culture, which has its origins in Scandinavian and European thought and values. A learning organisation implies encouraging employees to develop what might be loosely termed 'A corporate identity with Chinese characteristics', so that they have a genuine sense of 'ownership' and some control over the leading ideas about vision and values. Therefore a key element in the Process Improvement strategy was to enhance good conditions for team-based and self-directed learning as a foundation for a service quality mindset and work performance.

As a background to such lofty thinking it was considered necessary to better understand the cultural influences on Chinese workers. The reason for this rather academic approach was to obtain a better theoretical grasp of the problems likely to be encountered in attempting any kind of change management strategy in a Chinese workplace context. A literature search led to the ideas of a leading academic (Hofstede, 1983 and 1984) whose work introduced a useful conceptual framework based on four criteria, identified below.

The connection between each criterion and the reasonably comparable ethnic Chinese cultural organisational context of Hong Kong and Shenzhen is summarised below-

*Power distance*: typically there is a substantial power difference in Chinese organisations, which in combination with the strong Confucian traditions of hierarchy, effectively ruled out participative and democratic style learning activities. It was believed that such approaches to process improvement would be perceived as diminishing the power and status of the management. Some supervisors immediately felt threatened, as it was believed that Quality Circles and the like exposed the weak side of management and in any event workers were adverse to open criticism.

At the same time, it was noted that Confucian traditions upheld the values

of submission to those in power, in this instance those in management and supervisory positions.

*Uncertainty avoidance:* it was believed that although Mainland Chinese workers sought the kind of workplace security they had experienced in the past, they had poor commitment to the values and aspirations of the employer and were generally uninterested in helping achieve corporate goals. Under different market conditions workers now had little sense of loyalty and simply followed the best rates of pay. Within the context of PI programs the Quality Circle approach was doomed to fail, mainly because of high labour turnover and poor commitment to corporate goals.

Returning to a point made earlier, uncertainty could be avoided by simply obeying the managers. None the less, doing what the managers wanted falls well short of the aspirations of the learning organisation.

*Individualism and collectivism:* the trappings of centralised communist rule presses on in China but deep-seated collectivism is based more on the family than the party. Nor does it follow the 'groupism' of the Japanese workforce and is a long way from the individual self-centredness familiar to those living in the West. The main legacy is to leave workers with no understanding of taking initiative at the workplace and raising one's head above

the rest, lest it should attract the wrath of the authorities.

*Masculinity and femininity:* the dominance of the former over the latter is reflected in a 'live to work' attitude and an acceptance that the large work organisation has a right to interfere in personal life.

Even with only an acquaintance of the Hofstede model it was clear that within the context of a typical Chinese work organisation it is very likely that it would be characterised by high power-distance and the centralisation of power at the top of the pyramid, bringing with it the issue of maintaining and not losing 'face' between the hierarchical levels. This problem lower down the organisation was compounded by low trust and a fear of appearing to disagree with those in positions of authority. Hence the sensitivity managers felt about being exposed to the possible critical reaction of subordinates and the reluctance for workers to talk freely. Authoritarian traditions and the related mindset die slowly in the typical Chinese work organisation. All of these mindset and work behaviour characteristics was the opposite to the spirit and form of the vision and values of the company, TQM generally and CPI in particular, as will be explained a little later.

The point of the above model, allowing for its obvious over-generalised simplicity, is to highlight the presenting problem faced by any

manager attempting to bring about change in the mindset and work behaviour of the stereotypical Chinese employee through CPI or any other strategy. At least that was the initial understanding that confronted the co-author with responsibility for designing, implementing and managing the CPI process in the service maintenance department of the company. None the less, management is about changing the way things are done and therefore having an understanding of the deep-seated cultural dynamics of the Chinese workforce was not considered sufficient reason to delay the process of improving work behaviour and achieving the service quality objectives of the company. In short, it was considered timely to intelligently challenge the prevailing workplace culture and implement a more forward thinking change management strategy through the continuous process improvement program.

