國立勤益科技大學講座推薦表

申請日期： 111 年 3 月 25 日

推薦單位 (校長推薦由秘書室辦理)	管理學院	推薦層級	□系(自薦) ■ 院　　□校長
被推薦(自薦)人 姓名	陳坤盛	教授證號	教字第 009984 號
專長領域	生產大數據分析、製程能力指標、六標準差方法與應用及服務管理等	教授年資起算日	88 年 2 月 1 日
現職	國立勤益科技大學講座教授		
推薦講座種類	■ 專任講座 □專職講座 □兼職講座 □榮譽講座	校長推薦時擬設置單位	

資格條件（本校講座設置辦法第 3 條第 1 項所列 8 款，請勾選其中之一）：

□**一、諾貝爾獎得獎人。**

獲獎年度：_____(西元)年，獲獎種類：□物理　□化學　□生理學或醫學　□文學　□和平　。

□**二、中央研究院院士或國際知名之國家級院士。**

名稱：_____，獲獎年度_____年(西元)　。

□**三、曾獲總統科學獎或行政院傑出科技貢獻獎者。**

獲獎年度：_____年(民國)。 _____

□**四、曾獲得教育部學術獎或國家講座者。**

名稱：_____，獲獎年度_____年(民國)　。

□**五、曾獲國際著名大學之講座教授。**

大學名稱：_____，獲聘年度_____(西元)。

□**六、曾獲得國內外重要學術獎勵者。**

獎勵名稱：_____，獲獎年度_____年(西元)。

□**七、重要國際學會會(院)士。**

重要學會名稱：_____，獲聘年度_____(西元)。

■ 八、在學術上或專業領域上有傑出貢獻或聲望卓著者。

檢附資料：

一、符合上述資格條件一至二款其中之一者：

(一)學經歷(具5年以上合格教授證書)　(二)近5年著作目錄(自行表列)

(三)具體學術成就證明(獲獎證明文件)

二、符合上述資格條件第三款至第八款其中之一者，除上述資料外，請依所推薦講座之種類，檢附下列資料，由推薦單位會辦研究發展處認定，其認定基準見附註。

(一)■ 專任講座：下列各款擇一提列並勾選

1. ■ 前一年度以本校名義為第一作者或通訊作者發表 SCI 等級論文 12 篇以上(其中名列第 1 作者篇數應達 6 篇以上)。
2. □以產學合作計畫、中央各部會計畫(含有行政管理費)及以本校名義進行之技術移轉金(技轉金績效不得重複認列)任計畫主持人或共同主持人之計畫金額採計，其前一年度計畫金額累計至少應達新台幣 1,200 萬元以上。

(二)□專職講座：下列各款擇一提列並勾選

1. □前一年度為第一作者或通訊作者發表或接受 SCI 等級論文 12 篇以上(其中名列第 1 作者篇數應達 6 篇以上)。
2. □以產學合作計畫、中央各部會計畫(含有行政管理費)、技術移轉金(技轉金績效不得重複認列)任計畫主持人之計畫金額採計，其前一年度計畫金額累計至少應達新台幣 1,200 萬元以上。。

(三)□兼任講座：

□首次推薦：前一年度為第一作者或通訊作者發表或接受 SCI 等級論文 6 篇以上(其中名列第一作者篇數應達 4 篇以上)。

□再次推薦：前一年度為第一作者或通訊作者發表或接受 SCI 等級論文 6 篇以上(其中名列第一作者篇數應達 4 篇以上且至少須有 2 篇以本校名義發表)。

履行義務具體說明

(依講座設置辦法第 8 條規定，續聘時填列，新推薦者免填)

一、聘任期間：110 年 8 月 1 日至 111 年 7 月 31 日，每學年至少一次校內演講，聘期內共辦理 _1__次，辦理日期列述如下，相關佐證如附件。

(一)辦理日期:111 年 4 月 7 日上午 10:10-12:00

(二)辦理題目： 在共享經濟思維下的品質管理

申請推薦人簽名：____　　___(※由推薦單位主動推薦者，免填)

推薦單位主管	研究發展處
經查被推薦人具講座設置辦法第第 3 條所定積極資格且未具同條所定消極資格，被推薦案件審理期間如經檢舉查證有消極資格情事屬實願撤回推薦，絕無異議。 管理學院 院長 康鶴耀 (由系所推薦時，仍請送所屬學院院長核章)	✓本案依講座設置辦法第 3 條之積極資格條件認定合符。 □本案認定不合符。原因：_____ 校務基金專用 行政專員 王詩欣 111. 3. 31 研究發展處 學術產業組組長 陳凱榮 研究發展處 處長 葉彥良 0329

人事室	校長核示
☐本案屬講座設置辦法第3條第1項第1款至第3款其中之一，奉核後聘任，並於校教評會列入工作報告備查。 ☑本案屬講座設置辦法第3條第1項第4款至第8款其中之一。 人事室科員 尹光明 2022.4.11 人事室主任 鍾永政 2022.4.11	☐屬講座設置辦法第3條第1項第1款至第3款其中之一，逕行聘任，並送校教評會備查。 ☑屬講座設置辦法第3條第1項第4款至第8款其中之一，提相關會議審議。 2022.04.12
系教評會 （院、校級推薦，免填）	年 月 日 學年度 學期 次教評會審議通過(附會議紀錄)。 召集人核章：
學院教評會 （校級推薦，免填）	111 年 4 月 19 日 110 學年度 2 學期 2 次教評會審議通過(附會議紀錄)。 召集人核章：管理學院 院長 康鶴耀
校教評會	年 月 日 學年度 學期 次教評會審議通過(附會議紀錄)。 召集人核章：
校長核定聘任	

