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THE IMPACT OF GLOBAL TECHNOLOGICAL CHANGE ON MEDIUM AND LOWER SKILLED TEXTILE AND GARMENT WORKERS IN THAILAND

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ABSTRACT

This paper examines the effect of technological change on job security, job satisfaction, work relations and the overall socio-economic situation of medium and lower skilled textile and garment workers in Thailand. It also investigates the influence of job security, job satisfaction, and work relations on the overall situation of workers. Results show that the work pride, supervision quality, benefits, internal communication, fair pay, workers involvement in the change process, personal control and the overall situation are positively influenced by the technological change. The negative effects are increased skill demands, workload, complexity in work assignments, and strikes. Unskilled textile workers are more involved in downsizing from the change than garment workers are. The more skill demands and more frustration leads to a less positive overall impact on workers. The more involvement of workers in the change process and more personal control over their work result in more positive overall impact. Job satisfaction factors are not significantly related to the overall impact. However, job security, job satisfaction and work relations together are significantly related to the overall socio-economic impact of technological change on Thai workers.

BACKGROUND

One of the challenges of business globalization for the least developed countries (LDC's) is that technology change erodes the advantages of labour intensive technology. Textiles and garments are one of the leading labor-intensive industries that is still viewed as the driving force of industrialization in developing countries (Byrne and Rigby, 2000). These countries have been using traditional technologies for producing textiles and garments. The emergence of new and computerized technologies has changed the production systems of these countries towards capital intensive technologies. To satisfy the increasing demand of high quality products, textile and garment companies have been introducing new and advanced machines in the manufacturing process. The internal reasons for these adoptions are to support current performance, establish new business lines, and fulfil the demand of international customers. Technological change refers to adapting a technology that is new to the operating environment and that is more advanced than that used

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facing very difficult decisions related to the workers' performance and the future of the medium and lower skilled workers. The challenge is to identify the possible strategies to minimize the negative consequences of technological change on workers.

THE TECHNOLOGICAL CHANGE IMPACT ON THE TEXTILE AND GARMENT WORKERS

Global technological change brings advanced machines and computerized production systems concerning fabric preparation, cutting, materials handling, fusing, sewing, pressing, finishing, and dying into the textile and garment industry (Byrne and Rigby, 2000; Yang and Zhong, 1998). The change increases the demand for newer skills for the workers and compels management to deal with the limitations of the current workers (Cecilia and Mitter, 1994). This change has a negative influence on medium and lower skilled workers (Singh, 1995). Technological change is related to the attitudes of workers concerning job security, job satisfaction, and work relations (Beer, 1997). These, in turn, influence the overall socio-economic situation of workers.

Job security is affected by the technological change in the company (Bolt, 1983; Greenhalgh, 1983). Companies need reduce excess capacity and move towards high performance models of work organizations to be more competitive in international markets. This demands modification of organizational structure that includes broadening jobs, intensifying work, and creating new divisions of labor (Human Resources development Canada, 1998). A number of studies have stressed on how technology is changing workplace security. These studies primarily argue that the technological change alters job structure. The consequence is the reduction of workers by eliminating medium and lower skilled jobs from the company (Adams and McQuillan, 2000). Replacing people with technology facilitates this downsizing process (Dunkerley, 1996; Rifkin, 1995). This causes a negative impact on the morale and the overall commitment of workers to the organization (Brockner, 1992). The principal jobs that remain in the company are those that involve higher level of skills, computer programming intelligence, and knowledge of technology (Dunkerley, 1996; Golzen, 1996). Technological change demands newer skills, higher workability, and knowledge about new manufacturing processes (King, 1997; Soehnlein, 1998). New technology requires a different use of workers, different workers with different skills (Leicht, 1998). Workers are compelled to learn how to operate new and advanced machines. Lower skilled workers can not adapt these new technologies easily. They are often unable to operate machines because of less knowledge and low skills. Frequent failures in working with the new technologies increase uncertainty and make their jobs vulnerable. Workers are neglected by management and are often transferred to other low-tech factories. The ultimate consequence is dismissal of workers from their jobs. However, this is not always the case. Levi and Young (1986) claimed that technological change is more likely to change the nature of jobs than to

significantly reduce the number of workers.

The job satisfaction of workers is significantly influenced by the technological change. The studies related to job satisfaction primarily follow a combination of three broad theoretical approaches including social-psychological, neoclassical economic approach, and a more sociological approach. Some researchers used facets of the job to conceptualize job satisfaction, while others used total satisfaction as the basis for this conceptualization (Khaleque and Rahman, 1987; Rice, McFarlin and Bennett, 1989; Levin and Stokes, 1989). However, the social psychological approach seems to dominate the literature, which argues that a number of factors determine job satisfaction of workers (Mulinge and Mueller, 1998). These are mainly two kinds - intrinsic and extrinsic. Intrinsic factors include worker participation, autonomy, communication, task significance, distributive justice, career growth, and job variety. The extrinsic factors are pay, benefits, promotional opportunity, job safety, supervisory support, co-worker relations, work overload, role ambiguity, role conflicts, and resource inadequacy (Naumann, 1993). Fair pay is an important issue in technological change. Workers feel that new and advanced technologies increase unfair pay. Lower skilled workers are paid lower than the standard amount. Workers perceive that company discriminates against them by paying less and rewarding higher skilled workers. Temporary workers (e.g., contract workers, workers working in absence of other workers etc.) feel it is unfair when they are assigned more workload with low wages. These workers encounter a comparatively lower level of social supports and have more unfair pay. This results in a lower level of job satisfaction than skilled workers.