### **Process Improvement in a wider context**

More than a decade ago, when Japan showed the rest of the world how to perfect production techniques, such as team working, Quality Circles, Just-in-Time and other methods for controlling the precision and quality of output, they set standards for other to learn and emulate. Altogether the 'Japanization' movement was a tangible expression of the transition of industrial production to what has been generally termed a 'Post-Fordism' model, with its

emphasis on flexibility and new workplace cultures (Elsey, 1997). Among these holistic developments was Total Quality Management (TQM). TQM by definition implies a change management strategy, intended to reshape the overall organisational design, the production processes as well as the structure and culture of the organisation, chiefly to achieve a competitive edge in the market through the quality assurance of products and flexibility of service process. It entails top management commitment through to a range of means for enhancing the performance of employees, as well as the quality of goods and services. Within the context of a tradition-bound Chinese workforce TQM is likely to seem confronting and disturbing. Clearly any change management strategy has a big cultural and communication gap to close. From the standpoint of an international company anxious to make inroads into the Chinese market there was an imperative to bring about the desired changes to a key work unit with a critical relationship to customers with high-level expectations and needs.

In more general terms TQM also implies that everyone does a great deal of learning, in the form of skill mastery, problem solving and reflecting upon experiences, thereby increasing the knowledge base of the organisation. In that way TQM may be seen to contribute to practically realising the ideal-type of the learning organisation. Implicit in the process is the idea that

democracy, in the sense of being encouraged and enabled to engage in 'free talk' and practical problem solving, was an acceptable value of the company that the workers should model their behaviour upon.

Specifically, process improvement (CPI) was chosen as the change management strategy as it operates incrementally on the flow of work. It differs from a single focus on costs and profits by taking a holistic view of the relationship between the goals and values of the company, the organisation and management of its goods and services through to delivery to customers. This supply chain perspective was not only a 'big picture' approach, it was considered less of a direct assault on the old-style attitudes and behaviour of the workers in the service department. Hence the use of the action research approach as it provided more time and opportunity to learn and reflect upon the changes taking place. More about the research design follows shortly.

Furthermore, CPI in addition to focusing on the concrete realm of work productivity and service quality was also intended to foster the capacity of workers to learn and adapt to new ways of thinking and doing. Therefore in the CPI approach it was not enough to get workers to change technical and skill behaviour, they were also required to think about and meet customer needs and ultimately have more commitment and loyalty towards the company. Such

a demanding agenda cannot be achieved in a one-off training program. In overall terms CPI met the requirement for a gradual, evolving and non-threatening process of changing hearts and minds, with enough time for workers to learn and adjust to the changes asked of them.

### **The Action Research approach**

Action research (AR) and the related concept of action learning has achieved a 'hard' currency value to practitioners in the management of organisational and workplace change (Else, 2000). The theory basis of what is essentially a practical method of change management has been well documented and as a background to the project reported in this case study, the leading ideas were digested and used as an underpinning rationale. It is not necessary to repeat the theory dimensions of the concepts in this case study. The choice of the action research (AR) approach was pragmatic, mainly for the reasons given earlier. It was also practical as it allowed the managers and supervisors to join with workers in thinking about the change management process as a series of related steps or stages (the two AR spirals). The four key components of the AR cycle, that is, problem identification, planning, implementation, reflection and evaluation, were built into the two spirals. The first spiral, therefore, contained the identification of the problems

associated with providing service quality to customers leading to the planning of a CPI training program. In the same first spiral was the implementation of the CPI training program, followed by the reflection and evaluation stage, before beginning the second spiral.

Generally, CPI marries well with the AR spiral in allowing all the employees to mutually identify the problems of providing adequate service quality, basically enabling everyone to think and plan systematically and to reflectively consider how to evaluate the success of each completed spiral before going ahead with the next. The whole process could reasonably be regarded as an opportunity to gain mastery in keeping with the ideal of the learning organisation.

In more tangible terms, the CPI agenda and AR method covered three kinds of learning experience. First was *task-orientated learning* in which members focus on the room for improvement in service delivery. The Second was *dialogic learning*, meaning the process of communicating with an understanding of each other, both at the level of ideas and the concrete one of planning. The Third is *self-reflective learning*, purposefully to think about the scope for personal change. Certainly the manager in charge of the process planned CPI with a clear understanding of the conceptual and contextual background of the change strategy, but naturally

had to pay more attention to the details of turning ideas into concrete outcomes. This entailed a great deal of energy devoted to ‘winning the hearts and minds’ of the service department staff, all of them more familiar with traditional ways of working in China.

