



Proceedings

16th ANZAM Operations, Supply Chain and Services Management Symposium

THEME: Entrepreneurship and Global Supply Chain Management Driving Sustainability and Social Innovation

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Symposium Overview

The 16th ANZAM Operations, Supply Chain and Services Management Symposium was hosted by CQUniversity's School of Business and Law, and held at CQU's Brisbane Campus near Brisbane city's King George Square. The Symposium theme for 2018 is *Entrepreneurship and Global Supply Chain Management Driving Sustainability and Social Innovation*. This theme ties in very well with CQU's strong focus on Social Innovation, being the only Australia's only recognised Changemaker Campus, having been accepted into the global social innovation group Ashoka U.

The ANZM Ops Mgt Symposium has long been known to provide a venue where academics, research students and practitioners have an opportunity to share their research, knowledge and practical experiences in operations, supply chain and service management. In this way, the Symposium contributes to the continuing development of these key areas of management theory and practice and enhances the partnership between research and practice.

Brisbane, 3-5 June, 2018

**Venue: CQUniversity, Brisbane Campus, School of Business and Law
Level 6, 160 Ann Street, Brisbane QLD 4000**

Organising committee

- **Prof Ross Chapman**, CQUniversity Australia.
- **Dr Stephanie Macht**, CQUniversity Australia.
- **Prof Amrik Sohal**, Monash University.
- **Assoc Prof Daniel Prajogo**, Monash University.
- **Dr Malcolm Johnson**, CQUniversity Australia.

With special thanks to:

- **Dr. Olav Muurlink**, CQUniversity Australia.
- **Dr. Upamali Amarakoon**, CQUniversity Australia.
- **Cheryl Strike**, CQUniversity Australia.

Symposium Program

Sunday, 03 June 2018			
18.00	Welcome Reception Venue: Jimmy's on the Mall: www.jimmysonthemall.com.au		
Monday, 04 June 2018			
8.30	Coffee & Tea		Room 6.10
09.00 -09.15	Welcome and Opening Address <i>Chair: Prof. Ross Chapman</i> Prof. Lee Di Milia, Dean, School of Business & Law, CQUniversity Australia and President of the Australian and New Zealand Academy of Management (ANZAM) 2018		Room 6.10
09.15 – 10.30	Plenary 1 – 'Social and Supply Chain Innovation in Practice' <i>Chair: Prof. Ross Chapman</i> <ul style="list-style-type: none"> • Aaron Relph, Supply Chain Manager at <i>Yurika</i>. • Chad Renando, Mapping and measuring the Australian innovation ecosystem at the <i>Office of the Queensland Chief Entrepreneur</i>. • Dr. Olav Muurlink, Chair of education charity <i>Co-operation in Development</i>. • Jamie Ford, Head of Customer Experience and Analytics at <i>UnitingCare Queensland</i> and Board Member at <i>Second Shot Pty Ltd</i>. 		Room 6.10
10.30 – 10.50	Morning Tea		Room 6.10
10.50 – 12.20	Parallel Session 1 Room 6.10 <i>Chair: Prof. Ross Chapman</i>		Parallel Session 2 Room 6.11 <i>Chair: Dr. Geoff Chapman</i>
	1.1 Are there limits to Lean in Healthcare? The example of 'Daily Operating Systems' in hospitals. <u>McLoughlin, Ian</u> ; Burns, Prue; Ivcovici, Addie; Looi, Evelyn; Sohal, Amrik; Teede, Helena	2.1 The Effect of Socio-demographic Variables on Memorable Tourism Experience: Multi-group Analysis Using Partial Least Square. <u>Shabnam, Saadia</u> ; Ali, Md Borak; Shanka, Tekle; <u>Khan, Sardana Islam</u>	
	1.2 A study on integrated production planning model for remanufactured products in a reverse supply chain. <u>Kuik, Swee</u>	2.2 Resistance to integrate technology in service systems: A study on health care service in developing country context. Umme, Nusrat Jusy; <u>Chowdhury, Md. Maruf Hossan</u>	
	1.3 A qualitative study of third-party purchase (3PP) in China automotive industry. <u>Shi, Yangyan</u> ; Childerhouse, Paul; Liu, Luying; Glass, Walter	2.3 Tourists' Perception Towards The Water-Based Tourism: A Case Study On Cox's Bazar <u>Kamruzzaman, Md.</u> ; Uchinlayen	
12.20 – 13.20	Lunch		Room 6.10

13.20 – 14.50	Parallel Session 3 Room 6.10 <i>Chair: Prof. Ross Chapman</i>	Parallel Session 4 Room 6.11 <i>Chair: Dr. Stephanie Macht</i>
	3.1 On the brink of a tech revolution: Blockchain and ERP for sustainability in diamond exchanges. <u>Herbst, Judith</u>	4.1 Understanding Scientific Communities: A Co-Word Analysis In Supply Chain Agility Research. <u>Al Humdan, Eias</u>
	3.2 Demand Forecasting in Supply Chain: Machine learning vs. judgmental forecasting. <u>Abolghasemi, Mahdi; Beh, Eric; Gerlach, Richard; Tarr, Garth</u>	4.2 Service-dominant logic and network-centric operations. <u>Beckett, Ronald C.</u>
	3.3 Application of Information and Communication Technology (ICT) in ready made garment industry: Study on Bangladesh market. <u>Nipa, Nymatul Jannat</u>	4.3 Benders decomposition for whey reverse logistics network design under uncertainty. <u>Esmailbeigi, Rasul; Middleton, Richard; Garcia-Flores, Rodolfo; Heydar, Mojtaba</u>
14.50 – 15.10	Afternoon Tea Room 6.10	
15.10 – 16.40	Parallel Session 5 Room 6.10 <i>Chair: Dr. Swee Kuik</i>	Parallel Session 6 Room 6.11 <i>Chair: Prof. Amrik Sohal</i>
	5.1 Managing Container Flow Performance in Import Supply Chain at Indonesian Ports. <u>Laksmiana, Teddy; Shee, Himanshu; Thai, Vinh</u>	6.1 A comparison between various types of VMI in a supply chain. <u>Evazabadian, Farshid; Middleton, Richard; Heydar, Mojtaba; Talebian, Masoud</u>
	5.2 The Effect of Innovation Orientation on Competitive Capability and Business Performance. <u>Zhou, Quan; Olsen, Tava</u>	6.2 Weathering the storm: Supply chain resilience during large-scale weather disruptions. <u>Drozdebob, Adela</u>
5.3 Effect of “Internet of Things” on supply chain digital integration and firms’ sustainable performance. <u>de Vass, Tharaka; Shee, Himanshu; Miah, Shah</u>	6.3 Omni-channel Shopper Behavior: Toward a Conceptual Model. <u>Shabnam, Saadia; Sadeque, Saalem; Shamsudeen, Shammima Begum; Khan, Sardana Islam</u>	
19.00	Conference Dinner Venue: Jamie’s Italian Restaurant: https://www.jamieoliver.com/italian/australia/restaurants/brisbane/	

Abstracts

Parallel session 1

1.1 Are there limits to lean in healthcare? The example of 'Daily Operating Systems' in hospitals

Ian McLoughlin, Prue Burns, Addie Ivcovici, Evelyn Looi, Amrik Sohal, Helena Teede (all at Monash University). e-mail: amrik.sohal@monash.edu

PURPOSE

Although lean thinking has gained much popularity as one of the preferred improvement methodologies in healthcare (D'Andreamatteo, et al, 2015), its effectiveness remains inconclusive (Radnor *et al.*, 2012). This may reflect broader constraints in the application of lean in knowledge-based settings (Staats et al, 2011). The Daily Operating System (DOS) have been promoted as a key component of 'advanced lean' in healthcare (Albanese, et al, 2014), providing the 'steering wheel' through which continuous improvement can be managed (Mann, 2014). Our objective in this paper is to explore the role and potential effectiveness of the introduction of daily operating or management systems (DOS) in hospitals.

Whilst varied in their precise implementation, DOS essentially involves tiered team meetings (or 'huddles') which start at the front line operating level (e.g. hospital ward) and involve the visualisation and communication of key operational data (e.g. concerning patient flow, bed availability, staff shortages, equipment and building maintenance issues), which are then aggregated and passed upwards to one or more further tiers over the following hours. A key intention of the system is to ensure that teams at each level identify problems and allocate responsibility for their resolution, escalating problems that cannot be resolved at that level to the next tier. Progress in resolving problems is reviewed at each daily meeting, normally against pre-set deadlines for their resolution or escalation outside of DOS. The overall aim is to provide a basis for effective information flow and communication to ensure that the hospital is operationally ready to deliver safe, high quality care each day, and, if not, for the causes to be systematically identified and accountability for resolving them to be appropriately allocated (Albanese, et al, 2014, Mann, 2014).

DESIGN/METHODOLOGY/APPROACH

Existing research has typically focused on single-site implementations of 'huddles' within specific service areas, such as on a single ward, with little reference to the broader health system context (e.g. Khoshbin et al, 2009; Goldenhar, 2013; Wilbur, & Scarborough, 2013). In contrast, our data is drawn from a large-scale collaborative research project on the implementation of lean ideas and practices in hospitals (in this context grouped on the basis of geography or specialisation into 'health services') across the public healthcare system of an Australian state jurisdiction. This sector-level initiative has been in place for over a decade and provides a framework to explore the deployment of lean ideas and practices in contrasting organisational settings environments, which vary in terms of their 'lean maturity'.

The research question we explore in this paper is whether DOS is likely to be more effective in contexts where lean is already a mature and widespread practice in a health service. This maybe the case when there is a relatively high level of standardisation, embedded problem solving capability, and evidence of a continuous improvement culture and other enabling requirements. It may also be the case that DOS is least effective when deployed at earlier stages of lean implementation. We explore these issues

through an examination of the deployment of DOS in three health services at different levels of lean maturity and scale.

In each organisation, we conducted observation of huddles at different tiers and interviewed key staff involved in their implementation, and clinical leaders and managers involved in their execution. In one case, we were also able to draw upon survey data collected as part of an internal evaluation, and focus groups conducted by the research team to supplement this internal information.

FINDINGS

Our findings suggest that DOS can be deployed to good effect in less mature lean environments, but that its broader spread and sustainability is contingent upon the parallel development of other key lean requirements such as the standardisation of work and embedding of problem solving routines. Moreover, even where these elements are already present, the broader challenges to lean in knowledge-based environments are still salient, and DOS provides no more than a mitigation and not a solution, to these.

RESEARCH CONTRIBUTIONS

This paper contributes to healthcare improvement literature, in particular, highlighting the value of DOS as part of a process improvement methodology in a healthcare context to enhance information flow and communication.

PRACTICAL CONTRIBUTIONS

The three case studies provide valuable insights on how DOS can be deployed successfully within a healthcare context.

LIMITATIONS

This paper is limited with respect to data collected from only three health services. There is clearly opportunity to extend this study and gather data from a larger number of health services from different jurisdictions across Australia.

ORIGINALITY/VALUE

Improving the healthcare system is a top priority for federal and state governments, currently costs the nation around 10% of its GDP. Developing and implementing new approaches to making improvements is crucial. Our study provides evidence on how approaches such as DOS can be deployed successfully.

KEYWORDS (only provide 3)

Healthcare improvement, Daily Operating System (DOS), Lean.

REFERENCES

References available from the authors.

1.2 A study on integrated production planning model for remanufactured products in a reverse supply chain

Swee Kuik, Central Queensland University

PURPOSE

Product recovery strategy depends on the ability of a reverse supply chain to channel most components of returned products into the primary and/or secondary manufacturing processes. However, the cost implications are not insignificant: manufacturers bear the costs of incorporating virgin materials at the supply end and meeting landfill and disposal costs at the end of the product lifecycle. Some mathematical models for production planning in remanufacturing operations exist in the literature but these mathematical models are not applied to component obsolescence problems due to the complexity of product returns and remanufacturing processes. Therefore, we develop integrated mathematical models to examine remanufacturing production planning problems with and without component obsolescence scenarios in a reverse supply chain.

DESIGN/METHODOLOGY/APPROACH

The first mix-integer programming (MIP) optimisation model is formulated without taking component obsolescence into consideration. The second MIP optimisation model includes component obsolescence problem. The total associated costs including production costs, costs of components, setup, ordering costs, component inventory holding costs, disposal treatment costs for both MIP optimisation models are compared in this study.

