

A framework for managing the agri-fresh food supply chain quality in Indian industry

Agri-fresh food
supply chain
quality

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Abstract

Purpose – Research in agri-fresh food supply chain quality (AFSCQ) has been given less consideration in developing countries as compared to developed countries and its role in achieving organizational sustainability has not been researched yet. Thus, this study aims to determine and combine numerous significant factors to establish a framework for managing AFSCQ practices favourable to organizational sustainability in the Indian context.

Design/methodology/approach – To accomplish this, all-inclusive framework of AFSCQ has been established through succeeding phases of data collection, analysis using structural equation modelling along with refinement of data. The collection of data for this study was from the Indian food industry, which relates to agri-fresh food products.

Findings – The AFSCQ practices are conducive to enrich organizational sustainability, and then enhance economic, social and environmental performance indirectly. The study established relationships among the AFSCQ practices promising to enhance organizational sustainability.

Originality/value – AFSCQ practices have a huge impact on organizational sustainability by means of practices that sum up activities along the whole supply chain. The organizational sustainability consists of economic, social and environmental sustainability.

Keywords AFSCQ, Supply chain quality, Organizational sustainability, Sustainability, Factor analysis,


Supply chain management

Paper type Research paper

1. Introduction

The supply chain quality of agri-fresh food products can be considered as the agri-fresh supply chain quality (AFSCQ) that focuses on the process and product quality from farm to the delivery of the food products, to meet the organizational sustainability. Conclusively linked AFSCQ practices can improve organizational sustainability with competitive advantages (Siddh *et al.*, 2017). The sustainable outcome of AFSCQ is based on getting a balance among economic development, environmental security and social advancement. Baliga *et al.* (2019)




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Optimization of Process Parameter by using CNC Wire Electrical Discharge Machine through Taguchi Method

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Abstract: Wire Electrical Discharge Machining (WEDM) is utilized in industries to manufacture components of conductive strong metal with complicated shape, greater tolerance and precision. A review of the literature exposes that most of the research work has been intended for towards the optimization of WEDM operation and modeling of the process. Conventional wire electrode has been developed to a brass wire from a copper wire and finally to zinc coated wire on the brass, steel or copper wire core, by which more advanced WEDM, is realized in terms of better machining speed and accuracy. To examine the parameters like Peak Current (I_p), Time of Pulse ON (T_{on}), Time of Pulse OFF (T_{off}), etc. by the optimization of WEDM operation and modeling of the process during micro slit machining. Analyzed the results and optimize the process parameter conditions for maximum MRR (g/min), and surface roughness based on Taguchi's Methodology. The ANOVA analysis indicates the significant factors for maximization of MRR, improvement of Surface Roughness and regression analysis. By the research work, it has been concluded that the MRR reduces with cube in Time of Pulse OFF (T_{off}) and Set Voltage of spark gap (SV) besides Material Removal Rate (MRR) increases with encroaching in Time of Pulse ON (T_{on}) and PC (I_p).

Key Words: WEDM, MRR, ANOVA, DOE, EDM

I. INTRODUCTION

In Wire Electric Discharge Machining (WEDM) process the quality of product is always concerned by its procedural parameters such as wire feed, peak current time, time of pulse ON, time of pulse OFF etc. At past decennaries, several research seekers were deeply go through the tested parameters. In current scenario, numerous seekers were specifically using Design of Experiment (DOE) for such kind of studies and identifies the finest factors which influences the obtained result.

One simple work piece arrangement was used in this study and DOE was enforced to discover the best optimal input parameter value that alters the outcome result for specimen of WEDM. There was difficulty to pick out suitable approach for designing experiments because of enormous complexity in DOE. It was exposed through literature review that DOE founded by Taguchi method was previously utilized by many seekers and present study is also applying Taguchi method. Investigational complications plays a very important function for formulating DOE experiments. Table 1.1 shows the summary chart of four factors & four levels and Table 2 shows the L9 orthogonal arrays.

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1. Using MINITAB

Table 1.1: Summary chart of Factors and Levels

Levels	Factors			
	Peak Current (I_p) (Ampere)	Time of Pulse ON (T_{on}) (μs)	Time of Pulse OFF (T_{off}) (μs)	Feed Rate (m/min)
1	6	0.7	4	5
2	7	0.9	5	7
3	8	1.1	6	9

2. Orthogonal Array

Table 1.2: L9 Orthogonal Arrays

S. No.	Peak Current (I_p) (Ampere)	Time of Pulse ON (T_{on}) (μs)	Time of Pulse OFF (T_{off}) (μs)	Feed Rate (m/min)
1	6	0.7	4	5
2	6	0.9	5	7
3	6	1.1	6	9
4	7	0.7	5	9
5	7	0.9	6	5
6	7	1.1	4	7
7	8	0.7	6	7
8	8	0.9	4	9
9	8	1.1	5	5


II. DATA ANALYSIS AND DISCUSSION

WEDM process was experimentally solved in this study for wire cutting of using Regression Analysis (ANOVA) & Design of Experiment (DOE) were utilized further to get equations. DOE tables were discussed. Main responses from this study were following, which discussed. As discussed, feed back are essential prophecy for quality of product. For finding the almost essential critical factors and their feedback on present study, firstly, ANOVA was used in present investigation and discussed further in pursuing article.

