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Keynote Speakers



People management for a sustainable apparel sector

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Abstract

The optimization of socio-technical systems is an important requirement for sustainability of a globally competitive garment industry. This demands designing appropriate organizational structures, policies and processes understanding the interactions between people and the other elements of a system such as technology and production processes. The conditions that foster human potential and optimize human well-being in the garment industry have theoretical and practical significance, for producers and consumers alike.



The Role of Market Forces in Corporate Responsible Sourcing – Lessons from Rana Plaza

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Abstract

A common belief is that the risks and costs of tragedies like the 2013 Rana Plaza collapse are sufficient to motivate Western firms to shift production sourcing to developed, high-cost countries rather than developing, low-cost countries. In other words, it is assumed that capital market and consumer market forces are sufficient to change firm sourcing behaviors. To examine this assumption, we studied the stock market reaction to global apparel retailers with significant sourcing in Bangladesh at the time of the Rana Plaza disaster, as well as their corporate performance post-tragedy, and Bangladeshi garment exports post-tragedy. The evidence suggests that market forces alone are insufficient to improve the responsible sourcing practices of Western firms. Instead, we advocate for a more balanced approach with roles for buying firms, NGOs, and regulators.



Soft barriers to a creating a socially sustainable garment industry

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Abstract

Recent years have witnessed an increased dedication to ensuring that the garment industry is socially sustainable. Many such initiatives have failed to deliver the expected results or have been cancelled out by conflicting rationales. In operations management lean has frequently been assumed to be a driver of social sustainability but in the garment industry in the global south results have often been poor, thus lean is often argued to be mean. This keynote aims at nuancing this interpretation and argues that there are indeed numerous barriers in need of being addressed if a lean intervention should be socially sustainable among global garment suppliers located in the global south. While the conditions imposed on the global supplier's conditions impacts the possibilities of creating a lean-based socially sustainable garment production there are still options for the global suppliers. Yet, global suppliers need to soft factors related to competencies, communication and commitment to ensure that lean does not become mean.



Improving Sustainability for Retailers, Brands, and Suppliers through Better Buying

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Abstract

The key to every sustainable business relationship is mutual understanding and shared goals. In the consumer goods industries, realizing shared goals between Retailers, Brands, and Suppliers has been challenged by the absence of transparency, particularly in purchasing related activities. This “elephant in the room” is connected to many of the social and environmental sustainability challenges retailers and brands are attempting to address in their supply chains, but it also impacts business profitability for all supply chain partners. Better Buying™ is a bold idea that addresses the lack of clear, independent data about buying processes, and related outcomes that has impacted the ability of Retailers, Brands, and Suppliers to make mutually beneficial change. Learn how Better Buying™ is using applied research to reframe the conversation between Retailers, Brands and Suppliers, and through greater clarity and understanding, is creating a new supply chain system with more transparent information to guide responsible behavior of all stakeholders.



University Shaping up Future Graduate for Sustainable Manufacturing in Textile & Fashion

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Abstract

Sustainable higher education has emerged for universities to lead society towards a sustainable future and considered a distinct but interdisciplinary specialization of study and practice within sustainable science, education for Sustainable Development Goals (SDG).

The education required to accomplish this is a new way of thinking and learning about integrated, systemic solutions not just to the economic and environmental challenges but also the interdependent health, social challenges. Above all, this new way of thinking uses the green concept as the focal point for understanding the deep connection between manufacturing, economics, energy, the environment and social well-being. Universities are considered to have three missions, namely teaching, research and community services. Universities are therefore tasked to critically engage with values in order to produce students who can play a role in seeking solutions to industrial and societal problems.

In this Key note Paper emphasis is given how to shaping up further University Graduates for educating with sustainable learning at Textile & fashion higher education institutions.



Productivity Improvement in Readymade Garment Industries through Reduction of Lean Wastes

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Abstract

Now-a-days, it becomes vital for the readymade garment (RMG) industries to decrease its' production lead time as well as manufacturing cost. This can be achieved by decreasing lean waste such as waiting time and process bottlenecks. Time study and line balancing are effective techniques to reduce the waiting time, and process bottlenecks which have already been implemented in several manufacturing industries to increase their productivity. So, it becomes imperative to apply those techniques in RMG industries to minimize the waiting time and process bottlenecks. In this work, time study is performed for three different products of RMG industries and production lines are balanced through the sharing of works among the work stations by line balancing. Thus, new production layouts are modeled with the balanced capacity combining both modular line and traditional manufacturing system. In new production systems for three products, 10-86% improvement of labor productivity and 6-68% improvement of machine productivity were resulted for 27-79% reduction of waiting time and 33-100% minimization of process bottlenecks. As a result, new production layouts decreased 6-41% of production lead time, which finally reduced the production cost of those industries considerably. Besides, the strength, weakness, opportunities and threats for productivity improvement in RMG industries were also identified by SWOT analysis. This research paper renders detailed technical guidelines for the garments manufacturers to improve their industrial productivity and capacity by reducing lean waste.

Keywords: RMG, Lean waste, Waiting time, Bottlenecks, Time study, Line balancing.

The Self-Organization and the Power of Female Informal Workers: A Case Study of the Cooperative Production Team in the Garment Industry in the Yangtze River Delta

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Abstract

In China and beyond, garment industries are often dominated by female informal laborers. Existing studies on female informal workers have focused on describing the poor working conditions such as low wages, high risk, lack of job security, and gender segmentation, and analyzing the reasons behind them. However, there is little discussion on the associational power of these informal workers. Based on surveys and field studies in the garment industries in the Yangtze River Delta conducted between 2011 and 2013, this article explores the cooperative production team formed by the women workers and attempts to explain how female informal workers can gain the associational power to enhance labor standards and obtain control over the labor process. The findings of this study indicate the possibility of labor solidarity in informal employment and also expand our discussion on the power of female workers.

Keywords – Cooperative production team, Garment industry, Informal employment, Associational power

The “Making Out” Game outside the Factory: A case study of “making out” production in garment industry in Pearl River Delta area of China

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Abstract

The “making out” phenomenon occurring in the original equipment manufacturer (OEM) industries, especially for garment industry, in the coastal areas has challenged the traditional enterprise organization theory. Constrained by the high instability of orders and the labor market, the emerging out-sourcing patterns of “making out” production within factories or by tenants in the Pearl River Delta area differ remarkably from the traditional family OEM model. Rushing in orders is neither a supplementary way for household income (or temporary household labor), nor a way of creating an industrial reserve army. The game of “making out” is the self-exploitation of the immigrant workers, which generates little possibility of upward mobility for the garment workers. These workers and the employers arrive at an equilibrium point in a fully competitive labor market. The “voluntary” cooperation between the two sides has weakened the garment workers' resistance based on the work site, and it is not protected by the current legal system.

Keywords - Garment industry, original equipment manufacturer, “making out” production, out-sourcing patterns

An investigation of the economic and social effects of the links of entrepreneurs of SMEs in the garment industry in Vietnam to the Global Value Chain

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Abstract

Contrary to the 'legitimizing globalization narrative' income convergence has been the exception rather than the rule between countries. Since Doi Moi, renovation, in 1986, Vietnam has become a 'champion' in attracting Foreign Direct Investment (FDI) and an important manufacturing hub but the country has not graduated to the status of an industrialized country, national industry has not expanded and the composition of the labour force remains low skilled. Vietnam has emerged as one of the world's fastest growing garment exporters being in the top five garment exporters worldwide. However, the textile and garment industry in the country requires restructuring to be sustainable. This research takes an integrative approach to the theory of entrepreneurship investigating how economic and social development is affected by the links of the entrepreneurs of SMEs in the garment industry to the Global Value Chain (GVC) in Vietnam. It will focus on how institutions affect entrepreneur's links with the GVC and how this in turn affects the economic and social development of SMEs.

Keywords - Sustainable development, Garment industry, Motivations, Institutions, Local Entrepreneurs, Workers, Global Value Chain.

Own Brand Manufacturing (OBM) by Developing Country Suppliers: A case study on RMG industry of Bangladesh

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Abstract

Purpose: The purpose of this study is to investigate how developing country suppliers upgrade themselves as own brand manufacturing (OBM) suppliers and what motivates and enables them to convert themselves into OBM suppliers.

Methodology: Following qualitative research approach, multiple case study method has been applied for this study. Documentation, observation, and primary data collection were carried out through in-depth interview techniques and thereafter utilized for developing two/three cases. Through analysis of each case, summary findings have been derived.

Results: The study findings reveal that supplier firms' vision, management capability, forecasting accuracy related to future market trends, as well as gaining experience due to working for a long-time with global garment buyers and retailers are the main driving factors that propel them into becoming own brand manufacturing (OBM) suppliers.

Research Implications: This research would provide a clear and useful direction to the RMG suppliers of Bangladesh for their up gradation in the global supply chain.

Limitations: Due to time and resource limitations, we consider only two/three company cases to investigate the research problems. Future studies should consider more cases to explore better understanding as well as to make the findings more generalizable.

Originality/Novelty: A review of previous literature reveals that no previous study had addressed the mechanisms for Bangladeshi garment suppliers' up gradation within the global supply chain. Our study will open new research avenues for further studies in the field

Keywords - Own Brand Manufacturing (OBM), Upgrading, RMG suppliers

Chain reactions of occupational health and safety hazards: A Social Sustainability Perspective

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Abstract

Purpose: The main purpose of this study is to investigate how and why different stakeholders are affected by occupational health and safety (OHS) hazards, and how chain reactions of OHS hazards make garment suppliers' social sustainability vulnerable.

Methodology: Mixed research approach, and multiple case study method are used for this study. Documentation, observation, and first-hand data collection techniques have been used for developing the cases. Two cases were developed based on collected data from two case companies.

Results: The study findings reveal that workers of the Bangladeshi RMG sectors are exposed to various OHS hazards, stakeholders are directly or indirectly affected by workers' OHS hazards, and stakeholders are responsible in different extents for bringing social sustainability of RMG suppliers by assuring acceptable OHS condition.

Research Implications: This research would contribute to operations management, organizational behavior, supply chain management, and public health literature through a better understanding of occupational health and safety hazards from a social sustainability perspective.

Limitations: Due to time and resource limitations, we have confined our study to only two case companies. Future studies should consider more cases to explore better understanding.

Originality/Novelty: A review of extant literature reveals that no previous study had addressed the impact of OHS hazards by linking stakeholder and social sustainability together.

Future research: This study would pave the way for further research in different country contexts and allow the testing of applicability of the findings from this study to a more diverse set of cases.

Keywords - Occupational Health and Safety (OHS), Social Sustainability, RMG Supplier

Sustainable buyer-supplier relationship through Quality Control in Supplier's Factory: A Comparative Case Study in Bangladeshi Garment Industry

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Abstract

Although extant literature addresses tensions in buyer-supplier relationship, limited attention has been paid to understand how quality control practices can reduce tensions and maintain a sustainable buyer-supplier relationship. Drawing on this gap, our paper aims to investigate how buyer's intervention in supplier firms improves product quality performance. Using a root-cause analysis tool we observe how buyer's quality control initiative influences product quality performance that leads to economic and social sustainability in supplier firms. Following a qualitative research approach, data has been collected from one Danish buyer and four garment suppliers in Bangladesh. Out of four suppliers, two factories are controlled where the buyer firm has intervened the quality control system while the other two factories are out of intervention initiative. We have compared the findings from the two groups and developed propositions. This paper presents a new understanding of how quality control practices contribute to ensure relationship between buyer and supplier, while enhancing economic returns for supplier firm by reducing defects and saving time, and increasing incentive for workers through production target achievement. Thus, quality control intervention eventually leads to supplier firms' social and economic sustainability. Our study contributes to new insights on the strategies of quality control and sustainability for buyer and supplier in ready-made garments.

Keywords - Quality control, Sustainability, Buyer-supplier relationship, Root-cause analysis

Developing a thermal insulation composite material using waste fabric

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Abstract

Apparel industry is a key export earning source for many South Asian countries. Textile waste accumulation has become a major issue in this industry. This study was focused on developing a thermal insulate composite material using waste fabric as a sustainable solution for waste fabric management approach. Fabric weight, fabric particle size, molding pressure, and pressure applying time were considered as the critical few factors to see its effect on the thermal conductivity property of the composite material. Full factorial design (24) approach was used as the experimental plan and 16 numbers of composite materials were developed under different trial conditions where each factor was change at two levels. Lee's disk experimental method was used to measure the thermal conductivity of the composite material. Analysis shows that fabric weight ($p = 0.000$), molding pressure ($p = 0.064$) and pressure applying time ($p = 0.035$) have a significant effect and there is no effect from particle size on thermal conductivity at 5% significance level. The thermal conductivity of the composite material can be maintained at 0.062 W/Km when fabric weight is set at their high level, molding pressure and pressure applying time are at their low settings. Water absorption level, tensile strength and the compressive strength of the developed composite material will be assessed using standardized approach as further analysis of properties of the developed composite material in this study.