FINDINGS

In the numerical example, a production planning time-horizon for simulation is chosen about 12 periods. For these optimisation models, the computational time using an Intel i7 processor with 16 GB RAM is about 27 minutes to obtain the optimal solutions. Three types (i.e. PT1, PT2 and PT3) of remanufactured products are examined in our developed models. Each type of remanufactured product has four separate components to be assembled, which is named as CP1, CP2, CP3 and CP4. Each assumed to be critical components for remanufactured products. Comparisons of the results obtained for both optimisation models with and without component obsolescence have also proved that the total associated cost for the optimisation model without obsolescence is generally higher than the total associated cost for the optimisation model with obsolescence.

RESEARCH CONTRIBUTIONS

The contribution of this study is twofold. Firstly, the optimisation model aims to examine used component obsolescence for production planning problem in remanufacturing from returns streams. Secondly, the optimisation model with component obsolescence is developed to resolve some oversimplifications in optimisation modelling and analysis.

PRACTICAL CONTRIBUTIONS

The proposed approach may motivate manufacturers to consider component obsolescence issue for their production planning problem. The suggested optimisation model can also be used in the development of decision support system for operations planning.

LIMITATIONS

The optimisation model does not consider the variability in component wear-out life and technology cycle. In future studies, we may develop the optimisation model by considering the uncertainty of component wear-out life and technology cycle in production planning problems.

ORIGINALITY/VALUE

This study proposed an integrated optimisation models to examine remanufacturing production planning problems with and without component obsolescence' scenarios in a reverse supply chain and achieve operating cost effectiveness for manufacturers.

KEYWORDS (only provide 3)

Product recovery, reverse supply chain, component obsolescence

1.3 A qualitative study of third-party purchase (3PP) in China automotive industry

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PURPOSE

The purpose of this paper is to analyse the purchaser-supplier relationship in the view of third party purchase. Third-party purchase offered by third-party logistics providers is a new concept in the contemporary business context. 3PL providers with consolidated purchase orders have significant power to influence on negotiation with suppliers.

DESIGN/METHODOLOGY/APPROACH

In this paper, a typical 3PP service provider in China's automotive industry is analysed based on the interviews from two aspects – the service provider and supplier.

FINDINGS

The major finding from this study reveals that 3PP service provider not only helps to improve operational efficiency, and also its clients receive a cheap purchase price.

RESEARCH CONTRIBUTIONS

The key contribution of this research is a pilot study to comprehensively analyse the implementation of 3PP in the automotive industry in China.

PRACTICAL CONTRIBUTIONS

Identified factors to influence on the purchaser-supplier relationship between two parties has practical significance to make a rational decision for managers. As an innovative business model, 3PP service providers with consolidated purchase volume from different automotive manufacturers have significantly power to influence negotiations with suppliers, and manage the behaviors of suppliers, including quality of products, transparent purchasing process and tracking delivery. The automotive manufacturers can receive low purchasing cost, enjoy 'one-stop' service, and focus on core competence. Meanwhile, suppliers are keen to maintain good relationships with 3PP service providers due to larger purchase volume.

LIMITATIONS

This research only focuses on China's automotive industry and emphasizes on one specific company for an in-depth analysis of implementation of 3PP service in the automotive industry.

ORIGINALITY/VALUE

The key contribution of this research is a pilot study to comprehensively analyse the implementation of third-party purchase in the automotive industry in China.

KEYWORDS Third-party purchase, Automotive industry, China

Parallel Session 2

2.1 The Effect of Socio-demographic Variables on Memorable Tourism Experience: Multi-group Analysis Using Partial Least Square

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Md Borak Ali, Curtin University of Technology

Tekle Shanka, Curtin University of Technology

Mohammed Quaddus, Curtin University of Technology

Sardana Islam Khan, Central Queensland University

PURPOSE

The consumption system in tourism and hospitality industry is dominated by business models based predominantly on producing and delivering the superior tourist experience. Drawing upon Kim and his colleagues' phenomenal work on memorable tourism experience (Kim, Ritchie, and McCormick's, 2012), the present study put forward the argument to conceive dimensions of memorable tourism experience as it's formative indicators. This study further explores the moderation effects of demographic variables, namely, gender, age, education level and country-of-residence on the relation between memorable tourism experience (MTE) and destination revisit intention through the application of partial least square based multi-group analysis (PLS-MGA). The results indicate that there is the statistically significant difference in specific dimensions of MTE based on gender and country-of-residency. The research findings also highlight important theoretical implications and practical significance in destination marketing and management.

DESIGN/METHODOLOGY/APPROACH

An empirical study was conducted to test the proposed model and hypotheses. To explore the effect of memorable experience based on individuals' socio-demographic heterogeneity, the sampling frame consisted of university students who have prior experience with at least one international holiday travel in the past 12 months in a tourism destination in Australia and who have taken a holiday in the preceding twelve months at an international level. Convenience sampling technique was applied to approach the respondent for data collection. The total targeted response was 260 samples. Face-to-face personal interview technique was administered to collect data from students at a large Australian university during June to September 2016. The completed response has been collected from 211 students with the response rate of 81%. The questionnaire sought information about individuals' demographics, perceptions of the memorable experience regarding pre-specified scales of Kim et al. (2012) to visit the destination.

FINDINGS

To specify and validate the formative research model, this research follows the four generic guidelines for formative indicators (Diamantopoulos & Winklhofer, 2001; Jarvis, MacKenzie, & Podsakoff, 2003). MTE here is represented by seven mutually exclusive uncorrelated dimensions, which is consistent with formative indicators. The VIF values provide the evidence of the absence of multicollinearity for formative construct (Peng & Lai, 2012). Finally, this study found the significant influence of MTE on the endogenous latent variable (Murphy & Hofacker, 2009) and did not extend their relations with antecedents. The overall finding from the PLS-SEM Multi-group Analysis is the identification of

¹ Corresponding author

significant influence of gender and country-of-residency on the relationship of MTE and the revisit intention. There are no significant differences found among groups based on education and age in this particular context. The path between MTE and revisit intention are significant for each gender-based and residency-based subgroups.

RESEARCH CONTRIBUTIONS

This paper put forward the argument for modelling MTE dimensions as formative indicators of the second order MTE construct. Scrutinizing on the dimensions reveal that they all contribute to form individual tourists' memorable experience. Kim, Ritchie, and McCormick (2012) also note that memorable tourism experiences are subjective to individuals' assessment but at the same time they are tourists' tour experiences' constituents. Specifying the MTE as a formative construct will define the scope of creating memorable tourist experience which provides a valuable insight for academia and practitioners in the tourism and hospitality research.

PRACTICAL CONTRIBUTIONS

Tourists' visit intention is vital to manage and promote tourism destinations, and greater memorability of the tour creates the opportunity for destination marketing organizations (DMOs) to attract tourists for their repeat visits or positive referral to others. This study aimed to identify the influence of socio-demographic variables on the relationships between memorable tourism experience and the visit intention to the destination. For businesses in TH industries, it is important to know the differences in tourists' subjective interpretation of the meanings of tourism objects and destination. Current research has identified the influence of individual differences in the evaluation of MTE dimensions (Kim et al., 2012; Kim & Ritchie, 2014) based on gender and country-of-residency. Drawing on the social theory, it can be argued that females tend to be more receptive to their life-events (Assaker et al., 2015). In the MTE context of this study, male and female respondents are significantly different in perception. This provides some opportunities for DMOs to make the tour experience more engaging for individual gender-based visitor groups to leverage from their differential level of perceived MTE and create some avenues for the future visit. The DMOs managers striving to create 'not ordinary' experience may consider approaching local and international tourists with differentiation. International tourists expect more unique, new and contrasting experience since their social background, cultural orientation, and life experiences are expected to differ substantially from resident visitors. Since they are different regarding perceiving the influence of memorable tourism experience for the next time visit to the destination, different types of souvenirs targeting for local and international tourists, for example, can be the perfect memorabilia of the tour which would more likely add to the memorable experience.

LIMITATIONS

This cross-sectional study was conducted in a single Australian university in a snapshot approach as a single instance that can be extended to see the long-term changes in behavioral intention for real tour behavior in future. This study used student sample which might be representative of youth tourists. To generalize the findings of the study and to cross-validate them in the real-world tourism context, it is important to capture typical tourists' views on MTE dimensions to recommend potential strategies for the tourist population.

ORIGINALITY/VALUE

Thus, the gender category and the country-of-origin serve as the backdrop to develop memorability of tour events. For DMOs, the importance of memorability is the necessary precondition for estimating

behavioral intention. For them, the gender and residency based differentiation can be the particularly important starting point to design effective and 'memorable' destination management strategies.

KEYWORDS

Memorable tourism experience, Revisit intention, Multi-group analysis.

2.2 Resistance to health information systems: A study on developing country context

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Md. Maruf Hossan Chowdhury, University of Technology Sydney

PURPOSE: This research aimed at examining the factors responsible for resistance to health information systems (HIS) in developing country context from both management and end-user standpoint.

DESIGN/METHODOLOGY/APPROACH: Relying on the literature on health information systems as well as resistance theories two research models (both manager and end-user perspective shown in figure 1 and 2) were developed which were statistically tested and validated in the context of health service systems of a developing country. In this regard, a quantitative research method was carried out using questionnaire survey from healthcare service professionals. Total 51 usable responses from management and 89 responses from end user were obtained. The collected data were analysed using partial least square (PLS) based structural equation modelling (SEM).

FINDINGS: Our findings corroborate that the management resistance to HIS is predicted by the poor IT infrastructure and cost of HIS implementation. However, we did not find significant association between the institutional factors and management resistance to HIS. On the other hand, the end user resistance to HIS is predicted by poor IT infrastructure, ineffective change management and lack of compatibility of the systems. But we did not find significant association between lack of IT knowledge and end-user resistance to HIS.

RESEARCH CONTRIBUTIONS: This paper has significant theoretical contributions to resistance to innovation and technology adoption as it explores the resistance to health information systems both from management and end user perspective. Further, it has significant contribution to explore health information systems resistance factors in the case of developing countries.

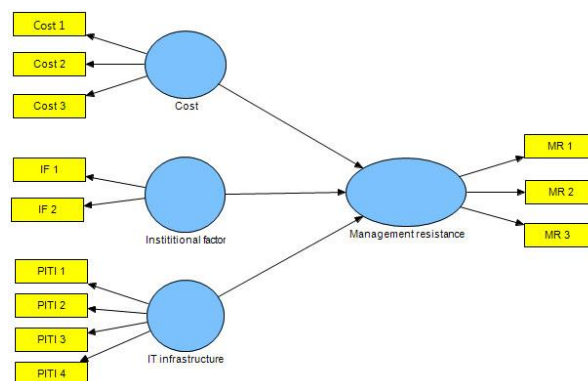


Figure 1: Management Resistance Model

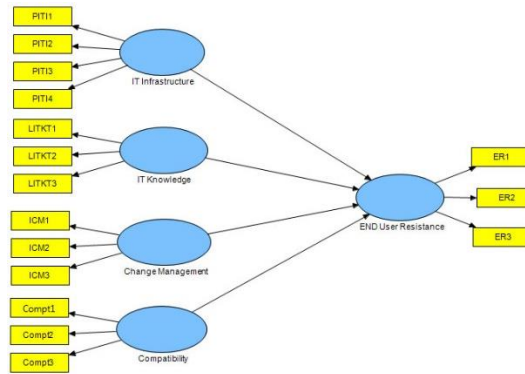


Figure 2: End-user Resistance Model

PRACTICAL CONTRIBUTIONS: This research also has significant managerial impact as the findings of this research will assist the health care service managers to strategize and expedite change management to adopt information systems by identifying the resistance factors from both management and end-user side.

LIMITATIONS: Increased number of respondents had been a challenge especially from management level people. As a result the researcher was required to work with limited sample size. It may also fall short of generalizability because the study involves only two cities in Bangladesh.

ORIGINALITY/VALUE: To date, there has been no empirical study which has investigated resistance to health information systems in developing country context from multiple user perspective.

KEYWORDS: Resistance, health information systems, Developing country.