This investigation uses Minitab software for Regression Analysis & ANOVA. Table 2.1 represents the four factors & four level.

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Prediction and optimization of abrasive wear loss of ultrahigh strength martensitic steel using response surface methodology, Harris Hawk and artificial neural network

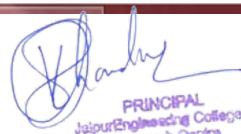
[Varun Sharma](#), [Sanjay Sharma](#), [Om Prakash Verma](#), [Bhuvnesh Bhardwaj](#), [Tarun Kumar Sharma](#) & [Nikhil Pachauri](#) 

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Abstract

Three-body abrasion wear problem in real industry application has been significantly reduced by replacing the heat-treatable steels with the newly developed ultrahigh strength martensitic steel. The wear performance under these conditions of one such steel, namely JFE EH400 was investigated in the present work. The input process parameters selected at different levels were employed to formulate the design matrix. Accordingly, 30 number of real time abrasion wear experiments were performed using dry sand rubber wheel test. The experimental results obtained were used to develop the quadratic model using Response Surface Methodology. Further, the prediction effectiveness was verified using Analysis of Variance. The results showed that the effect of load on wear loss was found to be most significant followed by the number of revolutions, flow rate and rotational speed. Moreover, for the validation of the performance obtained from statistical analysis, experimental data was employed to build the prediction models using Neural Networks (NNs). The proposed improved Generalised Regression-NN (GR-NN) was found to be an efficient and explorative predictive model in comparison to the Levenberg–Marquardt Perceptron-NN and Adaptive Linear-NN. The GR-NN was found to be most accurate owing to the minimum error as compared to other prediction models. The prediction ability of the GR-NN model with Harris Hawk Optimization



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Investigation on the Effect of Al_2O_3 and B_4C Ceramic Particles on Mechanical Properties of AA7075 Metal Matrix Composites

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Abstract

The present research work aims to investigate the mechanical properties of AA7075 hybrid composite reinforced with aluminum oxide (Al_2O_3) and boron carbide (B_4C). In this research, fabrication of composites is completed in two stages: In the first stage, the Al_2O_3 composites were fabricated and mechanical properties were tested. The reinforcement weight percentage (wt%) of Al_2O_3 having the maximum value of tensile strength, hardness, and flexural strength and impact energy is selected and reinforced with a different weight percentage of B_4C to investigate the effect. The internal structure of the composite is observed using a scanning electron microscope to analyze the fracture mechanism. The tensile strength, flexural strength, and hardness of the composites increased with an increase in the weight percentage of reinforcement. The tensile strength of the composites increased to 279 MPa, flexural strength increased to 340 N/mm², and elongation percentage of the composites decreased up to 4.6% by reinforcement of 12 wt% Al_2O_3 and 2 wt% B_4C . The impact energy of the composites decreased up to 4.4 J while the hardness of the composites increased to 143 BHN with 12 wt% Al_2O_3 and 3 wt% B_4C . Scanning electron microscopy (SEM) showed uniform distribution of reinforcement particles and grain refinement of the matrix.

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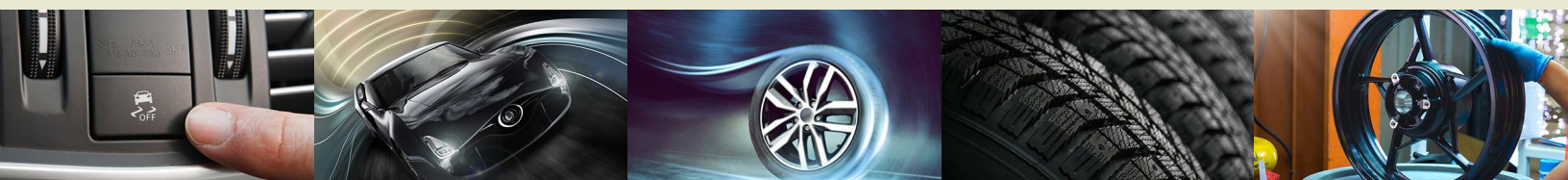
Composite materials,
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RESEARCH TRENDS, CHALLENGES, AND THE FUTURE OF AI IN DATA SCIENCE

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ABSTRACT

Pandemic is really putting every field to check for human alternate as social distancing becomes mandatory. This adds fuel to the rise in demand for digital workforce even after pandemic when everything becomes normal. This is being achieved easily with the help of AI. The world has started witnessing Data as real wealth anyone can have. Now we can relate how data is viewed by Data science and AI. Data Science will use AI for data analysis. In this paper let us discuss some of the Research Trends, Challenges and the Future of AI in Data Science.