附註. 依本校講座設置辦法第3條第4項、第5項規定如下：

第3條第4項：有關SCI論文與第一作者及通訊作者定義列述如下：

一、**SCI等級論文：**須發表論文於SSCI、SCI、SCIE、A&HCI收錄期刊(不含收錄於前述資料庫之研討會論文，如Conference article、Proceedings、Book series、Lecture notes及Editorial Material等)，且以申請表所附資料庫ISI查詢網址中明列之發表日期(須有完整期數與頁碼)為判斷依據，須符合該論文收錄至Web of Science(或該期刊持續收錄至Web of Science)且該期刊可於JCR資料庫檢索。

二、講座教授本人須為**論文之第一作者或通訊作者**；

(一)第一作者，以獨立創作發表或共同合著發表時依論文排版之作者群排序名列最上方、最左方算起第一名認列之。

(二)通訊作者，應符合：

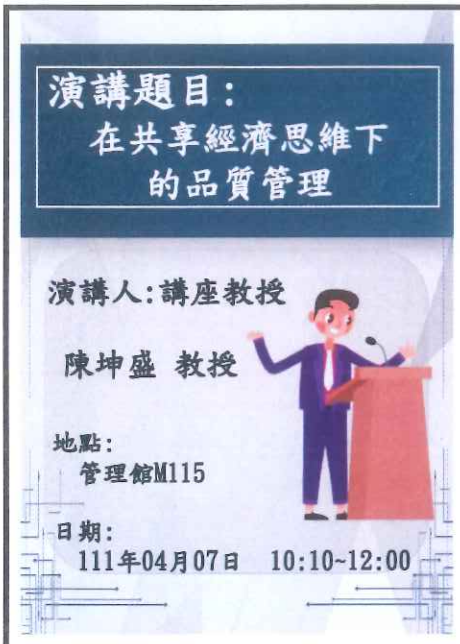
1. 以名列作者群前三名為限。
2. 通訊作者二名以上，應為自左方算起第一位始得認列之。

(三)同篇期刊論文僅能由一位教師提出申請，且每篇期刊論文限申請一次，如通訊作者標示不清，請提供接受函或與編輯者通信證明。

第3條第5項：產學合作計畫、中央各部會計畫(含有行政管理費)及以本校名義進行之技術移轉金(技轉金績效不得重複認列)須任計畫主持人之計畫；若擔任他校之共同主持人，需有計畫經費(應含行政管理費)納入本校，其金額(依核定清單、核定公文或契約書金額)採計不含校補助款。產學合作計畫及中央各部會計畫以結案日期為主(依核定清單或契約書

之期間規定，計畫展延期間不予採計）；技術移轉則以簽約日期為主。

申請續聘講座被推薦人履行義務內容佐證：


演講題目：
在共享經濟思維下
的品質管理
演講人:講座教授
陳坤盛 教授
地點:
管理館M115
日期:
111年04月07日 10:10~12:00


在共享經濟
思維下的品質管理

申請績效內容表列(請檢附佐證)

一、SCI 期刊(若欄位不足，請自行增加)

編號	作者屬性	合著者依序詳列所有作者(通訊請以*1、*2 加註)	發表年/月	論文名稱	期刊名稱	卷數 vol	期數 no	頁碼	論文屬性	研發處核符註記	備註
1 √	第一作者	**Kuen-Suan Chen**, Chung, L., and Chang, T. C.*1	2021 年 5 月	Developing a quality-based supplier selection model from the buying company perspective	Quality Technology & Quantitative Management	18	3	267-284	**SCIE**	核符	
2	通訊作者	Yang, C. M., and **Kuen-Suan Chen***1	2021 年 11 月	An integrated contract manufacturer selection and product quality optimization methodology for the mechanical manufacturing industry	Expert Systems With Applications	183		115336	**SCIE**	核符	
3	**第一作者**	**Kuen-Suan Chen**, and Yu, C. M.*1	2021 年 6 月	Dual dimensional fuzzy testing based on the upper confidence limits for supplier selection	Journal of Intelligent & Fuzzy Systems	40	6	11145-11158	**SCIE**	核符	
4	**通訊作者**	Yu, C. M., **Kuen-Suan Chen***1, and Guo, Y. Y.	2021 年 10 月	Production data evaluation analysis model: A case study of broaching machine	Journal of the Chinese Institute of Engineers	44	7	673-682	**SCIE**	核符	

