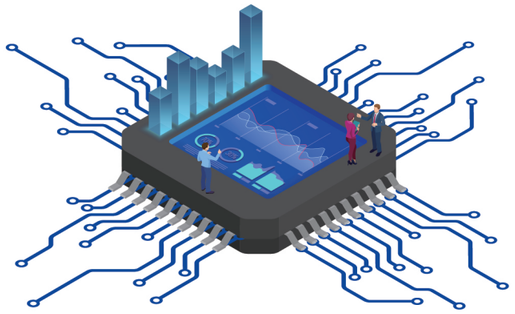
The 18th Korea–China Quality Symposium

The 4th Industrial Revolution and New Sustainable Quality and Productivity



The 18th Korea–China Quality Symposium

The 4th Industrial Revolution and New Sustainable Quality and Productivity

August 23–25, 2019

INCHEON NATIONAL UNIVERISTY, INCHEON, KOREA

National Research Foundation of Korea

国家自然科学基金委员会 National Natural Science Foundation of China

INCHEON NATIONAL UNIVERSITY

Incheon Tourism Organization

Contents

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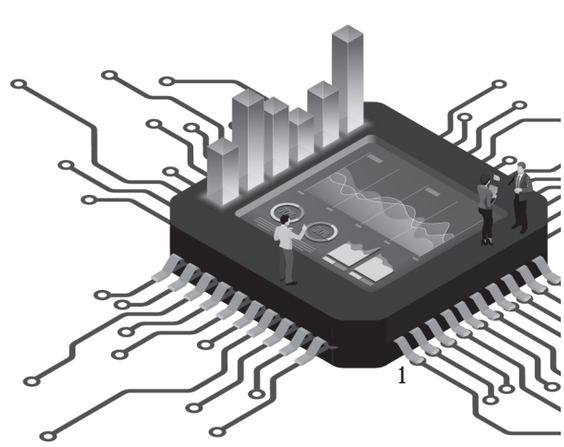


Symposium Program

Friday 23 August 2019
2019年 8月 23日 星期五

13:30 ~ 14:00	Arrival at HOTEL SKYPARK INCHEON, SONGDO
18:00 - 22:00	Diner at the 6th floor (Smooty Cookery, Hotel Skypark)

Saturday 24 August 2019
2019年 8月 24日 星期六

06:00 - 08:00	Breakfast Buffet at the 6th floor(Smooty Cookery, Hotel Skypark)
08:30 - 08:50	Gather in front of Hotel Lobby and Take a shuttle bus to INU
08:00 - 09:00	Registration at INCHEON NATIONAl UNIVERSITY Convention Center Building
09:00 - 09:30	The 18th Korea-China Quality Symposium Opening Ceremony
09:30 - 10:00	The 2nd Asia Quality Award(AQA) Ceremony President Bong-Hyun Nam, Incheon Port Authority
10:00 - 10:30	Group Photo Taking and Tea Break
10:30 - 12:00	Keynote Speech I: Environmental Efficiency in Transportation Professor Young-Tae Chang, Inha University Keynote Speech II: Advances in Two-Dimensional Warranty Data Analysis and Warranty Policy Design Professor Shuguang HE, Tianjin University
12:00 - 13:30	Lunch (Korean Restaurant, Chungdam Songdo) All participants take a shuttle bus to Korean Restaurant

13:30 - 15:10	INCHEON NATIONAl UNIVERSITY Convention Center Building				
	A1 (Room 503) (5 Papers) e-Commerce Paltform I	B1 (Room 504) (5 Papers) Quality Management	C1 (Room 505) (5 Papers) Quality Control I	D1 (Room 506) (5 Papers) Quality Engineering	E1 (Room 507) (5 papers) Supply Chain Management and Service I
15:10 - 15:30	Tea Break				
15:30-17:10	INCHEON NATIONAl UNIVERSITY Convention Center Building				
	A2 (Room 503) (5 Papers) e-Commerce Platform II	B2 (Room 504) (5 Papers) Service Qaulity	C2 (Room 505) (5 Papers) Quality Control II	D2 (Room 506) (5 Papers) Quality Control III	E2 (Room 507) (5 papers) Supply Chain Management and Service II
17:30-21:00	Banquet (Chinese Restaurant, Shangchai)				
	Venue: Faculty Office Building (3rd Floor)				
21:30	Take Shuttle Bus to Hotel SkyPark				

Sunday 25 August 2019
2019年 8月 25日 星期日

06:00 - 08:30	Breakfast Buffet at the 6th floor(Smooty Cookery, Hotel Skypark)
08:50 – 09:00	Gather at the lobby of Hotel Skypark
09:00 – 18:00	Technical Tour for Chinese Participants

Keynote Speech I

Environmental Efficiency in Transportation

Young-Tae Chang
Professor
Inha University, Korea

Abstract:

This presentation is to show various economic and environmental efficiency studies applied to transportation sectors as it is important to revisit the efficiency from an environmental perspective. The speaker will present important issues, new methodologies to address the issues and major findings. Specifically it will address various methodology issues such as: (1) radial vs. non-radial assumptions; (2) strong vs. weak disposability; (3) intertemporal changes and related pooled frontier vs. sequential frontiers; (4) impact of compliance with green regulations on efficiency; (5) sampling bias inherent from data generating process and overcoming methods by bootstrapping; (6) secondary efficiency determinant regression models between tobit and bootstrapped truncated regressions; and (7) single run model vs. centralized DEA model. The issues and corresponding models are discussed by presenting the applications of the models in various transportation sectors including maritime, air and land transportation.

Short Bio:

Dr. Young-Tae (YT) Chang is Inha Fellow Professor (University Chair Professor) at Graduate School of Logistics and also at Asia Pacific School of Logistics, Inha University in Incheon, Korea. Prior to working at Inha University, he worked for the Korea Ocean Institute of Science and Technology (formerly Korea Ocean Research and Development Institute) and the Korea Maritime Institute for about twenty years. He is a past President of Korea Port Economic Association. He was Visiting Professor at the University of Rhode Island in USA and visits the Australian Maritime College at the University of Tasmania as an Adjunct Professor on regular basis as well as Nanyang Technological University in Singapore as MPA Visiting Professor and the World Maritime University in Sweden as Visiting Professor. He has been key-note speakers and invited speakers in numerous places in the world. He publishes and reviews papers in numerous discipline areas including transportation and logistics.

Keynote Speech II

Advances in Two-Dimensional Warranty Data Analysis and Warranty Policy Design

Shuguang HE
Professor
Tianjin University, China

Abstract:

After-sales service and warranty are becoming more and more important for durable products. We are doing a research supported by NSFC between 2016 and 2020. In this presentation, so of the advances of this project will be introduced. There are three topics included: 1) Two-dimensional warranty data analysis and field reliability modeling, such as model parameters estimation considering the censored and incomplete two-dimensional warranty data. 2) Two-dimensional warranty policy design by maximizing the profit of manufacturers considering the warranty cost related to failures and boosted demand of warranty policy. 3) An application of the proposed methods in a company of China. Finally, some new topics might be interesting are discussed.

Short Bio:

Shuguang He, Ph.D. and Professor with College of Management & Economics, Tianjin University. He got his M.S. degree and Ph.D. degree from Tianjin University in field of Management Information Systems and Industrial Engineering. His research interests include quality management and quality engineering, warranty management and reliability, information systems and machine learning. He has finished several projects granted by National Natural Science Foundation of China (NSFC) and published about 50 academic papers. Some of the papers have appeared in journals like Journal of Quality Technology, International Journal of Production Research, Computers & Industrial Engineering, etc. In recent year, his research focuses in the field of warranty data analysis, warranty claims monitoring, two-dimensional warranty policy design.

Panel Sessions

A1 e-Commerce Platform I (13:30 ~ 15:10)

Convention Center Room 503

Chair Person: Prof. Decheng WEN

A1-1	13:30-13:50	Research on the Development of Cross-border B2B E-commerce in Henan Province Chang Guangshu and Sun Mingmeng Zhengzhou University of Aeronautics
A1-2	13:50-14:10	An Empirical Study on Affecting Factors of Continued Use of Mobile Easy Payment Service Junsung Park, Jaehyeon Jun, Jong Ho Lee, JoonWoo Yoo, and Heejun Park Yonsei University
A1-3	14:10-14:30	Quality Control Game with Risk Attitudes of Platform and Seller in Online Shopping Under Government Regulation Decheng Wen, Dongwei Yan, and Xiaojing Sun School of Management, Shandong University
A1-4	14:30-14:50	When Should Stars and eWOM be Responsible for the Box Office Performance? – An Empirical Study Based on Signaling Theory Liu Fan, Xiaoping Zhang, and Laxmisha RAI Shandong University of Science and Technology
A1-5	14:50-15:10	Adopting Expectation Confirmation Model and Concept of Inertia on Understanding Mobile Payment Service Continuous Use Intention Jong Ho Lee, Jaehyeon Jun, Junsung Park, JoonWoo Yoo, and Heejun Park Yonsei Univeristy

Panel Sessions

A2 e-Commerce Platform II (15:30 ~ 17:10)

Convention Center Room 503
Chair Person: Prof. Taegu KIM

A2-1	15:30-15:50	Analysis on Influential Factors in International Tourism Demand: Focusing on characteristics of Package Tour compared to the total Suyeon KIM and Taegu KIM Hanbat National University
A2-2	15:50-16:10	Supervision on the Collusion between Internet Platform and Third-party Based on Prospect Theory Liu Fan[a], Yichen Wang[a], and Xinmin Liu[b] [a]Shandong University of Science and Technology, [b]Qingdao Agricultural University
A2-3	16:10-16:30	Measuring Customer Perceived Value Considering Targets of Product Attributes Xinwei Zhang[a*], Yujian Qu[a], Hakki Eres[b], and Shurong Tong[a] [a]Northwestern Polytechnical University, [b]University of Southampton
A2-4	16:30-16:50	Analysis of 6th Industry promotion Business by City and County in Korea Sung-Uk LIM and ChangHwa Baek Daejin University
A2-5	16:50-17:10	Identification of Mobile Phone End of Life Stakeholders and Sustainability Requirements Analysis Keqin Wang, Shuai Zhang, Jing Li, Xinwei Zhang, and Shurong Tong Northwestern Polytechnical University

Panel Sessions

B1 Quality Management (13:30 ~ 15:10)

Convention Center Room 504
Chair Person: Prof. Min ZHANG

B1-1	13:30-13:50	Data Platforms and Their Quality Management in the 4th Industrial Revolution Era Sung Hyun PARK Seoul National University
B1-2	13:50-14:10	A Study Quality Definition of 4th Industrial Revolution Sangbok Ree Seokyeong University
B1-3	14:10-14:30	China Quality Award and the Market Value of the Firm Min Zhang, Wende Zhang, Qingmei Tan, and Liping Fu Tianjin University
B1-4	14:30-14:50	Open Quality – A New Quality Innovation Framework for the Era of Industry 4.0 WanSeon SHIN, Shujaat Ali, Hojun SONG, and Jeong Han Hwan Sungkyunkwan University
B1-5	14:50-15:10	The Spectrum of Servitization as a Solution to The Customer Needs Yong YOON and Younsung KIM Inha University

Panel Sessions

B2 Service Quality (15:30 ~ 17:10)