Keywords: AI, Data Science, Research Trends, Challenges, Application.

Introduction

Artificial Intelligence becomes more competing and efficient but it can't replace human intelligence. Humans can observe the things around them and able to easily compare them with the previous event and able to act in the way needed by rectifying the faults. However, AIs don't exactly match that capability just yet. AI is just enormous data bank to achieve their goals. This means that AIs require a huge pool of data to do something as simple as editing

and for making machines behave like human being becomes AI.

Data Science is a very vast field; it is being used in many industries. But in its core, Data science is the study of existing data and then providing insights about it and making further predictions. Data Science is the combination of several fields of knowledge like data, domain knowledge, computing and so on. But not all data scientist will have knowledge of these areas. Also they may have expertise in other areas too. Data Science uses many algorithms



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AlGaN/AlN/GaN SG-HEMT as pH detector: A simulation study

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Unlike other FETs where a sub-threshold regime is preferred for pH detection where power is a constraint, here both subthreshold and saturation region of operation can be used for sensing. In the saturation region, a large change in drain current shift is obtained compared to the sub-threshold region which leads to enhanced sensitivity. Similarly, sub-threshold parameters like transconductance (g_m), current ratio g_m/I_{DS} , threshold voltage (V_{th}) also can be applied as effective sensing metrics for biochemical sensing. The HEMT sensor design with AlN interlayer's in the epitaxial design and thin Al₂O₃ gate oxide layer enhances the overall performance of the device and g_m sensitivity. Using TCAD simulation an investigation is done on the applicability of different sensing metrics through the development of a charge-controlled model for the sensitivity analysis of solution gated HEMT (SGHEMT) for pH-sensing. The simulation results indicate the high potential of the device for pH detection.

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Quality Parameter Index Estimation for Compressive Sensing Based Sparse Audio Signal Reconstruction

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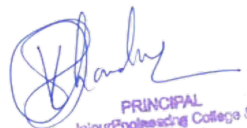
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Abstract. As we, all know that the size of data is increasing tremendously day by day. In a recent project, several petabytes were used to save an image of the Black Hole. Therefore, it is very crucial to develop a method that can reduce the size of data for transmission & storage purposes. The Traditional method for data compression & reconstruction requires so much data space, due to this problem another technique is proposed for the compression and recovery purpose. This method is termed Compressive Sensing (CS). As per the Nyquist sampling theorem, for proper reconstruction of the signal, we have to do sampling at the double rate of maximum data rate available in the signal. As a result, the storage requirement increased as well as the cost of the system was also enhanced. While on the other hand in Compressive Sensing, little samples are required for the reconstruction of the signal. So here in this paper, we have considered three music signals which are single tone, instrumental and vocal song. Values of Mean Square Error, Root Mean Square Error and Signal to Noise Ratio for different compression ratios mentioned in the tables and plots. By analyzing these values we can easily investigate the effectiveness of compressive sensing.



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Mid-infrared supercontinuum generation using low peak pump power in $As_{38}Se_{62}$ based chalcogenide photonic crystal fiber

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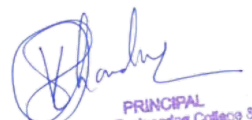
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Abstract. A supercontinuum (SC) based chalcogenide $As_{38}Se_{62}$ PCF for broadband mid-infrared light source is numerically reported. For the computational studies, the design of the proposed structure is made up of three rings of air holes with circular and elliptical shapes. The proposed structure provides excellent nonlinear coefficient and dispersion optimization. For the analysis, the finite difference frequency domain (FDFD) method is employed. Due to the high nonlinear refractive index and optimizing design of $As_{38}Se_{62}$ chalcogenide glass, an effective mode area of $40.5972 \mu m^2$ is obtained. The dispersion characteristic of the proposed structure has a zero-dispersion wavelength at $3.89 \mu m$. The nonlinear coefficient is $761 W^{-1} km^{-1}$ at the wavelength of $4 \mu m$. Dispersion is almost flat from $2 \mu m$ up to $10 \mu m$. The supercontinuum spectrum calculated ranges from $2 \mu m$ to $9 \mu m$. The presented structure is appropriate for medical imaging, optical coherence tomography and optical communications.



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