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2.3 Tourists' Perception Towards The Water-Based Tourism: A Case Study On Cox's Bazar

*Md. Kamruzzaman, Assistant Professor, University of Dhaka;
Uchinlayen, Lecturer, University of Dhaka;*

PURPOSE

The study focuses on the tourists' perception towards water-based tourism in Cox's Bazar. Considering Cox's bazar as the destination the objectives of this study are:

1. To explore the relationship between the tourist's perception and their level of satisfaction.
2. To identify the potentials of water activities, current scenario in Cox's Bazar areas, opportunities and its' contribution for tourism development in Bangladesh.
3. To analyze the components that can enhance visitor satisfaction, if utilized properly.
4. To discover the accessible assets for the advancement of water based tourism.

Some suggestions are also made for overcoming challenging issues in developing water-based tourism.

DESIGN/METHODOLOGY/APPROACH

The study is basically based on quantitative rather than qualitative in nature. The sample size is 200 where random sampling method has been used.

Both primary and secondary information has been used for the research purpose. For that, a structured questionnaire method was used where Likert Scale (5 point scale) was used to gather information /data from the respondents. Personal interview was also surveyed on the domestic tourists when they were on their visit to Cox's Bazar. Advanced statistical calculations have been made with the help of SPSS tools, for example, descriptive statistics, principal component analysis and factor analysis. Moreover, to find the inter-relationship between the dependent and independent data, analysis such as simple and multiple regression analysis and correlation analysis are employed. To find and evaluate the research findings and to select the best suited subset, ANOVA and Mallow's CP statistics were used respectively

FINDINGS

The study showed positive tourists' perception towards water-based tourism regarding some variables like natural beauty and environment, facilities in the Cox's Bazar sea beach, hospitality, water related activities etc. On the other hand tourists' hold some unfavorable perceptions towards safety and security facilities, sanitation and hygiene facilities, first aid services are remarkable. So, tourism planners, policy makers and stakeholders need to make strategic marketing based on these findings during the conduct of the research. They need to improve the safety and security, sanitation and hygiene in the Cox's Bazar sea area for marketing and promoting water-based tourism. During the planning process they should be careful so that the biodiversity, flora and fauna are not get polluted and sea beach areas get hampered due to water-based tourism activities performed by the tourist.

LIMITATIONS

The limitations that have been encountered during this research are as follows:

- The overall report has been conducted from the visitors' perspective view. Because of the lack of opportunity, data could not be collected from the media sector

- Time constraint was one of the limitations of this study to prepare the report.
- Lack of secondary data in the context of Bangladesh is another crucial limitation
- This study may not represent the actual view of respondents as the questionnaire was close ended, predetermined and prescriptive. The respondents did not get the opportunity to express their own view in detail

KEYWORDS *Tourists' perception, Destination Perception, water based tourism development, Cox's Bazar*

Parallel session 3

3.1 On the Brink of a Tech Revolution: Blockchain and ERP for Sustainability in Diamond Exchanges

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PURPOSE

Business appears poised at a tipping point. Blockchain is beginning to transform the nature of transactions from a centralised to a decentralised system of electronic ledgers with automated payment processes. It is forecast to be the next major force for change in future supply chain management, warranting attention because it promises to open the doors to ethical trading practices while creating greater efficiencies. This presentation explores how integrating technological approaches based on newer logistical formats in technology have the potential to realise sustainable change for diamond miners and their communities in the developing world.

DESIGN/METHODOLOGY/APPROACH

This research develops a conceptual model utilising simulation, represented in a flow chain diagram, to chart a diamond's life cycle from extraction to consumer over peer-to-peer transactions that are immutable. Combined with best practices of logistics in Enterprise Resource Planning (ERP), a wheel-and-hub prototype is presented to visualise the transfer of assets along the entire chain of custody. This presentation shows by connecting in-house expedited logistics capabilities of ERP with the breakthrough features of blockchain in a supply chain network, the union of these systems holds real promise for ethical trade. This kind of paradigm is an accepted method to document software engineering, and it can be extended to show how products and corresponding payments can be managed.

FINDINGS

Initial evidence with the rise of Bitcoin ushered in a growing currency marketplace for peer-to-peer transactions. There are signals from IT developers that the beneficial features of Blockchain as a distribution system are capable of being utilised to virtually trace any good from its point of origin, as it transfers from station to station until it is deposited into the hands of the consumer. Software is currently being piloted or projected for near-term development to test this approach to transfer coffee, tea and cocoa within private and public communities to nurture financial equity and social justice for farmers. Predictions based on the merit of established applications are that blockchain will play disruptive and manifold roles when it is transferred to other trade fronts, and when managers adopt it to conduct smart contracts or institute progressive lending practices.

RESEARCH CONTRIBUTIONS

This research contributes a new dimension to this burgeoning topic in that it offers a framework, pairing the advantages of internal and external processes with ERP and blockchain. Academics primarily focused on the benefits of blockchain to date for its positive characteristics associated with traceability separate from the advances previously accomplished with ERP. Yet, laboratory conditions

show the feasibility to join these systems, highlighting the potential to put them into practice for sustainable supply chain management of an array of commodities.

PRACTICAL CONTRIBUTIONS

Companies are expected today to abide by activities that promote corporate social responsibility, especially to meet growing consumer demand to curtail immoral or illegal practices across supply chains. Considering how many parties are involved in the globalised jewellery industry, and the complexity of negotiating layers to bring a diamond to market, it has been difficult to eradicate instances of fraudulent sales of synthetic diamonds and sourcing stones in regions that are plagued by war and corruption. Implications of technological development though show blockchain can provide the capacity to make a fundamental difference to people in developing countries that are still being exploited. Blockchain also offers competitive advantages for traders that are quick to seize opportunities to engage in this way precisely because it facilitates the ability for parties to deal through a transparent supply chain network.

LIMITATIONS

ERP has been successfully integrated for logistical efficiencies within companies. Blockchain now paves a pathway for greater innovation and improved supply chain management among companies as the technology moves forward. It is garnering much interest and investment from corporations and governments, but blockchain may still prove difficult to implement to reach and affect people where social change is needed most at the source of diamonds unless certification is used to validate that fair trade extends to appropriate local miners. Cybersecurity attacks could pose another danger; yet, the hashtag-based system of blockchain offers protection due to embedded cryptography coding options that are part of the verification featured in this node-to-node structure.

ORIGINALITY/VALUE

Blockchain facilitates accountability that goes beyond existing manual certification schemes through advantages of automation and real-time reporting. Coupled with streamlining of human, technology and resources in previously deployed systems of ERP, the model in this paper shows that further advances can be accomplished in sustainability for diamond exchanges.

KEYWORDS

Blockchain, logistics, sustainability

3.2 Demand Forecasting in Supply Chain: Machine learning vs. statistical-judgmental forecasting

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PURPOSE

The main purpose of this research is to implement and assess the performance of Machine Learning (ML) algorithms in demand forecasting for a particular type of demand time series that is impacted by promotion and has irregular pattern. The common practice in industry is to apply experts' judgment on the output of simple statistical forecasts. However, this can be very labour intensive and biased. The main stress of this paper is to propose an objective an unbiased method to forecast demand.

DESIGN/METHODOLOGY/APPROACH

ML algorithms are growing rapidly in supply chain demand forecasting and can be a candidate to replace statistical forecasts and experts' judgment. we utilised and applied four different ML algorithms namely Artificial Neural Network (ANN), Support vector Regression (SVR), K-Nearest Neighbours (KNN) and Random Forrest (RF) on a real case dataset. The models are validated through different accuracy criteria.

FINDINGS

The data are split into a training-set (first 80 weeks) and a test-set (last 20 weeks). The model used by company (Exponential smoothing adjusted by experts) is considered as the benchmark. Validity of the presented models is evaluated through Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE), and Root Mean Squared Error (RMSE).

Results on test-set	RMSE	MAE	MAPE
Experts' judgment	933	1860	74.7
ANN	1186	718	64.7
SVR	1619	514	51.9
KNN	2289	689	4.1
RF	4235	1396	24.0

Results on promotion	RMSE	MAE	MAPE
Experts' judgment	5485	3868	40.1
ANN	3417	2883	6.0
SVR	5079	1841	7.0

KNN	7238	6785	28.8
RF	13378	12429	34

RESEARCH CONTRIBUTIONS

We used ML algorithms that can learn from the historical data and generalize to predict the future. The investigated sale time series has irregular pattern and is subject to various changes. Our results indicate that ML models outperform judgmentally adjusted statistical forecasts. This is an attempt to mechanize the forecasting process while improving the accuracy of forecasts. The model is applied on a particular sale time series that is highly impacted by promotion. However, it gives insight to practitioners and researchers to develop and use ML algorithms on other sale time series that are subject to dramatic changes. The other contribution of this research is that forecasts are generated for both short-term and medium-term forecasts using ML algorithms using explanatory variables. ML algorithms outperform the benchmark in both scenarios.

PRACTICAL CONTRIBUTIONS

This research has a few practical contributions. First of all, it helps managers to forecast demand more accurately and plan for sale and promotional campaigns. Demand forecasting in downstream supply chain helps managers in upstream supply chain to make decision in production planning, inventory control and material resource planning. Therefore, it leads to performance improvement of the whole supply chain.

LIMITATIONS

One practical issue with ML algorithms is that they are computationally expensive. However, they are less labour intensive than judgmental forecasting and might be faster to forecast demand. The other issue is that ML models are somewhat black-box which makes it less trustable for practitioners that need to know the process by which the forecasts are generated. Regarding the accuracy, through our case study we showed that ML algorithms outperform judgmentally adjusted statistical forecasts when demand is highly impacted with promotion and has irregular pattern. While this is a prototype from real case study, it is worth it to try these models and other ML algorithms on different demand time series and evaluate their performance. Moreover, it would be interesting to test and compare other statistical models and judgments experts with ML algorithms.

ORIGINALITY/VALUE

Forecasting is inherently one of the pivotal tasks in supply chain management. ML algorithms have been proposed in demand forecasting as an alternative model to statistical model that are judgmentally adjusted by experts. ML models in industry are not as common as research. However, they can generate accurate forecasts and could be considered by practitioners as an alternative to labour intensive judgment.

KEYWORDS

Demand Forecasting, Statistical-Judgmental Forecasting, Machine Learning

3.3 Application of information and communication technology (ICT) in ready made garment industry: Study on Bangladesh market

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PURPOSE

This research is based on observing the application of ICT in Bangladesh's Readymade Garments (RMG) Sector and some recommended model for this industry. Though RMG sector is the most prominent and highest foreign currency earner sector in Bangladesh but it stuck with some minimal application of ICT. Application of ICT in automation of supply chain, security, employee database, financial database can make the RMG sector performing better. To gain competitive advantages over other nations, respective associates with RMG sectors of Bangladesh should take measures to improve ICT applications.

DESIGN/METHODOLOGY/APPROACH

A brief review of literature is presented. A model developed and implemented by the researcher is outlined. It is a literature and methodology work done prior to conduct an exploratory research on the title. The researcher hopes to conduct a research, for unveiling the information on ICT application in RMG sector of Bangladesh. The sample that would be chosen by the researcher includes the staffs, managers and owners from some readymade garments in Bangladesh. The sample size of this research will focus on targeting at least 100 Staff (including IT and administrative), 20 Managers, 10 owners and others.

FINDINGS

Findings from different articles are discussed here. The journey of ready-made garment (RMG) industry of Bangladesh started in the late 1970s. Within a short period of time, RMG industry has become a prominent player in the economy. This industry has contributed to export earnings, foreign exchange earnings, employment creation, poverty alleviation and the empowerment of women of Bangladesh. Information and communication technology has become a necessary part of the garments Industry. Employee attendance (clocking in), shipment dispatching, ERP software implementation, CAD/CAM system for pattern making or plotting, computerized cutting machine, online FIT approval, ERP for inventory tracking in the production management, mailing solution, preparation of MIS reports, voice chatting, semi-automatic and fully automatic sewing machines and real time communication with buyer through online solutions like Skype- all these jobs are done by the use of ICT. RMG sector remarks ICT not as a tool for competitive advantage but a necessary instrument for running day to day business successfully. Implementation of ICT on the structure, assumptions, process, efficiency and decision making in garments industry results with huge benefits. Bangladesh Government along with BGMEA (Bangladesh Garment Manufacturers and Exporters Association) and BKMEA (Bangladesh Knitwear Manufacturers & Exporters Association) should move on immediately in their pursuit to give technical support in ICT infrastructure and implementation in Garment Sector. This study would be an attempt to explore the literature of ICT application along with prospects in RMG Sector of Bangladesh.

RESEARCH CONTRIBUTIONS

This research results would be helpful for others in case of correlating ICT applications and organization performance. And it would also bring further research on these in future.