Technological change increases the significance of the job. New and advanced technologies are skill biased and the workers with higher skills get more benefit. Workers with the high skill variety, autonomy, and job significance experience a higher level of job satisfaction than their lower skilled counterparts (Hackman and Lawler, 1971; Sokoyo, 2000). The higher skilled workers are able to work with complex machines and can earn more. Working with a significant job improves the job satisfaction of workers. They feel proud of working with such jobs. Hackman and Oldham (1990) observed that working with significant jobs improves the job satisfaction of workers. Five core job dimensions including skill variety, task identity, task significance, autonomy, and feedback determine the level of motivation potential of workers at work.

Supervision quality is an important matter for the workers. Supervisors work at the floor level and they should be involved in the design of jobs involved in the change. The nature of job design includes task complexity, task varicty, and task interdependence which are correlated with job satisfaction (Appelbaum, 1997). Task interdependence demands similar skilled workers at the different stages of manufacturing process to produce a high quality product. This requires the active role of supervisors in the change. Engineers often perform job design without using the experience of supervision (Ostberg and Enqvist, 1984). This results in the

negative motivation of supervision.

Supervisors tend to more biased to skilled workers because they can work with advanced machines better than the unskilled workers. Unfair treatment regarding pay, allowances, work distribution, and the unfair behaviors of supervisors increases with technological change (Topolosky, 1998). Workers benefits are significantly modified by the introduction to new and advanced technologies. Lee (1997) found that the higher skilled workers get more benefits than the lower skilled workers do in the change. Workers with higher skills can easily adapt to the new work environment. They are able to perform a variety of jobs that increases their benefits. The benefits of lower skilled workers are reduced due to their inability to work with complex machines, which results in more dissatisfaction.

Work relations are defined as positive and negative relations between the management and workers. Positive relationships include worker support for the change, less militant unions, no confrontation, management support for skill development, and workers involvement in the work decisions. While, the presence of conflicts, confrontations, strikes, and psychological withdrawals of workers indicate negative work relations (Manson, 1998). Good work relations are an important factor for better performance of a manufacturing company. Technological change often hampers good work relations by bringing new and advanced machines into the company (Kuruvilla, 1996). The increase in frustration and dissatisfaction of workers leads to poor work relations.

Workers involvement in technological change activities improves work relations. The involvement of workers can improve the quality of the change process through increasing their commitment to it (Walton, 1985). However, workers involvement requires communication and management skills of team participants, knowledge of advanced systems, and coordination among related change attitudes, which affect effective workers involvement. Lower level workers lack communication and management skills. They have very low knowledge of advanced technologies. Workers do not have a clear understanding of the change process.

Training and skill development are significantly related to the technological change. For introducing advanced manufacturing systems training becomes essential for workers to fit the new system. The company should conduct a needs assessment to decide which workers will be trained for new positions (Downs, 1985). It is also essential to address the anxiety of workers about learning how to operate new and advanced machines and languages. Lack of time and limited resources restrain the effectiveness of the training and skill development initiatives of the company.

Communicating change plans to workers is another important step for implementing technological change. These are also positively related to work relations (Park, 1998). Lack of communication of change plans to workers causes

resistance to change (Bamane, 1994). Top management should emphasize open communication and act on it. These include more meetings with workers, increased use of internal publications, communication skills training with workers, and providing more resources to support training programs. Workers can adapt to change better if they are informed about the change earlier (Levi et al, 1986).

Managing technological change is a critical problem for the textile and garment managers (Slem, 1986; 1995). Technological change necessitates a greater concern about the appropriateness of human resources strategies (Maznah and Cecilia, 1997). At the enterprise level, new technology should be complemented by change processes including human resource planning, work organization, training and development, worker participation for improve work relations to reduce the negative consequence of the change on workers (Walton and Susman, 1987). In such situations, management requires a proactive approach to adapt technological change efficiently HRDC, 1997; Levi, 1991 & 1992). The relationship of technological change and the influence on medium and lower skilled workers are shown in Figure 1.

Figure 1: Relationships of Technological Change Impact on Textile and Garment Workers