Convention Center Room 504
Chair Persons: Prof. Qiang SU

B2-1	15:30-15:50	The risk factors and characteristics of pressure injury in hospitalized patients Qing Li [a], Qiang Su[a], Ying Lin[b], Guoying Deng[b], and Qiugen Wang[b] [a]Tongji University, [b]Shanghai Jiaotong University
B2-2	15:50-16:10	Medical service design for the outpatient treatment with TQC Sangchan PARK and Minjae KO Kyunghee University
B2-3	16:10-16:30	An Integrated Approach for Evaluating Hospital Service Quality with Linguistic Preferences Xiaobing Li[a] and Zhen He[b] [a]Dongbei University of Finance and Economics, [b]Tianjin University
B2-4	16:30-16:50	Will consumer sacrifice privacy for convenience? Focusing on personal information sharing on the e-commerce platform Li Wang and SungMin BAE Hanbat National University
B2-5	16:50-17:10	Societal Expectations and Concerns on Corporate Sustainability Quality in China: Big data and Survey Analysis Haiyun Zang and Su-yol LEE Chonnam National University

Panel Sessions

C1 Quality Control I (13:30 ~ 15:10)

Convention Center Room 505
Chair Person: Prof. Uk JUNG

C1-1	13:30-13:50	A CUSUM Control Scheme for Wiener Processes Liping Liu and Mengmeng Zhan Nanjing Normal University
C1-2	13:50-14:10	Nonlinear Profile Data Monitoring Method based On Lifting Wavelet and SVDD Yu min Liu, Fang cheng Wang, Hong can li, and Zhe yun Zhao Zhengzhou University
C1-3	14:10-14:30	Categorical Context-based Geodesic Distance for Clustering Categorical Data Changki Lee and Uk Jung Dongguk University
C1-4	14:30-14:50	A SPC Control Chart for Monitoring Positive Event Liang Qu Tianjin University
C1-5	14:50-15:10	Game Research on Safety Supervision of Online Catering Food: Under the Impact of Government Regulation and Word-of-Mouth Communication Effect Xiaojing Sun[a], Decheng Wen[a], Dongwei Yan[a], and Jie Lv[b] [a]Shandong University, [b]University of Jinan

Panel Sessions

C2 Quality Control II (15:30 ~ 17:10)

Convention Center Room 505
Chair Person: Prof. Jing SUN

C2-1	15:30-15:50	Consideration on Monitoring Mixed Data Variables Jing SUN and Arthur Yeh Tsinghua University
C2-2	15:50-16:10	The Robustified S-chart Haewon Kim[a], Tyasha WarnaValinda[a], Linhan Ouyang[b], and Chanseok Park[a] [a]Pusan National Univeristy, [b] Nanjing University of Aeronautics and Astron autics
C2-3	16:10-16:30	Identification the Key Quality Characteristics in Multistage Series-Parallel Manufacturing Process based On Iada-Lasso Wang Ning[a], Zhang Shuai[a], Yang Jianfeng[a], Wang Haiyu[a], and Cui Qingan[b] [a]Zhengzhou University, [b]Shanghai Maritime University
C2-4	16:30-16:50	Multiresponse Optimization Using a Reinforcement Learning a Method Dong-Hee LEE and Eun-Su KIM Hanyang University
C2-5	16:50-17:10	Residual Based MEWMA Control Chart for Monitoring Multivariate Autocorrelation Process with Variable Sampling Intervals Li Xue[a,b] and Zhen He[a] [a]Tianjin University, [b]Zhengzhou University of Aeronautics

Panel Sessions

D1 Quality Engineering (13:30 ~ 15:10)

Convention Center Room 506
Chair Person: Prof. Jai-Hyun BYUN

D1-1	13:30-13:50	A New Product Quality Supervision Model of Random Inspection KONG Qing-shan, ZHANG Qin, and WEN De-cheng Shandong University
D1-2	13:50-14:10	Integration of the Variance of Quadratic Loss for Evaluating Process Performance Jai-Hyun BYUN[a], Yanjing ZHANG[b], Yizhong MA[b], and Chanseok PARK[c] [a]Gyeongsang National University, [b]Nanjing University of Science and Technology, [c]Pusan National University
D1-3	14:10-14:30	A Decision Support Model for Risk Management of Hazardous Materials Road Transportation Based on Quality Function Deployment Yan-Lai Li[a], Qiang Yang[a], and Kwai-Sang Chin[b] [a]Southwest Jiaotong University, [b]City University of Hong Kong
D1-4	14:30-14:50	Evaluation of User Experience using a Virtual Reality Model: The Case of FOLED Chevron Alignment Sign Do-Hyeon Ryu[a], Ki-Hun Kim[a], Min-Gi Kim[a], Kwang-Jae Kim[a], Min-Sun Kim[b], Jung-Min Yun[b], and Jeongsam Yang[c] [a]POSTECH, [b]KITECH, [c]Ajou University
D1-5	14:50-15:10	Detection and Classification of Spatial Patterns in Semiconductor Wafer Bin Maps: A Review of Recent Literatures Seung-Hyun Choi[a], Chang-Ho Lee[a], Dong-Hee Lee[b], and Kwang-Jae Kim[a] [a]POSTECH, [b]Hanyang University

Panel Sessions

D2 Quality Control III (15:30 ~ 17:10)

Convention Center Room 506

Chair Persons: Prof. Wei Jiang

D2-1	15:30-15:50	An Approach to Discover Machine Sequence Patterns Causing Quality Variations in Multi-stage Manufacturing Process Chang-Ho Lee[a], Dong-Hee Lee[b], Seung-Hyun Choi[a], and Kwang-Jae Kim[a] [a]POSTECH, [b]Hanyang University
D2-2	15:50-16:10	A Change Point Control Chart for Monitoring the Production Lead Time based on Sum of Squared Ranks ZHONG Jianlan, ZHAO Hongwei, and JIANG Tian Fujian Agriculture and Forestry University
D2-3	16:10-16:30	On the Wallis Representation of the Unbiasing Factor C4. Xuehong Gao, Junhyeok Yun, and Piya Hengmeechai Pusan National Univeristy
D2-4	16:30-16:50	Predicting Field Reliability based on Two-dimensional Warranty Data with Learning Effects Wei Jiang Shanghai Jiao Tong University
D2-5	16:50-17:10	A Robust Stochastic Kriging Model for Simulation Optimization Linhan Ouyang[a], Mei Han[a], Yizhong Ma[b], and Chanseok Park[c] [a]Nanjing University of Aeronautics and Astronautics, [b]Nanjing University of Science and Technology, [c]Pusan National University

Panel Sessions

E1 Supply Chain Management and Service I (13:30 ~ 15:10)

Convention Center Room 507
Chair Person: Prof. Minjae Park

E1-1	13:30-13:50	Research on the Supply Chain Encroachment Strategy of High Quality Manufacturer SONG Hua-ming, LV Yi-fan, XU Qian, HUANG Fu, and HUANG Rui Nanjing University of Science&Technology
E1-2	13:50-14:10	Optimal Maintenance Strategy for Product under Warranty Minjae Park Hongik University
E1-3	14:10-14:30	Optimal Strategy of Service Supply Chain Considering Behavioral Factors Peng Xing[a], Cuihua Zhang[b], Tianrun He[a], and Chunyu Li[b] [a]Liao Ning University, [b]Northeastern University
E1-4	14:30-14:50	Service and Quality of the Era of Artificial Intelligence ChangHwa Baek and SungUk Lim Daejin University
E1-5	14:50-15:10	Order Winners and Order Qualifiers of IKEA Kyung Mi Bae, Youn Sung Kim, and Chul Yong Ahn INHA University

Panel Sessions

E2 Supply Chain Management and Service II (15:30 ~ 16:50)

Convention Center Room 507

Chair Person: Prof. WANG Lei

E2-1	15:30-15:50	The Impact of Heterogeneous Strategic Customers on the Decision-making of Low Carbon Supply Chain WANG Lei[a], LIU Xin-min[b], LIN Kang-kang[a], QU Jing[a] , and ZHAO Zhong-chao[a] [a]Shandong University of Science and Technology, [b]Qingdao Agricultural University
E2-2	15:50-16:10	Successful Quality Strategy for Smart Factory Construction HyeRan Chong[a], SungHoon Hong[a], MinKoo Lee[b], and HyuckMoo Kwon[c] [a]Chonbuk National University, [b]Chungnam National University, [c]Pukyong National University
E2-3	16:10-16:30	Hierarchical Decision-Making of Home Care Service Operations with Considering Stochastic Travel Time and Service Times Xinggang Luo, Huichao Chen, and Zhangliang Zhang Hangzhou Dianzi University
E2-4	16:30-16:50	The Impact of Self-Service Technologies on Consumer Satisfaction: Moderating Effect of Consumer Learning Jinzhe Yan[a] and Yeonggil Kim[b] [a]Sungkyunkwan University, [b]Shinhan University
E2-5	16:50-17:10	The Impact of Key Opinion Leaders in User-generated Contents on Brand Equity of E-retailers Chang Guangshu and Zhu Lili Zhengzhou University of Aeronautics

Hotel Information and Map

Hotel SKYPARK Incheon Songdo

(http://skyparkincheonsongdo.com/ch/index.php)

Tel: +82-32-717-0700

Address: 仁川广域市延寿区国际会展中心大路233 (松岛洞)

Distance from Incheon Airport: 仁川国际机场 → 酒店 (29km)

For Chinese Participants: 从仁川国际机场出发至天空花园酒店的方式

仁川机场1号航站楼(到达层) - 3B/4A区域6707B 乘坐巴士后 - 天空花园酒店将(徒步1分钟)

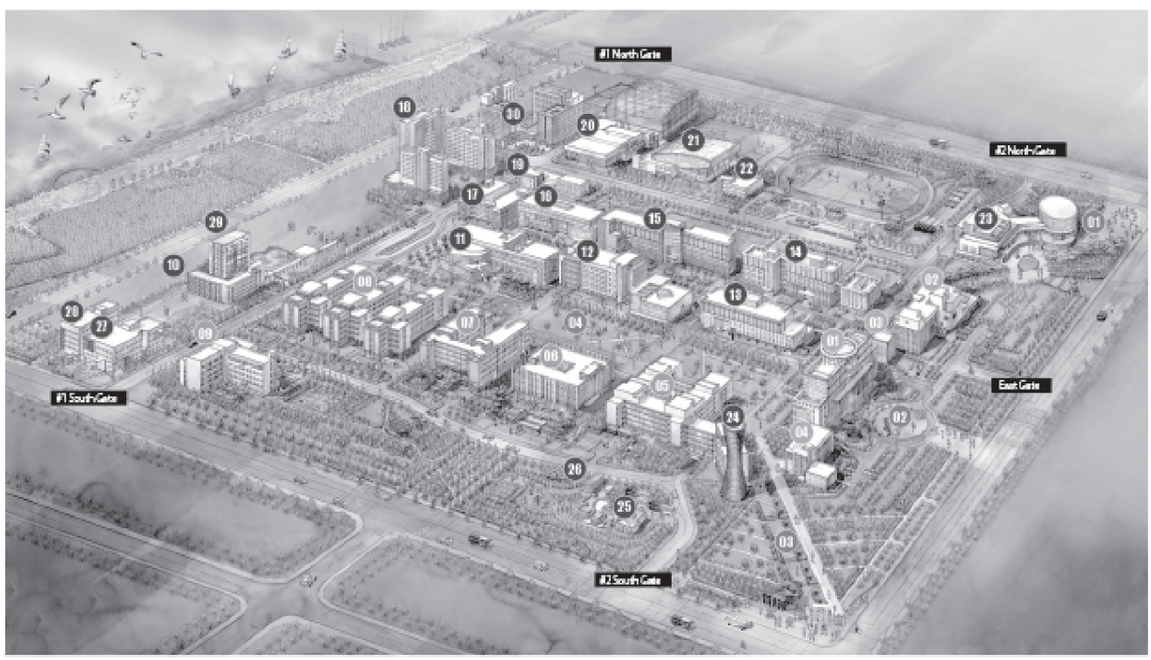
仁川机场2号航站楼(B1 层) - 17 ~ 19 区乘坐 6707B巴士后 - 天空花园酒店将 (徒步 1 分钟)