PRACTICAL CONTRIBUTIONS

The model is transferable and can be used in any country or any industries than Ready Made Garments.

LIMITATIONS

The exploratory research will take long time to get the findings and results. Sometimes ICT applications could be updated meanwhile. Technology shock results in negative in case of use of ICT applications. But then industries will get its advantages in a few times.

ORIGINALITY/VALUE

This is the first formal writing about ICT applications in RMG sector in Bangladesh. The model used here can be found in many countries or articles. But in Bangladesh no work has been done on ICT application in Ready Made Garments sector.

KEYWORDS (only provide 3)

Ready Made Garments, ICT Application, and Bangladesh.

Parallel session 4

4.1 Understanding scientific communities: A co-word analysis in supply chain agility research

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PURPOSE

The field of supply chain agility SCA has recently grown considerably with a significant increase in the number of academic publications. However, the state of knowledge about its structure and evolution remains limited. In this art, we provide a unique and systematic examination of the SCA literature by adopting an applied bibliometrics approach. Thus, revealing the intellectual development and providing a sound understating of the field's past assists in appraising the current structure and enables putting forward suggested thrust of the future research trends in SCA literature.

DESIGN/METHODOLOGY/APPROACH

107 specifically-related peer-reviewed journals papers were collected from Wos and Scopus and analysed bibliometrically by co-word technique using the textual data mining software Leximancer 4.5. Titles, abstracts and keywords data were used as input into the analysis and concepts seeds were created through the software. The patterns between concepts that arose were identified and aggregated into themes. The relationship between concepts and themes is illustrated through a concept map.

FINDINGS

First, words such as “manufacturing” and “flexibility” refer to where SCA has been extended from and where many seminal SCA scholarly work have based their analysis upon. Also, the term “virtual” derived from “virtual enterprise” has been extensively adopted by early SCA researchers. Additionally, we can depict that “capabilities” is at the forefront of the SCA research corpus. This might be due to the fact that a plethora of researchers conceptualise SCA as a capability, emanated from the “dynamic capability” and thus mirroring the dynamic nature of the markets and lending historical roots of SCA that lie outside operations management. Moreover, “integration” appears to be also as a vanguard of the SCA research. Finally, the impact of SCA on performance and its link to competitive advantage was heavily researched and constitutes the largest theme of SCA. By interpreting the semantically closely related themes and concepts and reading the contextual text from core articles, we identify four predominant research areas in SCA: 1) Analytical Techniques, 2) Knowledge and network-based perspectives, 3) Operational link to strategy, and 4) enablers and consequences of SCA.

RESEARCH CONTRIBUTIONS

A few studies have systematically reviewed SCA literature, but no study has done so through bibliometric analysis. To enhance prior research and assess the intellectual structure of SCA through a different perspective, this study applies co-word for the first time to this research field to unfold the architecture of the SCA research.

PRACTICAL CONTRIBUTIONS

Bibliometric analysis can be used by both experts and novices to understand the current state of the art of a scientific field and to predict where future research could lead. The application of such bibliometric method in this study enables a more robust, structured and systematic survey of this rapidly expanding research domain. The findings thus present a clearer understanding of the intellectual streams and key scientific communities that constitutes SCA. The study is thus useful for graduate students and in writing a literature review as it presents an interesting manner to examine a discipline.

LIMITATIONS

Although this study reduced the bias often associated with traditional literature reviews, the findings are influenced by the scope and nature of the underlying research design and methods. The restriction to certain keywords while building the sample may have had an impact on the results. To minimize sampling bias, this study employed a rigorous sample selection procedure by choosing multiple keywords and a wide range of journals and articles belonging to all business domains from two well-established publication outlets. Finally, as inherited with any bibliometric analysis, the results are the outcome of the algorithm employed by the analytic software. Hence a detailed methods description is provided for the reader.

ORIGINALITY/VALUE

This paper has found the field of SCA to be a dynamic area encompassing multiple knowledge groups within its identity. It has borrowed theories from other fields (e.g., RBV and dynamic capability). The findings of the study contribute significantly to SCA domain since it is the first attempt to explore the academic foundations of SCA research corpus.

KEYWORDS: Supply Chain Agility, bibliometrics, co-word

4.2 Service-dominant logic and network-centric operations

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PURPOSE. Network-Centric Operations (NCO's) may be viewed as complex service systems. Semi-autonomous agents are organised around common goals and particular events, which is also a theme in Service-Dominant-Logic (SDL) concepts. In a recent article, the original proponents of the Service Dominant Logic (SDL) concept (Vargo and Lusch, 2017) suggested the underlying principles could be viewed as a theory of value co-creation, and that evidence-based research was needed in a number of areas including strategy development and implementation. In this paper we explore the utility of drawing on a SDL viewpoint to characterise the implementation of Network-Centric Operational (NCO) strategies.

METHODOLOGY. The approach adopted was to separately examine literature describing a variety of scenarios where each of the constructs (SDL & NCO) was utilised, looking for common themes relating to each construct. Some researchers who have drawn on the foundation principles supporting the SDL concept have found it necessary to reframe the underlying principles. Drawing this observation, a combination of experience from prior studies, SDL literature related to service events (viewed in the context of a broader services ecosystem), and contributions from the services science literature, a functional model of a service event was formulated. A focus on the management of events was observed in the literature on Network-Centric Operations, e.g. in the field of network-centric warfare. Two very different case studies were characterised drawing on the common event-orientation theme identified to illustrate the potential utility of using them in combination. In one case the operations of Amazon.com were examined, and the other case examined the operations of a State fire emergency services network.

FINDINGS. The network-centric literature indicated that three kinds of event combined to support effective operations: learning in anticipation of a variety of emergent events, deployment of resources to provide the required service, and learning from the outcomes of that deployment. Operations were facilitated by information-sharing. This pattern could be observed in both the fire emergency case and in the Amazon.com bookselling case (where intelligent agents emulated the behaviour of an experienced sales assistant and remembered the details of past or associated service encounters). The core event associated with the application of SDL is a service encounter associated with value co-creation. This is framed here as an activity orchestrating service networks, e.g. in the Amazon.com case involving e-commerce and logistics networks. The core event is supported by a service entity backed up by a set of actors and resources. In the Amazon.com case this entity was an intelligent agent, and in the fire-fighting case a local fire brigade, but the same ideas could be utilised. The service entity was also supported by a variety of external institutional and infrastructure service ecosystem actors that supported orchestration activities (e.g. information services / the internet in both cases). Rules for the game came from an institutional business model linking a value proposition with a means of delivery. In the fire-fighting case the value proposition was represented as a form of insurance against emergent events that may threaten public safety. The final element of the SDL-inspired model used was consideration of the outcome as viewed by different stakeholders and considering the impact of the service encounter on reputation. Common themes across both cases could be framed as

aspects of service quality identified in the literature on that subject – responsiveness, the availability of timely information, access to resources and matters of perceived value delivered.

RESEARCH CONTRIBUTIONS. A SDL-inspired model is presented, along with linkages back to the SDL foundation premises. It is suggested that a typology of network-centric operations can be identified based on the particular combination of event volume and event variety, analogous to that identified by Silvestro et al (1992) in relation to service operations. For any type of operation, four network-centric event scenarios may be observed, arising from combinations of internal/external stimulus and responses.

PRACTICAL CONTRIBUTIONS. Unbundling a set of related service events using the frameworks presented in this paper supports a resource orchestration viewpoint of value creation rather than a simple transactional viewpoint, and provides rich insights into the underlying dynamics and what has to be managed.

LIMITATIONS. This is a conceptual paper that simply illustrates how the ideas presented may be used. The validity of the concepts require further testing.

ORIGINALITY/VALUE. Whilst there is recognition in the literature that SDL favours a network-centric viewpoint of markets, there have been relatively few studies of how the adoption of a network-centric organisational strategy may be informed by the service-dominant logic viewpoint presented here.

KEYWORDS: Service Dominant Logic, complex service systems, operations management

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4.3 Benders decomposition for whey reverse logistics network design under uncertainty

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KEYWORDS

Whey reverse logistics, Dairy industry, Hierarchical facility location, Stochastic programming, Benders decomposition.

PURPOSE

This research aims at finding practical solutions for a real-world optimization problem, that is, whey reverse logistics network design problem. Whey is a by-product of cheese making that should be processed due to economical and environmental motivations. Given a set of whey producing cheese makers, the problem is to select some of them to install two types of whey processing facilities and allocating other cheese makers to these facilities such that the total transportation and fixed costs are minimized.

RESEARCH BACKGROUND

Designing a whey recovery network is an important Reverse Logistics (RL) problem. Whey RL network design was first addressed by García-Flores et al. (2015) in which the authors study an actual cluster of cheese makers in Minas–Gerais, Brazil. The authors formulate the problem as a Hierarchical Facility Location Problem (HFLP) with collection centers and plants as two levels of facilities. Esmailbeigi et al. (2017) study a variant of the problem in which demands (the amount of raw whey) are random variables and propose the two-stage stochastic programming approach to address the problem. They present a huge mixed integer linear program and report numerical results for a set of randomly generated instances with five cheese makers. In this study, we present a benders decomposition algorithm to solve the same problem more efficiently.

RESEARCH QUESTIONS

In two-stage stochastic programming, we normally construct scenarios to approximate the expected value of cost. The higher the number of scenarios, the better the approximation. On the other hand, by increase in the number of scenarios, the size of the mathematical model and consequently its solution time increases accordingly. Benders decomposition is an appropriate tool to handle this class of problems. In this study, we are interested to know the impact of Benders decomposition on the solution time of the whey RL network design problem under uncertainty.

METHODOLOGY

We consider the mixed integer linear programming formulation (i.e., the extended formulation) of the problem developed by Esmailbeigi et al. (2017). The extended formulation can be solved directly by a standard linear solver such as CPLEX or GUROBI. However, we developed a Benders reformulation for the problem which enables us to solve the problem through Benders decomposition algorithm. We code the algorithm in C++ programming language and use CPLEX concert technology to call CPLEX.

FINDINGS

Our computational results on a set of randomly generated instances demonstrates the efficacy of the proposed Benders decomposition algorithm. When the number of scenarios is low, the solution time obtained from solving the extended formulation is comparable to that of the Benders decomposition algorithm. However, for larger number of scenarios, Benders decomposition can solve the problem much faster. Consequently, we can use more scenarios to increase the accuracy of the expected costs and solve the resulting (huge) formulation by using Benders decomposition in a reasonable amount of time.

CONTRIBUTION

Whey RL network design problem is a real-world problem occurring in dairy industry. Benders decomposition enabled us to improve the computational time and accuracy of the solutions for this problem under demand uncertainty. However, this technique is not limited to this class of problems. It can be adapted to other real-world problems to improve their solution time and accuracy.

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Parallel session 5

5.1 Managing container flow performance in import supply chain at Indonesian ports

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PURPOSE

Drawing on RBV theory, this study examines the extent to which container terminal flow process be improved by examining the influence of government support, terminal resources (e.g. equipment, personnel and infrastructure), lean principle and integration mechanism of port operations.

DESIGN/METHODOLOGY/APPROACH

The study used survey method to collect data from eight major terminal operators located in the ports of Tanjung Priok Jakarta, Tanjung Emas Semarang and Tanjung Perak Surabaya in Indonesia. The cross-sectional data of 216 respondents were analyzed using structural equation modeling.

FINDINGS

SEM results show that government support is positively associated with improvement in terminal resources and business processes at container terminals (H4 and H5 confirmed). However, government support and terminal resources alone cannot influence the terminal performance directly (H1 & H6 rejected). Further, the results show a positive influence of container terminal resources (CTR) on process improvement and integration process (PIIP) (H2 confirmed) that in turn can influence the terminal flow performance (H3 confirmed). It can be inferred that the adequacy of resources may have a positive effect on a terminal's business processes. Therefore, this research establishes the fact that government support and terminal resources have a positive effect on terminal operators' business processes integration, which in turn, influences the container flow performance within container terminals.

RESEARCH CONTRIBUTIONS

Theoretically, the current study extends the port performance measurement literature by conceptualizing and perceiving the role of lean principle and integration of business processes quite different from earlier studies based on the secondary published data. This study examined container operations, port resources, port business processes, and the government support in influencing the container flow process.