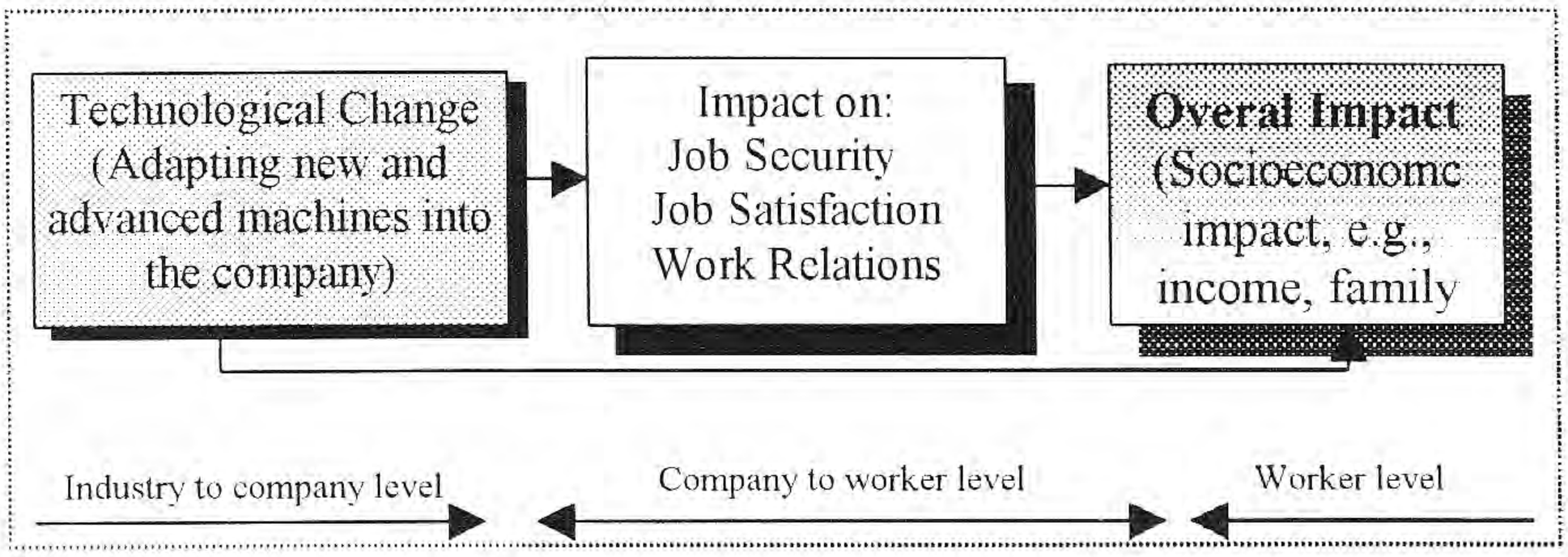

Figure 1 indicates that technological change has direct impact on job security, job satisfaction, and work relations. At the same time, the change in job security, job satisfaction, and work relations have a significant influence on the overall socio-economic impact. The overall impact is also directly influenced by the change. Technological change brings new and advanced machines into the company, which demands newer skills for the workers. The change eliminates lower skilled jobs from the company. Job insecurity of workers is increased through the increase of skill demands, work stress, anxiety and uncertainty. Job satisfaction of workers is influenced by the change. The increased task complexity, task variety, and workload make the job harder. Increased unfair treatments dissatisfy the workers. However, the change increases benefits and the job significance. Workers involvement in technological change activities, training and development, personal

control, and strikes are influenced by the change. The conflicting situation at the workplace induces workers to resist the change through strikes.

METHODOLOGY

Data Sources

This study is based on primary data. A structured questionnaire survey was conducted among the textile and garment workers to measure the technological change impact on medium and lower skilled workers in Thailand. In total, 234 workers were surveyed from 91 medium and large sized companies located in Bangkok. 80% workers are women. Only large and medium sized export-oriented companies were covered in the survey. Small size companies were not considered for this study because of low technological change in their manufacturing processes. Workers were surveyed during January to June 2000. A review of secondary data provides the overview of this industry and technological change relationships. The principal secondary data sources were statistical yearbooks, economic surveys, annual reports, directories of textile and garment companies, industry and company reports etc.

Sample Selection and Collection of Data

The respondents came from large and medium size textile and garment companies. The classification of the companies has been made based on volume of work and number of workers working in the company. The volume of work is defined as the number of orders handled by one company. Handling more orders require more workers to perform. Companies with 500 and more workers are categorized as large, while companies with 200 to 500 workers are as medium. Companies with less than 200 workers are defined as small. Textile and Garment Directories were used to select the companies and to identify the number of workers for this survey.

There are about 4,554 textile and garment companies in Thailand, of which about 2000 companies are export-oriented. About 75% of the total companies are in garment production and the rests are in textile (Thai Textile Statistics 1999). Human resource Experts and Human Resource Managers opinions suggest that around 60% of the companies are small and categorized as small companies in the present study. The rest 40% companies (i.e., 1821 companies) are large and medium sized, which are considered in this study. 20% of the selected companies are large (i.e., 364 companies) and 80% are medium in size (i.e., 1457 companies). Data has been collected from the 5% of large and medium sized companies. In total, 68 companies were selected from garment and 23 were from textile segment. Among 91 companies, 19 were chosen from large and 72 were from medium sized companies. In large category, 5 companies were from textile and 14 were from garment segment. While, 18 companies were selected from textile and 54 were from garment segment of medium sized companies.

Companies were selected purposively and the workers were chosen from the selected companies. To sample workers, companies were selected first with respect to departments. Each textile company is divided into 4 major functional departments namely spinning, weaving, dying and printing, and finishing. A garment company is mainly divided into 3 divisions such as cutting, sewing, and finishing. For representation of all the functions, one worker from each department of textile and two workers from each department of garment have been selected. 500 workers from textile and garment companies were finalized for the survey in which 92 were from textile and 408 were from garment. Among 500 workers, 104 were from large and 396 were from medium sized companies.

The survey has been conducted with a structured questionnaire with assistance of Thai MBA students of Kasetsart University, who explained the questions in Thai to the workers. The interviewers were trained in the variables representing the questionnaire before starting the interviews. 234 workers completed the survey, of which 78 were from the textile and 156 were from the garment segment indicating an overall response rate of about 47%. The response rate for textile was 85% and for garment was 38% (Table 1). The strict control of the company over workers and time constraints to complete the questionnaire caused the low participation in the survey.