5	第一作者	**Kuen-Suan Chen**, and Chang, T. C.*1	2021 年 9 月	A modified approach for Six Sigma quality assessment of product with multiple characteristics in intelligent manufacturing environments	Journal of Testing and Evaluation	49	5	3035 - 3053	**SCIE**	核符	
6	通訊作者	Li, M., **Kuen-Suan Chen***1, Yu, C. M.*2, and Yang, C. M.*3	2021 年 2 月	A fuzzy evaluation decision model for the ratio operating performance index	Mathematics	9	3	262	**SCIE**	核符	
7	第一作者	**Kuen-Suan Chen**, Chen, S. C., Hsu, T. H.*1, Lin, M. Y., and Wu, C. F.	2021 年 5 月	Fuzzy evaluation model of process improvement capability with costs consideration	Applied Sciences	11	10	4344	**SCIE**	核符	
8	第一作者	**Kuen-Suan Chen**, Chen, S. C., Hsu, C. H.*1, and Chen, W. Z.	2021 年 7 月	Statistical hypothesis testing for asymmetric tolerance index	Applied Sciences	11	14	6249	**SCIE**	核符	
9	第一作者	**Kuen-Suan Chen**, and Huang, T, H.*1	2021 年 10 月	A fuzzy evaluation model aimed at smaller-the-better-type quality characteristics	Mathematics	9	19	2513	**SCIE**	核符	

10	通訊作者	Li, M., Lin, L. Y., **Kuen-Suan Chen**[*1], and Hsu, T. H.[*2]	2021 年 10 月	Novel service efficiency evaluation and management model	Applied Sciences	11	20	9395	**SCIE**	核符	
11	通訊作者	Chen, T., Yang, C. M., **Kuen-Suan Chen**[*1], and Hsu, T. H.[*2]	2021 年 11 月	Fuzzy evaluation model of bank APP performance based on circular economy thinking	Mathematics	9	21	2761	**SCIE**	核符	
12	通訊作者	Yu, C. M., Wu, C. F., **Kuen-Suan Chen**[*1], and Hsu, C. H.	2021 年 12 月	Fuzzy quality evaluation model constructed by process quality index	Applied Sciences	11	23	11262	**SCIE**	核符	
13	第一作者	**Kuen-Suan Chen**, Hsu, C. H.[*1], and Hsu, T. H.[*2]	2021 年 12 月	Attribute service performance index based on Poisson process	Mathematics	9	23	3144	**SCIE**	核符	

教授證書

姓名：陳坤盛

身分證字號：G120658161

出生年月日：伍拾貳年伍月貳拾捌日

年資起算：捌拾捌年貳月

送審學校：國立勤益工商專科學校

教字第〇〇九九八四號

經本部依專科以上學校教師資格審定辦法審定合於教授資格此證

教育部部長 楊朝祥

中華民國捌拾捌年捌月貳拾肆日

1-169

Developing a quality-based supplier selection model from the buying company perspective

By: Chen, KS (Chen, Kuen-Suan) [1, 2, 3]; Chung, LAN (Chung, Leanne) [4]; Chang, TC (Chang, Tsang-Chuan) [5]
View Web of Science ResearcherID and ORCID (provided by Clarivate)

QUALITY TECHNOLOGY AND QUANTITATIVE MANAGEMENT
Volume: 18 Issue: 3 Page: 267-284
DOI: 10.1080/16843703.2020.1787307
Published: MAY 4 2021
Early Access: JUL 2020
Document Type: Article

Abstract
In the face of increased competition and globalization, supply chain management has become a crucial aspect of securing competitive advantage. Within this, the quality offered by suppliers is vital. Thus, in this paper, we develop a model to select the best supplier based on process quality from the perspective of the buyer. We first employ the process capability index, which can provide an exact measure of process yield, to evaluate the process quality of suppliers. However,must be estimated from preliminary samples or obtained subsamples. This increases uncertainty and can lead to miscalculation. To ensure the reliability of assessment, we derive the lower confidence limit ofto serve as a standard of process quality assessment and construct a process capability analysis chart to select the best supplier. The chart also provides recommendations for process improvement to serve as a reference for suppliers with poor performance. Finally, we present two real-world case studies to demonstrate the practical applicability of the proposed method.

2-171

作者: Yang, CM (Yang, Chun-Ming) [1]; Chen, KS (Chen, Kuen-Suan) [2, 3, 4]
EXPERT SYSTEMS WITH APPLICATIONS
卷冊: 183
文獻號碼: 115336
DOI: 10.1016/j.eswa.2021.115336
出版時間: NOV 30 2021
文獻類型: Article

摘要
Outsourcing is a crucial strategy of the mechanical manufacturing industry. When outsourcing, it is necessary for companies to carefully inspect the performance of contract manufacturers (CMs) to ensure high-quality products and satisfactory services. This study presents an integrated methodology for the quality performance assessment and optimization of products with multiple quality characteristics for CM selection in the mechanical manufacturing industry. First, we present a novel process capability analysis chart (PCAC) using the 100(1-alpha)% upper confidence limits of C-pmh, C-puh, and C-plh to gauge the process capabilities of products with multiple quality characteristics and reduce the influence of sampling errors. Second, we apply Pareto optimality to reexamine eligible CMs under the objectives of maximizing performance in individual quality characteristics and minimizing variance in overall performance. A feedback mechanism is included to advise ineligible CMs on means of improvement. Finally, we present a case study to demonstrate the feasibility and effectiveness of the proposed methodology.