In detail, results on questionnaire add empirical evidences that adequate personnel capability, reliability and trustworthiness is important for human capital investment in terminal operations. Sufficient quantity of equipment and its readiness is important to function the terminal operations. Nonetheless, sufficient capability of the yard to accommodate container stacking and adequate exit gate capacity to manage container traffic is also imperative to support infrastructure and hinterland connection.

Further, questionnaire results in process improvement and integration reveals that the lean methods and implementation tools to calculate time of container and document flow accompanied by standardization of operational procedures could significantly represent lean practices in terminal operations. Further, cooperation with shipping lines, government agencies and inland transport operators complemented with external customers' current and future requirements as well as the dissemination of its results to employee is considerably beneficial to increase the firm's relationship management with port stakeholders. Further, survey outcome demonstrated that the performance

evaluation of various transport modes to link terminal and hinterland destinations and identification of competing channels to find better alternatives for cargo flow are essential for integration process. Last but not the least, dedicated training and dissemination of updated knowledge and information to employee and stakeholders by a committed team is critical for knowledge management in terminal container firms.

On the other side, government role in providing support, incentive, policy and regulation in identifying and implementing best practices in container transportation, ICT and logistics education system is eminent. These supports in turn provide a higher a faster terminal's service performance that deliver higher value for customers. The firm's responsiveness also increases by delivering new services to the market quickly. Lastly, to retain customer satisfaction, container terminal firms should have met customer standards.

PRACTICAL CONTRIBUTIONS

Practically, the study draws the attention of terminal managers to manage the limited resources effectively that is perceived to integrate the container flow as well as information flow within the terminals. This integration mechanism improves the work flow by identifying the waste and eliminating them to improving the efficiency of container flow. It indicates that managers should update and integrate the current resources, procedures and incorporate shipping lines, government agencies, and inland transport operators as strategic partners to achieve a smooth, streamlined and sustainable competitive container flow efficiency that provides greater advantages for all stakeholders.

LIMITATIONS

The study acknowledges some limitations. First, the findings from the single case study can be generalized with caution. Second, the competitive pressure, for example neighboring ports in Malaysia and Singapore, is not considered in this model. So, institutional theory with a new variable 'competitive environment' can be used as a moderator in the future model to understand how it can affect the existing relationships in this import supply chain. Further, there are insignificant path relations in the model where container resources and government support insignificantly influence container flow efficiency. For future research requirements, this result may change by adding more samples. Also, various parties i.e. shipping lines, government agencies, and inland transport operators that involved in terminal operations have contrasting functions, thus, it is similarly important to investigate an inter-group analysis to see how their view vary across the stakeholders. This notion can be a stepping stone for forthcoming exploration.

ORIGINALITY/VALUE

Whilst studies on port performance are abundant in literature, they have overlooked the lean principle and integration of business processes and the role of government in improving container flow performance. Only a couple of studies so far documented (Marlow & Casaca 2003; Olesen et al. 2015) have, however, proposed conceptual lean practices in port terminals. Therefore, this study fills the gap by examining the extent of business process be improved by lean principle and integration of business processes using government support and terminal resources resulting in an efficient container flow.

KEYWORDS

Import supply chain, container flow efficiency, Indonesian container terminal

5.2 The Effect of Innovation Orientation on Competitive Capability and Business Performance

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PURPOSE

As for any main activities in businesses, innovation needs a strategic focus and is linked with various functions along the supply chain. Previous studies have investigated the impact of innovation on business performance yet suggested varying results. Meanwhile, studies have empirically tested the impacts of supply chain management on competitive advantages and business performance, for which innovation is not considered. As a result, few studies have examined the linkage between strategic directions of innovation and supply chain management and their impact on business performance. This work contributes to addressing this research gap and investigates how an innovation orientation can impact on exporters' competitiveness and business performance. In response, we combine the strategic direction of innovation with the typology of classifying supply chain strategies into efficient and responsive types, and integrate innovation with operations and supply chain management in strategic decisions in this work.

DESIGN/METHODOLOGY/APPROACH

Drawing on the knowledge-based view (KBV) of companies, we propose a conceptual model that consists of the strategic direction of innovation, competitive advantage, and business performance, from the lens of supply chain strategy and capability. We postulate that different strategic directions of innovation, such as an innovation focus on responsiveness versus efficiency, enhance firms' market strength and build competitive advantages in responsiveness and efficiency, respectively, which in turn influence business performance.

Further, we consider contingency when exploring the relationships between the proposed constructs. Drawing from related literature that shows product characteristics play a role in the supply chain types, we propose that the type of product moderates the relationships among the constructs. Also, we follow the theory that the managerial perception regarding the distance to market shapes strategic choices, and hypothesize the moderating effects of the perception of distance in the proposed relations.

Using data from New Zealand exporters, we conduct an empirical study to test the proposed conceptual model. We tested the relationships using Structural Equation Modelling (SEM), and estimated the models using the diagonally weighted least squares (DWLS) estimation method available in the lavaan package in R.

FINDINGS

The results suggest that the proposed positive associations among the constructs are generally supported; however, not all the moderation effects are supported. Though it is supported that product type moderates the relationships among innovation directions, competitive capability, and business performance, its moderating effect is on the opposite direction from what is suggested by the classical theory of strategic fit in supply chain management. Also, the perception of distance does not seem to have a significant moderating effect, which is counter to expectations.

RESEARCH CONTRIBUTIONS

This work contributes to the theoretical development of innovation management in at least two main aspects. First, it integrates innovation management with supply chain strategy, and demonstrates the positive associations among the strategic direction of innovation, competitive capability, and business performance, in both dimensions of efficiency and responsiveness. Second, the contingency of product type and perception of distance is investigated, and the results provide support for the notions of ambidexterity and combinative capability.

PRACTICAL CONTRIBUTIONS

The work highlights a practical perspective to explore the managerial insights for pursuing efficiency and responsiveness in the global supply chains. As the results suggest different levels of associations in the two dimensions of efficiency and responsiveness, managers need to place focus differently. This work provides detailed guidelines and implications on how practitioners can benefit from the integration of innovation and supply chain management.

LIMITATIONS

Though we carefully design the model and process the data, this work is not without limitations. As we use one single official survey questionnaire, obtaining data from multiple resources and using objective data would be more desirable if possible. Also, this study simplifies the product type as raw materials versus finished goods, and thus does not consider detailed product characteristics or product portfolios.

ORIGINALITY/VALUE

This is original work with important contributions for both research and practice.

KEYWORDS Supply chain strategy, innovation, exporting industry

5.3 Effect of “Internet of Things” on supply chain digital integration and firm sustainable performance

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PURPOSE

The paper examines the effect of Internet of Things (IoT) capability on supply chain digital integration to improve supply chain performance and firm sustainable performance.

DESIGN/METHODOLOGY/APPROACH

The paper used a mixed method to collect data in Australian retailers. The cross-sectional survey data of 227 Australian retail firms was analysed using structural equation modeling (SEM). The results were validated with 13 in-depth interviews with managers in the retail industry. Supply chain performance is measured by competitive dimensions like cost, quality, delivery and flexibility. Firm sustainable performance is assessed by economic, environment and social criteria.

FINDINGS

The SEM results reveal that IoT capability has a positive and significant effect on inter-functional, customer, and supplier process integration that in turn positively affects supply chain and firm performance. Further, IoT-enabled external integration is more than internal process integration. The qualitative findings via interviews confirm that many IoT technologies such as RFID, handheld devices, personal digital assistants (PDA), radio frequency (RF) scanners, Voice Pick, automatic guided vehicles, hand-held sensors, video analytics, IP cameras, GPS related track and trace systems and route optimisation systems coexist to provide additional capabilities over Internet via their ubiquity, intelligence and autonomy. IoTs are seen as improving efficiency and transparency in data collection and transfer while cost of investment and lack of understanding in the technology itself are considered as key obstacles. Interoperability and standardisation issues were also addressed as constraints. Qualitative analysis shows that IoT's capability improves real-time visibility, auto-capture and information sharing for greater supply chain integration in contrast to legacy ICT.

RESEARCH CONTRIBUTIONS

Theoretically, the study contributes to supply chain integration literature and organisational capability theory by providing empirical support of how IoT-enabled process integration can enhance performance of supply chain as well as firm. IoT technologies and organisational capability is a progression of traditional ICT capabilities helping supply chain processes to integrate for performance gains. From organisational capability perspectives, adoption of IoT is likely to add to the current capabilities in dealing with logistics process integration. This is new in this study.

PRACTICAL CONTRIBUTIONS

Practically, the study helps managers realise the potential of IoT deployment in their firms enabling suppliers and customers to integrate for logistics functions. This can complement ICT capabilities currently in place to achieve greater benefits, by stretching their focus from isolated organisational management perspectives to the entire supply chain.

ORIGINALITY/VALUE

IoT represents an advancement in technological innovation that connects objects and devices through Internet to capture and communicate data in real-time. The “digital upgrading” of conventional objects via Internet is considered as an innovative extension of traditional Information and Communication Technology (ICT) applications. While ICT-enabled supply chain integration is researched extensively, empirical studies of emerging IoT to integrate supply chain processes to improve the supply chain or firm performance is scarce. Therefore, this study contributes by filling the identified void in the literature.

KEYWORDS

Internet of things (IoT), supply chain digital integration, firm sustainable performance

Parallel session 6

6.1 A comparison between various types of VMI in a supply chain

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PURPOSE

This research aims to compare various methods introduced for VMI in the literature and identify which one could perform better. Moreover, we also define a new type of VMI collaboration and show that our proposed method could outperform all the other defined methods.

DESIGN/METHODOLOGY/APPROACH

The methodology of this research includes three different methods: 1. Reviewing the literature and identifying the existing methods of VMI. 2. Mathematical programming: In this step we introduce a new VMI type and develop a mathematical model for it. Moreover, we develop mathematical models of all other known types of VMI and clarify the differences 3. Numerical study: This step includes two parts: (i) some mathematical proofs that show superiority of our proposed method to the other methods, (ii) a set of numerical experiments that show how much the performance of supply chain will be improved by applying VMI. In order to compare the performance of the various VMI types, we first calculate the profit of whole supply chain. Then in the next step the profit of each member (retailer and vendor) is calculated separately. Finally, in order to compare the outcome of two VMI types with different profit for each member, we use multiplication of the profits of vendor and retailer as an indicator which has been used in the bargaining game.

FINDINGS

Our findings could be summarised as following:

1. Our VMI type always offers a win-win contract to the vendor and the retailer while the other methods are not necessarily a win-win partnership.
2. For the cases that all of the contracts are a win-win partnership, our proposed method could have higher negotiation value and would be preferred by the others. It means that, either it could dominate the other contracts by offering the both partners (retailer , vendor) higher profit, or in a negotiation game could have higher value.

RESEARCH CONTRIBUTIONS

The contribution of the research is in twofold:

1. Developing a new type of VMI and developing mathematical models for it and for other method in a dynamic environment. Proving the superiority of our method by mathematical proofs and showing its performance through numerical studies.
2. Considering VMI in a dynamic environment when the demand is not constant (unlike most of the studies in which EOQ has been used) and could change over time.

PRACTICAL CONTRIBUTIONS

There is no a specific practical contribution, but the results of the research is going to be applied for one of the Australian food companies as the main case study of the research.

LIMITATIONS

The research has not considered the competition of the retailers by assuming the retailers' demand are independent.

ORIGINALITY/VALUE

KEYWORDS (only provide 3)

Vendor Managed Inventory, Supply chain management, Lot-sizing

6.2 Weathering the storm: Supply chain resilience during natural disasters

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PURPOSE

The purpose of the present study is to understand supply chain resilience (SCRES) under specific contingency – natural disaster. In addition, study aims to identify enhancers of the SCRES under this contingency, primarily researching internal integration and ethical leadership practices. The study employs contingency lenses on the topic of SCRES, while utilizing social learning theory and social exchange theory, in the ethical leadership analysis. The complete research results are yet to be grasped; preliminary results are available and presented.

DESIGN/METHODOLOGY/APPROACH

Today's global supply chains (SCs) are increasingly lean, with low-buffer practices. Performance of the SC is previewed as indicator of how companies in the SC work together, rather than indicator of each independent partner's performance, therefore implying transferable effect of all advancements and shortcomings of operations (Jayaram et al., 2011). While streaming to high performance, low buffer goals are appropriate for normal operating conditions, yet they can become counter-productive in times of large-scale disruptions. Disruptions that arise as natural disasters in particular, such as tsunamis, hurricanes, tornadoes or storms. These natural disasters are becoming more frequent and severity of their consequences on the company and entire SC is increasing (Chopra & Sodhi, 2004; Thun & Hoenig, 2011). Current forecasts suggest greater risks of major weather events in the future with amplified frequency (Bhamra et al. 2011; Lee, 2004; Roh et al., 2015; UN, 2015).