Table 1: Distribution of Sample Workers Selected for the Survey

	Large Size		Medium Size		Total	
	Planned	Interviewed	Planned	Interviewed	Planned	Interviewed
Textile	20	10	72	68	92	78
Garment	84	37	324	119	408	156
Total	104	47	396	187	500	234

Sample Characteristics

This study is designed to survey both textile and garment workers together to assess the overall impact of technological change on this sector. The garment segment is the most important in the textile industry in Thailand. About 40% of the sample workers were from textile and the rest 60% were from garment segment. The respondents include 74% medium skilled and 26% lower skilled or unskilled workers. A medium skilled worker is defined as those workers who have had some technical training. They are able to operate machines. Lower skilled workers have only limited training and work experience. The workers with no training and no experience at all are termed as unskilled workers in this study. About 23% of the sample work on an hourly production basis. 44% of the sample are production assistants, who usually facilitate machine operators in production. They are semi skilled workers. The average age of Thai workers is about 30 years with the average work experience of 4 years. (Table 2).

Table 2: The Characteristics of the Sample Workers

Background Characteristics	Indicator
Total sample company (Number)	91
Sample size (worker in number)	234
Textile workers (%)	40.10
Garment workers (%)	59.90
Women (%)	79.50
Male (%)	20.50
Medium skilled (%)	74.20
Lower skilled or Unskilled (%)	25.80
Average work experience (years)	4.03
Average age (years)	29.89
Hourly production (%)	23.10
Clerical (%)	32.90
Production assistant (%)	44.00

Impact Measurement

This study analyses the overall impact of technological change on textile and garment workers. In order to do so, three main dimensions including job security, job satisfaction, and work relations have been analyzed. Finally, the relationships of these variables were linked to the overall socio-economic impact of workers. The direct influence of technological change on the overall socio-economic impact is also explained in this study. It is defined in socio-economic terms. It includes economic factors such as income, benefits and social concerns, such as, family, or status. A structured questionnaire on a seven-point scale has been developed for the variables relating to job security, job satisfaction, and work relations. The number of items included in the questionnaire includes 10 for job security, 36 for job satisfaction, and 10 for work relations. A seven-point scale ranging from 1 to 7 with 1 indicating lowest agreement and 7 indicating the highest agreement is developed for all the items included in job security, job satisfaction, and work relations. For the overall impact of change, the scale is divided into 7-points. Respondents could indicate the degree of agreement or disagreement. The scale positive (+3) to negative (-3) was used to measure the overall socio-economic impact of technological change on the worker group. To ensure the questions were understandable to the workers, the questionnaire was translated into the Thai language.

Reliability

Reliability reflects the consistency of a set of scale items in measuring a particular concept. It captures the individual differences concerning the intensity of agreement or disagreement of the concept studied. In this study, reliability measurement is important to check the internal consistency of all variables concerning job security, job satisfaction, and work relations. Cronbach's Alpha (α) is computed using SPSS reliability program for each dimension. The alpha value for the 10 items in job security is 0.78, for the 36 items in job satisfaction is 0.85, and for 10 items in work relations is 0.78. The overall alpha value (α) of 56 items in the questionnaire concerning job security, job satisfaction, and work relations is calculated as 0.85, which is more than the acceptable level (Hair, et al, 1998, Nunnally, 1978).

Data Analysis

In analyzing the data, both descriptive and inferential statistics were used. Simple percentages of agreement and disagreement were used to explain the positive and negative influences of technological change on job security, job satisfaction, work relations and the overall situation of workers. Multivariate Analysis techniques such as, Factor analysis and Multiple Regression analysis were used to analyze the relationships of the attitudes of workers on the impact of technological change. A Principal Factor analysis with an orthogonal rotation (VARIMAX) using the SPSS statistical package was performed on the survey data and was used to identify the factors concerning job security, job satisfaction, and work relations. The relationships of job security, job satisfaction, and work relations with the overall impact are assessed through Regression analysis.

RESULTS OF FACTOR ANALYSIS

To measure the impact of technological change on Thai textile and garment workers 56 attitudinal variables concerning job security, job satisfaction, and work relations were used in the analysis. Factor analysis identified 16 main factors, in which 3 are from job security, 10 are from job satisfaction, and 3 are from work relations. The variables constituted these factors have high factor loadings indicating high correlations with the factors.

Job Security Factors

Factor analysis of 10 job security variables identified 3 main factors those account for 64% of the variance in job security. The factors are identified as frustration, skill demands, and uncertainty.

Frustration

Factor analysis shows that frustration is the most important factor of job security with an eigenvalue of 3.54. This factor covers 35% of the variance. This factor is formed with four job security variables including time pressure, job responsibility, work stress, and frustration.

Skill Demands

The second important job security factor is skill demand. The eigenvalue of this factor is 1.71 with the variance of 17%. Skill demand is concerned with the variables such as requirement for newer skills, requirement for learning new machines, and workload. The high factor loading indicates the importance of the variables.

Downsizing

Technological change reduces the number of workers in the company. The third job security factor is downsizing with 1.10 eigenvalue and 11% of variance. The variables including reduction of workers, future uncertainty, and the future impact of the change formed this factor (Table 3).