關鍵字
作者關鍵字: Outsourcing; Process capability index; Pareto optimality; Contract manufacturer selection; Mechanical manufacturing industry
Keywords Plus: PROCESS CAPABILITY INDEXES; GROUP SAMPLING PLAN; SUPPLIER SELECTION; CONSTRUCTION; PERFORMANCE; VARIABLES; ALGORITHM; MODEL; COST

作者資訊
通訊地址: Chen, Kuen-Suan(通訊作者)

3-172

Dual dimensional fuzzy testing based on upper confidence limits for supplier selection

By: Chen, KS (Chen, Kuen-Suan) [1, 2, 3]; Yu, CM (Yu, Chun-Min) [1]
JOURNAL OF INTELLIGENT & FUZZY SYSTEMS
Volume: 40 **Issue:** 6 **Page:** 11145-11158
DOI: 10.3233/JIFS-202349
Published: 2021
Document Type: Article

Abstract
Many corporations purchase components from suppliers, which can reduce operating costs and enable firms to focus their resources on core advantages. Studies have indicated that process quality and manufacturing time performance are two crucial indicators for supplier selection. We used the process quality index and a manufacturing time performance index to create a dual dimensional fuzzy supplier selection model. First, the upper confidence limits of these two indices were derived, and a fuzzy membership function based on these limits was constructed. Based on the fuzzy test rules for process quality and manufacturing time performance, we divided the fuzzy supplier selection matrix into nine evaluation zones. Using the upper confidence limits of these two indices, we created evaluation coordinates and assigned weights based on the location of the coordinates. Then, the total of all the weights was employed to form a supplier selection index for which a higher value means a higher ranking. The use of confidence limits decreased the chance of misjudgment resulting from sampling errors while the fuzzy test rules increased the applicability of the model. Consequently, the proposed model can be used to select suppliers efficiently so as to form partnerships in which corporations and suppliers can grow together.

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Production data evaluation analysis model: a case study of broaching machine

作者: Yu, CM (Yu, Chun-Min) [1]; Chen, KS (Chen, Kuen-Suan) [1, 2, 3]; Guo, YY (Guo, Yun-Yu) [1]
JOURNAL OF THE CHINESE INSTITUTE OF ENGINEERS
卷冊: 44 期: 7 頁面: 673-682 特刊: SI
DOI: 10.1080/02533839.2021.1940290
出版時間: OCT 3 2021
早期取用: AUG 2021
文獻類型: Article
跳至
被引參考文獻深度分析

摘要
To increase machine tool reliability and overall product quality, process quality must be increased for all parts and components. Aside from quality, processing efficiency is also a crucial indicator of machine tools, which has brought about various customized machine tools with high processing efficiency. As broaching machines offer high production efficiency and are simple in structure and operation, we used broaching machines as a case study to construct a model for process capability evaluation, analysis, and improvement. Furthermore, the Six Sigma quality index directly reflects process yield as well as process quality levels. We then derived the relationships between the quality level of the product and those of individual quality characteristics to establish quality assessment standards and created a process quality analysis chart for products with multiple quality characteristics. We used a mathematical programming model to find the corresponding coordinate point of the upper confidence limit for Six Sigma quality indices. Process engineers need only check whether the corresponding coordinate points fall in the acceptable-quality zone or the poor-quality zone to identify critical-to-quality characteristics. Finally, we used a cause-and-effect diagram to determine the causes of poor process quality and formulate suggestions for improvement.

關鍵字
作者關鍵字: Six sigma quality indices; upper confidence limit; quality characteristics; process quality analysis chart
Keywords Plus: PROCESS CAPABILITY INDEXES; GENERALIZED CONFIDENCE-INTERVALS; PERFORMANCE ANALYSIS; QUALITY; CONSTRUCTION; LIMITS; PK

作者資訊
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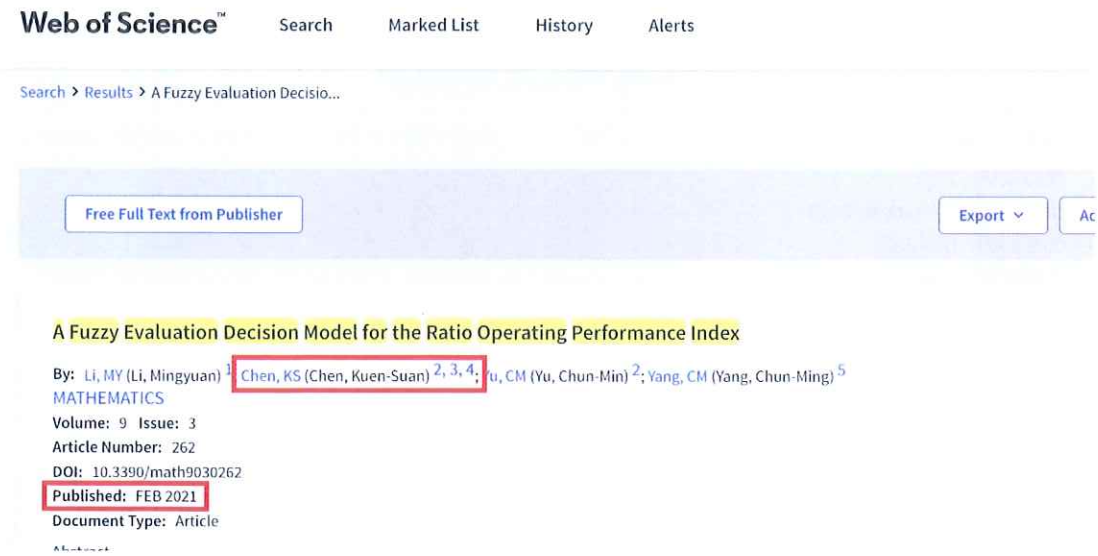
Natl Chin Yi Univ Technol, Dept Ind Engn & Management, 57,Sec 2,Zhongshan Rd, Taichung 41170, Taiwan
隸屬機構
National Chin-Yi University of Technology