### **The first spiral of the action research method: from design through implementation to evaluation**

This was the foundation stage upon which concrete outcomes in the improvement of service quality and delivery could possibly be sustained. The most important initial step was to carefully select staff to become process improvement facilitators. Given the anticipated difficulties in persuading Chinese employees to change their ingrained habits of thinking about and doing work, it was essential to find CPI facilitators who possessed the attributes of cultural sensitivity, notably to understand and effectively respond to the deeper meanings in communication with participants. They had to command a certain respect from workers as well as be seen as neutral, not the ‘eyes and ears’ of management. They also had to foster a participative style of communication with workers unfamiliar with such openness, and to take criticism when workers seriously engaged with the identification of problems in service quality and delivery to customers. Finally they had to be committed to remaining with the CPI project, even if they were promoted or



transferred to other duties in the company.

Six CPI facilitators, mostly department managers and supervisors, were eventually selected, each responsible for teams of 30 staff, a total of 180 representing the four sub-sections of the service department: Field Operations, Technical Engineering, Marketing, and Administration. The six CPI facilitators were sent on a specially designed training course on understanding CPI principles and practices. Part of the training included being able to adopt a more open and democratic approach to communication. This was essential in facilitating the capacity of team members to identify problems within the service quality function of the company and to propose solutions. They were also expected to translate CPI training documents into the Chinese language.

For the action phase of the first spiral it was decided that attention needed to focus on the problems associated with routine maintenance, falling under the management of the Field Operations of the department. Each team was asked to think about the common problems and to suggest remedies. Routine maintenance comprises three related activities: (1) *modules* (what needs to be done), (2) *intervals* (when things should be done) and (3) *standards* (measuring how well routine maintenance was carried out).

Each team met twice to consider the room for improvement in these three areas of routine maintenance. The teams were able to identify what needed to be done, when and to what standard. With regard to routine maintenance *modules* it was noted that the 'one size fits all' approach was ineffective and needed to reflect the different systems that the company had been selling and installing for several years. It was also noted that maintenance staff felt the need for more time to think about and design better ways and means of improving the running condition of systems, especially in treating 'sick' elevators. As for service *intervals* there was a need for more advanced planning of schedules and better tailored to different systems. The greatest criticism of routine maintenance practices was with existing *standards*, which were seen as inadequate or even non-existent. Another problem was that maintenance workers suffered from poor motivation to increase standards of workmanship in the absence of measurable targets and good feedback on their work.

In all six teams consistently reporting a clear 'performance gap' it was evident that PI was beginning to take effect, demonstrating that those involved in the operations of the department were well aware of shortfalls and the need to address the problems in a managed way. It suggested that the PI strategy had begun to find a way of encouraging Chinese workers to actively participate in a

mutual dialogue and to learn from each other.

In more tangible terms, the outcome of the first spiral was to devise an integrated program for addressing the reported problems. This was called the Quality and Planned Maintenance Scheme (QPMS). First, it identified the general running condition, the risk of breakdown and usage of each elevator owned by customers. Elevators were categorised as either 'normal' or 'sick' and planned service maintenance was defined as either 'routine', 'intensive' or 'technical'. A detailed 'health' account for each elevator was designed in which the condition of component parts could be accurately described, the maintenance procedure and standards agreed and trouble-shooting techniques identified in advance. The QPMS was also a criteria-referenced measuring device for monitoring and evaluating the work performance of service department staff set against clear procedures and standards.

Second, such knowledge provided the means to create an advanced planning schedule better suited to the predicted and various maintenance needs of customers. The intention was to avoid, as far as possible, sudden breakdown in the operations of elevators by ensuring a more sophisticated routine maintenance schedule was in place.

The evaluation of the first spiral comprised two sets of 'before' and

'after' questionnaires sent to CPI facilitators, maintenance employees and customers. The one directed at facilitators sought feedback on the CPI course they had attended, notably their understanding of the action research approach and the confidence to apply it in practice. Without exception the CPI facilitators had found the course useful and effective in preparing them for working closely with maintenance staff.

The one directed at employees sought information about changes in work behaviour arising from the first cycle of the CPI project. Analysis of the findings showed that nearly all attributes of employee satisfaction were positively correlated with work performance, the minor exceptions not being statistically significant (see table below).

It was evident from the experience of the first spiral of the action research that the Chinese employees were ready, willing and able to think about the need to improve service quality and to produce useful ideas as the basis of future work practices. Therefore the second spiral began on an optimistic note. Specifically, the second spiral carried over the QPM method.

The second spiral of the action research method: from design through implementation to evaluation.