Table 3: Job Security Factors

Factors	Variables	Factor Loadings	Eigen-value	Percen-tage of variance
Frustration	New technology creates more time pressure on workers.	.80	3.54	35.45
	My job responsibilities will be confusing.	.67		
	New technology makes me stressful in job.	.87		
	New technology frustrates me in the job.	.88		
Skill demands	New technology requires more ability / skills.	.80	1.71	17.12
	New technology requires me to learn new equipment / machine.	.75		
	New technology creates a lot of extra works.	.77		
Downsizing	New technology reduces the number of workers here.	.74	1.10	11.02
	The future of my job is uncertain.	.69		
	I do not know how does it will affect my job.	.58		

Job Satisfaction Factors

Factor Analysis of 36 attitudes in job satisfaction dimension identified 10 main factors including pride in work, goal ambiguity, supervision, benefits, workload, unfair behavior, communication, bureaucracy, fair pay, and work assignment. It accounts for about 69% of the variance in job satisfaction.

Pride in Work

The first job satisfaction factor called pride in work that accounts for the most variance (20%). It consists of 4 variables. This factor has the highest eigenvalue (7.36). This factor includes attitudes related to liking work, enjoying co-workers, feeling of pride in job, and enjoy the job.

Goal Ambiguity

The second important factor related to job satisfaction is goal ambiguity with an eigenvalue of 5.72. It covers 16% of the variance in the data. The variables associated to this factor are the meaningless job, work appreciation, goal clarity, appreciation of efforts, lack of transparency of the company, unnecessary work, and the way of rewarding efforts.

Supervision

Supervision is the third factor of job satisfaction that is constituted with 5 variables. The variance contains this factor is 7% with an eigenvalue of 2.37. The variables formed this factor are supervisor competency, salary increase, promotion chance for well-done work, liking supervisors, and promotion opportunity in the company.

Benefits

Benefit is an important job satisfaction factor for the workers. The eigenvalue and the variance of this factor are 1.76 and 5%. The variables formed this factor are benefits compared to similar companies, benefit package (e.g., allowance for food, transport allowance, accommodation facilities, medical allowance etc.), the chances for salary and benefit increases, and protesting for more benefits.

Workload

The next job satisfaction factor is workload. The eigenvalue and the variance of this factor are 1.63 and 5%. Five job satisfaction attitudes formed this factor including red tape, hard working for the incompetence of fellow workers, supervisors interest in feelings of workers, and too much work.

Unfair Behavior

Unfair behavior is another factor concerning job satisfaction of workers. The eigenvalue and the variance of this factor are 1.39 and 4%. The variables formed this factor are too little chance for promotion, satisfaction with the benefits, and unfair supervision.

Communication

Another job satisfaction factor is internal communication of the company with an eigenvalue value of 1.30 and the variance of 4%. The variables included in this factor are recognition for good job, smooth internal communication, and few rewards.

Bureaucracy

Bureaucracy is a job satisfaction factor. The eigenvalue and the variance of this factor are 1.14 and 3%. Only one variable related to rules and procedures constituted this factor.

Fair Pay

Fair pay is an important factor of job satisfaction with an eigenvalue and variance of 1.07 and 3%. Two variables formed this factor including payment of fair amount and liking fellow workers.

Work Assignments

Work assignment factor includes the variables of advancement in job and explanation of work assignments with the eigenvalue of 1.01 and the variance of 3% (Table 4).

Table 4: Job Satisfaction Factors

Factors	Variables	Factor Loadings	Eigen-value	Percen-tage of variance
Pride in work	I like doing the things I do at work.	.73	7.35	20.43
	I enjoy my co-workers.	.63		
	I feel a sense of pride in doing my job.	.83		
	My job is enjoyable.	.63		
Goal ambiguity	I sometimes feel my job is meaningless.	.52	5.72	15.88
	I do not feel that the work I do is appropriated.	.54		
	The goals of this organization are not clear to me.	.66		
	I feel unappreciated by the company when I think about what they pay me.	.62		
	I often feel that I do not know what is going on the company.	.64		
	I have too much unnecessary work.	.64		
	I do not feel my efforts are rewarded the way they should be.	.64		
Supervision	My supervisor is quite competent in doing his/her job.	.77	2.37	6.58
	Raises in salary are to few and for between.	.58		
	Those who do well on the job stand a fair chance of being promoted.	.50		
	I like my supervisor.	.70		
	I am satisfied with my chances for promotion.	.56		
Benefits	The benefits we receive are as good as most other companies offer.	.42	1.76	4.89
	The benefit package we have is equitable.	.84		
	I feel satisfied with my chances for salary increases.	.65		
	There is too much bickering and fighting at work.	.47		

Table 4 (continued)

Workload	My efforts to do a good job are seldom blocked by red tape. I find I have to work harder at my job that I should because of the incompetence of people I work with. My supervisor shows too little interest in the feelings of subordinates. I have too much to do at work. There are benefits we do not have which we should have.	.58 .44 .53 .65 .65	1.63	4.54
Unfair behavior	There is really too little chance for promotion on my job. I am not satisfied with the benefits I receive. My supervisor is unfair to me.	.51 .50 .71	1.39	3.87
Communication	When I do a good job, I receive the recognition for it that I should receive. Communications seem good within this company. There are few rewards for those who work here.	.41 .74 .63	1.30	3.61
Bureaucracy	Many of our rules and procedures make doing a good job difficult.	.76	1.14	3.18
Fair pay	I feel I am being paid a fair amount for the work I do. I like the people I work with.	.78 .54	1.07	2.99
Work assignments	People get ahead as fast here as they do in other places. Work assignments are often not fully explained.	.52 .71	1.01	2.80

Work Relations Factors

Factor Analysis of 10 variables in work relations dimension formed 3 main factors that account for about 60% of the variance. The factors are identified as change process, strikes, and personal control.