5-174

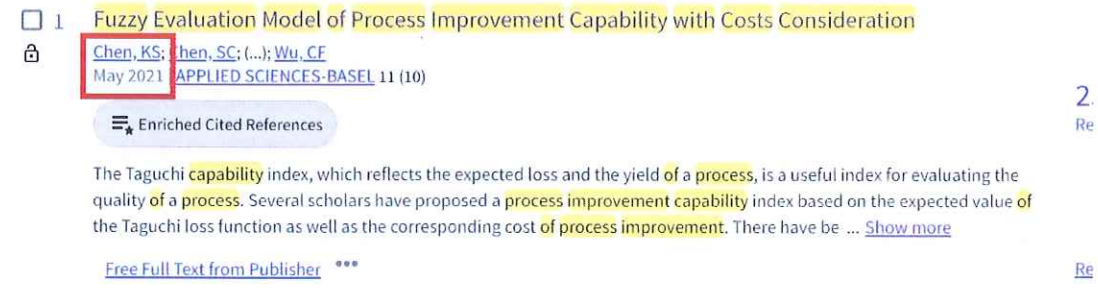
A Modified Approach for Six Sigma Quality Assessment of Product with Multiple Characteristics in Intelligent Manufacturing Environments

作者: Chen, KS (Chen, Kuen-Suan) [1]; Chang, TC (Chang, Tsang-Chuan) [2]
JOURNAL OF TESTING AND EVALUATION
卷冊: 49 期: 5 頁面: 3035-3053
DOI: 10.1520/JTE20200371
出版時間: SEP 2021
文獻類型: Article

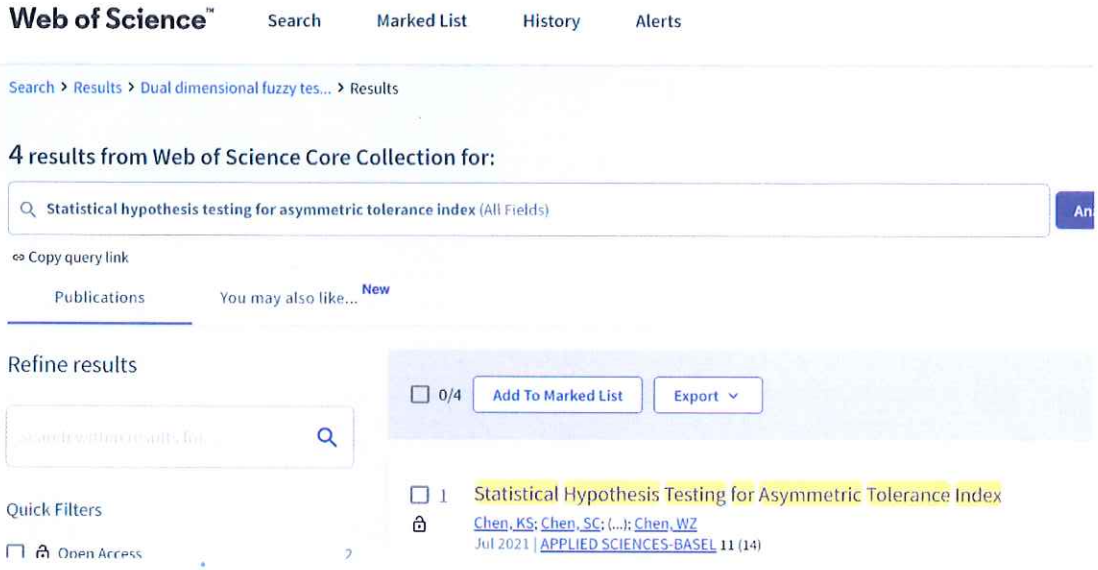
6-168



7-170



8-173



9-176

A Fuzzy Evaluation Model Aimed at Smaller-the-Better-Type Quality Characteristics

作者: Chen, KS (Chen, Kuen-Suan) [1, 2, 3]; Huang, TH (Huang, Tsun-Hung) [1]
MATHEMATICS
卷冊: 9 期: 19
文獻號碼: 2513
DOI: 10.3390/math9192513
出版時間: OCT 2021
文獻類型: Article

10-177

Novel Service Efficiency Evaluation and Management Model

作者: Li, MY (Li, Mingyuan) [1]; Lin, LY (Lin, Lung-Yu) [2, 3]; Chen, KS (Chen, Kuen-Suan) [4, 5, 6]; Hsu, TH (Hsu, Ting-Hsin) [7]
APPLIED SCIENCES-BASEL
卷冊: 11 期: 20
文獻號碼: 9395
DOI: 10.3390/app11209395
出版時間: OCT 2021
文獻類型: Article
跳至
被引參考文獻深度分析