Conference Site Information

Incheon National University (http://www.inu.ac.kr)

仁川大学是一个综合性的，坚持以学生为本的国立大学。如果你也正在考虑选择哪一所学校来度过你接下来四年的大学生活的话，我们真诚的建议并邀请你加入我们这所享誉世界的学校-国立仁川大学，在这里开创未来，实现和追逐你的梦想。我们始终致力于为学生提供优秀的教育质量和学习机会，并在这条道路上不断发展，精益求精。我们把对于学术的卓越贡献和孜孜不倦的发展创新相结合，给学生全球国际化的管理和教育，并为我们的学生提供切实有益的实习经验。仁川大学可以给你提供一个学习和研究的机会，同时，这里也是一个遵循你的个性，因材施教的地方。每个人都将在这里得到成长，对于未来找到灵感和方向，就像我们的口号里所说的那样，be INspired。

仁川大学约有在校生13,000余名，我们学校师资雄厚，在这里，你可以遇到来自世界各地的学生和优秀教师，与他们见面合作，交流学习。在仁川大学，可以让你开阔视野。加入我们，来这里一起探索和学习吧，这里是仁川 - 东北亚的中心。



01 Main building
02 Faculty office building
03 PR Hall
04 Computer & Information center (BM contents)
05 College of Natural Sciences/ College of Life Sciences and Bioengineering
06 Haksan Library
07 College of Information Technology
08 College of Engineering
09 Central Laboratory
10 Guest House
11 Welfare & Service Center (Cafeteria)
12 Convention Center
13 College of Social Sciences / College of Global Law, Politics and Economics
14 College of Business / School of Northeast Asian Studies
15 College of Humanities
16 College of Arts and Physical Education
17 Student Center
18 Dormitory #1
19 International Exchange Center
20 Sports Center & Golf Practice Center
21 Gymnasium
22 Reserve officer training center
23 Auditorium & Performance Hall
24 Observatory
25 Children's Center
26 Greenhouse
27 2nd joint laboratory
28 College of Urban Sciences
29 Division of Bioengineering
30 Dormitory #2 (planned)
Haesong Path
Youngjicheon
Haedangwha Path
Central Garden

- Opening Ceremony : Convention Center(12 on map) 1st floor
- Conference Session : Convention Center(12on map) 5th floor
- Banquet : Faculty office building(2 on map) 3rd floor

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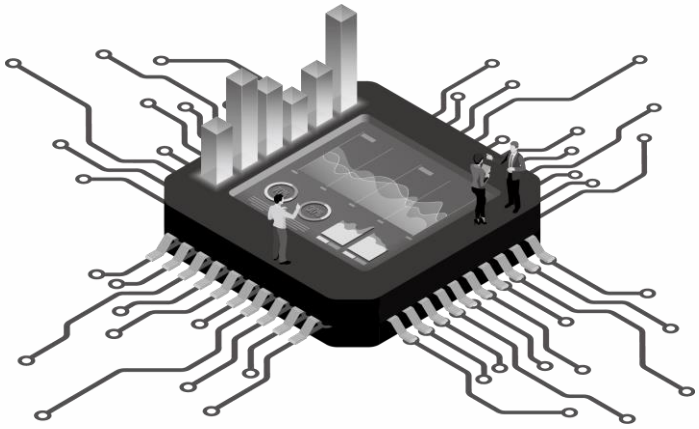

Session A1

e-Commerce Platform I

- Room 503
- 13:30 ~ 15:10
- Chair Person: Prof. Decheng WEN

Research on the Development of Cross-border B2B E-commerce in Henan Province

Chang Guangshu，Sun Mingmeng
(Zhengzhou University of Aeronautics, Zhengzhou 450046, China)

Abstract

Based on the background of Henan Province's participation in the construction of "Belt and Road", this paper analyzes the significance and promotion of cross-border B2B e-commerce to Henan cross-border e-commerce industry. Then the paper analyzes the current development status of cross-border B2B e-commerce in depth. However, under the background of the "Belt and Road" Initiative and the construction of the Zhengzhou Comprehensive Experimental Zone, the cross-border B2B e-commerce industry in Henan Province has ushered in opportunities and challenges. Furthermore, there are still some problems in the cross-border B2B e-commerce in Henan Province. Finally, the paper puts forward some suggestions on how to promote the development of cross-border B2B e-commerce in Henan, especially how to actively promote exports while regulating imports.

Keywords: Cross-border E-commerce; B2B; Belt and Road

An Empirical study on affecting factors of Continued Use of Mobile Easy Payment Service

Junsung Park[1, a], Jaehyeon Jun[2,b], Jong Ho Lee[3,c], JoonWoo Yoo[4,d] and Heejun Park[5,e]

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Abstract

Recently, mobile carriers, distribution companies, IT companies, retail companies, and banks have lately begun investing in mobile easy payment market for service diffusion. The primary purpose of this research is to identify factors that influencing user's continuous intention using mobile easy payment service

The research model proposed based on Value-Based Adoption Model (VAM) to suggest new model for user's continuance intention through mobile easy payment service. Based on VAM, this research adapted several variables that are worth considering. After verifying completeness our research model literally and conceptually, we conducted paper survey and a web-based survey in South Korea where the market for the MEPS is flourishing. The data gathered were analyzed using the structural equation modeling method of partial least squares (PLS)

By analyzing the research model with structural equation modeling, we examined that all of the benefit side variables (compatibility, simplicity, and economic value) have significant impact on perceived value of MEPS. However, none of the variables regarding sacrifice has impact. Based on our research findings, this study argued that some theoretical and managerial implications.

The analysis showed that typically, beneficial variables (compatibility, simplicity, and economic value) significantly influence the perceived value of the MEPS but none of the typically detrimental variables has an effect. The MEPS have thus far been primarily studied either from a technical perspective or from that of value enhancement for consumers. However, by adopting the VAM, this study considers aspects of the service that are beneficial as well as those that are detrimental to consumers.

Keywords: Mobile easy payment service; Value-based adoption model; Perceived value; Intent to continue to use; Personal innovativeness

Quality Control Game with Risk Attitudes of Platform and Seller in Online Shopping under Government Regulation

Decheng Wen is a professor in School of Management, Shandong University, China. He got his master degree from école Polytechnique Fédérale de Lausanne (EPFL) and PhD from Shandong University. His main research area is quality management and supply chain management.
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Dongwei Yan is a Ph.D. student at Shandong University in China, majoring in Management Science and Engineering. His research interest is in quality management.
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Abstract

Purpose: The purpose of this paper is to analyze the impact of different risk attitudes of Platform and Seller on online shopping product quality game and discuss whether government should strengthen or loose quality regulation to ensure product quality and improve the efficiency of coordination.

Design: This paper designs and solves the quality control game model of online shopping product quality with building the risk revenue functions from risk attitudes of Platform and Seller under government regulation and analyzes the factors resulting in the changes of Platform control probability and Seller compliance probability.

Findings: The risk attitude of Platform and the risk attitude of Seller have feasible intervals when Platform and Seller cooperate with each other. The impacts of government quality regulation on online shopping product quality coordination are not the same in any case. As for government, strengthening regulation is not always effective in improving the efficiency of online shopping market quality control. In addition, the optimal risk attitude combination of Platform and Seller does exist to achieve best quality coordination in a certain regulation intensity of government.

Originality/Value: This paper considers the impact of the risk attitudes of Seller and Platform on the effectiveness of quality control when discussing the game of quality regulation of online shopping products. This paper provides strategic suggestions for the government when to strength regulation and when to loose regulation to ensure product quality and improve the efficiency of coordination.

Keywords: government regulation; online shopping; quality control; game theory; risk attitude

When Should Stars and eWOM be Responsible for the Box Office Performance? – An Empirical Study based on Signaling Theory

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[2] College of Electronics, Communication, and Physics, Shandong University of Science and Technology, Qingdao, China, 266590, P.R.China;

Abstract

The especially short life cycle and the sharp decline in earnings as the frequent introduction of new movies makes is particularly important to determine the determinants influencing the movie success. Drawing upon the signaling theory, this study empirically investigate how the two types of signals, internal signals (i.e., actor power and director power) and external signals (i.e., eWOM volume and valence) influence box office performance in different time framework (i.e., opening week and later-run weeks). The moderating role of signaling environment also is explored. Analyzing panel data for 59 Chinese movies, it is found that box office performance is indeed influenced by the two types signals. Internal signals is instrumental in enhancing box office performance during the opening week, whereas early star power have a negative effect on performance if the movie does not satisfy the expectation of the audiences. Simultaneously, external signals exert a more importance effect on boosting performance in later-run weeks. Further, our results show that signaling environment has the ability to influence how the signals are processed. In opening week, signaling environment positively moderate with internal signals to influence box office performance. Signaling environment positively moderate with eWOM volume to influence box office performance, whereas negatively moderate the relationship between valence and box office performance. The results have important theoretical and practical implications.

Key word: signaling theory, box office performance, eWOM, star effect

Adopting Expectation Confirmation Model and Concept of Inertia on Understanding Mobile Payment Service Continuous Use Intention

Jong Ho Lee[1, a], Jaehyeon Jun[2,b], Junsung Park[3,c], JoonWoo Yoo[4,d] and Heejun Park[5,e]

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Abstract.

With significant increase in interest in mobile payment service(MPS), the amount of research on MPS has increased. However, prior studies have focused on users' first use adoption of MPS. Considering the length of time that has passed since MPSs were first introduced, it has become necessary to investigate usres' continuous use intentions of MPS. Therefore, in this research, we aim to verify which factors are influensive on continuous use intention of MPS.

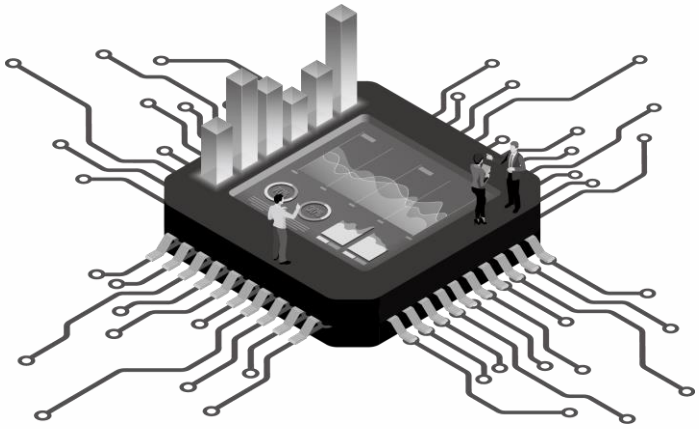
To achieve purpose, we adopt the expectation-confirmation model(ECM) and inertia. Also, we arranged our research in South Korea where has well developed market of MPS. We applied structural equation model to verify the hypothesis and conducted a survey on consumer who had an experiecne with MPS before.

The findings of this study highlight that importance of perceived usefulness. In this research, percieved usefulness have a significant effect on satisfaction and continuous use intention. Also, our findings emphasize the significant effect of inertia on the continuous use intention of an MPS. These findings have somethig in common with previous researches.