Keywords - Thermal conductivity, Composite, Waste fabric, Thermal insulation, Apparel

A Case Study on the Improvement of Working System in a Garment Industry using 5S Methodology

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Abstract

The improvement of an organization depends on the various way of conducting business policy. The old business models no longer work in the new economy. Using 5S in an organization, the improvement of any working system has occurred through time management and cost optimization. This paper deals with the improvement, benefits, and challenges of 5S and identified the key factor influencing the successful implementation of 5S methodology in the Garment industry. The objectives of this paper are to improve the working system of Garments, applying the 5S methodology and satisfying anticipated demand. In twelve weeks survey in a garment industry, by using 5S methodology at that industry the improvement shows that 5S reduces waste in all forms, cuts down employee frustration, improve safety, and creates a visually attractive environment and finally results in state that the improvement of production system efficiency varies 10-15% from its present efficiency.

Keywords - 5S, Time management, Cost optimization, working condition, Efficiency improvement

Is employment injury insurance the missing link in Bangladesh's labour standards?

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Abstract

In the five years since the collapse of Rana Plaza, a variety of strategies have been developed to improve labour conditions in Bangladesh's readymade garment industry. The most prominent of these efforts are private programs to inspect and remediate factory buildings where government safety regulations have fallen short. Much less attention has been paid to the role that employment injury insurance can play in raising health and safety standards. This paper describes and analyses new developments in the promotion of employment injury insurance in Bangladesh's apparel sector. First, using the case of the 2013 Rana Plaza disaster, I explain how the ILO and industry stakeholders created a voluntary, collaborative model for providing compensation to injured workers and the families of those killed in line with international standards for compensating occupational death or injury. The Rana Plaza Arrangement—as the compensation agreement came to be known—was an innovative approach that has since been replicated in Bangladesh and Pakistan. However, the Rana Plaza Arrangement was complicated to run and costly to administer, left out workers harmed in smaller or less famous incidents, and required negative public attention to pressure global apparel companies to contribute. In the second part of my paper, I explain how these problems have led to calls for more permanent solutions that include the universal provision of employment injury insurance. Providing employment injury insurance to garment workers in Bangladesh will require strong participation from the state and local employers. Drawing on anthropological insights from my research, I argue that the right to remedy is a complex right that can only ever partially be met through employment injury insurance, but that the structural vulnerabilities of garment workers require stakeholders to work together to achieve it.

Keywords - Employment injury insurance, Rana Plaza Arrangement, Compensation, Right to remedy labour standards, International Labour Organization (ILO)

The role of market knowledge and institutional network in improving the export performance of apparel manufacturers from a developing country

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Abstract

This study aims to explore the relationship between foreign market knowledge, institutional networks, and export performance. This paper argues that it is not sufficient for exporting firms to rely only on market knowledge to improve their performance. Foreign market knowledge needs to be upgraded through moderation from institutional networks to have a positive impact on export performance. The study involves a survey of 206 apparel exporters from Bangladesh, the second largest apparel exporter in the world. Using regression analysis the study examines the foreign market knowledge-export performance linkage with the moderating influence of institutional networks. Specifically, we found that of three dimensions of market knowledge (institutional, business, and internationalization), only foreign business knowledge is directly and positively associated with export performance. Foreign internationalization knowledge becomes a significant determinant of export performance only when this is moderated by institutional networks (measured by the informational and advisory assistance received from government agencies). This research provides several managerial and academic implications along with the contributions to knowledge-based view and network theory in internationalization.

Keywords- Market knowledge, Institutional network, Export performance, Apparel manufacturers, Developing country

Whither transnational private labour regulation in the wake of judicial review? Whither judicial review in light of transnational private labour regulation? - Lessons from High Court rulings against the Accord on Fire and Building Safety in Bangladesh

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Abstract

In the aftermath of Rana Plaza, global fashion brands and retailers signed the Accord on Fire and Building Safety in Bangladesh (Accord) vis-à-vis global and local union federations. The construction of the agreement innovated on shortcomings of transnational private labour regulation (TPLR). High rates of remediation of safety issues have corroborated its effectiveness in improving the safety of garment factories. Therefore, some consider the Accord a model for the regulation of labour rights in supply chains.

In Bangladesh, however, writ petitions filed by suppliers against the Accord at the High Court division of the Supreme Court of Bangladesh signify the political contestation surrounding the operation of the Accord. In a first case, the High Court subjected the Accord to judicial review and held it to account under Bangladeshi constitutional law. In another case, the Court ordered the government not to extend the permit for a local presence of the Accord beyond November 2018. While the High Court lacked legal authority to nullify a foreign private contract, its decision hampered the Accord's operation

Against this backdrop, the paper seeks to develop lessons for TPLR and its review by domestic courts. By reviewing the legal construction of the Accord and perceptions of different stakeholders on its operation in practice, the paper finds that the Accord established economically coercive authority over suppliers that were backed in Bangladesh only by pragmatic and diachronically waning legitimacy. This finding leads the paper to call for more reflexivity of TPLR that allows for adjustments to the shifts in its perceived legitimacy. With regard to future judicial review of TPLR the author advocates a pluralist jurisprudence that upholds the authority of TPLR, but cures deficits of accountability towards affected persons.

Keywords: Transnational private regulation, Labour rights, Judicial review, Accord on Fire and Building Safety in Bangladesh, Legitimacy

Enhancing the Novel Solution Representation with a Route Reconstruction Operator for Solving Capacitated Vehicle Routing Problem

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Abstract

Capacitated vehicle routing problem (CVRP) is the simplest version of many realistic transportation problems existing in the real world. Handling transportation problems, due to the grace of growing markets related to logistics, has become very interesting area of research. Many of the researchers and practitioners have devoted their contributions to solve simple CVRPs and many practical versions. As CVRP is one of the non-polynomial hard (NP hard) problems, it is difficult to solve with exact algorithms or at least significantly time consuming if the size of the problem increases. Many approximate algorithms thus come into action to solve the problems within reasonable time though such approaches compromise in ensuring to find the optimal solution. Particle Swarm Optimization (PSO), one of the recent approaches has been adopted along with the route reconstruction operator, main contribution of this article, to solve several benchmark CVRPs. Computational results have portrayed the significance of the concept in handling CVRP.

Keywords: Capacitated Vehicle Routing Problem, Enhanced Particle Swarm Optimization, Route Reconstruction Operator, Novel Solution Structure

Removing bottlenecks in the sewing line – possible consequences for workers' health

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Abstract

The sewing industry is known for an increased risk of repetitive strain injuries (RSI) due to the repetitive tasks in short cycles. The removal of bottlenecks is increasingly used as an integrated part of lean implementation, and the questions is whether this change will increase or decrease the risk of RSI. Data about bottleneck removal was collected during lean implementation in six garment factories in Bangladesh. Data included time and motion studies as well as suggestions for change in order to reduce bottlenecks. In addition, data was collected about workers' muscular pain. The immediate effect on worker pain indicate a positive effect, but it is not possible explicitly to sort out bottleneck effects from other lean changes initiated by 5S, value stream mapping, quality improvements and reduction in change-over time. As a next step we analyzed a series of specific bottleneck reductions and distributed on four different types of the reductions: removal of tasks, reduction of cycle time, changed working method and/or workers helping each other. For each of these changes we assessed the likely consequences for the risk of RSI. Furthermore, we also assessed the consequences for the other workers in the line. The conclusion is that most specific changes do not have a negative impact as such, but there may be an increase in the overall risk if the individual operator tasks become more repetitive or the management uses the opportunity to increase the production targets beyond the gain from the bottleneck improvement. Management therefore need to take careful consideration of the health and safety of workers when they implement lean and in particular when they apply time and motion studies in bottleneck analysis.

Keywords- Time and motion studies, Repetitive strain injuries, Lean, Garment

Organizational and Operational Stress and Subjective Well-being in Police

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Abstract

The effect of occupational stress on both physical and mental health has received much attention over the years. This effect is particularly alarming in high stress occupation like policing. Research on stress (Organizational and Operational police stress), subjective well-being, life satisfaction, positive affect, and negative affect of police is rarely done in a collectivistic country like Bangladesh. This study aimed to investigate whether subjective well-being (SWB), life satisfaction (LS), positive affect (PA) and negative affect (NA) of police can be predicted by organizational (ORG police stress) and operational police stress (OP police stress). Towards this end, the study was conducted on 160 police officers working in Dhaka, Bangladesh. The results showed that the overall model was statistically significant which included ORG police stress and OP police stress as the predictors and SWB, LS, PA and NA as the criterion variables. The SWB was calculated using the formula of, $SWB = (PA - NA) + LS$. The parameter estimates demonstrated that ORG police stress had significant impact on SWB and NA. On the other hand, OP police stress had significant impact on LS only. Results of multivariate multiple regression indicated that the model explained 8.6% of the variance in SWB, 12.8% of the variance in NA and 8.1% of the variance in LS. The unstandardized B values indicated that an increase of 1 unit raw score in ORG police stress is accompanied by a decrease of 0.035 unit raw score on SWB and by an increase of 0.136 unit raw score on NA. On the other hand, an increase of 1 unit raw score in OP police stress is accompanied by a decrease of 0.064 unit raw score on LS. Thus, ORG police stress is a good predictor of SWB and NA whereas OP police stress is a good predictor of LS. However, none of them predicted PA in police. These findings have variety of significance for police population particularly in stress management, maintaining subjective well-being, life satisfaction etc.

Keywords: Organizational Stress, Operational Stress, Subjective Well-being, Life Satisfaction, Positive Affect, Negative Affect, Police

Identification and Analysis (ANOVA) of Occupational Safety and Health Problems of Workers in a Ready Made Garment (RMG) Industries – A Case Study

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Abstract

Improving workers' productivity and occupational health and safety (OHS) conditions are the major concerns in the industry, especially in developing countries like Bangladesh. A mismatch between worker abilities and job duties, adverse environmental issues besides poor human to machine system design as well as inappropriate management programs. This leads to workplace hazards, poor workers' safety and health, mechanical equipment injuries, disabilities, and in turn reduces worker productivity and product/work quality and increases the cost of overall production. Environment, Task and Management and Ergonomics or Human factors application have been found to improve worker productivity, occupational health, safety and satisfaction, reduce the cost of Production. These three factors have both direct and indirect effects on the overall performance of workers and productivity. It would, therefore, be extremely difficult to attain a company's objectives without giving proper consideration to these three factors. The main study of this research was to conduct an assessment of occupational safety and health-related problems in the garments industry. A checklist, physical audit and medical records were used in the investigation to identify the problems. The results showed significant health, environment, task and management related problems that could be attributed to ergonomic deficiencies in the work system of the industry. Some major issues identified were hard physical work, back pain, discomfort, hot environment, long shift, poor management, workstations and diverse schedule etc. By conducting an interview with the use of the questionnaire, risk analysis, and measurement of workplace condition, the situations and possible causes of the problems were understood, identified and evaluated. This research has some limitations as data have collected within a short time but there has a lot of opportunities to further improvements in future work. As it is a case study, the survey has been performed on Karim Textiles Ltd; Noorbag, Kaliakoir Gazipur, Dhaka.

Keywords- Ergonomics, Environmental Conditions, Productivity, Identify problem

Compliance with the Occupational Health and Safety Legislation of the Readymade Garment Industry in Bangladesh

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Abstract

A strong occupational health and safety (OHS) management program of any industrial establishment can assure a safe and healthy work environment. However, many readymade garment (RMG) factories have difficulties in achieving this goal. The study is aimed at identifying and comparing the present OHS conditions in RMG factories with the relevant OHS laws. Qualitative data were collected in three factories. The data included personal observation and interviews with workers, supervisors and managers of the selected garment factories. The results of the data collection were compared with the present OHS legislation and we subsequently assessed to whether the factories complied with the law. The results from the study indicated that the sampled factories do not follow all the requirements regarding health, hygiene and safety of workers as per the Bangladesh Labor Act 2006 amended in 2013. The most common problems are that the factories do not ensure the prescribed space for every worker at a workstation; dangerous machineries are not securely fenced, which may cause accident; and the toilets, washrooms, dustbins and spittoons are not up to standard and clean at all times. We use the findings to give recommendations in order to advance the health and safety of the factories. The most important recommendations are ensure more hygienic work environment, dangerous machinery should be well fenced to avoid unexpected accident, company should emphasize on maintaining the law so that they can avoid risk. We also suggest that the RMG together with concerned stakeholders such as buyers and the regulatory bodies (including government of Bangladesh) should give a higher priority to improve the overall OHS conditions of the garment industry in Bangladesh.

Keywords: Hygiene, Work Environment, Labor act, OHS management

Impact of top-management commitment on voice behavior in teams: Insights from implementing lean in the RMG in Bangladesh

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Abstract

Lean and organizational behavior scholars have established that top management commitment (TMC) and prosocial voice behavior in teams are crucial components for a successful lean implementation. The lean literature suggests that top management commitment helps to initiate lean implementation by ensuring the required resources, access to the needed support, shielding against short-term goals and by empowering the teams. The organizational behavior team literature underscored the centrality of a prosocial voice behavior in successful teams. Yet, how the top management's commitment to implementation teams impacts the voice behavior in the implementation teams has not been studied. This paper aims at making a contribution to reducing this research gap by exploring the interaction effects between top management commitment and team's voice behavior on the outcome of a lean implementation in the Ready-Made Garment (RMG) industry in Bangladesh. Drawing on methods from socio-technical action research the researchers collaborated closely with two factories in Bangladesh on designing a lean implementation strategy. The findings showed that top management commitment positively impacted the voice behavior of the implementation teams and thereby the performance of the implementation team.