The Change Process

The first work relations factor is defined as the change process accounts for the most variance (35%) consists of 4 variables. This factor reflects that the workers are highly influenced by the technological change. The eigenvalue of this factor is 3.25. The variables formed this factor are workers participation in decision making,

workers support in the change implementation, communicating change plans to the workers, and conflicts between workers and the management.

Strikes

The second work relations factor is strike with an eigenvalue of 1.28 and 13% of variance. The variables forming this factor include adapting new technologies into the company, firing lower skilled workers, strikes for more benefits, and involvement of workers in the change process.

Personal Control

The third factor concerned with work relations is personal control that accounts for 12% of the variance in the data. The eigenvalue of this factor is 1.15. Two variables represent this factor: scope for training and skill development and personal control (Table 5).

Table 5: Work Relations Factors

Factors	Variables	Factor Loadings	Eigen-value	Percen-tage of variance
The change process	Workers participation in work decisions.	.76	3.52	35.29
	Employee support in change implementation.	.84		
	Communicating work change plans widely among workers.	.71		
	Conflict with management on the change.	.47		
Strikes	Adapt new machines, computers, and manufacturing processes.	.59	1.28	12.87
	Fire lower and semi-skilled workers.	.71		
	Strikes for more benefits from the change.	.80		
	Opportunity to participate in change implementation.	.59		
Personal control	Training, educating, budget for training, and expand training scope for skill development of workers.	.67	1.15	11.55
	Personal control on work and quality.	.82		

THE IMPACT OF TECHNOLOGICAL CHANGE ON JOB SECURITY, JOB SATISFACTION, WORK RELATION AND OVERALL IMPACT ON WORKERS

Job security, job satisfaction, work relations and the overall socio-economic impact on Thai workers are influenced by the technological change in the company. Mean scores of the variables constituted the factor were used to analyze these relationships. Results show that fair pay is the most influenced factor followed by skill demands, pride in work, personal control, benefits, strikes, quality of supervision, workload, and work assignments.

As can be seen from Table 6, technological change has direct influence on the overall socio-economic impact on Thai workers. The overall influence is slightly at the positive level (1.22) based on the 7-point scale ranging from positive (+3) to negative (-3).

Job security is affected by the technological change. More ability and newer skills are demanded by the change. The mean score of skill demands is at the very high level (5.09). Technological change substantially increased skill demands for the Thai workers. They believe that skill demand is increased by the change but it does not increase frustration (3.50) and downsizing (3.93) in their companies.

The job satisfaction of Thai workers is affected by the new and advanced technologies. Thai workers have higher level of positive agreement in job satisfaction factors including fair pay (5.54), pride in work (4.78), quality of supervision (4.26), and benefits (4.36). They believe that technological change increased fair pay and benefits. Technological change also increased quality of supervision, which improved their pride in work. The workers have higher level of agreement on the increased workload (4.20) and work assignments (4.20). They have to work more now than the past. Workers have lower level of agreement on goal ambiguity, unfair behavior, and bureaucracy. They believe that the change has no influence on goal clarity of the company, behavior of supervisor, and the bureaucracy. They remained neutral regarding the influence on internal communication of the company.

Work relations are significantly influenced by the technological change. Strikes and personal control are the most important factors. Thai workers perceive that the change increased their control over work (4.43). They are more independent in performing their jobs, but the change increased strikes (4.26) in their companies. The strikes increased are related to the increase in skill demands, workload, and work assignments for the workers. Thai workers do not feel they influence the change process of the company (4.03).

Table 6: Job Security, Job Satisfaction, and Work Relations

Factors	Mean Scores N=234	Standard Deviation
Frustration	3.50	1.581
Skill demand	5.09	1.373
Downsizing	3.93	1.345
Pride in work	4.78	1.369
Goal ambiguity	3.64	1.222
Supervision quality	4.26	1.089
Benefits	4.36	1.193
Workload	4.20	1.037
Unfair behavior	3.72	1.304
Communication	4.06	0.892
Bureaucracy	3.91	1.936
Fair pay	5.54	1.168
Work assignments	4.20	1.293
The change process	4.03	0.867
Strikes	4.26	0.722
Personal control	4.43	1.041
Overall impact	1.22	1.333

COMPARING TECHNOLOGICAL CHANGE ON MEDIUM AND LOWER SKILLED WORKERS

T-tests were conducted on factors related to job security, job satisfaction, work relations, and the overall impact. Table 7 shows that there are significant differences between the medium skilled and lower skilled workers about the effect of technological change. Significant differences were observed on frustration, skill demands, downsizing, pride in work, goal ambiguity, supervision quality, benefits, and work assignment. Lower skilled workers (4.05) were more frustrated by the technological change than the medium skilled workers (3.30). Both groups believed that the change increased the skill demand. Lower skilled workers (5.47) are comparatively more affected than the medium skilled workers (4.95) regarding skill requirements. More lower skilled jobs (4.62) were eliminated from the company compared to medium skilled jobs (3.69). In pride in work, medium skilled workers perceived more pride than lower skilled workers. Although both believe that the change increased work pride. Lower skilled workers believe that the change created more goal ambiguity for them than their counterparts. Both groups ranked this factor below the neutral level. Medium skilled workers believe the change increased the quality of supervision, but the lower skilled didn't. Medium skilled workers (4.46) were positive to benefits, but lower skilled workers (4.05) were

comparatively less positive to it. Lower skilled workers perceive that the change increased complexity in the work assignment (4.68). Medium skilled workers were neutral on the impact of the change on work assignment (4.02).