Because young user constitute the majority of the respondents, generalizing the finding to individuals of all ages is difficult. Further, we only colledcted sample data form MPS usres in South Korea. Consumer perceptions and therir effects on intention may differ from culture to culture. The robustness of these results may be enhanced by replicating the study across various cultures and multiple consumer age groups. Also, because the previous study which is verifying effect of ECM on MPS is scant, theoretical basis seemed not that much robust. On this study, we struggle to build relationship adapting Inforamtion System(IS) context to MPS environment. On the further study, we expect additional reseraches which are using ECM on various IS environment.

This paper is an early research verfiying influencial factors on continuous use intention of MPS. This attempts and research of findings enable to offer timely advice to manager of MPS. Also, we struggle to apply concept of inertia to MPS environment to reflect more actual behavior of consumers.

Keywords : Mobile payment service; Expectation-confirmation model; Inertia; Continuous use intention; Satisfaction



Session A2

e-Commerce Platform II

- Room 503
- 13:30 ~ 15:10
- Chair Person: Prof. Taegu KIM

Analysis on the influence factors of International Tourism Demand: Focusing on characteristics of Package Tour compared to the total

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Abstract

The tourism industry is a high value-added industry and has economic impacts in various fields such as food, transportation, and lodging. In particular, foreign currency imports from the tourism industry are highly effective in improving the international balance of payments. As a result of the improvement of the living standards of the Korean people and the appreciation of the won, overseas travel became the most common leisure activity for the entire nation. The number of outbound travelers increased from 16.8 million in 2014 to about 26.5 million in 2017, an increase of 61%. On the other hand, package sales by travel agencies registered with the Travel Agents Association during the same period also posted a similar increase of 57 % from 5.68 million to 9.88 million. In addition to improving the standard of living for the people, tourism demand in the future will continue to increase. In this study, factors that affect international tourism demand are analyzed based on general tourists and package tourists compared to the status of departure for Koreans. As an analysis model, three models were set up: a full tourist model, a package tourist model, and a regular tourist model. Based on the model, basic, economic, and network variables. The generated variables are analyzed by linear regression analysis. This study will be able to understand the main determinants of Korean travel choices. Also, it is significant that the dependent variables are divided into total tourists, package tourists, and general tourists. It will help to strengthen the competitiveness of travel agencies and tourism industry and to utilize marketing. Through this, efforts will be made to improve the tourism balance and revitalize the domestic tourism industry.

Keywords: Tourism industry, Tourism demand, Package Tourists, Korean travel

Supervision on the Collusion between Internet Platform and Third-party based on Prospect Theory

Liu Fan[a], Yichen Wang[a], Xinmin Liu[b]
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[b]College of Economics and Management, Qingdao Agricultural University, Qingdao266109, China

Abstract

The entities participating in the ecosystem of Internet platform make behavioral decisions regarding their own interests in different situations, which in turn, leads to platform risks and influences the sustainable development of platform ecology. Based on the Prospect Theory, this study develops a static game model among three-parties on the Internet platform, namely Internet platform, platform third-party and platform users, to explore the collusion behavior between Internet platform and third-party from the perspective of user and government supervision. The result shows that Internet platforms and third-parties are more sensitive to the supervision from users than government; platform is less sensitive than third party in considering the operational cost and potential benefits; and with the increase on the collusion benefit, the probability of collusion intention gets lower. Therefore, multi-agent collaborative supervision is encouraged to strengthen the supervision on the Internet platform ecosystem, and improve the operation mode of the Internet platform, which helps to reduce the probability of collusion behavior and promote the sustainable development of the platform ecology.

Keywords: Internet platform, Collusion behavior, Game analysis, Prospect Theory, Supervision mechanism

Measuring Customer Perceived Value Considering Targets of Product Attributes

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Abstract

Targets are explicitly or implicitly set by customers when they evaluate products' attribute performance and overall product performance. They are important but usually ignored construct in the measurement of customer perceived value. An approach for measuring customer perceived value considering targets of product attributes is proposed in the paper. Firstly, product attributes for measuring customer perceived value are identified by constructing the partitioned hierarchical value map of a product with regards to a specific use situation. Then, the attribute performances and targets under uncertain condition are measured by fuzzy statistical experiment, and the probability of each attribute attaining its corresponding target is calculated based on fuzzy number comparison algorithms. Finally, weights of value elements in each branch of the partitioned hierarchical value map are obtained with fuzzy DEMATEL method, and probabilities of each attribute attaining its corresponding target are integrated to get the overall measurement of customer perceived value. The approach is applied to measure the customer perceived value of air-to-air missile. The results show that the approach can effectively measure the customer perceived value when there are uncertain targets and attribute performances.

Keywords: customer perceived value; hierarchical value map; fuzzy target; product attribute; target-oriented decision analysis; DEMATEL method

Analysis of 6th Industry Promotion Business by City and County in Korea

Lim, SungUk. Baek, ChangHwa
Daejin University

Abstract

The purpose of this study was to propose useful suggestions by analyzing causal effect relationship between port service quality, and customer satisfaction and performance in port industry. The collected data through the survey were analyzed using multi-regression analysis. The measurement tools used for this study were divided into three dimensions such as internal quality, interaction quality and environmental quality. The results of this study are as follows; regarding the influence of pot service quality dimension on customer satisfaction, it was found that the effects of interaction quality and internal quality were significant and those of environmental quality was not significant on customer satisfaction. It was found that customer satisfaction made statistically significant influence on performance from the investigation of the causal effect relationship between customer satisfaction and performance. Incheon Port needs to act actively paying attention to port facilities, efficient operation, network, cargo recruitment activities, smooth communication and fast handling.

Keywords: Port Service Quality, Customer Satisfaction, Performance

Identification of Mobile Phone End of Life Stakeholders and Sustainability Requirements Analysis

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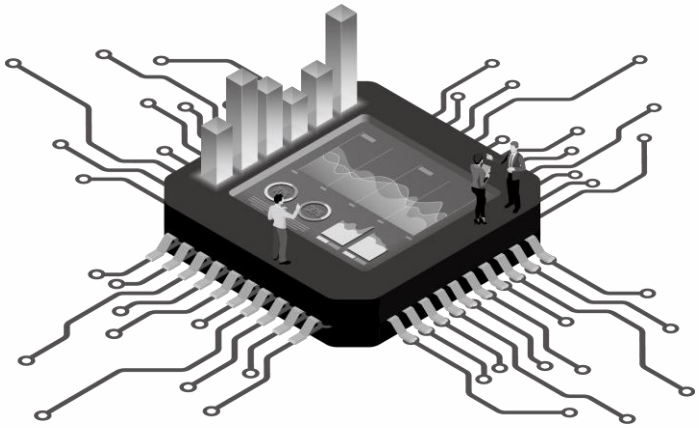
Abstract

End of Life (EoL) of mobile phones is facing a serious sustainable problem. Through obtaining the requirements of EoL stakeholders to guide the sustainable design of products can improve the sustainability of mobile phone. Firstly, flowchart analysis was used to identify stakeholders in the EoL of mobile phones. Literature analysis was used to identify parameters influencing the sustainable design of products. Then, interview, questionnaire survey and literature analysis were used to obtain the sustainability requirements of mobile phone in EoL. Requirements and sustainable design parameters of the product were connected by the matrix analysis method, and the important parameters influencing the sustainable design of the mobile phones were obtained.

Keywords: EoL, Stakeholders, Sustainable Design, Sustainability Requirements, Sustainability Parameters



Session B1

Quality Management

- Room 504
- 13:30 ~ 15:10
- Chair Person: Prof. Min ZHANG

Data Platforms and Their Quality Management in the 4th Industrial Revolution Era

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Abstract

The 4th Industrial Revolution can be defined as the data-oriented intelligent digital transformation, and many business data platform enterprises such as Amazon, Google, Facebook and Alibaba begin to dominate the world stock market. Even though the quality management (QM) of data platforms becomes very important, not many research papers have dealt with this area. In this paper, several aspects of data platforms are discussed, and the ways of QM for data platforms are suggested and discussed. In order to manage data platforms well, it is necessary to use some methodologies of Big Data, artificial intelligence (AI) and internet of things (IoT) efficiently. In this paper, several methods to use Big Data, AI and IoT well for data platforms are presented and discussed. Also, some new paradigm of QM in the 4th Industrial Revolution era is discussed.

Keywords: Data Platform, Enterprise data management platform, Customer data platform, Quality Management, 4th Industrial Revolution, Big Data, Artificial intelligence, Internet of things

A Study Quality Definition of 4th Industrial Revolution

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Abstract

We try to propose quality definitions that is appropriate for the 4th Industrial Revolution. To do this, we surveyed the articles related to quality definition. Many papers failed to find a unified quality definition and quality definition was different from various viewpoints. The manufacturing industry after the 4th Industrial Revolution has many differences from the existing ones. It is time to define the right quality definition. In this paper, the quality definition suitable for the 4th industrial revolution is simply presented. Much research is needed to present a precise quality definition for the 4th industrial revolution that can be utilized. We expect quality definition that can be practically applied.

Keywords: quality definition, survey quality, 4th industrial revolution

China Quality Award and the Market Value of the Firm

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Extended Abstract

Quality has always been an important factor affecting the competitive advantage and financial performance of firms. National quality awards have been established in many countries and regions. Among them, the most famous ones are The Malcolm Baldrige National Quality Award in USA, Deming Prize in Japan, and European Quality Award (EQA) in Europe. The companies winning Quality Award are considered as performance excellence. Some research showed the positive impacts of Malcolm Baldrige Award in USA and European Quality Award on the firm market values in several developed countries (Hendricks and Singhal 1996; Tuck 2005;. Eroglu et al., 2016).

From 2013, China Quality Award, which takes place once every two years, is organized by China's State Council and the National Bureau of Quality Inspection aiming to help China to be a powerful manufacturer of quality. However, the impact of China Quality Award on the firm market value is not clear. Based on the 85 winning China Quality Award events during 2013 to 2018, we investigate whether the quality award winning firms have significant abnormal returns during the announcement period using the event study methodology (Hendricks and Singhal 1996; Xia et al., 2016). The results show that the stock market does not react significantly to the announcement of winning China Quality Award in short-term, while there is significant long-term effect.

We further investigate the market reaction of China Quality Award winners from six aspects which are nature of property right, industry type, competition ability, registered address, number of winning the awards, and the related firms winning awards, respectively. Our results show that the announcements of winning China Quality Award have significantly positive response for state-owned firms, firms belonging to non- manufacturing industry, firms located in the developed region of China, and firms with weaker industry competition, respectively.

We contribute to the existing literature into three accounts. First, this study concentrates on China Quality Award in contrast to most of the existing literature involved in developed countries. It is possible that some factors such as the regulatory environment, the effectiveness of capital market, and firms' capacity for influencing stakeholders result in the non-significant short term reaction associated with China Quality Award. Second, we investigate the difference of the stock market's reaction to China Quality Award winners between state-owned firms and non-state-owned firms. The state-owned firms and non-state-owned firms face different market environments under the conditions of China's transition economy and emerging market economy, which may affect the market reaction of China Quality Award winners. It shows that the positive abnormal stock return is stronger for state-owned firms than the non-state-owned firms. Third, we investigate both the short-term reaction and long-term reaction of winning China Quality Award. The results show that the short-term reaction is not significant, while there is significantly positive long-term (+1 to +12 months period) effect. Although the stock market does not react immediately to the quality award announcements, the companies can benefit from winning China Quality Award in the long term.

Keywords: China Quality Awards, Market value, Abnormal stock returns, Event study

Open Quality – A New Quality Innovation Framework for the Era of Industry 4.0

Wan Seon Shin[1*], Shujaat Ali[2], Hojun Song[1], Jeong Han Hwan [3]
Department of Systems Management Engineering[1]
Department of Industrial Engineering[2]
Department of Management of Technology[3]
Sungkyunkwan University, Korea
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Abstract

The purpose of this study is to propose Open Quality which can deal with rapid changes in the industry 4.0. Open Quality's main goal is to cope with every quality aspects and ensuring quality responsibility through shared quality level.