Keywords: Top management commitment, Lean behavior, Lean production

Significance and Scope of Value Stream Mapping (VSM) for increasing Value-Added Activities in Apparel Industry of Bangladesh

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Abstract

At present the apparel industry is the most encouraging sector of Bangladesh. It is a significant source of foreign remittance in Bangladesh. It has always been a challenge to sustain in the international market for the developing country like Bangladesh. Lack of proper coordination aimed at improving productivity is the impediment in overcoming this challenge. This article illustrates the scope of application of value stream mapping (VSM) on pilot sewing lines of selected garments factory of Bangladesh. As a preliminary part of the research work, prevailing condition of the production system which do not have application of VSM technique has been analyzed to identify the existing percentage of non-value added activities and to find out the scope of VSM technique application in the pilot lines. The main objective of this research paper is to ascertain various non-value activities those occur in the sewing line and presenting how these hamper efficiency. Current state map for sewing line has been drawn by identifying value added, necessary and unnecessary non-value added processes and different types of wastes in the sewing floor. The study under consideration focuses on increasing value added activities by removing unnecessary non value activities to improve the effectiveness of the production line as it is found that the non-value added activities has significant role in increasing production lead time. Finally further strategies and suggestions have been made by drawing future state map which resulted in increasing value added activities in the sewing line.

Keywords: Apparel, Lean, Value added, VSM, Production lead time

Ensuring Sustainable Livelihood for the Workers for the Sustainable Development in Ready Made Garments Industry in Bangladesh: An Empirical Study

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Abstract

For the last few decades Bangladesh export oriented Ready Made Garments (RMG) sector has made significant contribution to country's economic development and earning foreign exchange. All this progress will come undone unless Bangladesh can make ensure sustainable livelihood for garments workers. It is high time to give concern in poverty alleviation as well as overcoming vulnerability among workers. If sustainable livelihood is not ensure for marginal level workers, no sustainable development of workers like training program, career development program, performance management development which are the indicators of Human Resource Development is possible. As a result sustainable development in RMG Industry can't be ensured. So, in the first stage, this study attempted to explore workers vulnerability considering their income along with expenditure in basic needs. Most of the marginal workers have to expense all the income to manage minimum food and shelter for family. So there is no option of education, medicine or recreation. For this study, relevant data were collected from garments workers on Narayangonj Basic Area. Both qualitative and quantitative analyses were done to achieve the objectives. It is found that socio-economic condition of garment workers is not in a sustainable stage. Workers who work down to dusk but their wages are not in the satisfactory level. They cannot afford their minimum foods, cloths, housing, medicines and educations of their children as they are ill paid. Their children suffer from malnutrition and unhygienic complexities. At the end, some recommendations were placed for sustainable livelihood for the workers for the sustainable development in RMG industry in Bangladesh.

Keywords: Livelihood status, Ill paid garment workers, Basic needs, Sustainable development

Energy Efficient Compressed Air Solution for Textile Industry in Bangladesh

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Abstract

The textile industry plays a vital role in the growth of the economy of Bangladesh. In the textile sector of Bangladesh, electricity consumption is an increasing trend due to the growth of this sector and inefficient design and use of the system and machinery. Compressed air systems have a significant impact on energy consumption in the textile industry. Compressed air, also referred to as the "4th Utility" (after electricity, water & steam) is one of the major energy consumption utility in any industry. A large volume of compressed air is required for integrated cotton textile industries having Air Jet Looms & as well in the Polyester yarn industries. It is a well-known fact that of the life cycle cost of any compressor, 85-90% is towards energy and only 10-15% towards initial investment & maintenance. Hence, the design, selection, and use of the compressors have a significant role towards a total energy efficient system. This paper provides an overview of technology and methods to set up and run a compressed air system with optimum energy efficiency

Keywords: Compressor, Energy efficiency, Energy recovery

Improving Operational Performance and OHS Conditions Using Lean Tools in Readymade Garments Industries – An Example of Real Life Studies

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Abstract

In Bangladesh, the readymade garments sector plays an important role in growing the economy and increasing GDP shares. Limited number of research has been conducted to improve the operational performance and OHS conditions of the RMG sectors of Bangladesh. The health and safety condition of the workers in most of the industries is not up to the mark. Here, the management emphasizes only on improving productivity, not giving much importance to the health and safety of the workers. The aim of the study is to improve operational performance considering different occupational health and safety factors and their lacking. Numerous lean tools are implemented to improve productivity and to identify the integration of productivity and occupational health and safety. To identify the interrelation, Single Minute Value (SMV) and Value Stream Mapping (VSM) have been calculated by time study from real life cases and also, workers have been interviewed to measure the outcome. For the interview, a list of questionnaires have made that has been related to their health and safety condition and their working environment to understand that relation. Though lean manufacturing eliminates waste and improves productivity its effect on the health and safety of the workers is not always beneficial although it intensifies the work that the workers are performing. By finding the interrelation, both the worker and the management can be satisfied. By analyzing all these factors, the actual co-relation between productivity and occupational health and safety and propose a safety model for the betterment of the workers and the industry is determined.

Keywords: VSM, SMV, OHS, Productivity, Employee Voice

Sustainable Building Materials: Bangladesh Perspective

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Abstract

Currently, the construction material of choice for many types of buildings in Bangladesh is traditional brick. Different types of bricks are obtained from brickfields, which mainly use fertile top-soils of agricultural lands. This practice results in detrimental effects on food production in Bangladesh, a country which already suffers from limited agricultural land. Furthermore, the combustion process in the traditional brickfields contributes to air pollution. To combat these negative impacts of traditional brick manufacturing processes, alternative eco-friendly building materials should be used in Bangladesh. In recent times, initiatives have been taken in the country by various organizations to produce alternative environment-friendly bricks and other construction materials for the various building components. These alternative construction materials have the potential to foster sustainable development within Bangladesh. In the present research, alternatives for traditional building materials for different components of buildings will be identified. Then, they will be critically analyzed in Bangladesh perspective from the environment and economical viewpoints. It is expected that the findings from the present research will help the building related stakeholders to select appropriate construction materials in Bangladesh.

Keywords: Sustainable Building Materials, Green building, Sustainable development, Brickfield

Modeling and optimizing the intermodal transportation network system of RMG sectors for improving supply chain capabilities in Bangladesh

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Abstract

This research is focused on the problem of implementing intermodal (combination of rail, or road, or air, or ship) transportation system as well as developing a transportation network model. The network model has been developed by the help of graph theory. Dijkstra algorithm and Ford Fulkerson algorithm have been used for optimizing the transportation network model. Hence the model is applied to the RMG industry of Bangladesh for improving the supply chain management which contributes to the manufacturing lead time and on time delivery of products. Transportation network model has a strong impact on performance in any RMG because it determines the supply chain configuration and set constrains within which the other supply chain drivers can be used either to decrease supply chain cost or to increase responsiveness. Greatly open access policy for neighbors and international trade and public private partnership initiative for supply chain infrastructure development that will create the opportunity for Bangladesh to act as integrated service providers of sustainable RMG in the region extremely. The finding of the investigation has identified the shortest path with maximum flow for minimum costs in the developed network model. Thus reduces the manufacturing lead time and on time delivery for customer satisfaction in the RMG supply chain. Lastly this research has tried to set the future direction on the basis of outcome of analysis to overcome the business barriers.

Keywords: Supply Chain, Logistics, Intermodal Transportation, Optimization, RMG

Development of a sustainable pretreatment process of organic cotton knit fabric prior to garment dyeing using ecofriendly raw potato juice

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Abstract

Current global textile garment industry cannot be sustained without sustainable ecofriendly development for all involved processes in this sector. Pretreatment of fabric prior to dyeing is a significant step in removing unwanted impurities and increasing both whiteness and hydrophobicity, allowing the dye to penetrate more deeply into the fibre. In addition, this process gives the maximum value to garment by improving its aesthetics, comfort and functional properties. The conventional pretreatment process consumes huge amount of water, high energy and many chemicals. After this process garment industry discharges effluent changing temperature, pH, COD and BOD which may cause detrimental effect to the aquatic environment. For sustaining global garment industry pretreatment process should be more ecofriendly. In this research work, raw potato juice is applied on cotton knit fabric in order to develop sustainable ecofriendly pretreatment process for knit garment made of organic cotton. Twenty seven samples were created using Minitab software by Taguchi method putting different variables like concentration, temperature and time for this experimental design. These twenty seven samples were pretreated with raw potato juice varying concentration, temperature and time in the lab. One optimized potato juice treated (OPJT) sample was selected after evaluating through different tests like weight loss percentage, absorbency, whiteness index and bursting strength, Then both conventional pretreated (CPT) and OPJT samples were dyed with reactive dyes. Both discharge baths of treated samples were subjected to pH, COD, BOD and TDS tests. Colorimetric measurements in terms of color strength (K/S), color fastness to washing and rubbing and physical test like bursting strength and bending length were done for both types of dyed fabrics. Molecular level analysis of raw potato juice, grey fabric, OPJT and CPT were done using ATR- FTIR spectroscopy. Costing was calculated for both types of pretreated fabrics. Potato juice treated process has reduced effluent load compared to conventional pretreatment process. It is ascertained that color strength (K/S), color fastness to washing and rubbing, bursting strength and bending length are better for potato juice treated fabric compare to conventional. OPJT sample has more amorphous region than CPT according to spectroscopic analysis. Finally it is found that OPJT process is cheaper compared to conventional. It can be concluded that this innovative ecofriendly alternate process reduces around 60% energy, 10% time and 30% water and required less number of chemicals and increases product quality without creating any negative impact on environment. In this regard textile garment industry will be able to develop more ecologically and economically sustainable pretreated textile products. This sustainable developed eco-friendly process could be applied for printing and finishing pretreatment of cotton material. In near future many potato starch factory could be established around the globe where raw potato juice would be a cheaper source and would create many jobs opportunity parallel to garment industry. Furthermore, this alternate pretreatment process can be argued that through its focus on reducing environmental and social harm it assists innovations that would contribute to the well-being in nature and humankind. In this way three dimensions of sustainable development: environmental stewardship, economic and social equity will be balanced.

Keywords: Raw Potato Juice, Sustainable, Ecofriendly

Optimization of Work-In-Process Inventory through Value Stream Mapping

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Abstract

Much research has been done to optimize the work in process inventory level with wide range of success. We have considered three objectives to optimize the work in process inventory, such as meeting the existing production target that is close to the actual demand, minimizing the level of work in process, and reducing the cycle time. Work in process (WIP) is one of the three inventories which can found on a balance sheet of production process while other two inventories are raw materials and finished goods. Through WIP we can describe the flow of manufacturing costs which varies from one area of production to the next level of production. To optimize WIP we have used value stream mapping (VSM) method as the VSM has become very useful tool for waste identification and maximize production. Analyzing VSM, a production house can see the whole process in current position as well as the desired future position. The research shows that VSM has been applied in a swing industry to achieve its desired state. Through a flowchart of VSM, we showed the steps those are required to improve the production system.

Keywords: WIP, Inventory, VSM

Application of Lean Manufacturing with a Two-Stage Tri-Level Optimization Model to Reduce the Lead Time and Cost in Inventory

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Abstract

We have proposed a modified inventory control model based on Rahdar et al. (2018) for lean manufacturing in an incapacitated warehouse of a readymade garment manufacturing facility under demand and lead time uncertainty. The objective is to make ordering decisions in such a way that minimizes the total system cost. We want to introduce a two-stage tri-level optimization model with a rolling horizon to address the uncertain demand and lead time. In addition, an exact algorithm is being prepared to solve the model. We have compared the results of our proposed model with deterministic and stochastic lead time model, and regarding our objective to reduce the system cost and lead time. The future research can extend our tri-level model and compare with the base stock inventory model and inventory record inaccuracy model.

Keywords: Lean, Inventory, Optimization, RMG

Productivity & Lot Size Scheduling: Case Studies in RMG & Solar Industry

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Abstract

Productivity and proper scheduling has been a major problem in manufacturing industries around the world. Much research has been conducted on these areas within the last two decades with varying degrees of success. This research presents a new scheduling model which determines the number of units in each lot for any assembly line based on production target which will help to reduce the pillage of parts in workspace and the in process bottleneck with non-finished jobs after working hour. From the real life experience, it is seen that workers select the lot at random. So, often there are many unnecessary parts placed around the workspace which may cause occupational health and safety hazards. The proposed scheduling model operates based on the values of the variables, such as lead time, normal time, cycle time, constraints, SMV and VSM. The analysis of the real life data and outcomes of the proposed model has identified the optimal lot size and resolved lean issues subsequently by minimizing the wastages further to increase the productivity. The forecasting and sensitivity analysis on real data has been done to identify the order quantity with minimum errors. This learning can be applied in growing sector, mature sector and a declining sector.