The main focus of the second action research spiral was to reinforce the progress made in planning for

process improvements, particularly in the vexed area of routine maintenance, and encourage workers to think more about how to effectively manage and respond to customer needs. Moreover, in addition to 'software' advances it was necessary to fortify the improved 'hardware' of the Quality and Planned Maintenance Scheme (QPMS) established in the first spiral. The Process Improvement Teams (PITs) had re-engineered the technical service process in the first spiral, reducing the incidence of equipment breakdowns, but they still looked for a positive correlation with employee commitment and customer satisfaction.

The PITs worked on the management of customer expectation and a customer-oriented philosophy for the front-line staff. A four-stage schedule including identification and analysis, planning, implementation and evaluation was established. In a technically orientated company with many trained engineers such criteria-referenced schedules fitted well into the organisational culture and were readily received and understood.

The first task was to develop a detailed comprehension of what the customer wanted. Customers were invited to voice out the priority of their needs. The results were therefore consolidated into an agreed memorandum of understanding of consumer benefit. It was unanimously agreed that reliability and availability were the two most important focal

points. The PITs had carried out the improvement of the two aspects in the first spiral and they set a further goal of 0.7 breakdown rate/month and 95% availability rate in the second spiral.

In the planning process, the PITs used the memorandum of consumer benefits and the result of the first spiral to define the internal-performance gap and external-performance gap. The performance gap was defined as the difference between the perceived service given (internal staff) and the expected service (external customers). The PITs had to strike a balance between the level of expectation from customers and improvement of service standard provided by internal staff, thereby developing a reasonable standard of service. Taken together the work of the PITs, which had produced an understanding of customer needs and performance criteria, naturally led to the development of a communication strategy that was intended to be a work behaviour charter for the service department of the company as a whole. But first the strategy had to be implemented and tested within the confines of the action research project.

An integrated implementation campaign, named Soccer Operation Improvement Plan (SOIP), was developed to put the objectives in practice. The QPM was included in the plan and the SOIP was aimed at improving total customer satisfaction and finally customer loyalty. Using the metaphor of the soccer team, three

kinds of play were envisaged: defence, mid-field and attack or offence. Both the defence and mid-field were regarded as having a prime focus on making the QPM strategy effective. On the defence side, the PITs kept regular contact with customers, benchmarking the service and the costs involved for the company and to communicate the rationale of the customer service charter. The objective was to significantly reduce the gap between what the company could realistically offer and what the customer expected. The management of customer loyalty is critical. It is the foundation for optimising the usage of limited resources to satisfy the high priority needs of customers. On this basis the company was able to position itself to offer the best elevator service package in the country (a mid-field strategy). Offence or attack was seen as effectively communicating the service quality strategy to secure customer satisfaction and loyalty.

The successful QPM scheme was continued in the second spiral to address the need for better reliability and availability. The PITs increased attention on the root cause for the breakdowns of various components and organised specialised training sessions, the development of new maintenance methods and the creation of special maintenance kits. Special arrangement with the company head office led to enhancements of the computer system so that the time taken to supply spare parts was shortened.

Continuing with the soccer metaphor, on the offence side, the elevators owned by customers were classified into 'normal', 'sick' and 'healthy' types, according to the performance criteria established earlier. Typically, normal customers had both high usage and a high breakdown rate. The PITs embarked upon a better communication of service standards to manage the performance gap. A related strategy was to encourage workers to transform their work attitude and become more proactive in meeting customer needs quickly and effectively. Those customers with 'sick' elevators had high breakdowns and a low usage rate. The key focus was to minimise mistakes and therefore reduce the failure rate. A relationship-building strategy was adopted to deal with the healthy customers, that is, those with elevators that worked well and caused few problems. Service offers were aimed to communicate to them the commitment to service quality and the overall reliability of the company.

In evaluating the results of the second spiral, the same surveying method in the first spiral was used. Customer satisfaction had increased regarding their rating of perceived performance in the areas of maintenance, repair, response time and level of communication. There was also improvement in employee commitment in both technical and non-technical areas. When comparing the mean scores before and after the second

spiral, there is a general increment in all 8 aspects of measurement.

The second spiral greatly enhanced the involvement and commitment of employees and the management had a more thorough customer understanding under the SOIP program. The performance-based maintenance offers also helped to increase customer confidence in the company. Findings supported the effectiveness of the AR spirals in helping employees to learn, first through a technically driven AR spiral, then through a customer-focused second AR spiral.