This paper is unique in that it proposes new quality innovation concept by focusing on smart manufacturing industry which is the main driving force of Industry 4.0. The Open Quality is proposed with three main activities: Measurability, Traceability and Connectivity. We first analyzed the smart manufacturing process in order to define key activities. By driving the most important activities in manufacturing, we analyzed the aspects that affect the quality level of product or services.

Organic relation of MTC is the important factor of Open Quality. We have derived various factors that consist MTC and the correlation of those aspects. With four step cyclical Open Quality process, the organization can improve its quality level.

This study proposes a new quality innovation concept for smart manufacturing in industry 4.0. Open Quality contribute to ensuring quality responsibility and maintain continuous quality improvement through MTC.

Keywords: Quality Scorecard(QSC), Open Quality(OQ), Quality Innovation, Quality Responsibility, Cost of Quality, Industry 4.0, Blockchain

The Spectrum of Servitization as a Solution to the Customer Needs

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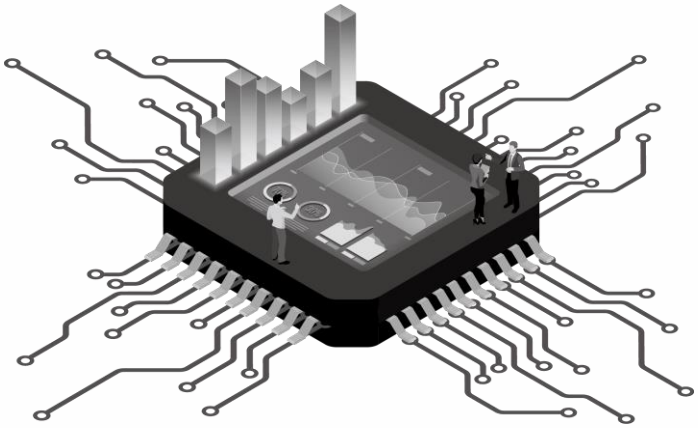
Abstract

The servitization is one of the primary object in manufacturing and service industry. And it has become a common and important trend. To address the heterogeneous needs of customers related with setvitization, the spectrum of servitization types according to some cases is suggested in this work. For data sampling, firms of manufacturing and services companies are investigated and adopted by the review of previous literature about types of servtization. To summarize the mechanism of servitization, a framework of spectrum with basic, intermediate and advanced solution to the needs of example firms is offered. The of servitization as a solution includes the following: manufacturing and service systems integration, value added activities, support services, proposition of business, improvement of business, process management of business, consulting, design and so forth.

Keywords: Service, Servitization, Spectrum, Servitization case, Solution



Session B2

Service Quality

- Room 504
- 15:30 ~ 17:10
- Chair Person: Prof. Qiang SU

The Risk Factors and Characteristics of Pressure Injury in Hospitalized Patients

Qing Li[1]，Qiang Su[1]，Ying Lin[2]，Guoying Deng[3], Qiugen Wang[3]

1. School of economics and management, Tongji University, Shanghai, 200092
2. Care center, Shanghai General Hospital, Shanghai Jiaotong University School of Medicine, Shanghai, 201620
3. Trauma center, Shanghai General Hospital, Shanghai Jiaotong University School of Medicine, Shanghai, 201620)

Abstract

Pressure injuries are a significant clinical problem for both patients and all healthcare facilities. A cross-sectional survey is conducted in the Shanghai General Hospital in China. Data from 2017-2018.8 is collected and inpatients with pressure injury are selected. This study quantities the prevalence of hospital acquired pressure injury and pressure injury on admission under different factors. The prevalence are 26.51% and 73.49% respectively. Demographic characteristics are analyzed, in which male patients and elder patients account for the majority. The most common location of pressure injury is sacrum with 223(64.27%) patients. Inpatients in pathology and ICU department are easier to develop pressure injury. Skin type, incontinence and athletic ability are risk factors that have significant impact on PI. Finally, considering the different symptoms of patients, different nursing measures are applied.

Keywords: Pressure injury; Inpatients; Prevalence; Risk factors

Medical Service Design for the Outpatient Treatment with TQC

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Abstract

Service design is an area that uses design methods to improve the user experience in the process of delivering services. In the area of medical service design, the subjective judgment of selecting pain points sometimes hinders the optimal process innovation. To address this matter, we carried out the service design utilizing an objective method. Thus, we focus on innovating the process through the 4M (Man, Material, Machine, and Method) of TQC (Total Quality Control) for objectification of service design.

We obtained data regarding on outpatient treatment lead time from EMR (Electronic Medical Record) data in an outpatient injection room from one of the university hospitals. The cleansed data used for the analysis consist of 823 patient data from two clinical departments.

We identify and compare the lead time probability density functions of distinct pain points represented in 4M (by physicians, first visit or not, by departments, and by days of the week). We also conduct the Chi square test to examine the difference in patient average latency between the above mentioned four factors.

We reveal that, among 4M factors, the doctor was the typical cause of the pain point. We expected the improvement of the process from the patient's perspective while improving hospital processes and productivity.

Keywords: Service design, Medical Service, Designing for Service, Process innovation, Wating Time

An Integrated Approach for Evaluating Hospital Service Quality with Linguistic Preferences

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Abstract

Hospital service quality (HSQ) evaluation is critical for hospital service improvement and hospital sustainable development. However, effective evaluation of HSQ is seriously challenged due to the uncertainties of evaluators' subjective perception and the choice of evaluation methods. To solve these two problems, this paper proposes a novel integrated evaluation approach, 2-tuple Borda method, which integrates TAA (2-tuple Arithmetic Average), 2-tuple TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) and 2-tuple GRA (Grey Relational Analysis). A new HSQ evaluation framework using 2-tuple Borda method is presented that reduces uncertainty of evaluation information and diversity of evaluation results, thus it provides more consensus evaluation result.

Keywords: hospital service quality; 2-tuple Borda; fuzzy linguistic approach; multi-criteria decision making

Will Consumer Sacrifice Privacy for Convenience? Focusing on Personal Information Sharing on the E-Commerce Platform

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Abstract

In the digital economy, people are shaped by their personal information and online activities, but they become more cautious of personal data providing as privacy violation increases. Thus, acquiring more personal information can be the competitive advantage of an e-commerce service provider for offering better services. Previous studies have proved that individuals usually compare the benefits and risks before they provide personal information. To clarify personal information sharing behavior on the e-commerce platform, this study proposes and examines a privacy calculus model that benefits (satisfaction of desire, personalization, convenience, and newness), risks (privacy concern, unpleasant experience, and fear of privacy violation), and environmental factor (social influence) are hypothesized to influence the intention to provide personal information. The result shows that privacy concern and fear of privacy violation can negatively influence the intention to provide personal information, but the positive influence of convenience is not significant, indicating that people may be not willing to sacrifice privacy for convenience. Social influence gives the most significant influence on the intention, which means that people pay great attention to others' personal information offering behavior. This study helps e-commerce service providers encourage consumers to provide personal information, which supports the improvement of service quality.

Keywords: Personal information sharing, privacy calculus, hierarchy of benefits, privacy concern, e-commerce platform

Societal Expectations and Concerns on Corporate Sustainability Quality in China: Big data and Survey Analysis

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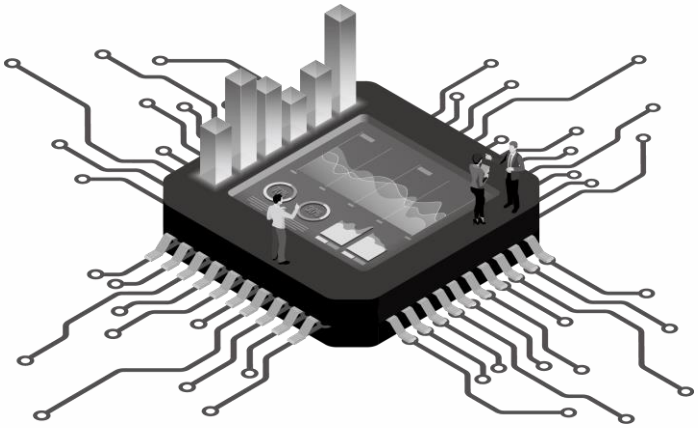
Abstract

Corporate social responsibility and sustainability have been paid more attention in China. Stakeholders include consumers, regulatory agencies, investments, and the public have increasingly expected that corporations should take corporate sustainability quality more seriously; however, very little have reported that what agenda and issues among economic, social, and environmental aspects are more prioritized. This study examines how and in what extent Chinese stakeholders consider corporate sustainability quality and how it changes for a decade. Using big data and survey analysis, this study provides evidence that societal expectation has been prioritized in the economic dimension of sustainability quality including corporate ethics and it has changed depending on specific incidents that have paid country-wide attention.

Keywords: Corporate sustainability quality, Stakeholder expectations, Chinese consumers, Big data analysis, China



Session C1

Quality Control I

- Room 505
- 13:30 ~ 15:10
- Chair Person: Prof. Uk JUNG

A CUSUM Control Scheme for Wiener Processes

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* Corresponding author E-mail address: lpliu1016@163.com

Abstract

With increasing attention to quality production, Wiener process has become a famous degradation model. This method is largely used to describe the degradation path of manufacturing systems. At the same time, the Cumulative Sum (CUSUM) control chart had been proposed to detect small drift of a system in the field of quality control. In this paper, the CUSUM control chart is applied on the Wiener degradation process. The drift of Wiener process is related to Rayleigh distribution which can be simulated by MonteCarlo method. The sensitivity of control chart will be represented by the Average Run Length (ARL). The ARL will be calculated by Markov chain. As the degradation of a system is affected by several factors, the shift of Wiener process will changes consequently. These are discussed further in this article.

Nonlinear Profile Data Monitoring Method based on Lifting Wavelet and SVDD

Yu min Liu[1], Fang cheng Wang[2], Hong can li[3], Zhe yun Zhao[4]
[1-4]Business School, Zhengzhou University, Zhengzhou450001, China

Abstract

In order to solve the problem of nonlinear profile monitoring with complex functions and fixed observation points, a method based on lifting wavelet reconstruction and support vector data description (SVDD) is proposed to monitor the abnormal fluctuations of nonlinear profile. First, the lifting wavelet is used to reconstruct the original data and enhance the distinction between normal and abnormal profile; Secondly, the reconstructed data is trained by SVDD model and the control limit is determined by the method of Bootstrap to improve the efficiency of finding model parameters; Finally, the abnormal profile monitoring performance of the training model is studied. The results of computer simulation show that the average chain length of this method is short in the process of quality control and the abnormal profile can be found in time.

Key words: nonlinear profile monitoring; lifting wavelet; support vector data description

Categorical Context-based Geodesic Distance for Clustering Categorical Data

Changki Lee[1] and Uk Jung[2]

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Abstract

Measuring the distance (or dissimilarity) between two observations is the basis of many data mining and machine learning algorithms, and its effectiveness usually has a significant impact on the learning outcomes. For continuous data, the distance computation has been a manageable problem because many numerical operations can be successfully applied. However, unlike continuous data, it is not straightforward to define a distance between pairs of categorical values of a categorical variable. In the present study, we propose a novel method to measure the distance between two categorical observations, which is called the categorical context-based geodesic distance, for the categorical-data-clustering problem. The proposed method considers the relationships between categorical variables and discovers the implicit topological structures in categorical data. In other words, it can effectively reflect the nonlinear patterns of the categorical data set. Our experimental results confirm that the distance that considers both data patterns and relationships among the categorical variables generally yields better clustering performance than other distance measures.