Keywords: VSM, SMV, Scheduling, Productivity, Lot size

Applying Lean Tools and Measuring Eco Efficiency for Garments Industries

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Abstract

This paper focuses on improving sustainability of garment industries by considering lean practices and measuring eco-efficiency. Many apparel industries are coming forward to contribute in environmental causes. Sustainability in garment industries can prevent harmful effects on human health as well as environment, make economic growth and maintain a good relationship among other companies who are already involved in this cause. In this paper, some lean and environment friendly practices are considered to measure environmental and economic performance. A mathematical model is created to measure this performance. This research shows that garment industries can be both lean and green. The proposed model shows that an eco-efficient supply chain can be achieved by implementing some lean and green practices.

Keywords: Sustainability, Eco-efficiency. Economic performance, Lean, Green

A case study of dyeing machine scheduling to optimize the dye house production

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Abstract

Maintaining lead time in textile production is the most challenging task for the manufacturers. Dyeing is one of the most critical processes in textile production which consumes a great portion of lead time of end product. This is why, scheduling of dyeing machine is a prime factor of maintaining lead time. Scheduling of very often biased by the conflicting interest of the authority of different subsection in a dye house e.g. the accountant, marketing manager, dye house manager and plant manager. The purpose of the current study is the evaluation of the dyeing machine scheduling of knit dyeing factory with different scheduling methods e.g. FCFS, EDD, LPT, and SPT in terms of average job lateness and average job completion time. The processing time of dyeing of the common products are practically monitored from the dye house and the dyeing batch related information was collected from the record book. The scheduling formula (FCFS, EDD, SPT, and LPT) is applied to find out the most effective process of scheduling. The individual Gantt chart of FCFS, EDD, LPT and SPT based on the item, due date & order receive date provides overall information of these data at a glance. The lateness of each scheduling was calculated from the due date and the flow time obtained by cumulative way. Dye house typically do not follow any single scheduling method rather they only schedule their machines only to serve various interest groups. In this study, EDD method of scheduling shows the better result in scheduling process and it minimizes both the lateness and the completion time. In this highly competitive global market, manufacturing companies need to implement sustainable and efficient work method to meet up the customer demand with the quickest possible time. This study will facilitate to shift the long traditional view of scheduling in the dye house into a quantitative scheduling rule.

Keywords- Scheduling, dye house, FCFS, EDD, SPT, LPT

Building up a sustainable relationship between employee and employer of the RMG (Readymade Garment) sector of Bangladesh

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Abstract

RMG (Readymade Garment) sector is the major foreign currency earning industry in Bangladesh. More than 3.2 million people are engaged in this sector directly and indirectly. Most of the employees of this sector are female. There is an unrest existed in this sector from the last ten years. One of the major reasons of this unrest is the employee-employer relationship which is unstable i.e. not sustainable. This paper mainly investigated the causes and remedies of the existing unstable relationship between employee and employer of RMG sector. A semi structured questionnaire containing ten questions was prepared focusing on three pillars of sustainability and then an interview was executed to different garment industries to receive feedback from employees and employers. The total sample size was 30 (thirty). Then the analysis was done based on the feedback of those participants. It was found that the existing employee-employer relationship may become sustainable with the participation of both parties; employee and employer in a common platform.

Keyword: Sustainable relationship, employee, employer, readymade garment industry

A Sustainable Apparel Supply Chain under the Sales Rebate Contract

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Abstract

In this paper, a mathematical model is formed relating Vendor Managed Inventory (VMI) for apparel industries under a sales rebate contract. The supply chain consists of one supplier and two independent retailers. Two vertically differentiated fashion products (VDP) are considered such as luxurious brand shirts with high demand and generic shirts with low demand. We optimize the aggregated supply chain profits with respect to varying rebate percentage. The research shows that profits of both the supplier and retailers can be increased if sales rebate is imposed on both products. Numerical simulations are also carried out for a detail analysis and deriving further managerial insights. The result shows that applying a sales rebate contract may improve the sustainability of apparel purchases.

Keywords- Vendor Managed Inventory (VMI), Vertically Differentiated Product (VDP) and Sales Rebate.

Buyer initiatives to improve supplier quality performance: A study on the Garments Industry of Bangladesh

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Abstract

Purpose: The main purpose of this study is to investigate how buyer's initiatives to the supplier firms contribute to quality performance improvement.

Methodology: Following a qualitative research approach, four individual cases developed based on the collected data from one Danish buyer and their four corresponding Bangladeshi garment suppliers. Data collected from the suppliers in two rounds: two suppliers in the first round and two suppliers in the second round. Data analyzed following cross case data analysis technique.

Findings: This study demonstrates that buyer's current support to the supplier firms is insufficient, and their systematic intervention in supplier factories can improve supplier quality performance, specifically reducing quality defects. This study also reveals that buyer's supports like routine auditing, regular inspections on supplier factories, giving regular training, expert personnel sharing, and close monitoring are required to improve product quality performance.

Research implications: This study would contribute to total quality management, buyer-supplier relationship, and operations management literature by bringing new insights into buyer relationship dynamics and making quality control practices more effective in a cross-border context. The new relationship dimension may help the managers of buyer and supplier firms to reduce quality defects and improve quality performance as well.

Research limitations: Although this research digs deeper into the four large size supplier companies, further studies should be taken by considering the different level of more supplier companies to get the better understanding of the nature of the industry.

Originality/Value: This research approached quality performance improvement in a cross-border context based on a buyer from a developed country and the suppliers from a developing country. As per systematic literature search, this is a unique study which considers buyer intervention in garment supplier firms in cross-border context to improve product quality performance.

Keywords- Buyer-supplier relationship, Intervention, Defects, Quality performance

Facilitating the creation of synergies between OHS and Productivity: The implementation sequence of lean tools

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Abstract

The literature emphasizes that bundles of reinforcing HR and manufacturing practices are likely to enhance performance, as they provide several ways for workers to acquire skills and multiple incentives to boost their motivation (Macduffie, 1995). However, the question remains of whether companies should implement all practices within a bundle in parallel or sequentially. Within this context, Imai (2012) states that standardization, housekeeping, and the elimination of waste should form the foundations for building improvement capabilities. As for the organizational factors influencing OHS and productivity, research point that the same issues – such as improper workplace design, poor human–machine fit and inappropriate incentives – are responsible for both worsening work conditions and reducing worker productivity. Moreover, studies reveal that a range of lean practices can influence OHS and productivity outcomes simultaneously (Adler et al., 1997; Gapp et al., 2008; Kaminski, 2001).

Purpose- This study aims to identify patterns of related to the sequence of implementation of lean tools, which affect simultaneously OHS and Productivity outcomes.

Design/methodology/approach- Factor and Cluster analysis of a range of lean and OHS tools used in a sample of 50 garment manufacturers.

Findings- We find evidence that garment manufacturers, performing well on both OHS and Productivity measures, have adopted a distinct pattern related to the sequence of implementation of lean tools. Our results support insights proposed in the literature (Imai, 2012), where tools such as standardization and housekeeping (5S) form the foundations for improvement in both domains (OHS and productivity).

Practical implications- The study has direct implications for managerial practices. Some lean tools or bundles of tools create the foundations for improvement; thus managers ought to focus on the implementation of these tools in the beginning of lean transformation.

Originality/value- The study adds value the literature related to lean implementation by pointing to specific tools or bundles of tools that can enhance productivity and OHS outcomes simultaneously.

Keywords- Lean, OHS, Lean implementation, Bundles of tools.

Challenges in introducing lean production system in the RMG industry in Bangladesh: A Lean enabling Human Resource Management Perspective

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Abstract

Although lean has been considered as a source of competitive advantage and continuous improvement, but organizations face challenges to introducing and implementing lean successfully. Among other factors, human factors has been identified a major challenge for implementing lean (Van Dun & Wilderom, 2012, 2016) if not address properly. Some HRM practices are found as enablers in implementing lean production system (Marodin & Saurin, 2013). These practices help to create a lean environment. Literature on HRM policy in implementing lean suggests that a good recruitment policy (Bessant, Caffyn, & Gallagher, 2001; Rothenberg, 2003; Liker & Hoseus, 2010), training and development (Rothenberg, 2003; Jorgensen, Hyland, & Kofoed, 2008; Salas et al., 2008), job security (Rothenberg, 2001), and reward and incentives (Zeeith, Johannesson & Ritchie, 1997; Bessant, Caffyn, & Gallagher, 2001) play important role in implementing lean in any organization.

The Ready Made Garment (RMG) Industries in the third world countries has considered the lean implementation to improve the productivity with varying degrees of success within the last decade and RMG industries in Bangladesh has been started to introduce lean production system to achieve competitive advantage and improve the productivity within the last couple of years. Though HRM plays critical role in implementing lean but no such study yet to carryout in the RMG industry in this regard. So, the purpose of this research is to examine the challenges in practicing lean enabling HRM policies in the RMG industry in Bangladesh.

Research has been carried out in six RMG factories where few lean tools has been introducing. Data has been collected through semi structure interview and document observation. Data has been analyzed following manual coding process.

Primary result suggests that lack of knowledge on lean production philosophy and lean enabling HRM policies are the main cause of unsuccessful implementation of lean. Research also found that short term or temporary recruitment policies, lack of appropriate training and development policy and practices, weakness in incentive policy and practices, and finally lack of job security are some causes of failure of lean implementation. Some factories have some good policies, but they are not aligned with the lean production philosophy.

Keywords: Lean production system, Lean enabling HRM policy

Minimum wage rate and minimum required to live for RMG Workers in Bangladesh: Beyond the two minima

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Abstracts

By nature, Ready-made garments industry is labor intended industry and that's why, the mass presence of such industry in the countries like Bangladesh where cheap labor is abounded in is observed. But the existence of cheap labor makes another concern of provision of least salary by which they can meet their necessary demand for living at least beyond the poverty level. For this concern, Government of Bangladesh enact a standard of wage that is considered as the minimum wage rate for this industry. The aim of this paper is to reexamine this minimum wage with respect to their minimum needs to spend. This paper would first revisit this two minima of wage rate and amount required to sustain beyond the poverty level. In order to revisit this two minima, data regarding the earnings of RMG Sectors and their disposal spending by sector would be collected as well. Descriptive statistics would be formulated by rational calculation of what they need actually in response of what they earn from this sector. Later an inferential analysis would confirm the facts obtained from descriptive statistics. Initial analysis demonstrates that what they earn from this sector by virtue of minimum wage is far behind the actual need to exist beyond the poverty level. Lastly, this paper recommends that minimum wage rate should be increased to cover the minimum required and this wage should vary with respect to family member condition as law of large number in this case can generalize but never be able to provide solution for everyone. Rather it is imperative to keep these marginal workers beyond the poverty line. This study includes only the marginal workers or the workers exist in the lowest situation in the organizational structure but directly engaged with the production procedure as well.

Keywords: Labor intended, Abounded, Minimum wage rate, Two minima, Descriptive statistics, Inferential analysis, Poverty level, Marginal workers

Study of Waste Management Impact on Environmental and Economic Sustainability in RMG Sector

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Abstract

In the past few years, there have been widespread concerns around the world about the disposal of textile and chemical waste, and this is more prevalent in Bangladesh, where textile and Ready Made Garment (RMG) industries are major contributors in GDP. The fast changing and short fashion cycle in the textile and RMG industry has led to a high level of consumption and along with that, waste generation. This can impact the environment negatively since the textile industry is one of the most polluting industries. The purpose behind this research is to examine the existing method of waste handling in Bangladeshi textile and RMG industries through Life Cycle Assessment (LCA) and study the impacts of proper waste management system in the pillars of sustainability. The first part seeks to understand the types and amounts of wastes in various textile production processes. Using LCA the impacts of each stage on environment are defined and the relevant waste management steps are taken based on the waste hierarchy. This part also compares various physical and chemical effluent treatments for instance sludge treatment, sedimentation and skimming. The second part explores the subsequent improvement in efficiency through minimizing wastes and emissions, also decreasing overall cost involved in processing the material, thus proving to be economically beneficial. Using aforementioned analysis, the most appropriate measures are used to formulate a model which is environmentally and economically sustainable for Bangladesh.