The differences between the views of medium skilled and lower skilled workers on workload, unfair behavior, communication, bureaucracy, fair pay, change process, strikes, and personal control were not significant. Both groups believe that the technological change increased workload and strikes in their companies. Workers strongly believe that the change increased fair pay in their companies. They also perceive that the change increased personal control over their work. Medium skilled workers are more optimistic about better internal communication and their involvement in the change process compared to lower skilled workers. Both groups rated unfair behavior and bureaucracy as low.

The overall impact of technological change is found at slightly positive level. Thai medium skilled workers (1.25) are more positive regarding the overall socio-economic impact compared to lower skilled or unskilled workers (1.13). However, the difference was not statistically significant.

Table 7: Technological Change and Medium and Lower Skilled Workers

Factors	Medium Skilled Workers N=173	Lower Skilled Workers N=60	Significance (2-tailed)
Frustration	3.303	4.058	0.001*
Skill demands	4.959	5.472	0.013*
Downsizing	3.690	4.622	0.000*
Pride in work	4.919	4.391	0.010*
Goal ambiguity	3.542	3.933	0.033*
Supervision quality	4.388	3.888	0.002*
Benefits	4.465	4.054	0.021*
Workload	4.189	4.230	0.796
Unfair behavior	3.757	3.594	0.407
Communication	4.119	3.911	0.116
Bureaucracy	3.849	4.066	0.457
Fair pay	5.595	5.400	0.266
Work assignments	4.023	4.683	0.001*
The change process	4.072	3.941	0.316
Strikes	4.304	4.133	0.114
Personal control	4.488	4.291	0.205
Overall	1.25	1.13	0.566

Note: Equal variances assumed. *Significant at 5% level of significance.

COMPARING TECHNOLOGICAL CHANGE ON TEXTILE AND GARMENT WORKERS

Table 8 shows that there are significant differences between textile and garment workers regarding job security, job satisfaction, work relations, and the overall impact. The differences are related to frustration, downsizing, pride in work, supervision quality, benefits, fair pay and the overall impact. Garment workers (1.58) are significantly more positive to the overall impact of technological change than the textile workers (0.68). Technological change frustrates textile workers (4.04) more than the garment workers (3.14). Textile workers believe that downsizing (4.17) is increased by the change, while garment workers (3.77) do not think so. This is because of comparatively higher skill demands in textile jobs. Both the groups strongly believe that the change increased pride in work and fair pay. Garment workers are comparatively more optimistic to the influence on pride in work and fair pay than textile workers. Garment workers feel that supervision quality is increased by the change, whereas textile workers disagree with this perspective. Garment workers (4.57) perceive that the benefits are increased by the technological change, while textile workers (4.02) are neutral.

No significant differences have been observed skill demand, goal ambiguity, workload, unfair behavior, communication, bureaucracy, work assignment, change process, strikes, and personal control. Both textile and garment workers perceived increased skill demands, increased work assignment, increased strikes, and increased personal control on work.

Table 8: Technological Change and Textile and Garment Workers

Factors	Textile Workers N=93	Garment Workers N=141	Significance (2-tailed)
Frustration	4.04	3.14	0.000*
Skill demands	5.30	4.95	0.053
Downsizing	4.17	3.77	0.024*
Pride in work	4.34	5.07	0.000*
Goal ambiguity	3.63	3.65	0.875
Supervision quality	3.99	4.44	0.002*
Benefits	4.02	4.57	0.000*
Workload	4.25	4.16	0.534
Unfair behavior	3.58	3.81	0.185
Communication	4.11	4.02	0.395
Bureaucracy	4.19	3.72	0.065
Fair pay	5.31	5.70	0.013*
Work assignments	4.30	4.13	0.327
The change process	3.94	4.10	0.158
Strikes	4.16	4.32	0.096
Personal control	4.37	4.69	0.486
Overall	0.68	1.58	0.000*

Note: Equal variances assumed. *Significant at 5% level of significance.

JOB SECURITY, JOB SATISFACTION, AND WORK RELATIONS ON THE OVERALL SOCIO-ECONOMIC IMPACT OF WORKERS

Table 9 shows that job security, job satisfaction, and work relations have a significant relationship with the overall socio-economic impact on Thai workers. Multiple Regression of 16 factors concerned with job security, job satisfaction, and work relations with the overall socio-economic impact shows that frustration, skill demands, the change process, and personal control are significantly and positively related. Frustration and skill demands are job security factors. The negative relationship of frustration (-.317) and skill demand (-.197) with the overall situation indicate that the more frustration and the more skill demand will result in less positive overall impact on Thai workers. Downsizing has no significant relationship with the overall impact. The change process (.233) and personal control (.223) related to work relations are significantly and positively related to the overall impact of workers. These relationships explain that the more worker involvement in the change process and the more personal control in work will lead to a more positive overall impact. Strikes are not significantly related to the overall impact. Job satisfaction factors such as pride in work, goal ambiguity, supervision, benefits, workload, unfair behavior, communication, bureaucracy, fair pay, and work assignments have no significant relationship with the overall impact of change on Thai workers.