摘要
Numerous scholars have invested in the research of service innovation management, hoping to find a more objective and scientific service efficiency evaluation and management model so as to stride forward towards the goal of smart innovation management. In the service operating system, the multi-workstation service operation is one of the common service operation models. Some studies have pointed out: apart from a good service attitude, the service operation time of each workstation is a key factor which measures the performance of the workstation's service operation. Therefore, this paper proposed a standardized concept with a service operation efficiency evaluation index. This index is not only convenient and easy-to-use, but it also has a one-to-one mathematical relationship with the performance achievement rate. Next, the radar evaluation chart was employed to evaluate the service efficiency of each workstation. First, according to the upper confidence limit and the required value of the index, the minimum value (MV) of the index estimator was derived and marked on each radar line; at the same time, all MVs were connected to form a control block. When the point estimate of the index does not fall into the control block of the radar chart, it represents that the service operation efficiency of the workstation has not reached the required level, so it needs to be improved. Because this model can directly compare the point estimate of the index with the MV, it can judge whether the service operation efficiency reaches the required level. In this way, the advantage of simple and easy-to-use point estimate can be maintained, and the risk of misjudgment caused by sampling errors can be reduced as well, which is helpful for the service industry to move towards the goal of intelligent innovation management. This method is not only applied to the performance evaluation of the multi-workstation service operation process but also applicable to the performance evaluations of other service operations.

關鍵字
作者關鍵字: multi-workstation service operation; service efficiency; index; radar evaluation chart; minimum value; control block
Keywords Plus: QUALITY

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11-178

Fuzzy Evaluation Model of Bank APP Performance Based on Circular Economy Thinking

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MATHEMATICS
卷冊: 9 期: 21
文獻號碼: 2761
DOI: 10.3390/math9212761
出版時間: NOV 2021
文獻類型: Article
跳至
被引參考文獻深度分析

摘要
As the environment of the Internet of Things (IoT) gradually becomes common and mature, various smart application (APP) platforms have sprung up, making what we are doing more convenient, more economical and more efficient. Then, this paper used a bank APP as the research background to discuss issues related to smart APPs. Obviously, through the bank APPs, customers can complete their transfer and payment for various expenses at home, eliminating the inconvenience of going out, which not only can alleviate traffic congestion as well as reduce carbon emissions but also can save the manpower expenditure costs for banks. Consequently, improving APP performance and increasing the number of users of an APP is a very important issue. Therefore, this paper proposed an APP performance index to evaluate the performance of a bank APP. This APP performance index is to evaluate the performance of the APP through the time interval of customers' access to the APP. The shorter the time interval is, the greater the number of users within a unit time is. In addition, based on cost considerations and effectiveness, the sample size n is usually not too large in practice, in order to make decisions quickly and accurately in a short time. Since the fuzzy testing model based on the confidence interval can be integrated with the past accumulated experience of data experts, the testing accuracy can be leveled up under the condition of small-sized samples. Accordingly, a fuzzy evaluation model was proposed to evaluate whether the performance of the bank APP can reach the required level, and this model was also regarded as a basis for decision-making to determine whether to improve the bank APP. At the same time, we can grasp the opportunities for improvement, achieve the effect of cost reduction, energy saving and carbon reduction, and further move towards the goal of innovative and intelligent management.

關鍵字
作者關鍵字: circular economy thinking; bank App; APP performance index; confidence interval; fuzzy evaluation model
Keywords Plus: SUPPLIER SELECTION

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12-179

Fuzzy Quality Evaluation Model Constructed by Process Quality Index

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APPLIED SCIENCES-BASEL
卷冊: 11 期: 23
文獻號碼: 11262
DOI: 10.3390/app112311262
出版時間: DEC 2021
已建立索引: 2022-01-04
文獻類型: Article
跳至
被引參考文獻深度分析

摘要
Many studies have pointed out that the-smaller-the-better quality characteristics (QC) can be found in many important components of machine tools, such as roundness, verticality, and surface roughness of axes, bearings, and gears. This paper applied a process quality index that is capable of measuring the level of process quality. Meanwhile, a model of fuzzy quality evaluation was developed by the process quality index as having a one-to-one mathematical relationship with the process yield. In addition to assessing the level of process quality, the model can also be employed as a basis for determining whether to improve the process quality at the same time. This model can cope with the problem of small sample sizes arising from the need for enterprises' quick response, which means that the accuracy of the evaluation can still be maintained in the case of small sample sizes. Moreover, this fuzzy quality evaluation model is built on the confidence interval, enabling a decline in the probability of misjudgment incurred by sampling errors.

關鍵字
作者關鍵字: fuzzy hypothesis test; process quality index; membership function; quality level; normal process distribution
Keywords Plus: PROCESS CAPABILITY; ASYMMETRIC TOLERANCES; ANALYSIS CHART; C-PK; PERFORMANCE

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13-180

Attribute Service Performance Index Based on Poisson Process

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MATHEMATICS
卷冊: 9 期: 23
文獻號碼: 3144
DOI: 10.3390/math9233144
出版時間: DEC 2021
已建立索引: 2022-01-04
文獻類型: Article

跳至

被引參考文獻深度分析

摘要

The purpose of a shop enhancing customer satisfaction is to raise its total revenue as the rate of customer purchases in the shop increases. Some studies have pointed out that the amount of customer arrival at a shop is a Poisson process. A simple and easy-to-use evaluation index proposed for the Poisson process with the attribute characteristic will help various shops evaluate their business performance. In addition, developing an excellent and practical service performance evaluation method will be beneficial to the advancement of shop service quality as well as corporate image, thereby increasing the profitability and competitiveness of the shop. As the surroundings of the internet of things (IoT) are becoming gradually common and mature, various commercial data measurement and collection technologies are constantly being refined to form a huge amount of production data. Efficient data analysis and application can assist enterprises in making wise and efficient decisions within a short time. Thus, following the simple and easy-to-use principle, this paper proposes an attribute service performance index based on a Poisson process. Since the index had unknown parameters, this paper subsequently figured out the best estimator and used the central limit theorem to derive the confidence interval of the service efficiency index based on random samples. Then, we constructed the membership function based on the alpha-cuts of the triangular shaped fuzzy number. Finally, we came up with a fuzzy testing model based on the membership function to improve the accuracy of the test when the sample size is small in order to meet enterprises' needs for quick responses as well as reducing the evaluation cost.