Keywords- Waste management, Life Cycle Assessment (LCA), Garment Industry, Garment Waste, RMG

English Proficiency for Sustainable Career Development in Fashion Industry

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Abstract

English has become a via-media between people's life and their professions in current day world. Being competent user of English in academic life leads to better understanding of study materials, like books, journals, class lectures, the internet, and so on. Again, better understanding of study materials means better results in formative tests as well as summative assessments. Eventually, the continuous better results lead to gaining cumulative grade point average (CGPA). Anyone who has been able to obtain an honorable grade in his university degree will get lucrative job offers if he wants to enter into the professional life. Moreover, if he wants to further his academic career, he may be blessed with a scholarship abroad. Likewise, knowing English language enhances the possibility of one's getting hired by high paying firms. For this purpose, this paper aims at finding out the role of English language played in the careers of people working in the fashion industry, and through a survey and review of literature, this paper has found that proficiency in English is a must for sustaining one's job in the fashion industry in the 21st-century globe

Keywords: Competent user of English, Sustainable career, Fashion industry

Development of Garment Design Module for Sustainable Product Development

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Abstract

Sustainability is matter of great concern in today's world and it also affects the fashion garment production as the fast fashion strategy of today's fashion business not only pollutes the environment but also consumes a great amount of textile goods due to characterization of large volume, faster production and cheapest rate which finally leads to ample disposal and also resulting shortening of the design process particularly in the idea generation phase; gives increased homogeneity of products. The only purpose for the companies to sell and sell more products without giving neither importance to the user's value or its sustainability for the environment. It becomes apparent that sustainable fashion production and consumption is counter to the current industrial model. Although several researchers have suggested different solutions for sustainable product development, especially to use Eco-friendly raw-material and chemicals. But even sustainable raw material is used like organic cotton instead of normal cotton we end-up disposing the garment to the environment and processing of organic cotton production, distribution and transport still requires water & energy consumption. A designer's efforts should therefore focus not only on durable & sustainable materials and processes, but also on the use-value of a fashion items to enhance product longevity. Tools to support sustainable design practices exist in some disciplines; however, only a few tools exist to support sustainable fashion as a process of co-design. Participatory design or co-design has received academic attention for sustainable design over the last few years. The purpose of this study is to develop an appropriate and effective design system to enable customers as designers to facilitate sustainable production and consumption at the idea generation phase. At first various designs (from different sources like fashion books, magazines, websites etc.) have been collected and then drawn to make style libraries for the components of the garments separately in separate layers and finally programmed them to make the design module. With such a system, users can generate interesting design sketches by selecting their preferred style features with a few mouse clicks without training. Which facilitates creating value to the end-users, thus potentially increasing the lifespan of the product and results better sustainability.

Keywords: Sustainability, Garment design, Co-design, Sustainable product development

Implementation of Westinghouse system in garments production process to determine the workers performance rating accurately

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Abstracts

Worker's performance rating can be regarded as a critical work study problem which is affected by various factors. Using an appropriate performance rating provides effective labor and capacity planning in real life production system. At present, only working pace is considered to rate the workers performance during time study performed within garments manufacturing process in Bangladeshi perspective. The aim of this study is to determine workers performance using Westinghouse rating system and compare it with the system presently used in the garments factory. During implementing Westinghouse rating system, four factors such as skill, effort, consistency of the workers activities and condition of the workplace have been considered. For all four factors, different levels of performance have identified and calculated through corresponding recommended numerical values. The result revealed that the workers performance rating is higher while using Westinghouse system compare to traditional or existing method. As various factors are considered in the Westinghouse system, it provides more accurate performance rating. The outcome of this study might be contributed to the garments manufacturing process for identification of workers performance more accurately and its usage will help the practitioner more effectively.

Keywords- Performance rating, Garments production process, Westinghouse system

Development of sustainable antimicrobial and wound healing properties on cotton medical bandages by using the extract of eco-friendly herbs

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Abstract

Bacteria are microscopic living organisms, usually one-celled, that can be harmful when they cause infection or beneficial as in the process of fermentation. Clothing-fabrics, coming into intimate contact with skin organisms, create a warm and moist condition on the skin, which promote the growth of bacteria & produce odors. These can lead to discoloration, tissue damage, physical irritation, allergic diseases or skin infections. Moreover, wound and skin infections are the growth and spread of microbes, usually bacteria. Wound can be cured without applying any dressing material on the wound place. But it takes much time and chance to turn of the wound in chronic wound. The available dressing material is chemically treated which is very toxic and harmful for nature. On the other hand available bandage do not have any dressing properties. So if the bandage have antimicrobial and wound healing properties it is very easy for the patient to cover up his or her wound place. The purpose of the study is to produce herbal bandages which have antimicrobial properties as well as which will heal the wound place without applying any additional dressing materials. In this purpose extracts of two eco-friendly herbs such as Durba grass (Scientific name: *Cynodon dactylon*) & Bikash spinach (Scientific name: *Micania cordata*) were used. These herbs were dried in standard atmospheric condition and blended into almost powder form. The extracts were then padded on both knit & woven fabrics with minimum pressure to achieve required pick up percentage. After the sample preparation, the odor test, antibacterial test, FTIR analysis was done. To justify wound healing properties, implementation of the samples of both herbs was done on the wound place of a rabbit with the permission of local veterinary department and followed the instruction of a certified doctor. Both the herbs performed excellent results upon antimicrobial and odor test. Results of healing for Durba grass was better as compared to Bikash spinach. There are large demands on natural & eco-friendly products in the medical fields. So these treated samples can be used as medical bandages in commercial basis as well as can be imparted antimicrobial finishing effect on inner-wear garments.

Keywords- Eco-friendly herbs, Antimicrobial, Wound healing, Medical bandages

Technology Adoption Strategy and Innovative Capacity in Garments Industry for Sustainable Development; Bangladesh Perspective

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Abstract

The aim of this research is to develop an effective strategy for technology adoption for the garments industries of Bangladesh to contribute towards a sustainable development goal. Sustainability in the garments industries has been a big issue in the recent years and to achieve sustainable development industries must adopt appropriate technologies. So, this research investigates the mechanism of technology adoption and organizational transformations in the garments industries in a view to recommend an effective technology adoption strategy so that sustainable development can be achieved. The method of the research is a mixed method of quantitative and qualitative. The current practice of the industries is discovered by analyzing responses collected through appropriate questionnaire. A sample of 15 industries was selected through a random and convenience sampling method. The key findings from this research depicts a close connection between the technology adoption success and the innovative capacity of the industries. Industries must adopt different strategies for technology transfer according to their capacity to innovate. Innovative capacity here is a combination of their organizational culture, resource at disposal, content and strength of competitiveness and extent of networking ability. A model strategy is developed keeping the above findings in mind that enables the industries to adopt the appropriate technology and ensure organizational transformation for sustainable development.

Keywords- Garments industry, Technology adoption, Strategy, Innovative capacity, Sustainable development

Investigation of Corporate Social Responsibility Activities in the Ready Made Garment Industry of Bangladesh

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Abstract

In recent year Bangladeshi readymade garment (RMG) industry have attracted media attention in the Global and Western press for its rapid progress in global economy. The post Rana Plaza period has familiarized Bangladeshi RMG factories with corporate social responsibility (CSR) activities. The aim of this research was to reveal purposes and effects of CSR activities in garment factories in Bangladesh. Qualitative research methods in the form of interview and document analysis were used in the research. Interviews were held with management representatives of these factories. According to the research results, it was found that the purpose for the factories of involving in CSR activities were dissemination of social awareness, social benefit and realization of advocacy mission. It was observed that CSR activities had favorable effects on the workers such as the approach of workers to the garment factories, increasing loyalty. Finally, it was witnessed that CSR activities were strengthening the image of the garment factories thereby making it possible to differentiate themselves to the buyers.

Keywords: Apparel, Image, Garment workers, Loyalty

Sustainable Knit Garment Manufacturing: A Review of Cost Analysis through Material Flow Cost Accounting

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Abstract

Material Flow Cost Accounting (MFCA) is a strong sustainability measurement tool for improving the material efficiency of a manufacturing unit by reducing the cost of wastage. This study is aimed at review the total manufacturing sequences of a vertically integrated knit garments production unit in the light of MFCA for sustainability evaluation. The whole manufacturing unit for a cut and sewn garment, like polo shirt, was studied from fabric manufacturing following the procedure of MFCA. Costs of both positive and negative products for each quantity center were identified starting from knitting, then dyeing and finally garments-making. The MFCA analysis reveals that the highest portion of negative product or waste with associated costs were generated from the last quantity center, i.e. from the garments manufacturing unit and lowest from the first one, i.e. knitting. However the second quantity center or dyeing has been identified as the most sensitive one on environmental perspective. The outcome gives a scope to an entrepreneur or manufacturer of this trade to think for cost-effective and sustainable plant establishment or process development.

Keywords: MFCA, Production Quantity Center, Sustainability measurement, Knitting, Dyeing, Garments

Study on Present Environmental Sustainability Condition at Woven Readymade Garment Factories in Bangladesh

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Abstract

Readymade garment (RMG) sector is one of the fastest growing industries in Bangladesh. Presently, RMG is one of the major foreign currency earning sources of Bangladesh. Almost 80% of the total export covers from this sector. The purpose of this study is to determine the present scenario of the environmental sustainability and the reason behind for adopting sustainable environmental practice to determine the major challenges at the implementation stage in readymade woven garments industries. Different brands and factories are working in a collaborative manner for sustainable environment. The RMG sectors in Bangladesh have come forward in recent days to be more sustainable with limited success. Most common good practices for sustainable environment are: tracking energy, water consumption, calculating GHG emission, waste inventory, and EIA analysis. Maximum woven garments factories owner adopt this practice on the pressure of brands and for securing business. These data's are not analyzed by individual industry for aiming further long term strategies. But this is high time to implement special environmental strategies for securing our mother earth. Environmental sustainability decreases the pressure on ground water, energy consumption, and introducing reuse-recycling practices. At one word a sustainable environments means a sustainable economic growth.

Keywords: EIA, GHG, Sustainability, Woven, Readymade garment (RMG)

Assessing the Impact of Green Human Resources Management on environmental management in the Context of Bangladeshi Garment Industry

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Abstract

Environmental Management (EM) is one of the most effective tools to achieve sustainable development. Thus, there is an emerging need for the integration of Environmental Management into Human Resource Management (HRM) which is called Green Human Resource Management (GHRM). Consequently, GHRM is attracting the increased concentration among the recent management scholars towards achieving sustainable Environmental Performance (EP). This paper presents an empirical assessment and measurement of the impact of GHRM practices on Environmental Performance of Ready-Made Garment industry in Bangladesh context. Furthermore, it identifies the variables that could affect the GHRM implementation from the perspective of the respondents. In order to analyze the impact of GHRM on Environmental Performance the research used both qualitative and quantitative aspects. An exploratory research was conducted by using semi-structured questionnaires to collect data from employees of different garments. The statistical analysis revealed that there is a statistically positive and significant relationship between GHRM practices and Environmental Performance. The contribution of this paper lies in extending the scope of GHRM in the actualization of sustainable environmental performance of organizations. The implications of the research offer constructive insights on how ready-made garments should strategically link their HR functions to support their EP crucial for achieving competitive advantage.

Keywords: Environmental Management, Green Human Resources Management, Environmental performance, RMG

Transfer mechanisms of Lean Implementation in the Apparel Industry in Bangladesh

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Abstract

Lean manufacturing is suggested to contribute to secure that the apparel industry in Bangladesh can maintain its competitiveness. However, lean implementation is not straight forward. Qualifications, commitment and resistance to change are some of the factors playing an important role for the success of lean implementation, and there has so far only been limited research in the mechanisms of lean transfer in the garment industries. The purpose of this paper is to identify the transfer mechanisms and barriers of lean implementation in the apparel industries of Bangladesh and thereby to deepen the knowledge on how lean implementation can be facilitated in an effective manner. We adopt as theoretical foundation the transfer mechanisms related to the societal interaction between the transferor and transferee. The transfer mechanisms have been studied during lean implementation in four garment factories in Bangladesh where qualitative and quantitative data were collected and form the basis for the empirical analysis. The study identifies that the success of lean technology implementation is reliant on the effectiveness of transfer mechanisms which can overcome the barriers to change. A key mechanism is the translation of lean thinking of the specific context of factories where it is necessary that lean makes sense for the local actors. This research creates a new knowledge regarding the facilitation of lean implementation in the apparel industries.

Keywords: Garment, Lean manufacturing, Resistance to change, Bangladesh

Influence of ergonomics and its impact on sewing machine operators' musculoskeletal disorders in lean environment in the RMG industry of Bangladesh

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Abstract

This study presents the sewing task with the approach of the ergonomic analysis of the work in lean environment. Some task which have a high risk for the development of work-related musculoskeletal disorders (MSDs). In literature indicate that un-ergonomic work places can cause MSDs and other occupational health problems among workers. Different types of assessment of body posture have done in six garment factory and interview also take from the workers. Data collection included measurements and assessment of material handling in sewing activities, distance between the workstation and awaked posture in lean context. This data was also combined with information from informal interviews. The findings are that, un-ergonomic work places cause for musculoskeletal pain in the highly reparative task in garment factory. Self-awareness training and short physical exercise in working time helps to reduce the MSDs and pain intensity in lean environment.

Keywords: Ergonomic, Occupational Health and Safety, Lean

Reduction of changeover time in small lot size sewing industry

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Abstract

Rapid changes of fashion trends is about to dominate in today market, not least due to Ecommerce. In today's consumer market, competition has increased with consumers expecting a larger product variety. The consequence is larger variation and small lot size orders to sewing industry. The industry is therefore facing frequent line changeover and style changes. Reduction of changeover time and at the same time assuring higher quality have thus become an important driver to be competitive in garments manufacturing industry. Reducing changeover time is also important to improve productivity and efficiency growth. Single minute exchange of dies (SMED) is the most popularly used method for this purpose. It was originally it was developed by the Japanese industrial engineer Shigeo Shingo and gives a really straightforward approach to improve existing setups. However, in the case of complex manufacturing systems the simple application of the standard SMED methodology is not enough. Sewing systems composed of different working machines with vertically connected facilities constitute a good example of this problem. The interplay between machines, manpower skills and technical know in combination with the constraints from task precedence and synchronization requirements are just some of the influencing factors that make an improved SMED desirable. The present paper is based on analysis of results from an industrial case provides a heuristics methodology that integrates the traditional SMED with the workload balancing problem that is typical of sewing line. It thereby specifically addresses the setup reduction problem in the case of small lot size sewing industry. The methodology is validated in an industrial case and the results demonstrate that the proposed model is useful in practice.