Keywords: Geodesic distance; Categorical data; Mutual k-nearest neighbor graph; Association-based dissimilarity; Gower distance.

A SPC Control Chart for Monitoring Positive Event

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Tianjin University, Tianjin, China 300072

Abstract

For monitoring the quality of product or some disastrous in manufacturing processes, frequency and magnitude are two key elements to characterize the occurrence of events. This article presents the procedures for simultaneously monitoring the event frequency and event magnitude for the positive events. A positive event is an event that is benefitial to the society or an organization. One always hopes that the time interval T of a positive event is short (high frequency) and magnitude X is high. In this paper, the Statistical Process Control (SPC) chart (the PG chart) was developed based on a synthetic statistic PG which includes both T and X. This chart makes use of the information about the event frequency as well as the information about the event magnitude based on minimizing the average loss (AL). The results show that the new chart has significant performance advantages in many situations such as supply chain management, financial engineering, office administration and health care industry.

Keywords: Statistical process control, time between events, frequency and magnitude, positive events, average loss

Game Research on Safety Supervision of Online Catering Food: Under the Impact of Government Regulation and Word-of-Mouth Communication Effect

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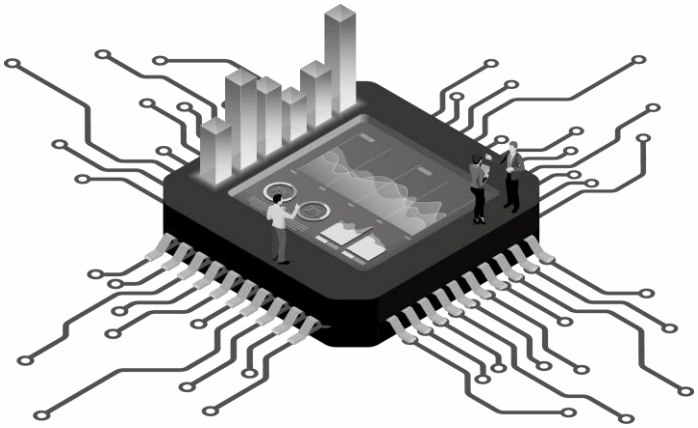
ABSTRACT

With the rapid development of online food delivery market, the safety of online catering food has gradually become the focus of the whole society in China. This research constructs an evolutionary game model between the online food delivery platforms and sellers under the impact of government regulation and word-of-mouth communication effect, then discusses the ESS of the system under different conditions, and finally carried out data simulation analysis with Matlab software. The research results show that government regulation can effectively improve the safety of online catering food. However, China has not established the food safety supervision mechanism that is compatible with the new online food delivery business, so the government should play a more active role in the safety regulation of online catering food. Another important finding of this research is that word-of-mouth communication effect is also important to improve the safety of online catering food. With the enhancement of word-of-mouth communication effect, the safety of online catering food gradually evolves towards a good direction. The research results can not only contribute to extending the current food safety regulation theory, but also bring some inspirations for food safety co-governance subjects, such as the government, the online food delivery platforms and the sellers.

Keywords: Online Food Delivery Industry, Online Catering Food, Food Safety, Word-of-mouth Communication Effect, Evolutionary Game.



Session C2

Quality Control II

- Room 505
- 15:30 ~ 17:10
- Chair Person: Prof. Jing SUN

Consideration on Monitoring Mixed Data Variables

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[2] Department of Applied Statistics and Operation Research, BGSU, USA

Abstract

- The Era of Big Data
  - The four V's of big data: Volume. Variety, Velocity and Veracity
  - Multivariate quality variables
  - A mix of continuous, count and categorical quality variables

- The Problem to Tackle
  - The complexity of the joint distribution; and consequently the charting scheme
  - Easier implementation of the control charting scheme
  - Easier diagnostics at granular levels

The Robustifed s–chart

Haewon Kim[1,a], Tyasha WarnaValinda[2,b], Linhan Ouyang[3,c],Chanseok Park[4,d]

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Abstract

Many industries use control charts as a tool for statistical quality control. If the products can be repeatedly produced so that quality characteristic of the products produced in the producing process is uniform, it is most desirable on the side of quality control. Therefore, it is important to assess whether the process is statistically under control through a control chart. Among control charts, the s–chart is a control chart that manages the process using standard deviation. However, standard deviation is vulnerable to contaminated data. To solve this problem, we propose to use MAD (median absolute deviation) and RC (Rousseeuw Croux) estimators instead of standard deviation. In this paper, we explain about MAD and RC estimators and show that these are more robust than using standard deviation when the data is contaminated through a breakdown point. We propose a new control chart that uses robustness estimators instead of the conventional standard deviation.

Keywords: control chart, robustness, breakdown point, MAD, Rousseeuw Croux

Identification the Key Quality Characteristics in Multistage Series-Parallel Manufacturing Process based on Iada-Lasso

Wang Ning, Zhang Shuai, Yang Jianfeng, Wang Haiyu, Cui Qingan
(Business School, Zhengzhou University, Zhengzhou 450000)

Abstract

To solve the problems that multiple correlations, high data dimensions, small samples existing in the key quality characteristics identification of multistage manufacturing process, the Ada-Lasso method was improved by Partial Least Squares, the state space idea and Bootstrap method are integrated to identify the key quality characteristics in multistage process. The specific steps of key quality characteristics identification based on the IAda-Lasso are given, the effectiveness of the IAda-Lasso, Lasso and Ada-Lasso in different correlation degree of quality characteristics is demonstrated by simulation and application examples. The IAda-Lasso method has a good ability to identify key quality characteristics in multistage processes, especially when there is a strong correlation between quality characteristics, which is significantly better than the other two methods.

Keywords: multistage manufacturing process; key quality characteristics; state space model; bootstrap; IAda-Lasso

Multiresponse Optimization Using a Reinforcement Learning a Method

Dong-Hee Lee[1, a] and Eun-Su Kim[2, b]
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Abstract

In product or process development processes, it is common to have multiple responses to be optimized. The multiple responses are often in conflict; thus, it is important to consider the tradeoffs between the responses to obtain a satisfactory solution. Most of existing methods for multiresponse optimization, use response surface methods which build empirical models for the multiresponse. However, when dealing with process operational data, it is difficult to build reliable empirical models. In this regard, the proposed method proposed a reinforcement learning based method which optimizes the multistage process by considering the tradeoffs between the multiple responses. In this optimization, parameters for reward and penalty of the reinforcement learning are set in order to systematically consider the tradeoffs between the responses. The proposed method is explained and illustrated by a step-by-step procedure with a case example.

Keywords: multistage process; process optimization; reinforcement learning method

Residual Based MEWMA Control Chart for Monitoring Multivariate Autocorrelation Process with Variable Sampling Intervals

Li Xue[1,2] and Zhen He[1]

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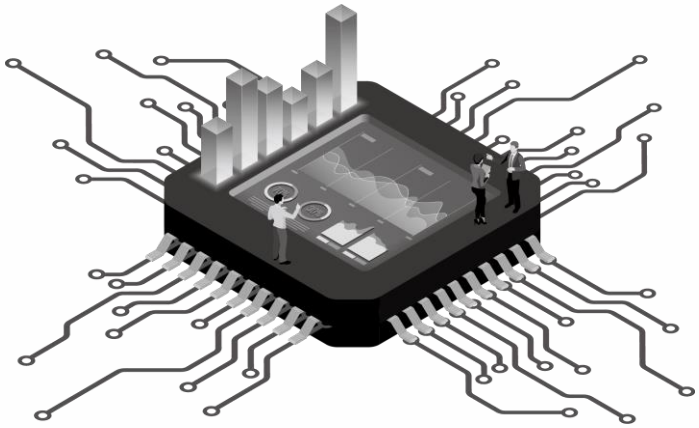
2. School of Management Science and Engineering, Zhengzhou University of Aeronautics, Zhengzhou, 450000, China

Abstract

Residual based MEWMA control chart eliminates the autocorrelation of statistics and satisfies the basic hypothesis of statistical process control theory that statistics are independent of each other, so it can be used to monitor multivariate autocorrelation process. In order to improve the monitoring efficiency of control charts, the Residual based MEWMA control chart with variable sampling intervals (VSI) is studied in this paper. Firstly, residual based MEWMA control chart with variable sampling intervals for monitoring multivariate autocorrelation process is designed; Secondly, the average time to signal of this control chart is calculated using Monte Carlo simulation method; Finally, taking the average time to signal as the evaluation criterion, residual based MEWMA control chart with variable sampling intervals and fixed sampling intervals are compared. The computing results show that the VSI residual based MEWMA control chart is the more efficient in detecting shifts than the fixed sampling interval (FSI) residual based MEWMA control chart.

Keywords: variable sampling intervals; multivariate autocorrelation process; residual based MEWMA control chart; average time to signal



Session D1

Quality Engineering

- Room 506
- 13:30 ~ 15:10
- Chair Person: Prof. Jai-Hyun BYUN

A New Product Quality Supervision Model of Random Inspection

KONG Qing-shan[1,2,] ZHANG Qin[1] and WEN De-cheng[1]
1. School of Management, Shandong University, Jinan 250100, China
2 School of Innovation Intermediary, Shandong University, Qingdao 266237, China

Abstract

'Double Random, One Disclosure' is an innovative supervision model which proposed by the government of China and pursued in the field of market supervision. An oversight model drawing on random inspections by randomly selected law enforcement officers or inspectors and requiring the prompt release of results. For the first time, we use the evaluation game theory to construct the theoretical analysis framework of 'Double Random, One Disclosure' product quality supervision, clarify the relationship between 'Random Inspections' and 'Release Information' as well as participants, analysis the group behavior evolution of enterprise in market entity list and inspectors in law enforcers list, raise the incentive mechanism for the supervision model. Our study finds that it's not enough to quash the quality false behavior and inefficient inspection behavior by 'Double Random, One Disclosure'. Enforcing inspection incentives for inspectors or quality incentives for enterprise separately play a role in system benign evolution when the public reputation is high enough, otherwise the system needs to enforce inspection incentives and quality incentives at the same time. Designing inspection incentives need enforcing inspection incentives for inspectors of standard quality and quality fraud, designing quality incentive need enforcing quality incentives for efficient and inefficient inspections. There are great differences in the evolution track of system stable points between inspection incentives and quality incentives. The inspection incentive makes inspectors evolve to efficient inspection, then drives enterprise evolve to standard quality by reputation effect, while quality incentive make enterprise evolve to standard quality, then drives inspectors evolve to efficient inspection by reputation effect, however, the system cannot evolve to ideal state because the transmission system be cut off with lower public reputation. Finally, we make some suggestions for the government to complete and innovate 'Double Random, One Disclosure' supervision model. This new supervision model come from China is a radical innovation for product quality supervision management.

Keywords: random inspection; product quality supervision; public reputation; evolution game; incentive mechanism

Integration of the Variance of Quadratic Loss for Evaluating Process Performance*

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Abstract

This article interprets Taguchi's quadratic quality loss function from a different viewpoint by considering the variance of quadratic loss as well as the mean of quadratic loss. The behavior of the variance of quadratic loss is characterized by the kurtosis and variance of the quality characteristic. To evaluate the location and dispersion performances of the quadratic loss simultaneously, a distance method linked with a Pareto front approach is proposed for process performance evaluation.