## **Conclusion**

The outcomes of the two action research spirals reached such a satisfactory stage in the behavioural changes required of the Chinese workers in the service department that it was considered sufficient for the initial start-up phase of the continuous improvement process to bring the project to closure. Of course, it was readily acknowledged that if process improvement was to have more lasting value, continuous effort had to be made to sustain the changes into the long-term. None the less, it was clear that a number of important developments had taken place and noting these concludes the case study.

The project showed that in spite of the long cultural traditions that most Chinese people had experienced under

communism, notably a marked unwillingness to think and take initiative at work, the employees in the company service department demonstrated a readiness to embrace active thinking and learning. The provision of a first rate maintenance scheme that quickly responds to breakdowns and other emergencies is critical in securing customer satisfaction and loyalty. It was a pressing need for the company and an imperative to embark upon a change management strategy. The project showed the capacity of the Chinese employees to devise a workable scheme for assessing the condition of lifts and elevators of customers and to implement an action plan for managing problems as well as routine maintenance more effectively than before. Certainly the service department manager (and co-author) was satisfied with the outcomes.

The project was well in line with people management strategies that focus on the motivation and learning abilities of human resources as the cutting edge of change, making particularly good use of team-working and group problem-solving. The use of action research provided just the right momentum to get things done while at the same time providing time and opportunity to think ahead and reflect on past actions. It is an open question whether additional spirals of the action research process would have inspired and enhanced more action learning and achieved even better results. But as

stated earlier, it was recognised that the continuous improvement process means just that and therefore the effort to empower employees and make things work even better has to be sustained. It was also clear that the euphoria of a good beginning may not be enough to avoid a return to old habits of thought and work practice, hence the need to keep going forward into the long term future. The same thought applies almost as much to managers and the company as a whole, for it is quite easy to become complacent and in the competitive world of the industry this could be damaging. It would be claiming too much to argue that the CPI project provides substantial evidence of the learning organisation in action. As stated earlier it is wiser to be more cautious in arguing that the learning organisation arrived on the back of the single CPI project. But a good beginning was made and the future prospects look quite good, providing the effort is sustained.

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**APPENDIX**

<b>Table 1 Growth of China's Elevator Market</b>		
<b>Year</b>	<b>Productivity</b>	<b>Yearly Growth %</b>
1985	9178	--
1986	11268	22.77%
1987	12033	6.79%
1988	13530	12.44%
1989	12705	-6.10%
1990	10717	-15.65%
1991	12000	11.97%
1992	16000	33.33%
1993	24100	50.63%
1994	27900	15.77%
1995	28900	3.58%
Source: Yam Tin Siu (1997), <i>Meeting with the China Elevator Industry</i> , The International Association of Elevator Engineers		

<b>Table 2 Paired T-Test of employee survey before and after the first AR Spiral</b>		
	<b>T-value</b>	<b>Sig (2-tailed)</b>
Supervisors Direction	-0.6900	0.4910
Contribution Made	-0.1530	0.8790
Belief	0.1430	0.8860
Interested in work	1.4880	0.1390
Held responsible	-1.2950	0.1970
Supervisor has power	-0.2470	0.8050
Supervisor Competence	9.7520	0.0000
Commitment	0.1530	0.8790

**Table 3 T-Test of the Four Satisfaction Ratings from Customers on Company Services Including Maintenance, Repair, Response Time, and Communication**

Customer – Paired T-Test (between first and second AR spiral)		
	t-value	Sig. (2-tail)
Maintenance	7.0930	*0.000
Repair	4.2080	*0.000
Response Time	3.1657	*0.000
Communication	2.4547	*0.000

\*Significant at 95% confidence level, 2-tailed.

**Table 4 T-Test of the Eight Employee Perception Ratings**

Employee – Paired T-Test (between first and second AR spiral)				
	Mean		t-value	Sig. (2-tail)
	Before	After		
Direction given	5.894	6.294	7.209	*0.000
Contribution	6.350	6.489	3.779	*0.000
Interest	5.733	6.139	8.867	*0.000
Belief	6.128	6.461	7.256	*0.000
Responsibility	6.267	6.611	8.364	*0.000
Power	5.944	6.478	10.784	*0.000
Competence	5.928	6.428	11.888	*0.000
Commitment	5.839	6.478	11.495	*0.000

\*Significant at 95% confidence level, 2-tailed.