Keywords: SMED, Line balancing, Garment

Optimization of Process Parameters for Dyeing Jute-Cotton Blend Fabric with Reactive Dyes using Box-Behnken Experimental Design

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Abstract

In view of increasing global awareness over the environment and health, there is an increasing trend of market share towards natural fiber products including jute-cotton based decorative and diversified home textile products. Blending jute with cotton fiber may be an acceptable way of jute diversification by which value added products can be produced. The aim of this study is to investigate and optimize the process parameters for dyeing Jute-cotton blend woven fabric by using different types of reactive dyes (cold, medium and hot brand). The shade%, salt concentration and alkali concentration were selected as three variables with three proper levels for dyeing jute-cotton blend fabrics. The design and analysis of the experimental work were carried out using MINITAB® statistical software according to the Box–Behnken design of response surface methodology. The dyeing processes were done using three different shade% (1%, 2% & 3%), varying salt concentrations (30g/l, 45g/l & 60 g/l) and different concentration of alkali (15g/l, 25g/l & 35g/l) at 40° C, 60° C and 80° C temperature for cold, medium and hot brand respectively for a period of 60 minutes. The exhaustion and fixation percentage were determined by using a spectrophotometer. The three dimensional response surface plots were created which indicates the correlation among the shade%, salt concentration with exhaustion% and shade%, alkali concentration with fixation%. Optimum values of these variables for maximum exhaustion and fixation were determined for all three types of reactive dyes. Better results were found in terms of exhaustion and fixation percentage for cold and medium brand reactive dyes with light and medium shade than deep shade. But hot brand reactive dyeing shown very poor exhaustion% and fixation%. It could be concluded that optimal use of dyes and chemicals for dyeing jute-cotton blend fabric will lead to substantial savings in terms of cost and energy. It will also minimize the effluent load, thus have environmental benefits.

Keywords: Box-Behnken Experimental Design, Optimization, Reactive dyes, Jute-cotton, Blend fabric

Identification and Elimination of the Factors Related to the Instability of the Textile Engineering Graduates at the Entry Level of Spinning Mills in Bangladesh

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Abstract

Spinning (Yarn Manufacturing) is one of the most flourishing sectors in Bangladesh. This sector is contributing to the export growth of the RMG sector of Bangladesh every year. Job opportunities for fresh graduates of textile engineering are also created with the help of this sector. These engineers can play a vital role in the growth of this sector by applying their knowledge. But the engineers are not continuing their job for a long time in spinning mills at the entry level. This is creating a negative image on the job sector of the spinning mills. The main objective of this study was to find out the factors behind the instability of textile graduates at the entry level of spinning mills in Bangladesh. A semi-structured (open and close loop) questionnaire was prepared to conduct the research work. The feedback of this study was taken from 100 respondents. A Likert 5.0 Scale was used for deeper and appropriate analysis of the survey questionnaire. Quantitative analysis of the survey questionnaire was done by using close ended questions whereas the open ended questions were used for qualitative analysis to assess the factors. According to the survey result, the starting salary, yearly increment and working environment were the main reasons behind this instability of the fresh graduates of textile engineering. This research throws light on the necessity of economic and socio economic development of the spinning mills of Bangladesh which will eventually make the textile engineering graduates stable at the entry level of their career.

Keywords- Sustainability, Survey, Spinning Mills, Fresh Graduates, Instability

Impacts of the Level of Women Empowerment on Ready Made Garments Industry in Bangladesh

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Abstract

Ready Made Garment industry is an emergent industry in Bangladesh, which made it the second largest RMG exporting country in the world. At present, the scope of employment in this sector is over 4 million people the majority of which are women. However, the majority of people involved in this sector are women but the level of women empowerment in this sector has barely seemed satisfactory. This paper is aimed to identify the level of women empowerment in Bangladesh RMG industry and its impact on this industry. In this paper, data has been collected by conducting a survey by using a questionnaire. This research is a descriptive research where qualitative and quantitative both types of analysis have been used. This study has validated some facts as women are more preferred as a worker but downcast in the managerial position, by default abolition of women from mid-level management, lack of empathy in management decision because of male-dominated management. This study may provide a concise idea of the level of women empowerment in the RMG sector and their participation in decision-making and its impacts on the RMG sector of Bangladesh. This study can be a way forward for further rigorous study of these impacts and their significance on the RMG sector of Bangladesh.

Keywords: RMG (Ready Made Garments), Empowerment, Women Empowerment

Effect of implementing lean tools on manufacturing performance of textiles and apparel firms

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Abstract

The main objective of this paper is to find out about the empirical extent of lean practices in the Bangladeshi garment industry to improve the manufacturing performance and identify factors for enabling an environment for practicing lean successfully in the apparel manufacturing firms. The main focus of this paper is the implementation of two lean tools: colored flags in workers table (Kanban) and reducing the bulk amount of each operation. The purpose was to see the result of the implementation of these tools, which was done by using four rows of operators, each row containing 50 operators – two rows using the lean tools, other was conventional. It was found that the operators using the lean tools, lean tools implemented line gained improvements in terms of efficiency, production rate, operators' mentality toward workload. At the same time, it improved the product quality, on-time delivery. This finding will impact the local and global textile and apparel industry positively as well as cover the way to implementing these two lean tools in the textile and apparel manufacturing firms.

Keywords- Lean, Kanban, Efficiency, Garments

Access to Five Basic Rights for RMG Workers of Savar: A Cross Disciplinary Inferential Approach

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Abstract

One of the major sources of being employed for both unskilled and semi-skilled workers is to be employed in readymade garments sector in Bangladesh. But a significant number of research literatures have already confirmed poor status of these workers in terms of five basic rights such as Food, Clothing, Housing, Education and Medication. Economic condition is one of the most rationale culprits behind this. But perception regarding this should not be ignored at all. The aim of this research lies exactly hereby and it is to access their poor condition with respect to self-proclaiming perceptions and their economic conditions as well. To access this, descriptive statistics and inferential statistics such as linear regression model and binary regression model would be run for each stated rights. Finally, an overall regression would again confirm this as well. The initial finding of this study has confirmed self-proclaiming perception is also liable with economic status. This study also suggests the more economic betterment of these workers in terms of raising wage rate can do a lot but it is not sufficient along. Behind this, some programs must be enacted to eradicate or minimize their self-proclaimed inferior perceptions as well. But it is also true that this sort of inferiority complex can be determined exogenously.

Keywords: Perception, Wage, Five Basic Rights

Development of New Convertible Portable Shelter Combining Tent and Tarp Having Improved Features

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Abstract

Tarpaulin or tarp is a piece of canvas, which is covered in oil, wax, tar or a synthetic material to make it water repellent. Tarp-shelters are simple shelters made from a Vertical Support System (VSS), rope, ground stakes, a tarpaulin (or a fabric or plastic sheet), and ingenuity. A tent is a shelter made of canvas or nylon which is held up by poles and ropes, and is used mainly by people who are camping. The main objective of this study was to develop a new user-friendly multifunctional shelter i.e. a tent combining features of both tarp and tent for tourism lovers. The total study was performed in two steps. The first step consists of designing and production of the tent and in the second step a survey was carried out regarding the acceptance of the people towards the produced tent. This tent can be converted into a tarp so that it can be used as a rectangular awning or during BBQ parties as roofing. This multifunctional tent can also be converted into a backpack where along with different tools of the tent as well as different necessities can be carried out. A solar power bank had been added to ensure minimum supplies of electricity. The focus of the study was on framing a multifunctional tent within a minimum cost so that it can be possible for the end-users to afford all the happiness into one box. The costing for setting up a two lines tent factory has also given in the project, where sample calculation to set up a small factory within BDT 10,00,000/- or USD 12,500/- has been given which may be a best business plan for the textile businessmen in near future. The major portion of participants of the survey showed positive response to have this developed tent. It can be said that this multifunctional tent may be sustainable on the basis of production and costing.

Keywords: Tarp, Tent, Convertible portable shelter, Multifunctional shelter, Improved features

The missing link between industry upgrading and social upgrading: the lessons from a China's garment cluster

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Abstract

In recent years, China has promoted advanced manufacturing to boost the economic development. However, little research examines the social influence of industrial upgrading in China. With a case study of a garment cluster in China, this research examines the gap between industrial upgrading and social upgrading. At first, it traces the historical trajectories of the development of the local textile/garment industry and discusses the role of local state in contributing upgrading as policy maker, strategic recouping and labor regulation. Then it analyzes the aspects of social upgrading and emphasizes the double sides of upgrading particularly discussing the labor challenges of the production network of the Taobao Economy. In a summary, the industrial upgrading without social upgrading shall fail to achieve economic and social sustainability.

Keywords: Industrial upgrading, Social upgrading, Garment industry, Cluster

Occupational Health Hazards, Safety Issues and Applications of Ergonomics in Textile Industry: An Academic Review of Research Articles

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Abstract

Occupational health and safety (OHS) in the industries of developing nations are overlooked in many aspects. Among them, textile industry, particularly in Southeast Asia where it plays the most important role in the economy, has been ironically the worst victim of safety and health issues according to various studies. Long working hours, lack of proper illumination and ventilation, unhealthy and polluted environment, scarcity of safety equipment, noise irritation, unsafe manufacturing units etc. have been found to be some of the major obstacles in the way of physical and mental wellness of the workers in many small and large garments factories in those countries. Governments are introducing zero tolerance policy toward any negligence and imposing higher standards of OHS on garments which are bound to require a brand new cost analysis. Hence in this study an overall scenario of health and safety conditions of the workers, including women, in the textile industry in the developing countries has been summarized and a reconstruction of the safety system with smart technologies and minimal costs has been recommended using the knowledge from between early 90's and recent research articles.

Keywords: Occupational Health and Safety, Textile, Smart Technologies, Ergonomics

Health and Safety Issues in Sustainable Spinning Industry

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Abstract

The spinning industry is playing an important role as backward linkage of the RMG (readymade garment) sector of Bangladesh. This industry has faced higher hazard and risk than any other textile processing units. So, the main focus of this paper was to identify the hazards related to yarn production in spinning industry and prioritize the risks using Satty scale. To perform the study, a survey was carried out for ranking the risk using interviews with a questionnaire. The questionnaire was prepared with 10 (ten) questions based on health and safety issues of employees required in sustainable spinning industry. Then the questionnaire was sent to 30 (thirty) participants of 05 (five) spinning mills to receive their feedback. The feedback received from participants was analyzed and the raking of risk was developed priority basis using Satty scale. From this study, it is clear that dust, dirt, noise, improper lighting and fire are the major hazards responsible for higher risks in sustainable spinning industry of Bangladesh.

Keywords- Health and safety issues, Hazard, Risk, Sustainable spinning industry, Satty scale

Improvement of Sustainable Geo-Jute Designed for Geo-Technical Purposes through Chemical Treatment

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Abstract

Principally synthetic and natural fibers are used in the production of geo-textiles. The jute geo-textiles have now proven their mettle to match with geo-synthetics in different areas involving soil erosion control, filtration, drainage and separation and such areas constitute about more than 50% of all geo-textile applications. This study investigates against bio-degradation of jute fibers due to hydrogen bond in moist environment by applying Bitumen emulsion and polyester resin with gamma radiation. The effectiveness assessed by employing moist soil burial test which gives favorable environment for microbial attack and tensile strength which confirms the effect of chemical treatment. Two formulations was prepared with using different percentage of bitumen emulsion (20% and 30%) and polyester resin (10%) where MEKP used as a cross linking agent, cobalt naphtha as a curing agent and styrene monomer as a solvent. Jute fabric was treated with these solutions .Tensile strength and weights of treated jute fabric were increased gradually with the increase of coal tar and polyester resin percentage. Chemically treated fabrics were irradiated under Co-60 gamma radiation at various doses (2.5kGy/h and 5kGy/h).Better durability properties were found after 2.5kGy/h. The weight of the treated jute fabric was increased maximum 71.07% and minimum 28.43%. The tensile strength of treated jute fabric was increased maximum 61.55% in warp way direction and 44.73% in weft way direction. The minimum strength increases 4.8% in warp way direction and 5.26 % in weft way direction. The FTIR (ATR) spectra make it confirmed the formation of new bonds in the treated jute fabric by chemical treatments. Scanning electron microscopic images of untreated and treated jute fabric illustrated that fiber-chemical interfacial contact occurred in treated jute fabric. Treated jute fabric and untreated jute fabric were reserved under 6 inch deep soil and samples were pulled out after 15 days, 45 days, 90 days and 120 days. Raw jute fabric was demolished after 45 days where as the chemically treated jute fabrics with radiation were not damaged after 120 days.