關鍵字

作者關鍵字: confidence interval; fuzzy testing; membership function of fuzzy number; Poisson process; service performance index

Keywords Plus: MANAGEMENT

SCIE SSCI

Journal of the Chinese Institute of Engineers, Transactions of the Chinese Institute of Engineers,Series A • 卷 44, 期 7, 頁 673 - 682 • 2021

文獻類型
論文

來源出版物種類
期刊

ISSN
02533839

DOI
10.1080/02533839.2021.1940290

展開

Production data evaluation analysis model: a case study of broaching machine

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摘要

To increase machine tool reliability and overall product quality, process quality must be increased for all parts and components. Aside from quality, processing efficiency is also a crucial indicator of machine tools, which has brought about various customized machine tools with high processing efficiency. As broaching machines offer high production efficiency and are simple in structure and operation, we used broaching machines as a case study to construct a model for process capability evaluation, analysis, and improvement. Furthermore, the Six Sigma quality index directly reflects process yield as well as process quality levels. We then derived the relationships between the quality level of the product and those of individual quality characteristics to establish quality assessment standards and created a process quality analysis chart for products with multiple quality characteristics. We used a mathematical programming model to find the corresponding coordinate point of the upper confidence limit for Six Sigma quality indices. Process engineers need only check whether the corresponding coordinate points fall in the acceptable-quality zone or the poor-quality zone to identify critical-to-quality characteristics. Finally, we used a cause-and-effect diagram to determine the causes of poor process quality and formulate suggestions for improvement. © 2021 The Chinese Institute of Engineers.

作者關鍵字

process quality analysis chart; quality characteristics; Six sigma quality indices; upper confidence limit

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http://pib.sagepub.com/content/by/year
doi: 10.1177/0954405413508118

View at Publisher

Journal of Intelligent and Fuzzy Systems • 卷 40, 期 6, 頁 11145 - 11158 • 2021

文獻類型
論文

來源出版物種類
期刊

ISSN
10641246

DOI
10.3233/JIFS-202349

展開

Dual dimensional fuzzy testing based on upper confidence limits for supplier selection

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摘要

Many corporations purchase components from suppliers, which can reduce operating costs and enable firms to focus their resources on core advantages. Studies have indicated that process quality and manufacturing time performance are two crucial indicators for supplier selection. We used the process quality index and a manufacturing time performance index to create a dual dimensional fuzzy supplier selection model. First, the upper confidence limits of these two indices were derived, and a fuzzy membership function based on these limits was constructed. Based on the fuzzy test rules for process quality and manufacturing time performance, we divided the fuzzy supplier selection matrix into nine evaluation zones. Using the upper confidence limits of these two indices, we created evaluation coordinates and assigned weights based on the location of the coordinates. Then, the total of all the weights was employed to form a supplier selection index for which a higher value means a higher ranking. The use of confidence limits decreased the chance of misjudgment resulting from sampling errors while the fuzzy test rules increased the applicability of the model. Consequently, the proposed model can be used to select suppliers efficiently so as to form partnerships in which corporations and suppliers can grow together.

作者關鍵字

fuzzy membership function; Fuzzy supplier selection model; manufacturing time performance; process quality; upper confidence limit

已索引的關鍵字

熱門主題 ⓘ

計量

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SCIE SSCI

Expert Systems with Applications • 卷 183 • 30 November 2021 • 論文號碼 115336

文獻類型
論文

來源出版物類型
期刊

ISSN
09574174

DOI
10.1016/j.eswa.2021.115336

展開

An integrated contract manufacturer selection and product quality optimization methodology for the mechanical manufacturing industry

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摘要

作者關鍵字

已索引的關鍵字

熱門主題

計量

資金詳情

摘要

Outsourcing is a crucial strategy of the mechanical manufacturing industry. When outsourcing, it is necessary for companies to carefully inspect the performance of contract manufacturers (CMs) to ensure high-quality products and satisfactory services. This study presents an integrated methodology for the quality performance assessment and optimization of products with multiple quality characteristics for CM selection in the mechanical manufacturing industry. First, we present a novel process capability analysis chart (PCAC) using the 100(1−α)% upper confidence limits of C_{pmh}, C_{puh}, and C_{plh} to gauge the process capabilities of products with multiple quality characteristics and reduce the influence of sampling errors. Second, we apply Pareto optimality to reexamine eligible CMs under the objectives of maximizing performance in individual quality characteristics and minimizing variance in overall performance. A feedback mechanism is included to advise ineligible CMs on means of improvement. Finally, we present a case study to demonstrate the feasibility and effectiveness of the proposed methodology. © 2021 Elsevier Ltd

作者關鍵字

Contract manufacturer selection; Mechanical manufacturing industry; Outsourcing; Pareto optimality; Process capability index