Under natural disaster contingency, the SC is as strong as its weakest link. Primary, affected company needs to be resilient, in order to make entire SC resilient to such event. In the case of high uncertainty, internal integration becomes the main enhancer of the resilience (Christopher & Lee, 2004). Moreover, ethical practices in the leadership proliferate integration (Brown et al., 2005; Mayer et al., 2009) and may influence company to recover faster.

Based on this discussion, the study will examine the following research questions:

- Q1)** What is influencing SCRES?
- Q2)** How does ethical leadership influence SCRES?
- Q3)** How does internal integration influence SCRES?
- Q4)** How does ethical leadership influence SCRES through internal integration?

While addressing four research questions the study will utilize inductive research. To improve understanding of SCRES toward natural disasters and investigate its enhancing factors, the study employs exploratory, semi-constructed interviews. This enables the grasp of knowledge about resilience toward natural disasters, as well as integrating processes and leadership style that enhances resilience. Template thematisation approach is applied, where first set of codes was generated from the literature and the second set of codes emerged from the interviews.

FINDINGS

Preliminary results indicate existence of influence of ethical leadership on the SCRES with indication of internal integration importance for this effect. The interviewees dedicated significant attention to the description of the ethical leadership practices and explanation how application of these practices helped firms to bounce back faster and conduct recovering activities more efficiently. They also emphasized that ethical leader influences the level of internal integration, the way and intensity of communication on different levels of the company. Some of the outcomes of the ethical leadership were information exchange proliferation, common knowledge emerging and faster recovery of the firm and entire SC.

RESEARCH CONTRIBUTIONS

The present study contributes to existing research in a number of ways. First, theory building – improving our understanding of resilience and extending the nomological network to include SCRES in the case of natural disasters. Additionally, it applies the contingency theory to an area previously unexplored – SC research area.

This research will identify and explain the relationship between SC integration and SCRES, with specific contingency, hence it will contribute SC integration area. Furthermore, the research is bridging together research areas never combined before - leadership and operations, and SC, with a unique contingency in scope.

PRACTICAL CONTRIBUTIONS

The present study will identify important practices which company and entire SC might apply in order to become more resilient while facing natural disasters. The increasing number of the natural disasters, their unpredictable and uncontrollable nature, and financial consequences they are causing to global SCs, are making this research insights urgent for practitioners.

LIMITATIONS

Limitations of the study are present in the terms of study sample and study nature. This study included 23 in-depth semi-constructed interviewees and interviewees witnessed about 44 natural extreme events. While this enabled study to capture strong qualitative insights, it limited its generalisability in some manner. The future studies might include more cases in order to increase generalisability. In addition, this study has qualitative character and it identifies the presence of the relationship while leading to some implications of its nature. Therefore, it provides good foundation for the future research to test identified effects.

ORIGINALITY/VALUE

The existing research gaps and selected research design warrant the present study will provide an improved understanding of SCRES and comprehensive insights about relationships between SC integration, ethical leadership, and SCRES. The pioneering nature of the SC research that investigates resilience was additionally enlightened with novel approach that accounts for human factor, hence guarantying revolutionary insights in this research area.

KEYWORDS

Supply Chain Resilience, Natural Disasters, Ethical Leadership.

6.3 Omni-channel Shopper Behavior: Toward a Conceptual Model

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PURPOSE

The evolution of interactive media has made selling to the customers extremely complex in the modern digitalized retail environment. With the advent of personal computers, mobile phones and tablets, retailers are facing increasing challenges of integrating these new channels to provide their customers with a seamless experience. Customers' active presence in the social media platform has added another climax to the scene. This has prompted many retailers to engage in multiple-channel retailing strategies (Verhoef, Kannan, & Inman, 2015), where both online and offline offerings provide the shopper with holistic shopping experience built around customer-brand-channel interactions. This paper examines omni-channel shopper perceptions through an exploratory qualitative methodology. The customer interviews are content analysed which reveal deep and highly contextual information pertaining to research-shopper behaviour and influence of word-of-mouth. Results provide substantial academic value and deeper insights into the culturally and economically significant buyer behavior in Singapore, with distinct implications for omni-channel design strategy formulation for marketers.

DESIGN/METHODOLOGY/APPROACH

In order to answer the research questions, a conceptual model is proposed based on consumer discourse. An exploratory qualitative research design (Kerlinger, 1964; Creswell, 2013) is utilized to investigate significant variables that influence the omni-channel shopper behaviour. This study addresses the research questions through a social science theoretical lens based on a priori theories and employed as a series of logically related steps (Creswell, 2013) in the domain of multichannel consumer shopping behavior. This study employs non-probability sampling techniques, firstly, judgmental and then, snowballing procedure to select 12 participants for in-depth interviews from Singapore. Transcripts are then coded to context-specific meanings related to the research questions. For qualitative exploration based on thematic analysis, a directed design of content analysis is used (Hsieh & Shannon, 2005) to guide the initial coding and pattern of relationship between codes with the help of NVivo software. The process of reflexivity (Creswell, 2013) is adopted prior to analyzing the data to keep the analysis free from researchers' bias. The coding process employs open, axial, and selective coding (Strauss & Corbin, 1998). A conceptual model is then developed based on the identified factors and their inter-relationships.

FINDINGS

The omni-channel system earns benefits such as cost savings on expenses, sales growth, personalized communication, extended trust, the synergy of multiple channels, and better differentiation (Saghiri, Wilding, Mena, & Bourlakis, 2017). Therefore, it is of immense importance for marketers to have a comprehensive understanding of consumers' journey across channels that result in improved return on marketing investment. The current research employs a qualitative study and develops a contextualized conceptual model based on the findings of the content analysis. The result of content analysis of customer interviews revealed a set of five factors, namely variety, convenience, familiarity, image consciousness, convenience and one moderator that is word-of-mouth related to omni-channel

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shopping phenomena. Two of these factors were further classified into two sub-themes. Moreover, it is identified that the influence of word-of-mouth has a moderating effect on the inter-relationships of the factors that influence the research shopping behavior.

RESEARCH CONTRIBUTIONS

When consumers engage in shopping, it can range from having to fulfil their basic needs such as hunger to fulfil a more complex need such as self-esteem. In recent times, the introduction of online marketing channels has altered the retailing industry dramatically (Verhoef et al., 2015). The multichannel shopping environment, being facilitated by the digitalization, has evolved into omni-channel that allows for more freedom for consumers. The omni-channel platform presents a completely new shopping experience by allowing customers to shop across multiple channels using a variety of platforms in real-time. The freedom to shop across multiple channels has led to the free-riding shopping behaviour. This is a relatively new phenomenon in buyer behaviour which demands attention from academia (Lazaris, Vrechopoulos, Katerina, & Doukidis, 2014). Research shoppers' perception about omni-channel is an underexplored area that can contribute to the consumer behavior, retail distribution strategies, and strategic decisions relating to companies presence in the digital marketplace. Hence, the purpose of this study is to define its nature, characteristics, determinants, and dynamics in the Singaporean context and developing a conceptual model.

The findings of this study provide managers with a greater understanding of factors that influence consumers research shopper behavior, engage in omni-channel shopping with an especial emphasis on the role of word-of-mouth communication.

PRACTICAL CONTRIBUTIONS

The findings of this study provide managers with a greater understanding of factors that influence consumers research shopper behavior, engage in omni-channel shopping with an especial emphasis on the role of word-of-mouth communication. It is now recognized that such behaviour can potentially have a detrimental effect on a company's profitability. This information can help managers formulate strategies that would be congenial to develop a better partnership strategy for affiliate marketing, managing retail channels and mitigate the problems caused by consumers' engagement in multiple channels.

LIMITATIONS

This research is limited in its qualitative methodology and exploration of omni-channel shopping behaviour amongst a sample of predominantly highly-involved "research shoppers" in Singaporean context. In future, quantitative research focused on establishing descriptive information on these unique consumers and causal exploration of their decision-making process would be particularly fruitful. As identified increasing mainstream adoption and subsequent plurality of research shoppers, more robust segmentation of such shoppers would also provide significant value. Consideration of W-O-M's role as social instrument may be of empirical and practical importance.

ORIGINALITY/VALUE

Customers view interactions with the company as a single relationship that makes the omni-channel operation especially challenging for the marketers. Leveraging market advantage from the omni-channel marketing depends on syncing content across all the channels to build up integrated personalization and continuity of interactions with each and every customer.

KEYWORD: *Omni-channel, Research Shopping phenomena, Qualitative research*

Parallel session 7

7.1 Thoughts on the absence of deception in the literature on sustainability in corporate culture

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PURPOSE

Addressing sustainability is nowadays one of the keys to success for businesses in competitive markets. This has become more challenging in situations where multiple stakeholders have invested in individual outcomes, and thus it is nowhere more evident than in the area of supply chains. Moreover, as sustainability has become a mandatory part of supply chain strategies following pressures by governments, regulators, or end consumers on manufacturers and retailers to implement sustainable practices. Consumers, in particular those who enact a strong believe in their lifestyle with respect to sustainable practices, are being asked to trust supply chains being in line with their values when making a choice about products. Integrating sustainable business concepts in embedded organisational culture should respect the society, economy, and environment and discourage deception on a larger scale to harm any of these. Yet, recent events demonstrate the opposite. Dieselgate and Takata Airbags are just two examples where a small cohort in the supply chain seems to deceive the sustainable practices over a long period of time. In this contribution, we investigate the relationship between sustainable practices of an organisation and its culture and how it may encourage deception. It acts as a foundation stone for the discussion of how to detect and prevent deception in the future.

DESIGN/METHODOLOGY/APPROACH

Sustainable practice theories are applied to discuss the link between sustainable practices, corporate culture, and deception. The discussion is based on real-life examples demonstrating deception in the supply chain and its social or environmental impact.

FINDINGS

We argue that there exists a gap between claimed sustainable practices or culture for sustainability and actual impact of these practices on the triple bottom line. This gap may lead to deception. It is also suggested that social impact of deception such as threat to human life is more severe than environmental or economic impact.

RESEARCH CONTRIBUTIONS

This work is conceptual in nature with focus on contributing to the knowledge on supply chain sustainability supported by an extensive corporate culture. Here, we provide an initial review of the literature and pave the way for ongoing research by addressing the existing research gaps.

PRACTICAL CONTRIBUTIONS

In terms of the impact of deception, this contribution shows the effect on consumers when promises regarding their claims for sustainability are not fulfilled. We use two examples, namely Dieselgate and Takata Airbags, to demonstrate how the corporate culture is undermined by a small group with the aim to deceive either the regulatory body to ensure high customer satisfaction or being greedy for cost reduction over the safety of the customers.

LIMITATIONS

This contribution is conceptual in nature and is attempting to place the corporate culture in line with sustainable practices with the focus of avoiding deception. Explaining how deception can manifest in a strong corporate culture using the sustainable practice theory is providing the initial seed to establish focused research activities; yet the lack of insight in real-world supply chains prevents to fully encompass the cause for deception.

ORIGINALITY/VALUE

Although sustainability in supply chain has been discussed by researchers, there are still open questions such as the relation between sustainable practices and corporate culture with respect to how deception can manifest without detection. This paper promotes the use of a theory to initiate the research and find a solution to prevent deception in the future.

KEYWORDS

Sustainable practices, corporate culture, deception.

7.2 Financing the operations of social innovation projects through Crowdfunding

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PURPOSE

In order to operate social innovation projects or initiatives, financial resources are required, in the same manner that finances are required to operate commercial enterprises and projects (Bugg-Levine et al., 2012). However, many traditional funding sources, such as conventional bank loans, are less or not at all suitable to fund the operations of social innovation projects (Sunley & Pinch, 2012), as these tend to aim towards the solution of complex and wicked societal problems, rather than the development of profits or other financial outcomes (Mulgan et al., 2007). In line with developments in other fields like journalism (Aitamurto, 2011), research (Wheat et al., 2013) and commercial business (Hammoud et al., 2017), the concept of ‘tapping the crowd’ for funding (Belleflamme et al., 2014) is becoming increasingly prominent in the context of social innovation (Lehner, 2013; Hsueh et al., 2016). In simplified terms, crowdfunding refers to the process whereby private individuals (i.e. the ‘crowd’) provide small amounts of their own capital to specific projects, which collectively may result in substantial amounts of money available to the project initiators (Mollick, 2014). In many cases, the crowd do not require a financial return on their investment, and often do not even require any other rewards – they may be satisfied with small, intangible rewards (e.g. a thank you note) or simply the warm and fuzzy feeling of knowing that they have supported someone else’s project. The similarity between crowdfunding and the more traditional process of donating to charity is obvious.