Keywords: Bitumen emulsion, Polyester resin, Jute fabric, Tensile strength, Soil degradation, Gamma radiation

Challenges of Quality assurance –A Case Study of Women Entrepreneurs in the Garment Sector of Bangladesh

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Abstract

In Bangladesh women make 52% of the population which means huge potential to be utilized for socio-economic development of the country. It is a resource-limited and overpopulated country with highly stratified society, services and opportunities are determined by gender, class and location. Development and enrichment of women entrepreneurship are the means of promoting national competitiveness and sustainability. It represents the individual and community level initiative and contribution towards the greater national economy, poverty alleviation models pursued by both the GOs and NGOs consider the above mentioned phenomenon as one of the prior sector of intervention. The present study examines the contribution of women entrepreneur in different sectors of business and commerce - Agriculture, Readymade Garments and Small Business Enterprises. Among the sectors, the ready-made garment (RMG) industry of Bangladesh started in the late 1970s and became an important player in the economy and is contributing to export earnings, foreign exchange earnings, employment creation, poverty alleviation and the empowerment of women. SME plays a significant role in the economy and it is also considered a major sector to contribute to sustainable development of our country. In Bangladesh SME provides over 87% of the total industrial employment and is responsible for the creation of over 33% of industrial value added goals. At present women entrepreneurs constitute less than 10% of the total business entrepreneur in Bangladesh. Women Entrepreneurs are mainly engaged in SMEs. So development of Women Entrepreneurs engaged in RMG would in turn contribute a lot to the development of the SME sector. One criteria for the development is quality assurance. The present research aims at investigating the qualifications of the workforce (HR), Qualified Management, technology, price, market and competitiveness of the garments run by women entrepreneurs. The research will take into account all the primary and secondary data available as well as examine the available literature. Required support services, policies, and strategies would help to change the scenario of Bangladesh especially for the women who have gathered courage to break barriers and enter the off-house working force as entrepreneurs and workers in RMG sector - a situation not appropriate for women or accepted by the society in the past.

Keywords- Women entrepreneur, Bangladesh, Ready-made garments, Quality Assurance

Addressing the gender issues for Sustainable Development of Garment Sector in Bangladesh: A Tri partite model

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Abstract

It is needless to say that the garment industry has become the backbone of the economy of Bangladesh. About three million people are involved with garment and textile industries of which women workers account for 85% of the total workforce. Therefore it is essential to address the gender issue to promote sustainability in this large industrial sector. It is high time to adopt special strategies and an approach towards sustainability. This research work proposes a tri partite model to achieve sustainability with special consideration towards gender. The research will analyze the current problems of the female workers. Since welfare of the female workers is a part and parcel of sustainability, this issue needs to be addressed and understood in a wide perspective. Problems evolving in the garments sector results in harming female workers which in turn affects the sustainability. This research suggests a tri partite model involving all the stake holders in turn enabling the garment sector to achieve sustainable status. We would use existing literature and available data to develop a qualitative model. The final analysis will suggest economic, social and last but not the least legal issues in favor of female workers. Welfare is only achieved when all these issues are addressed in a proper frame work. This framework is the ultimate outcome of the research. The women workers of Bangladesh will have their right to decent jobs and dignity by winning in their struggle for a future free from poverty and exploitation. Appropriate policy implications for the role of all concerned- the female workers, government and the private sector -would simply pave the way for the greater good of the garment sector of the country.

Keywords: Sustainability, Tri –partite model, Qualitative Research, Garment Sector, Bangladesh

Governing Labor Standards for Social Sustainability in Garment Global Production Networks: Perspectives from Below

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Abstract

The tragic 2013 Rana Plaza building collapse was a focusing event that galvanized key transnational and national stakeholders into pursuing policies aimed at improving factory safety in Bangladesh, while calling attention to the need to uphold international labor standards. Both these factory safety and upholding labor standards constructed the notion of social sustainability. Therefore, firstly, we examine factory responses to a set of new institutions (particularly, the Accord, Alliance and the National Tripartite Plan of Action) created by international and national organizations to improve building safety. The presence of this new institutional ensemble have optimized promises and pitfalls that we want to comprehend for its consequences intended for safety governance and labor standards. Secondly, we analyze the relationship between factory management and employees, both in terms of procedural (such as worker representation) and substantive (such as pay and working conditions) aspects. Subsequently, this perspective indicated the responses from the blow of the production network. Evidence is presented on inter-factory variation followed by explanations based on integrating GPN theory, political economy and resource dependent theory. Our paper is organized as follows. After introducing the Bangladesh garment industry, we discuss the literature relating to key concepts and outline our analytical framework and methodology. We then present our findings concerning factory management view, worker outcomes and discuss the theoretical implications. The concluding section highlights the need for continuing improvements in social sustainability.

Keywords: Labour Standards, Factory safety, Social sustainability

Aligning Ready-Made-Garment (RMG) Industry with Manufacturing Paradigm

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Abstract

The winning and satisfying the customers is now considered as the key measurement of the success of manufacturer. The fast and furious competition in business among the industry and rapid & unpredictable changes in the desire of customers raise uncertainty in business. To cope up this uncertainty the manufacturer compelled to change their operations and setting of market & time specific order winning and qualifying criteria through the adoption of latest manufacturing system. The inceptive manufacturing system was changed day by day as the manufacturer faces incremental uncertainty from external and internal environment. The study was focused on the manufacturing paradigm shifting over time, their features and capability to manage the uncertainty through literature review. The main objective of the study was to look for the appropriate manufacturing system for RMG. The study tried to figure out the features of RMG industry by observing the present scenario and predicting the upcoming features for upcoming scenario through the discussion and interview with decision makers and practitioners in this sector. Considering the internal and external uncertainty, the features of manufacturing systems and the features of RMG industry was aligned. It was found that the RMG industry featured from Craft Production to Mass Production to Mass Customization and even to Personalization with advantages of both economies of scale and economies of scope. Again considering order winning and qualifying criteria, satisfying environmental & society more conscious about the end users are becoming and the scarcity of resources becoming an emerging issues like every industry, RMG industry also try to practice various environment friendly manufacturing system. The study conclude that RMG industry need to adopt a tailored manufacturing system to achieve both economies of scale and economies of scope along with a suitable environment friendly manufacturing system.

Keywords: Ready-Made-Garment Industry, Manufacturing paradigm, Environment friendly manufacturing

Prospects of Enabling Sustainable Energy Solutions in the RMG Sector of Bangladesh

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Abstract

The economy of Bangladesh is growing at a faster pace in recent times. One of the major contributors in the impressive GDP growth rate of the country is the ready-made garments (RMG) sector which is significantly dependent upon the conventional non-renewable energy sources. In the wake of environmental degradations, both at local and global levels, and accelerated depletion of these energy sources in recent times, sustainable energy technologies are becoming increasingly popular around the globe. Under this backdrop, the present research aims to investigate the existing energy technologies in the RMG industries of Bangladesh and identify measures to minimize energy waste through an array of sustainable solutions. The research work will be mainly based on literature reviews and field visits through which data will be gathered and critically analyzed. Then, some of the innovative and proven sustainable options like green buildings, tri-generation, and energy-efficient measures/appliances will be investigated for the RMG industries of Bangladesh. It is expected that the present work will inspire different RMG stakeholders in the country to opt for sustainable energy solutions in the future.

Keywords: Sustainable energy, RMG, Bangladesh, Garments

RMG Sectors Sewing Productivity Analysis through OHS and 5S

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Abstract

The readymade garments (RMG) industry is one of the highest export earnings sector for Bangladesh economy. So, the occupational health and safety (OHS) of garments workers should be focused on broadly. But in our country the OHS condition of RMG workers are prioritized to a lesser extent. For which working productivity is decreasing day-by-day. In past, many research works focused either on productivity or on OHS. In this research, productivity was analyzed and improved in alliance with OHS and one lean tool i.e. 5S. A proportional relation among productivity, OHS and 5S was emphasized on. 5S is a lean tool which has a conducive impact on OHS and productivity. As a part of the research study a garment sewing floors productivity was analyzed. For this analysis data was collected by survey questionnaires of workers and SPSS software was used. After the analysis the positive effect of OHS and 5S on working productivity was determined and implemented a model for improving the productivity in the sewing sector. The goal of this research is to improve productivity in RMG sewing sector through sustainable OHS practices and proper application of 5S method.

Keywords: OHS, 5S, Productivity, RMG

Carbon footprint evaluation of cotton knit garments production in Bangladesh

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Abstract

Carbon footprint is defined as the amount of greenhouse gases including carbon dioxide, methane, etc., generated during whole lifetime or within a specific boundary of a product. This measure helps to find out sustainability of a product by assessing the impact of its generated gases on environment. This assessment can be done on any industrial product throughout its lifetime or during its production stage since daily use of the product is not expected to generate too much greenhouse gases. Knit garments are produced in huge quantities in Bangladesh and this study has tried to measure the average carbon foot print of a cotton knit garment during its production. The results have shown the amount of carbon dioxide emission at different stages of a knit garment production. Cotton processing has resulted quite high carbon dioxide emission. Data from different factories have been taken to compare the results and to give an average result of carbon footprint calculation. This study has also tried to reveal some general reasons for which carbon footprint of a cotton knit garment varies by finding out the differences between processing systems at different garment industries.

Keywords: Carbon footprint, Cotton, Knitting, Production

How does compliance issue redirect employees' organizational attraction and work engagement toward their intention to leave: a study in RMG industry

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Abstract

Post-Rana Plaza incidents, compliance is a burning issue among the owner, employees, and buyers of ready-made garments (RMG). Specifically, compliance on several issues, namely social compliance, environmental compliance, labor law, and physical, is repeatedly mentioned by the donors, buyers, and policy makers as the critical objects for maintaining their long-term relationships. Theoretically, job-demand resource and conservation resource theories also extended that when organizations facilitate their employee, they tend to tender their resources for organizations' sake. If organizations fail to better serve employees, they tend to slow down their work, and involve their least resources for the organizational development. Gripping the essence of the dynamic relationships among aforesaid stakeholders in RMG in the light of theory and empirical findings, the present study is an attempt to examine the potential impact of compliance issues on the employees' intention to leave. This study also inclines to experiment the mediation effect of job attraction and job engagement, and moderating effect of age on the association between compliance issue and intention to stay in the firm. Following the deductive reasoning approach, we have collected 350 replies and completed the analysis using the structural equation modeling. The result shows that all the examined relationships were supported other than the moderating effect of gender. The study also described the policy recommendations for the betterment of the RMG in the long run. In addition, limitations are also proposed for the future researchers so that the future result can ensure the generalizability of the findings.

Keywords: Compliance, Job engagement, Organizational attraction, Turnover intention, Gender

Internationalization of Apparel Firm from Bangladesh to Ethiopia: A perspective of Lead buyer's business model, institutional condition, and Supplier's entrepreneurial capability

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Abstract

International business literature tends to view internationalization process from the perspective of down-stream value chain that how firms enter foreign countries and sell products/ services there. In doing so, firms need to manufacture in and source from different countries depending on the available factor conditions and geographical and cultural proximities in relation to firm and its markets. Firms therefore need to gather market knowledge, coordinate units in different locations, and make decisions on how to manufacture and sell products in foreign countries that would give them competitive advantage. Since this is the dominant perspective of internationalization model (i.e. as illustrated in Uppsala stage model and OLI paradigm), extant literature overlooks supplier-firm's internationalization from emerging economies that tends to work for multinationals in which internationalization takes place in the upstream value chain of the lead buyer, while that part of the value chain is considered the downstream (i.e. sells) value chain for supplier.

We investigate a large garment supplier from Bangladesh, i.e. DBL Limited, who is a long-term supply partner of H&M and has internationalized its production plant to Ethiopia in 2014 with an aim to supply fast fashion products at a relatively cheaper price and lower lead-time to H&M. Even though DBL has been exporting garments to H&M and other multinationals since 1991, it has, for the first time, crossed national boundary for manufacturing garments in a foreign location and selling from there not only to the same lead buyer- H&M but also to other global brands.

Our study on internationalization of supplier firm from emerging economies demonstrates an alternative perspective in a way that, instead of going to the nearest geographic location, DBL has gone to Ethiopia, the geographically, culturally, and institutionally distant context. While the internationalization did not follow an incremental step-wise process to gather knowledge on Ethiopian context and thereby progress step by step; instead the decision for internationalization was driven by lead buyer H&M's business model change, long-term buying commitment and complementary resource support, institutional incentives offered in the host context, and DBL's entrepreneurial capability and vision to grow globally.

Our study makes two important contributions to supplier-firm's internationalization from emerging economies. First, it demonstrates an alternative perspective of internationalization that does not completely match with the assumptions of traditional internationalization models i.e. Uppsala model. Thus, it inspires future researchers to investigate supplier's internationalization process from the perspective of buyer's business model, commitment, and nature of relationships.

Second, our study unfolds an ignored area of internationalization, i.e. internationalization in the upstream value chain, in which suppliers internationalization motive is stimulated by lead buyer's degree of commitment and institutional incentives of the host country; while the actual internationalization and its sustainability lies on supplier's entrepreneurial and managerial capability and vision for globalization.