Keywords: Quadratic Loss, Variance of Quadratic Loss, Kurtosis, Distance Method, Pareto Front Approach, Performance Evaluation

*This article is a reduced version of a paper to be published in Quality Engineering (DOI: 10.1080/08982112.2019.1635698)

A Decision Support Model for Risk Management of Hazardous Materials Road Transportation based on Quality Function Deployment

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[c] Department of Systems Engineering and Engineering Management, City University of Hong Kong, 83 Tat Chee Avenue, Kowloon Tong, Hong Kong, People's Republic of China

Abstract

Risk management of hazardous materials (hazmats) road transportation has long been a concern because of the potential hazards that poses to society and the environment. In this work, a systematic and semi-quantitative decision support framework for risk management of hazmats road transportation based on the combination of quality function deployment (QFD), fuzzy analytic hierarchy process (F-AHP), fuzzy failure mode and effect analysis (F-FMEA), and nonlinear goal programming is proposed. The QFD is used innovatively to construct the overall framework, which contains three main components of general risk management: risk identification, risk assessment, and risk control. The F-AHP is used to build a hierarchical risk assessment system and determine the importance rating of each risk factor. The F-FMEA is used to evaluate the potential risks of risk control measures and determine the risk adjustment coefficient of each risk measure, which is used subsequently to modify the fulfillment level of risk measure in the nonlinear goal programming model. To address the inherent vagueness and uncertainty contained in the risk management process, the fuzzy set theory is introduced as an effective tool. An empirical case on risk management of a hazmats transportation company is presented to demonstrate the effectiveness and feasibility of the proposed methodology. Some managerial implications on risk management of hazmats road transportation are provided based on the obtained findings.

Keywords: hazardous materials; quality function deployment; failure mode and effect analysis; nonlinear goal programming; trapezoidal fuzzy number; fuzzy analytic hierarchy process

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Evaluation of User Experience using a Virtual Reality Model: A Case of FOLED Chevron Alignment Sign

Do-Hyeon Ryu[1,a], Ki-Hun Kim[2,b], Min-Gi Kim[3,c], Kwang-Jae Kim[4,d],
Min-Sun Kim[5,e], Jung-Min Yun[6,f], and Jeongsam Yang[7,g]
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Abstract

Providing a driver road information at the appropriate time is important to reduce accidents. A flexible organic light emitting device chevron alignment sign (FOLED-CAS) is a smart safety device that consists of a solar battery and FOLEDs. It is charged in daytime and turns on FOLEDs at night to give drivers advance warning of a curve. The sign directly interacts with a driver and could reduce driving fatigue and cognitive load. Therefore, it is important to evaluate the sign has a positive effect for safe driving and delivers satisfied experiences for a driver. This study conducted an experiment to evaluate user experience (UX) of FOLED-CAS in various driving contexts. The experiment utilized a virtual reality (VR) model to overcome the limit of space, time, risk and cost. The model has 12 scenarios depending on weather, type of car, and size and type of CAS. Each of 24 subjects virtually drove in all scenarios of the VR model implemented by a head-mounted display and a driving simulator. While driving in each scenario, a driving simulator collected driving behavior data such as a number of rapid deceleration and sharp turn. UX survey data such as usability and affect were collected after each scenario. Analysis of the collected data provided that the UXs are different depending on the size of FOLED-CAS. Additionally, most subjects experienced difficulty in recognizing the sign at foggy night and argued that the sign needs to be more vivid. These results can be applied to redesign FOLED-CASs and contribute to improving driving experience and safety.

Keywords: user experience, user experience evaluation, virtual reality model, head-mounted display, driving simulator, FOLED chevron alignment sign

Detection and Classification of Spatial Patterns in Semiconductor Wafer Bin Maps: A Review of Recent Literatures

Seung-Hyun Choi[1, a], Chang-Ho Lee[2,b], Dong-Hee Lee[3,c], and Kwang-Jae Kim[4, d]

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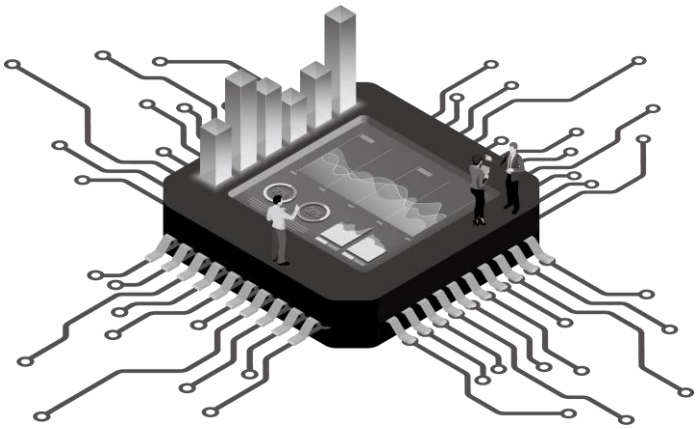
Abstract

Wafer bin maps (WBMs) in probe tests represent spatial information of defective dies on wafer and spatial patterns of defective dies provide critical clues to extract defect causes in complex semiconductor manufacturing process. Classification of defective dies spatial pattern into pre-defined or new spatial pattern suggest which defect causes occur in the wafer fabrication process. With the aid of rapid advance of classification methods, there exists various approaches to detect and classify spatial pattern of defective dies. However, existing studies have rarely provided comprehensive review of WBMs spatial pattern detection and classification methods. This paper reviews recent 43 studies about detecting and classifying WBMs spatial patterns. There are two major review points: 1) classification methods (e.g. probability model-based, feature extraction-based, or etc.), 2) classification criteria (supervised/unsupervised). This paper also suggests future research issues in WBM spatial patterns detection and classification. This study will provide a recent research trend of WBMS spatial pattern detection and classification.

Keywords: Wafer bin map (WBM), defect pattern, spatial pattern, classification, defect cluster, detection, systemic defect



Session D2

Quality Control III

- Room 506
- 15:30 ~ 17:10
- Chair Person: Prof. Wei JIANG

An Approach to Discover Machine Sequence Patterns Causing Quality Variations in Multi-stage Manufacturing Process

Chang-Ho Lee[1, a], Dong-Hee Lee[2, b], Seung-Hyun Choi[3, c], and Kwang-Jae Kim[4, d]

[1, 3, 4] Dept. of Industrial & Management Engineering, POSTECH, Pohang, Korea,
[2] College of Interdisciplinary Industrial Studies, Seoul, Korea,
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Abstract

A multi-stage manufacturing process (MMP) consists of a series of process stages that are designed to conduct specific tasks in order to produce products. As the production process undergoes, a history of operated machines at each process stage of a product is referred as a processing record. To increase efficiency and capability of production, a modern MMP operates multiple machines in a process stage. Since the machines at each process stage can have differences among their performances in practice, these differences result in variations to the desired value of product quality. To ensure product quality reliably, it is important to capture where the variations occur in the middle of MMP. However, in the MMP, a result of the former process stage affects to the results of the later process stages. Consequently, a compound effect by machines at various process stages results in a variation of product quality. This study proposes an approach to discover suspicious combinations of machines at different process stages, so called machine sequence pattern (MSP), causing significant variations to product quality. The proposed approach extracts the suspicious MSPs by evaluating two aspects of the MSP: frequency of appearance and influence on product quality. Frequency of appearance filters out the MSP that appears by chance on the processing records. Influence on product quality determines whether a MSP has a significant effect on the variation of product quality. A hypothetical dataset of processing records on MMP is generated to evaluate the performance of the proposed approach. The simulated experiment shows the viability and effectiveness of the proposed approach in discovering the MSP causing the variations.

Keywords: Multi-stage manufacturing process (MMP), quality variation, machine sequence pattern

A Change Point Control Chart for Monitoring the Production Lead Time based on Sum of Squared Ranks

ZHONG Jianlan, ZHAO Hongwei, JIANG Tian
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Fujian Agriculture and Forestry University, Fuzhou, China

Abstract

Assuming that a two-stage processing system is an M/G/M queuing system. Firstly, let sojourn time of the order in one stage is the system state, and the state space equation is used to model this system. Also, the influence of the mean shift of sojourn time on the downstream stage is analyzed. Secondly, the average sojourn time is calculated, and the distribution function of the sojourn time is estimated based on the Laplace-Stieltjes (LS) transform. Thirdly, a change point control chart is designed based on the sum of squared ranks to monitor redundant orders. Finally, simulation analysis is used to evaluate the monitoring performance of the change point control chart in term of the average run length, the accuracy of the change point estimation and the out-of-control process estimation. The results show the change point control chart can effectively detect the mean shift of lead time, and more accurately estimate the change point and its out-of-control stage. And its effect is more robust.

Keywords: squared rank; a change point control chart; production lead time

On the Wallis Representation of the Unbiasing Factor C4.

Xuehong Gao[1,a], Junhyeok Yun[2,b] and Piya Hengmeechai[3,c]

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Abstract

It is well known that a sample variance is an unbiased estimator of a population variance. A sample standard deviation, however, is not an unbiased estimator of population standard deviation. In order to make a sample standard deviation unbiased, the bias-correction factor C_4 is widely used especially when the sample is from a normal distribution. There are several approximations for the bias-correction factor C_4 to ease computational difficulties. In this study, we propose new approximations of the C_4 based on the linear regression method along with the idea from the Wallis' product formula. We compare with three existing approximations of the C_4 by calculating the mean absolute deviation to illustrate the effectiveness of the proposed approximation of the C_4 function. The results show that the proposed approximations are quite accurate and simple to calculate.

Keywords: C_4 function; linear regression model; normal distribution; unbiased estimator

Predicting Field Reliability Based on Two-dimensional Warranty Data with Learning Effects

Wei Jiang
Antai College of Economics and Management, Shanghai Jiao Tong University

Abstract

Understanding field reliability of a sold product is crucial to both managers and engineers for monitoring product quality and improving warranty service design. When modeling warranty data, it often assumes that the lifetime of products manufactured in different days is homogeneously distributed, i.e., product reliability remains the same over time. Based on a two-dimensional warranty data set collected in an auto manufacturer, we find that the reliability of products improves over time. A log-linear regression model on the failure rate of the products is proposed by considering the usage rate and manufacturing day as covariates. The maximum likelihood approach is used to estimate the parameters. The results show the existence of learning effects in reliability in the early stage of manufacturing. A learning curve model is then used to predict the reliability of new items produced.

A Robust Stochastic Kriging Model for Simulation Optimization

Linhan Ouyang[1], Mei Han[1], Yizhong Ma[2], Chanseok Park[3]

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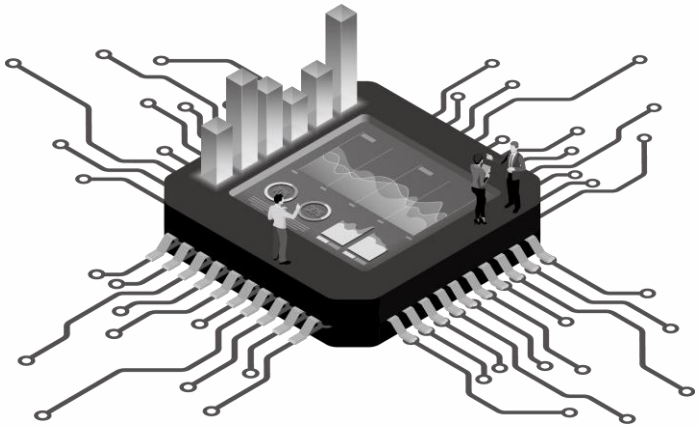
[2] School of Economics and Management, , Nanjing 210094, China Nanjing University of Science and Technology

[3] Department of Industrial Engineering, Pusan National University, Busan, Korea

Abstract

Metamodels are widely used as fast surrogates to facilitate the optimization of simulation models. Stochastic kriging is an effective metamodeling tool for a mean response surface implied by a stochastic simulation. In stochastic kriging, it is usually assumed that the experimental data are normally distributed and uncontaminated. However, these assumptions can be easily violated in many practical applications. This paper provides some theoretical results on the predictive and optimization performance of stochastic kriging and proposes a robust stochastic kriging which is less sensitive to normal departure and data contamination by using robust location and scale estimations. Statistical properties of the robust estimators used in this paper are briefly analyzed and the performances of the proposed methods are compared through numerical examples of different features. The comparison results show that the proposed robust stochastic kriging with the robust estimations is quite efficient no matter whether the standard assumptions hold or not.