Table 9: Relationships between the Factors and the Overall Socio-Economic Impact on Workers

Factors	Unstandard-ized Beta Coefficients	Std. Error	Std. Beta Coeffi-cients	Compu-ted t	Sig.
(Constant)	1.241	.084		14.862	.000
Frustration	-.317	.112	-.236	-2.828	.005*
Skill demand	-.197	.101	-.144	-1.956	.052**
Downsizing	.036	.093	.027	.390	.697
Pride at work	.014	.102	.011	.143	.886
Goal ambiguity	.010	.093	.008	.110	.912
Supervision	-.089	.109	-.067	-.818	.415
Benefits	.078	.103	.058	.761	.448
Workload	-.143	.087	-.107	-1.640	.103
Unfair behavior	-.135	.087	-.101	-1.547	.124
Communication	.007	.097	.005	.076	.940
Bureaucracy	.045	.086	.035	.532	.595
Fair pay	-.134	.091	-.098	-1.464	.145
Work assignment	.034	.086	.026	.404	.687
The change process	.233	.104	.177	2.236	.026*
Strikes	.124	.107	.093	1.154	.250
Personal control	.223	.093	.165	2.392	.018*

**Significant at 5% level of significance.*

*** Significant at 10% level of significance.*

An Analysis of Variance (ANOVA) shows that all the factors are significantly related to the overall socio-economic impact on Thai textile and garments workers as can be seen in Table 10. Together they explain 24.20% of the variance in the overall socio-economic impact on workers. The remaining variance is likely to be the context factors, such as, industrial change, or company profitability etc. The correlation between the factors and the overall socio-economic impact is 0.49.

Table 10: ANOVA of the Overall Socio-Economic Impact on Workers

R	R^2	F	Significance
.492	.242	3.943	.000*

*Significant at 5% level of significance.

SUMMARY AND CONCLUSIONS

Technological change has negative consequence on the job security of workers because of the increase on skill demands. The advanced technologies demand newer skills of workers. Job satisfaction is positively influenced by the change through the increase of pride in work, quality of supervision, benefits, degree of internal communication, and fair pay. The negative effects on job satisfaction are increased workload and increased complexity in work assignment. Work relations are improved through the increase of worker involvement in the change process and increasing personal control of workers. Strikes are the negative consequence of the change. However, relationship of technological change to the overall socio-economic impact on workers is only slightly positive.

The medium and lower skilled or unskilled workers are significantly different on the impact of technological change. Unskilled workers are more frustrated because technological change increased work assignments, demanded more skills, and eliminated jobs from the company. They believe that the change increased more complexity in the work assignments than their counterparts. Lower skilled workers perceive that the change increased workload in their companies. Medium skilled workers have more pride and more benefits compared to lower skilled workers. They also believe that the quality of supervision and internal communication are also improved by the change. Workers strongly agree that the change increased fair pay in their companies. They feel that work relations are improved with the increase of personal control.

Workers in textile companies are affected more by downsizing and become more frustrated than garment workers. Technological change increased skill demands for the textile workers. The change did not increase supervision quality and benefits for the textile workers, but it increased workload. They felt less pride in their jobs than garment workers. Textile workers were not involved in the change process of the company. Garment workers felt a higher level of pride related to their jobs because

technological change increased their benefits, improved supervision quality, and increased fair pay. The personal control of garment workers is also increased by the change. However, both the groups agree that the change increased workload and work assignments. Textile and garment workers perceive that technological change positively influenced the overall socio-economic impact, but the garment workers rank it much higher.

Job security, job satisfaction, and work relations together have a significant relationship to the overall impact on Thai workers. Frustration and skill demands related to job security are significantly and negatively related to the overall impact. The more frustration and more skill demand results in less positive overall impact. Work relations related to the change process and personal control are significantly and positively related to the overall impact. The more involvement of workers in the change process and more personal control of workers lead to more positive overall impact on workers. Thai workers perceived higher level of personal control over the work and more involvement in the change process. Strikes have no significant relationship to the overall socio-economic impact on Thai workers although these are the negative consequences of the change. Technological change does increase strikes but strikes do not have significant relationship to the overall impact on workers. Thai workers usually limit conflict and confrontation with management. Job satisfaction factors have no significant relationship to the overall impact on Thai workers.

To implement new and advanced technologies into Thai textile or garment companies, frustration and skill demands are the main factors for improving the job security of workers. The work relations in Thai companies will be improved through the increase of personal control and the involvement of workers in the change process. Specifically, decreasing skill demands through training and skill development programs, decreasing frustration by reducing uncertainty, increasing workers involvement in the change process, and expanding personal control of workers will help to bring positive results of technological change in the Thai textile and garment companies. The situation described in Thailand represents a different stage in the development of the textile and garment industry. Other Southeast Asian countries including Indonesia, Philippines, and Vietnam with similar labor-intensive technologies in producing textiles and garments will change in the same direction. The approaches to managing change suggested here can help solve the problems of introducing new technologies. Although, a better change process will be difficult to manage but it can increase the positive impact of technological change on medium and lower skilled workers in a rapidly competitive textile and garment industry with the eroding competitiveness of labor.

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