Keywords- Supplier, Buyer, Internationalization

Lead MNE's contribution to Changing Business System Characteristics' and Path-Dependent Lock-in Supplier Development: A case of Interstoff Apparel Company Bangladesh

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Abstract

Extant studies inform us on how lead firms contribute to upgrade ready-made garment (RMG) suppliers; however they did not reveal how lead firms contribute to changing governance, nature of relationship and network, and the internal management dynamics of the supplier firms (i.e. which are known as business system characteristics) as compared to the local firms which are not internationalized or linked with foreign firms in the global value chain. Based on an in-depth case study on 'Interstoff Apparel Limited', which began its journey primarily by supplying to Marks and Spencer, UK, and later diversified its sales network with over 20 foreign MNEs, our study reveals that MNE-lead firms through their governance with supplier-firms contribute to develop collaborative relationship between firms in garment industry, while this collaboration phenomenon is not typically the same for local firms in Bangladesh (i.e. that are doing business locally and are not linked with foreign firms).

Lead firms also contribute to develop superior management practices in supplier firms, which is not the case for local companies and their suppliers in Bangladesh. It is a qualitative improvement in business system characteristic in apparel industry, especially for the companies that are working closely with multinational lead firms. However, we argue that such sticky relationship with lead firms' influences suppliers to pursue a path-dependent growth trajectory particularly for capacity development and exporting. While such sticky relationship that is centered on export model holds supplier back from developing own brand for international markets. This is because strong tie keeps suppliers busy with meeting buyer's changing expectations and making handsome profit. This condition keeps suppliers to stay focus on supply function, locking-in the supplier to export business model. As a result suppliers tend to extend their business operation in upstream value chain without focusing on downstream diversification i.e. brand development and global retailing. Thus, they do not necessarily focus on managerial capability development for brand development and marketing. However, this may not be the case for suppliers with high entrepreneurial capability and ambition for global brand development.

Keywords: RMG, Supplier, Buyer, Brand, Governance, Capability development

Maximization of Sewing Line Production Using Taguchi Signal-to-Noise Method

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Abstract

The ready-made garments (RMG) sector of Bangladesh is the biggest export-oriented industry in terms of growth and foreign exchange earnings. Despite having much success story this sector got number of formidable challenges - less production per hour is one of them. Here, profit margin of an industry is heavily involved with that issue. In that respect, this research work presents an optimization model to improve number of production per hour in a sewing line. The Taguchi signal-to-noise method was adopted to maximize the number of production per hour. To perform this work, six variables with two-level designs were developed by using general full factorial design. The used software is MINITAB 17. Optimized results indicate that the optimal process parameter of sewing line production increased from 197 to 210 Pcs per hour of the studied sewing line. The main factors that affected the hourly production in a sewing line were also identified. Expectedly, application of this strategy in general to garment industries will help to improve the productivity – saving time and increasing profit.

Keywords: Sewing line, Production, Optimization, Taguchi Signal-to-Noise method, RMG

Sustainable Supply chain for Sustainable Garments Industry

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Abstract

As the textile industry is one of the most fragmented, resource-intensive and least transparent industries in the world. This is a crucial step on our way to improve sustainability of the textile industry. Sustainable garments industry will be ensured by sustainability of all tier as one single ring is more than enough to make the whole chain system dysfunctional. For continuous improvement in garments industry based on the values and principles of the global sustainability impact, sustainable plans, are the ones that improve not only supply chain economic performance, but also their environmental and social performances. In this study, the concept of supply chain sustainability and its importance in today's business world is introduced. The idea of the triple bottom line as the foundation of sustainability is used. This study analyses sustainability practices of one RMG manufacturer's supply chain sustainability from a business perspective as a case study and discusses findings from recent surveys on the benefits and challenges of supply chain sustainability. Our research findings reveal that sustainability practices can be successfully implemented across a garment industries' entire supply chain, including second and third tier suppliers to gain positive environmental and social impacts while still promoting a strong economic bottom line. The article wraps up with a roadmap for developing excellence and expertise in supply chain sustainability, limitations.

Keywords- Sustainable supply chain, Triple bottom line, Sustainable plans, Roadmap

Reflections of Practical Wisdom in Decision Making: An Integrative Approach to Corporate Sustainability Management

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Abstract

Previous research has identified significant practical wisdom pertaining and managing opposing but interlocked reflections related to environmental, social, and economic aspects as one of the most crucial future challenges in corporate sustainability (CS). However, a little reflection has been devoted to providing substantive guidance on how to apply practical wisdom into day-to-day managerial decision-making processes. Therefore, it has been applied the established link between wisdom and sustainability to the insistent topic of managing reflections in CS. The literature overview commences of reflections in sustainability management, which manifests our basic work assumption concerning the need for practical wisdom in CS. To do so, the researcher introduces the concept of practical wisdom, highlight its recent adaptations in management, and draw a link to self-guided decision-making. In this study, it has been discussed the mutual interconnectedness between practical wisdom and reflections management in CS, where has been illustrated in a conceptual model to develop a set of propositions on how a practical wisdom approach influences CS in practice and how it differs from a business-case approach. Finally, it has been discussed suggestions of application, theoretical implications, limitations, and propose paths for further research.

Keywords: Decision Making, Corporate Sustainability, Practical Wisdom, Interconnectedness

Risk Analysis of Readymade Garment Sector in Bangladesh

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Abstract

Managing industries effectively in the ready-made garment sector has emerged as a crucial issue in existing uncertainties and in order to attain the objectives in RMG sector, disruption risks has to be properly assessed so that the practitioners and academics can mitigate them accordingly. This study focuses on identifying and analyzing some common risks that occur in garment sector in respect of garment industries of Bangladesh. The proposed model evaluates twelve risk factors based on their order preference mathematically with the help of TOPSIS and fuzzy-TOPSIS method. The result of this study indicates major risks of the network and by the outcome of this research managers or practitioners in this sector can take actions to reduce the disruption risks. By changing the risk factors or the weightage of the criteria, this study can be used with any changing environment or even in other sectors.

Keywords: Ready-made garment, Risk ranking, Risk analysis in RMG, TOPSIS, Fuzzy TOPSIS

Raw Material Inventory Control Model for RMG with Shortage Prediction using Nature Inspired Algorithm

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Abstract

Inventory control management is one of the most important tasks in RMG industry for optimizing lead time, production time, total inventory cost, storage space and buyer-supplier relationship. This research is about optimizing the total inventory cost and inventory layout management by controlling the inventory model and determining the economic order quantity (EOQ). Assuming deterministic demand, the raw material inventory control model is designed. In order to solve the nonlinear inventory control model, a metaheuristic nature inspired algorithm named multi-objective particle swarm optimization (MOPSO) algorithm is proposed. Raw material shortage is predicted using support vector regression (SVR) to meet the production demand before deadline.

Keywords: RMG Industry, Particle Swarm Optimization, Inventory Control. Metaheuristic, Nature Inspired Algorithm, Multi-objective Optimization

Health and Safety Management Induced Individual Work Performance in the RMG Industry of Bangladesh

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Abstract

This study aims to investigate the relationship between individual work performance and health & safety management systems for the readymade garments employees in Bangladesh. Quantitative research approach has taken for this study. Using a three-stage cluster sampling technique, data collected from 384 respondents from different readymade garments companies in Dhaka. Mean, standard deviation, correlation, and stepwise multiple regressions were calculated to understand the relationship between individual work performance and health & safety management systems. The study findings indicate that OHS policy, worker participation, OHS training, communication, emergency response, preventive and protective action are the significant predictors of individual work performance. The findings also demonstrate that worker participation is the most powerful (79.3%) to the variance of work performance and most substantial (78.9%) to the difference of contextual performance. Moreover, this study shows that communication act as the main influential (63.8%) input to change the counterproductive work behavior. This research finding contributes to human resource management, organizational behavior, operations management, and health & safety management literature. The results also could bring more insights into the management of readymade garment companies to increase individual employee work performance. This study considers specific respondents only garment companies in Dhaka city. However, garment companies are scattered around the country. Therefore, future studies could find a large number of respondents from different readymade garment clusters around the country. This is a unique research attempt to address a new dimension of work performance from the health and safety management perspective in the readymade garment industry context.

Keywords: Health and safety management system, Work performance, Readymade garment

Cost Analysis of Denim Wash: A Study on Denim Washing Industry of Bangladesh

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Abstract

Denim industry is one of the largest in the global market due to its exotic fashion trend. Bangladesh is now the largest exporter of denim products over the European market and just after China in worldwide production. Fashion sense in denim fabric is drastically increased due to the introduction of multiple washing methods where it is a type of fabric finishing treated in a different way for the change of appearance. This paper is on the denim washing and washing cost trend within the year 2010 and 2018 and find out various consequences to analyze the market status of denim washing. The study is upon the primary data collected from two global brands "INDITEX" and "H&M" and the data received from their order executing factory Nassa Basic Ltd., Bangladesh. The study shows that around 2010 the trend of dry washing processes was not so familiar but after around 2015 there an extensive practice gets executed dominating the conventional wet washing technologies, on the contrary process as sand-blasting got banned from around 2013 for its harmful effects on workers and users. Besides various expensive wet washing technology like acid wash, stone enzyme wash, towel wash, brightener treatment, optical wash etc. has been incorporated to provide with quality wash effects. The paper also shows the costing trend of different wash technologies. Such as majority of the dry and wet wash technologies got more expensive with the time gradually due to the increase in labor cost, utility costs, chemical and process costs but it also found that some new technologies like laser technology provided effective costing with reasonable quality through the initial investments are high. The paper gives a prediction for the upcoming trend of denim washing as well as the costing of the technologies.

Keywords: Denim wash, Washing technology, Cost analysis, Wash cost trend

An Integrated Support Vector Classification Approach for Performance Evaluation and Selection of Multi-Attribute Suppliers

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Abstract

Supplier selection is an important and widely studied concern since it has significant impact on purchasing management in supply chain. Multi-attribute supplier classification and selecting the optimum supplier is a popular multi-criteria decision-making problem dealt in most of the manufacturing companies. Moreover, multi-attribute decision making models depend on human judgment for evaluating different weights for different qualitative features creates severe impact in the enterprise's production and quality directly. Support vector machine has received much more attention from researchers. Hence, an AI classification technique, Support Vector Machines (SVM) is being chosen in this research to correlate and classify multi-attribute suppliers considering both the qualitative and quantitative attributes as well as to find the best among them. The developed model can be used in RMG sectors for supplier section in a complex multi-criteria situation.

Keywords- Supplier Selection, Support Vector Machines (SVM), Performance Evaluation, Artificial Intelligence (AI)

Sustainability of Bangladesh Garment Industry by improving OSH and Decent Work

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Abstract

RMG sector of Bangladesh turned around after the devastating Tazreen Fire and Rana Plaza Disaster. Following these tragedies, international stakeholders, brands and national Stakeholders like government, employers' associations, trade unions and civil society joined hands together aimed at rebuilding a sustainable and equitable RMG industry for the development of economy and labour market in Bangladesh.

Accord on Fire and Building Safety in Bangladesh, The Alliance for Bangladesh Worker Safety, ILO Initiatives and National Tripartite Plan of Action on Fire Safety and Structural Integrity in the garment Sector of Bangladesh (NTPA) are mentionable initiatives in this regard. In a view to ensure safe and sustainable RMG industry, a five year plan to establish building and fire safety program was taken. Hundreds of brands, retailers along with national and international trade union solidarity signed together for bringing positive changes in structural Integrity and fire safety, ensuring compliance, upgrading Inspection department and providing training for compliance.

As a result, a good number of RMG factories brought under safety, compliance and inspection. As per the latest data of the Accord, 89% initial remediation have been completed, while 197 factories completed the initial remediation and over 90% remediation at 996 factories are done. However, accidents are still happening infrequently in different RMG and its backward and forward linkage industries. Still RMG workers are scared about their lives and safety due to lack of their safety and trade union rights. Therefore, to eliminate negative impression about Bangladesh RMG sector and fulfill the business target along with ensuring decent work for workers, we have to go furthermore. This presentation will discuss issues on improving OSH situation for enhancing productivity and Decent Work which may ensure Sustainability of Bangladesh Garment Industry.

Key words: Decent Work, OSH and Productivity, Loss of working hour and earning, Trade Union, Safety Committee, Participation Committee, Labour Law & Rules, Health Audit & Productivity, Gender Violence, Green Industry.

A comparison between Agency System and Regular Employment of RMG workers in Bangladesh

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Abstract

The objective of readymade garments (RMG) is to improve the productivity and competitiveness of RMG industry in Bangladesh. In order to reach this objective the many research strives towards gaining new knowledge about the sustainable OHS and productivity advancements. Research in RMG domain has identified the positive synergies between productivity and OHS conditions. There are Lean and OHS model for sustainable productivity improvement has been developed for the intervention process with quantifiable success with positive outcomes. Many RMG industries in Bangladesh are operating on the basis of regular employment of workers with a certain turnover rate. However, there are successful industries those running on sustainable Agency system of skilled workforce supply on regular basis where the workers are getting paid on production of garment pieces they achieve rather hourly rate. The active cleaning, green waste management, employee participation, digital system of payment and workers well-being are the vital drivers for worker motivation and higher productivity. This research has investigated the occupational health and safety, and productivity issues in such successful case and compares the baseline outcomes on follow-up.

Keywords: RMG, Productivity, OHS, Agency, Employment