Keywords: Simulation; Stochastic kriging; Contamination; Model departure; Outlier-resistance



Session E1

Supply Chain Management and Service I

- Room 507
- 13:30 ~ 15:10
- Chair Person: Prof. Minjae PARK

Research on the Supply Chain Encroachment Strategy of High Quality Manufacturer

SONG Hua-ming*, LV Yi-fan, XU Qian, HUANG Fu and HUANG Rui
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Abstract

This paper explore the optimal encroachment mode of entrant who produce high-quality products, and analysis the impact of encroachment on the incumbent, the impact of the service on the members of the supply chain. By formulating a two-level supply chain system that includes a incumbent manufacturer, a potential manufacturer and a retailer, applying the backward method, the competitive equilibrium of supply chain members under no encroachment, encroachment through retail channel and encroachment through direct channel is solved. Then analysis the equilibrium solution of wholesale price, selling price and profit which between the two competing products under different scene. The results show that the encroachment of high quality products will force incumbent to lower the wholesale price and selling price. However, the service level of the incumbent does not change and the low quality products cannot be squeezed out of the market. When production cost and direct selling cost are high, the incumbent manufacturer can benefit from the encroachment. The best encroachment mode of entrant depends on the combined impact of the degree of the quality difference, the production cost and the direct selling cost. But the incumbent manufacturer tends the entrant to encroach by direct channel. When the incumbent manufacturer's service efficiency is high, it may change the encroachment mode of the entrant.

Keywords: supply chain; encroachment; quality difference; service

Optimal Maintenance Strategy for Product Under Warranty

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Abstract

In this paper, we develop a cost model under two-dimensional warranty with age and usage based on lemon law and determine decision variables such as optimal preventive maintenance cycle for age and usage perspectives and optimal length of warranty period. We propose a two-dimensional maintenance strategy, under which the item is preventively maintained according to a specified age interval or usage interval, whichever occurs first. A periodic preventive maintenance service is considered which can be implemented to reduce the repair cost of a repairable product under warranty. The optimization of imperfect preventive maintenance for repairable items is investigated from the manufacturer's perspective by taking into account the moments of customers purchasing two-dimensional warranty. During the warranty period, preventive maintenance service and refund is conducted to reduce the degradation rate which the product is in operation and to increase customers' satisfaction. We consider minimal repair service, refund, preventive maintenance for the warranty services. The numerical application is implemented using the proposed approach and examples are discussed to exemplify the applicability of the methodologies derived in this paper.

Keywords: Cost model, Expected cost rate, Lemon law, Optimal replacement age, Refund, Repair time threshold

Optimal Strategy of Service Supply Chain Considering Behavioral Factors

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(2. School of Business Administration, Northeastern University, Shenyang 110819, China)

Abstract

In the condition of demand uncertain, considering service integrator with corporate social responsibility and service provider with service quality effort, a research on the optimal strategy in service supply chain. By analysis of service integrator, the leader of service supply chain, the utility functions of service integrator and service provider with behavior character is established. The models are optimized, through the range of corporate social responsibility and service quality effort and the target of utility function maximization on the members of service supply chain respectively. Finally, the optimal strategies of corporate social responsibility, service quality effort, price and so on can be obtained under different constraints.

Keywords: service supply chain; service quality effort; corporate social responsibility; utility function; optimal strategy

Service and Quality of the Era of Artificial Intelligence

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Abstract

The fusion and innovation technology of the 4th Industrial Revolution era is rapidly being applied. Especially, economic, social, and cultural changes have been proceeding rapidly, centering on artificial intelligence. These changes are applied to the service sector, and unlike the past, services based on artificial intelligence are expected to spread rapidly. There has been a great change in terms of quality, and there have been many studies focusing on SERVAQUAL. However, it is not suitable for artificial intelligence centered service because it is based on people. Therefore, it is necessary to define the concepts to be newly applied to the service quality of the AI(Artificial Intelligence) era and to study the appropriate evaluation methods.

Keywords: Artificial Intelligence, Artificial Intelligence Service, Characteristics of Artificial Intelligence Service

Order Winners and Order Qualifiers of IKEA

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[2,] College of Business Administration, INHA University, Incheon, Korea

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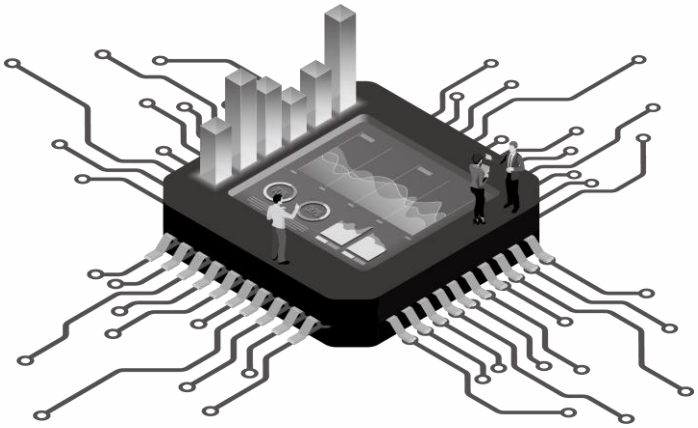
Abstract

In this study, we evaluate the strategic attributes of the global furniture company, IKEA, which has entered Korea and present the data for the response of domestic companies. Strategic attributes were identified for the IKEA analysis and the order winners and order qualifiers of the strategic attributes were identified through the Interpretive Structural Modelling (ISM) and Matriced Impacts Croisés Multiplication Appliquée á un Classement (MICMAC) analysis methods, which are multi – criteria decision methods. The questionnaire was conducted through a survey agency for IKEA customers. As a result, IKEA is evaluated to be using strategic image of brand image and overall quality through low cost, various products, reasonable price, shipping reliability, design and after-sales service.

Keywords: Furniture Industry, IKEA Retail Company, Multi-criteria Decision Making, Strategic Property Evaluation, Strategic Advantage Requirements



Session E2

Supply Chain Management and Service II

- Room 507
- 15:30 ~ 17:10
- Chair Person: Prof. Lei WANG

The Impact of Heterogeneous Strategic Customers on the Decision-making of Low Carbon Supply Chain

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Abstract

When a product is first introduced, customers may choose to strategically delay their purchasing decisions in anticipation of the product reviews of their peers. This paper studies the impact of strategic customer behavior on supply chain performance. And we introduce the concept of heterogeneous strategic customers based on their preferences, compare and analyze the corresponding solutions under myopic and strategic scenarios. Then on the base of these, we study the impacts of strategic customers' purchasing price threshold and green degree threshold on the equilibrium solutions. The main results show that:(1) With the sensitivity of demand to price increasing, the sales price, green degree level, demand, firm's profit experience downward trends. (2) With the sensitivity of demand to green degree increasing, the sales price, green degree level, demand, firm's profit experience upward trends.(3) the strategic customer behavior can affect the solutions, the customers' purchase price threshold can increase optimal equilibrium, while the customers' purchase green degree threshold decrease.

Keywords: myopic customers; strategic customers; heterogeneous; green degree threshold; price threshold

Successful Quality Strategy for Smart Factory Construction

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Abstract

As interest in the 4th Industrial Revolution increases, Korea is strengthening its capabilities nationwide in order to prevail the competitiveness of future manufacturing industries. Smart factory construction is now recognized as a prerequisite for manufacturing survival. The purpose of this study is to provide guidelines for the quality section to establish the ideal definition of smart factories and practical implementation strategies. We will review the five levels of building a Smart Factory, and conduct quality strategies and case studies on the direction of changes in quality management techniques at each stage. Smart Factories are divided into ICT unapplied phase, basic level phase, intermediate level 1, middle level 2 and advanced phase. Compared to the existing factory automation, Smart Factory's differentiation is added to the five features of intelligence, activeness, connectivity, agility and reliability. Up to mid-level 1 of Smart Factory 5 level, existing quality improvement techniques can be utilized with quality strategy similar to existing automation.

The quality improvement strategies used in the middle level 2 and upgrading stages should be strengthened in software quality, big data quality, process flexibility quality, equipment advance preservation quality, technology accuracy and zero quality, and information security stability and security quality.

Keywords: The 4th Industrial Revolution, Smart Factory, Smart Factory Maturity, Quality Strategy

Hierarchical Decision-Making of Home Care Service Operations with Considering Stochastic Travel Time and Service Times

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Abstract

This research considers the routing and scheduling problem of home care service with the hierarchical decision-making of home health care (HHC) company and caregivers. The uncertainties of the caregiver's travel time between two customers and service time for customers are modeled as stochastic parameters. A bi-level programming model for HHC service is established, in which the upper level represents the company's assignment decision and the lower level represents the home caregiver's routing and scheduling decision. A chance constraint is incorporated in the model to ensure the minimum success probability of the assignment solution. Tabu-search algorithm with Monte Carlo simulation is developed to solve the proposed stochastic model. A series of computational experiments on test instances show the effectiveness of both the established stochastic model and the developed algorithm.

Key words: Home Health Care, bi-level programming, chance constrained programming.

The Impact of Self-Service Technologies on Consumer Satisfaction: Moderating Effect of Consumer Learning

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Abstract

The aims of this research are to (i) identify the effect of self-service on consumer satisfaction (ii) explore the aspect of self-service technologies like difficulty of task, and (iii) exam the moderating effect of consume learning in order to reduce the darkness self-service technologies (difficulty of task in self-service). The data collected by online survey platform. To test proposed hypothesis, OLS regression method was adopted. The empirical results show that SSTs' efficiency has positive effect on consumers' satisfaction in line with proposed assumption. Task difficulty of SSTs has negative effect on consumers' satisfaction. Moreover, we confirmed consumer learning effect. Finally, consumer learning has moderating effect between efficiency, and task efficiency and consumer satisfaction.

Keywords: Self-Service Technologies (SSTs), Consumer Satisfaction, Consumer Learning

The Impact of Key Opinion Leaders in User-generated Contents on Brand Equity of E-retailers

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Abstract

With the development of user-generated content promoted by Wed 2.0, key opinion leaders in user-generated content have become the key force connecting consumers and e-retailers' brands. Many enterprises are committed to exploring excellent key opinion leaders that match their brands. In this context, identifying the characteristics of key opinion leaders and promoting brand equity has become a hot issue in current theoretical research. This paper studies the impact of four characteristics of key opinion leaders in user generated content, namely, professionalism, popularity, product involvement and interaction, on the brand equity of e-retailers, and uses SPSS24.0 software to analyze the data. The results show that the product involvement and interaction of key opinion leaders in user generated content have a more significant positive impact on the brand equity of e-retailers than the characteristics of professionalism and popularity. Customer loyalty plays a part of intermediary role between key opinion leaders in user generated content and brand equity of e-retailers.

Keywords: User generated content; Key opinion leaders (KOL); E-retailers; Brand equity