RESEARCH APPROACH

This paper focuses on examining the funding of one-off social innovations, rather than traditional charities. The former are characterised by typical innovation traits, which also includes the fact that they are risky and complex, and their outcomes are typically uncertain and potentially unpredictable (Antadze & Westley, 2012). This paper will: present four examples from around the world that highlight how crowdfunding is creating a new landscape for the development and implementation of social innovation initiatives; explore the ways in which these case study projects are using crowdfunding to finance their project operations; and reflect on the implications that this new funding options can have for the financing of social innovation.

FINDINGS

The first project (Das, 2017), based in Indonesia and conducted by the University of Hawaii, addressed the growing social issues of low-paid, insecure employment and insufficient public transport infrastructure. The second project (Levis, 2017) was based in the United States, and was conducted by the University of Massachusetts. This project focused on assisting young people who come from low socio-economic backgrounds or ethnic minorities to transition into adulthood more successfully. The third project (Payne et al., 2017) was based in Burkina Faso, and was conducted by the University of Cambridge. This project was designed to address the ongoing societal issue of food shortages and lack of income sources in Africa through the development of edible insect farming businesses. The fourth and final project that this paper examines (Nwobilor & Aiguwuhuo, 2017) was conducted by the University of San Francisco, and was based in Nigeria. This project focused on the societal issue of equality for women in developing countries, and examined a variety of tools designed to improve entrepreneurial performance and opportunities for females living in poverty.

RESEARCH CONTRIBUTIONS

As Grimm et al. (2013) describe, all four of these campaigns take a contemporary societal challenge, and seek crowdfunding in order to be able to develop and implement a specific social innovation project with a view towards finding a solution. The case examples seek funding for various elements of their project operations, including: recruitment of human resources; purchasing of supplies to carry out research projects; production of reports of research findings; and the provision of training to researchers and/or research subjects/communities. Crowdfunding literature also suggests that the crowd can provide more than just financial capital (Macht, 2014). Although the four case examples provide limited evidence thereof, there is still evidence that ‘tapping the crowd’ can have other benefits for the social innovator: For instance, it is possible for funders to offer their time as additional research subjects (Das, 2017).

PRACTICAL CONTRIBUTIONS

The paper demonstrates that managers need to rethink the way that their business interacts with society. Specifically, managers should endeavour to capitalise on the growing segment of society that is willing to pay for entrepreneurial ventures that attempt to address social issues. In addition, managers should be making a conscious effort to ensure that they upskill themselves and their colleagues in digital competencies that will help them to access this segment.

LIMITATIONS

The study is exploratory in nature, and the findings presented will need further support from both quantitative and qualitative empirical studies. Additionally, only a small selection of social innovation projects are examined, as a broader selection did not fit within the scope of the study.

ORIGINALITY/VALUE

Literature in the area of crowdfunding is still in a state of emergence, and studies that specifically examine crowdfunding in the context of social innovation are even more uncommon. However, the research that does consider this specific application of crowdfunding unanimously shares the perspective that crowdfunding is an ideal platform for the development of social innovation initiatives (Lehner & Nicholls, 2013; Ashta et al., 2015). The projects described in this paper further underline this notion as they demonstrate the power that crowdfunding has as a key driver for social innovation by facilitating the raising of capital to fund the operations of social innovation projects.

KEYWORDS

Social Innovation; Crowdfunding; Project Operations

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7.3 Hybrid cargo airships – a new way of providing logistic support to bush firefighters

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PURPOSE

The aim of this paper is to review the potential use of the emerging generation of Hybrid Cargo Airships (HCAs) to provide logistic support for those engaged in combating bush fires – a form of natural disaster that impacts many thousands of people across Australia on an annual basis.

DESIGN/METHODOLOGY/APPROACH

This conceptual paper compares the potential of HCAs with existing approaches to conduct a variety of logistic tasks including the carriage/discharge of suppressants and/or retardants, the transport of firefighting equipment and/or personnel, and the provision of a flying operations room to oversee the firefighting activities.

FINDINGS

The paper concludes that, of the three generic logistic roles summarised above, the potential use of an HCA to provide a command/control function is the most promising given the ability of the emerging generation of suitably equipped platforms to remain in the vicinity of the fire ground on a 24 hour basis for some seven days and undertake both visual and photographic (regular and infra-red) analysis of the fire's progress and the activities of those fighting it.

RESEARCH CONTRIBUTIONS

Given that the first generation of HCAs is approaching operational status, the research offers a timely consideration of their potential employment in support of a major cause of natural disasters in both Australia and many other countries.

PRACTICAL CONTRIBUTIONS

Whilst the paper focuses specifically on the potential use of HCAs to provide logistic support to firefighters, a similar approach could be utilised by humanitarian logisticians responding to other disasters such as earthquakes and cyclones.

LIMITATIONS

Given the paucity of publicly available data, the analysis, and in particular its financial component, inevitably reflects a degree of estimation that will require re-visiting as the operation of HCAs and their associated costs becomes clearer.

ORIGINALITY/VALUE

This paper is believed to be the first that considers the potential use of HCAs to provide logistic support to the operations of firefighters. As such, whilst providing an initial assessment of the benefits and challenges of such an approach, it also offers a number of areas where further research and development is perceived to be of value.

KEYWORDS

Humanitarian Logistics, Hybrid Cargo Airships, Bush Fires

7.4 The initiation and development of sustainable innovation: An absorptive capacity perspective

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PURPOSE

Sustainable innovation is an outcome of organisational processes through which environmental, social, and economic values of sustainability are successfully integrated into a firm's supply chain. Sustainable innovation is an 'inside-out' approach as the potential benefits of sustainable innovation go beyond conventional organisational boundaries and embrace a broader environmental and societal context. Yet, despite the importance of sustainable innovation, the knowledge of how firms initiate and develop such innovation is rudimentary. Prior research has focused predominantly on the role of a firm's stakeholders or strategic view of the world, in facilitating the uptake of such innovation. These allow firms to increase their exposure to sustainable innovation, but do little to resolve internal barriers to its adoption. Sustainable innovation is often without precedent for the firm in form or function. Thus bridging the gap from outside-information to inside-acceptance is a key challenge for firms as such; managers in particular may play an important role in the process of acquiring, assimilating, and developing sustainable innovation. Their capacity however to achieve this and to further motivate internal processes to accommodate such innovation, is unknown. Firms may use various methods to identify sustainable innovation from the external environment yet they still require a process through which they may internalise such information and fully exploit its potential. As we propose, this requires a key actor and a process for bringing the 'outside-in' that can encompass the multi-domain nature of sustainable innovation. For these reasons, we draw on absorptive capacity to explore the adoption process for SOI and examine the degree to which managers act within and outside of the firm to acquire and assimilate innovative ideas and turn them into environmentally and socially friendly products and services.

DESIGN/METHODOLOGY/APPROACH

We used a qualitative research design to obtain an in-depth understanding of the roles of managers and the degree to which they help firms initiate and develop SOI. We followed an inductive approach because this approach is helpful in a situation where there is limited theory and on problems without clear answers. We targeted directors and managers in Australia and the USA to ensure exposure to international meanings for SOI and explore the complexity and diversity of SOI phenomenon within different regions. We only targeted large and medium-sized firms across different industries due to the unique characteristics of small firms. In total, we collected 40 semi-structured interviews (n=40) as we obtained sufficient sample sizes to reach data saturation. Moreover, we used template analysis and NVivo to analyse the interview data and develop codes within, between, and across the dataset.

FINDINGS

We found that managers as enablers and facilitators are moving on a continuum between proactivism and pragmatism to initiate and develop sustainable innovation. We identified organisational processes

and routines that increase managerial abilities to acquire and assimilate environmental and social values and turn the values into commercialised outcomes.

RESEARCH CONTRIBUTIONS

First, we extended the knowledge of ACAP into the sustainable innovation literature by examining the roles of managers and the extent to which they help firms acquire and assimilate sustainability ideas and turn those ideas into sustainable outcomes. Second, we advanced ACAP theoretical perspectives by integrating the micro-foundations of individual learning and intra-organisational factors. Third, we extended the champion and innovation literature by identifying the enabler and facilitator roles of managers.

PRACTICAL CONTRIBUTIONS

This study provides significant insights for managers and firms on the key skills and approaches necessary to facilitate the development of sustainable innovation.

LIMITATIONS

One of the limitations our study is empirical generalisation. We adopted a qualitative research design and explored SOI development within Australia and U.S.A. regions that limits statistical generalisability of the findings. As a result, it provides only analytical generalisation that can be applied to other settings

KEYWORDS

Sustainable innovation, absorptive capacity, managerial roles

Parallel Session 8

8.1 Food waste: An extensive literature review on causes-consequences

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PURPOSE

In the past few years, an increasing number of studies have examined the causes behind food waste/loss either throughout the food supply chain or in a specific sector. Also, studies have explored the impact of the food waste on economy, society and environment (triple bottom line). Nonetheless, systematic synthesis of the existing studies is missing. Therefore, the purpose of this article is to undertake a state-of-art literature review on the 'causes and consequences' of food waste/loss and highlight the future study area. A recent FUSION study identified that to address the food waste issue, knowledge about different drivers behind food waste and impacts of food waste on triple bottom is important (Vittuari et al., 2016). Therefore, the main research questions of this study are:

What is the current state of research on the causes/consequences of global food waste?

What are the key themes for future studies emerging from the current research?

DESIGN/METHODOLOGY/APPROACH

A systematic literature review was used. The main steps that were followed in this literature review: a) development of research questions; b) search through the databases for locating the articles; c) selection and exclusion of suitable/unsuitable articles; d) analysing the articles; and e) discussions of the findings. A total 90 articles matched our selection criteria.

FINDINGS

Reports published by different governments or NGO are quite high in number (18). Resources, Conservation & Recycling is the journal published majority of the articles (15), followed by The Journal of Cleaner Production (13) and Waste Management (13). Other journals also published one or two articles on this topic. Existing studies used case study (20) and surveys (17) extensively. Other common methods were secondary data analysis and expert interviews. In terms of the location, European (17) focused studies were more in number than other location. The next significant location was global (14) followed by UK only (11) and Sweden (7) based studies. Out of 90 papers, 51 papers have discussions about the consequences or impacts of food waste. Regarding the consequences 21 papers focused on all three dimensions, followed by only economic (13) and environmental (14) consequences. Social consequences (3) were less explored. Regarding the stages in supply chain, 34 papers focused on household sector, 20 papers focused on the retail sector and 29 papers explored the food waste from the whole food supply chain. Only 1 study explored the agriculture/production sector, 2 studies explored transport/distribution sector, 4 studies explored commercial & industrial sector to identify the food waste causes/consequences.

RESEARCH CONTRIBUTIONS

First, the literature search reveals that studies are not equally distributed across all stages in the food supply chain. Specifically, the under-researched area includes transport of raw materials from agricultural producers to manufacturers and the finished products from manufacturers to distributors or retailers. Second, in the existing study a lack of information from the developing countries was found. Third, the extant research on food waste used diverse range of data collection strategy, research methodologies and definitions of food waste. Hence, it is hard to compare the findings across the studies and understand the causes/consequences of food waste. Fourth, the search reveals that there is a sufficient opportunity for future studies to explore: 1) social impacts thoroughly; and 2) environmental and economic impacts with other parameters. Finally, it is found through the literature review that the popular theory has been Theory of Planned Behaviour to explore the customer related food waste. There is an opportunity to explore other theories in relation to food waste.

PRACTICAL CONTRIBUTIONS

The implications of this research are for various stakeholders. For developing countries, the focus should be given to the producers and farmers and for the developed countries, the emphasis should be given to the consumers first, followed by retailers. In addition, the findings can help governments to develop policies to handle food waste throughout the food supply chain. Our findings can help all the stakeholders to achieve United Nations' Sustainable Development Goal to 'halve per capita food waste at the retail and consumer level by 2030, and reduce food losses along production and supply chains, including post-harvest losses' (Raak et al., 2017, UN, 2013).

LIMITATIONS

The topic is very broad, and several articles have been published in different types of outlets. Since, we only focused on the peer reviewed journals and widely referenced reports, we had to remove several articles from our final list. In this process, we may have removed some relevant articles too.

ORIGINALITY/VALUE

There has been a lot of studies on food waste from diverse perspectives. There have been a few literature reviews too. However, this research is different from the existing ones since this research has been done from the supply chain perspective and focusing on the causes and consequences of the food waste. Also, unlike the existing studies, this study focuses on the whole food supply chain.

KEYWORDS (only provide 3)

Food Supply Chain, Food Waste, Literature Review

8.2 Social innovations reducing waste in food supply chains: Food rescue in Australia

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PURPOSE Food rescue is the term used to describe a component of the global food supply chain dedicated to collection of food unable to be sold in retail markets and its redistribution to needy individuals. The paper reviews food rescue supply chains in Australia.

APPROACH

Food waste emerges from numerous sources in the intricate web of integrated supply chains forming the global human food system (Pearson et al., 2017). The food waste reduction hierarchy provides a structured approach to dealing with this surplus. In order of most to least preferred options are reduce, rescue, transform and dispose.

Social innovations aim to make the world a better place through seeking to have a positive social impact by empowering individuals and helping communities to thrive (Pol and Ville, 2009). Not-For-Profit agencies dominate the food rescue industry, all seeking to have a positive social impact. In 2017 food rescue agencies provided food for around 100 million meals (Foodbank 63 million, SecondBite 20 million, OzHarvest 17.1 million, FareShare 1.16 million. Information from agency websites).

Contributions from social innovations could be at one or more of four levels as identified by the Impact Spectrum (Kim, 2015). All food rescue agencies previously mentioned are making a significant contribution through the first two levels. These being Direct Service provided in local communities and further contributions in Scaled Direct Services in State capital cities and a few of the larger regional cities. However, their contribution at the next two levels of Systems Change and Framework Change, which would require both reduction in food waste and eradication of human hunger, is minimal, and emerges from their limited policy and advocacy activities.

Main stakeholders along the food rescue supply chain are food donor, food rescue agency, food relief provider, and food recipient. Their characteristics are:

- Food donors do not receive payments, hence incentives are limited to reducing waste disposal costs and potential Corporate Social Responsibility benefits. Most donated products are on the cusp of spoiling, whilst some have other non-food safety faults such as damage or incorrect product labelling.
- Food rescue agencies have responsibility for collection of food from the donors, its storage and redistribution to food relief providers. These agencies rely on financial donations, fundraising, sponsorships, government grants, and voluntary labour (Booth and Whelan, 2014).

- Food relief providers collect or receives food from the food rescue agencies, with no or minimal payment. A relatively small number of food rescue agencies supply a much larger number of food relief providers. For example, the largest food rescue agency distributes to 2,600 providers (<https://www.foodbank.org.au/>).
- Food recipient receives free or heavily subsidised food from the food relief provider.
- To meet needs of hungry individuals an estimated 60% increase (60 million meals per year) in amount of food rescued is needed (Derived from figures provided by Foodbank <https://www.foodbank.org.au/>).

Features of rescued food:

- Most donated food has a short shelf life, and much requires refrigerated transport and storage as it is perishable.
- Donated food emerges in a 'surprise chain' where product, amount, and location vary on a daily basis.

Existing food rescue supply chains see food rescue agencies tending to embrace one of three distinctly different models:

- Centralised hub warehouse with transport spokes. Minimum donations are one pallet (a full pallet could carry up to 1,000 kg of food). Food relief agency collects from food donor. The food relief provider collects from the warehouse. Food donors are usually wholesalers, distribution centres, and manufactures.
- Established collection and drop-off routes. Refrigerated van with 1,000 kg load capacity undertaking run encompassing 4-6 collections from regular donors prior to drop off at food relief provider who has direct contact with food recipients.. Food in packed in folding plastic crates with 20 kg capacity.. Food donors are typically supermarkets, food service outlets, and event caterers.
- Meal preparation. Collection of food from either previously mentioned methods for preparation into ready-to-eat meals for distribution to food recipients by food relief provider. This may include commercial size kitchen.

FINDINGS The three models of food rescue supply chains appear to be a historical evolution blending logistical issues associated with physical transport of food, environmental sustainability associated with reducing food waste, and welfare considerations associated with feeding hungry people.

CONTRIBUTIONS The next generation of social innovations are likely to identify opportunities emerging from application of new technologies, such as real-time communications between stakeholders in the food rescue 'surprise chain.'

LIMITATIONS It is also relevant to note the food rescue industry is not without its critics. Key amongst these are that it does not address the underlying structural causes of hunger and the potential self-interest in continuation of organisations involved in it.

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KEYWORDS Supply chain, social innovation, food rescue.

8.3 Sustainable Inventory Optimization for Fresh Food Supply Chains

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PURPOSE

The world's total energy, for the most part, is consumed in the form of electricity by the industry sector. The increase in electricity price, on one hand, and environmental concerns, on the other hand, have urged managers and decision makers to rethink about the operation of their organization with a sustainability-based view.

In this research, we study how to reduce energy cost and food loss in the inventory stage of fresh food supply chains (FFSC) from the sustainable operation management (SOM) standpoint. SOM is established by concepts such as energy conservation, environment protection, waste prevention, products' value addition, to name a few. Our approach to averting waste of energy and food, and subsequently carbon emissions of industrial activities, is to manage inventory not only by controlling the inventory flow, but also the active number, setup and operation of storage rooms. One challenge of this study is dealing with fresh food products, whose quality degrades at a fixed rate during storage by the passage of time. Taking this feature into account while managing the inventory can result in a more realistic outcome.

DESIGN/METHODOLOGY/APPROACH

There exist different technologies for storage of fresh foods, such as fruits and vegetables. One of the most significant innovations to store a wide range of fruits and vegetables is controlled atmosphere (CA) storage system, as atmosphere regulations in the storage have a noticeable impact on the quality of fruits. In regular atmosphere (RA) storage, only temperature and humidity are under control, while in CA storage apart from temperature and humidity, other atmosphere elements, such as oxygen and carbon dioxide levels are also adjusted. Therefore, food deterioration is slowed down by using CA storage. In other words, food losses happen with a lower rate in CA storage than in RA. Another advantage of using CA storage is that it incurs less electricity cost. It is justified by the fact that CA storage rooms are closed and there is no fruit flow and less interaction with the outside. However, the rooms are open in RA storage and there can be input to, and output from them. Therefore, while using CA storage seems more efficient (as it produces less fruit loss and consumes less electricity), it cannot satisfy the demand. From the operational point of view, a storage room is active (on) at most once. That is, it is turned on at the time of the first fruit input and is turned off when all fruits are depleted. A storage room can switch its state between RA and CA storages. Obviously, a storage room is in RA state at the beginning, since it has fruit input. If it switches to CA state, it may stay in CA until the end or switches once again to RA state to satisfy the demand.

This research presents a multi-product mixed integer linear programming (MILP) model to manage the inventory stage of FFSCs using CA and RA storage technologies from the sustainability point of view by optimizing inventory flow, the active number of storage rooms, operational length and state of storage rooms (RA/CA), while satisfying the demand. The objective function of the model is to minimize total

inventory costs consisting of handling cost, electricity cost, setup cost when a storage room starts to operate, and food loss penalty costs.

FINDINGS

Findings show how the practitioners working in the FFSCs can minimize the total inventory costs by determining set up and operation of storage rooms, and therefore support sustainable development.

RESEARCH CONTRIBUTIONS

The contribution of this research is a new MILP model for FFSCs which investigates the number of active storage rooms, when to turn them on/off and when to switch their state from RA to CA or vice versa to save energy. At the same time, these measures, besides controlling the inventory flow, causes food loss reduction.

PRACTICAL CONTRIBUTIONS

We propose the first MILP model in the literature that can assist in designing sustainable inventory control for apple supply chains in Australia. The model is multi-product, contains option for changing the type of one particular storage room during the planning time horizon, and considers deterioration of fruits over storage. It is tested with real data sets collected from an apple industry in Australia by using Gurobi solver 7.0.

LIMITATIONS

This research is based on evidence from the apple industry in Australia. So, future studies can investigate other fruit industries in different locations.

ORIGINALITY/VALUE

The traditional inventory control models do not consider energy expenditures and environmental impacts in the objective function, and do not make decisions on the setup and operation of storage rooms. Therefore, the proposed model can be used as a novel tool by managers and stakeholders of all fresh food supply chain, especially those using CA storage technology, to move toward the sustainable development.

KEYWORDS (only provide 3)

Sustainable inventory control, Fresh food supply chain, Energy saving

8.4 The Performance of the Contract Rice Farming in the Mekong Delta: Insights from and Agent-based Model

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PURPOSE

The purpose of the research is to investigate into the performance of the contract farming scheme under the context of the Mekong Delta' (MKD) rice supply chain in Vietnam. There are three main obstacles to the expansion of the contract rice farming scheme in the region. Firstly, many rice contractors failed to build trust and invest in long-term relationships with the smallholder farmers. Secondly, several studies revealed that low prices offered from paddy contracts lead to a low rate of participation as well as high rates of breaches from the farmers. Thirdly, the opportunities for the contractual relationship are also limited to the enterprises who are not equipped with required rice processing capacity.

DESIGN/METHODOLOGY/APPROACH

We implemented agent-based modeling (ABM), a discrete-event simulation framework that allows a bottom-up approach to model how individuals or human make decisions in a complex system. ABM is a well-suited technique and has been gaining popularity in the research field of agricultural supply chain management and agricultural policy analysis. Both contractor and farmer make decisions based on the preference rankings, which are expressed in scores. The score is calculated on the utility and adaptive trust that the two parties have in each other. At the end of each crop, the farmer updates their trust in the partners through communication with the neighbourhood. The contractor also adjusts their targeted rice demand for the following crop based on the performance of their contract farming scheme in the prior crops. The contract farming simulation runs separately with two rice varieties, including low-value ordinary rice and high-value jasmine rice. We then evaluated the performances of the contract farming in the MKD region with the different combination of scenarios related to the three existing problems, which are represented from the perspective of the contractors.

FINDINGS

Our results firstly show that fully-equipped contractors who opportunistically breach a relatively small proportion (less than 10%) of contracted farmers in most of the scenarios outperform the spot market-based contractors in terms of profit average achieved each crop. Secondly, the committed contractors, who offer lower purchasing prices than the most typical rate, obtain better earnings per ton of rice as well as higher profit per crop. However, those contractors in both cases could not enlarge their contract farming scheme since their offers are unable to compete with the benefits from the competitor or the spot market. Thirdly, the study results are also in agreement with the existing literature that the contract farming scheme is not a cost-effective method for the large buyers with limited rice processing capacity, which is a common situation among the contractors in the MKD region.

RESEARCH CONTRIBUTIONS

We presented a generic contract farming model in the context of the agricultural supply chain with the use of agent-based modeling. The decision-making process is based on two most critical factors: economic incentive and the role of trust. The general context is designed to have the competition of contractors and the introduction of a spot market in which both parties can break the contract. The opportunistic behaviours are induced by the volatile nature of the trading prices in the agricultural supply chain. The generic agent-based contract farming model could be applied to different contexts, regions, and agro-produce.

PRACTICAL CONTRIBUTIONS

The contract rice farming model in the MKD region serves as the basis to evaluate enabling policies from the Government and local authorities related to the contract rice farming scheme. Different activities including the Government's land consolidation programme and the support from farmer organization into the emergence of a large-scale paddy field will be assessed to maintain a sustainable contract farming model and improve the livelihood of millions of smallholder farmers in the MKD region.

LIMITATIONS

Most of the data were taken from An Giang province, which is considered the best scenario in the context. Relevant data in different locations should be collected to properly assess the performance the contract farming scheme in the MKD region.

ORIGINALITY/VALUE

The research examines three existing obstacles in the expansion of the contract rice farming in the MKD region with the use of agent-based modeling. The simulation results are consistent with the current literature. They also provide important insights that incentive of building trust-based relationship and sufficiency of rice processing capacity are necessary for the contractors to implement a viable and sustainable contracting program in the region.

KEYWORDS

Agent-based modeling, contract farming, agricultural supply chain