已索引的關鍵字

熱門主題 ⓘ

計量

資金詳情

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SCIE SSCI

Quality Technology and Quantitative Management • 卷 18, 期 3, 頁 267 - 284 • 2021

文獻類型
論文

來源出版物種類
期刊

ISSN
16843703

DOI
10.1080/16843703.2020.1787307

展開

Developing a quality-based supplier selection model from the buying company perspective

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摘要

In the face of increased competition and globalization, supply chain management has become a crucial aspect of securing competitive advantage. Within this, the quality offered by suppliers is vital. Thus, in this paper, we develop a model to select the best supplier based on process quality from the perspective of the buyer. We first employ the process capability index (Formula presented.), which can provide an exact measure of process yield, to evaluate the process quality of suppliers. However, (Formula presented.) must be estimated from preliminary samples or obtained subsamples. This increases uncertainty and can lead to miscalculation. To ensure the reliability of assessment, we derive the lower confidence limit of (Formula presented.) to serve as a standard of process quality assessment and construct a process capability analysis chart to select the best supplier. The chart also provides recommendations for process improvement to serve as a reference for suppliers with poor performance. Finally, we present two real-world case studies to demonstrate the practical applicability of the proposed method. © 2020 International Chinese Association of Quantitative Management.

作者關鍵字

lower confidence limit; process capability analysis chart; process capability index; process quality; Supplier selection

已索引的關鍵字

熱門主題 ⓘ

計量

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Journal of Testing and Evaluation • 卷 50, 期 1 • 1 January 2022

文獻類型
論文

來源出版物種類
期刊

ISSN
00903973

DOI
10.1520/JTE20200371

展開

A modified approach for six sigma quality assessment of product with multiple characteristics in intelligent manufacturing environments

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摘要

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已索引的關鍵字

Sustainable Development Goals 2021

熱門主題

計量

摘要

Process quality and yield are always crucial determinants of a firm's competitiveness; therefore, monitoring and assessment for process quality are vital aspects of their sustainable development. The Six Sigma quality control is based on defect rate and nonconforming units to eliminate factors that cause process defects. Thus, it has become a powerful instrument for manufacturers to achieve the quality goals of only 3.4 defects per million opportunities. However, the originated Six Sigma program is based on the 1.5σ shift in the process mean to recognize the tendency of processes to shift over the long term and achieve this goal. With the production environment of intelligent manufacturing today, manufacturers keep up to date with production performance and then monitor the distance between the process mean shift and the target value at all times. This makes it possible to adopt a more rigorous standard by decreasing in allowable shift to define the quality level in Six Sigma. For this reason, this paper proposes the redefined Six Sigma quality indexes as an assessment tool and has developed a modified approach for Six Sigma quality assessment of products with multiple characteristics. The proposed method uses more rigorous standards to analyze process quality, thereby allowing manufacturers to provide industry partners or consumers with products of higher quality, meet their needs, and even enhance their own industry competitiveness to continue progressing toward sustainability. We present a real-world example to demonstrate the practical applicability of the proposed approach. © 2020 by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959

作者關鍵字

Multiple characteristics; Process quality; Product-based process quality analysis chart; Six Sigma; Six Sigma quality indexes

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View at Publisher

SCIE SSCI

Mathematics • *開放取用* • 卷 9, 期 3, 頁 1 - 13 • 1 February 2021 • 論文號碼 262

文獻類型
論文 • *Gold Open Access*

來源出版物種類
期刊

ISSN
22277390

DOI
10.3390/math9030262

展開

A fuzzy evaluation decision model for the ratio operating performance index

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摘要

In order to take into account cost and timeliness and enhance accuracy testing, this study developed the fuzzy number and membership function, using the confidence interval of ratio operating performance index. Subsequently, according to the statistical test rules and the application of the fuzzy number and membership function, a fuzzy evaluation decision model for the operating performance index is proposed, to evaluate if the business performance reaches the needed level. Based on the abovementioned, the evaluation model in this study took into account not only timeliness but also accuracy, so that it could grasp the opportunity of improvement for operating organizations with poor operating performance after being evaluated. This fuzzy evaluation decision model for the operating performance index constructs a fuzzy membership function retrieved from an index's confidence interval, reducing the chance of miscalculation due to sampling mistakes and improving the efficiency of evaluation. Finally, in order to facilitate the application of readers and the industry, this paper uses cases to explain the proposed fuzzy verification method. On the whole, the model proposed in this paper is a data-based auxiliary tool for the service operating performance improvement strategy. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

作者關鍵字

Confidence interval; Exponential distribution; Fuzzy evaluation decision model; Fuzzy number; Ratio operating performance index

熱門主題 ⓘ

計量

資金詳情

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View at Publisher

SCIE SSCI

Applied Sciences (Switzerland) • *開放取用* • 卷 11, 期 10 • 2 May 2021 • 論文號碼 4344

文獻類型
論文 • *Gold Open Access*

來源出版物種類
期刊

ISSN
20763417

DOI
10.3390/app11104344

展開

Fuzzy evaluation model of process improvement capability with costs consideration

Chen K.-S.[a, b, c] ✉ , Chen S.-C.[a] ✉ , Hsu T.-H.[d] ✉ , Lin M.-Y.[a] ✉ , Wu C.-F.[e] ✉

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摘要

作者關鍵字

熱門主題

計量

摘要

The Taguchi capability index, which reflects the expected loss and the yield of a process, is a useful index for evaluating the quality of a process. Several scholars have proposed a process improvement capability index based on the expected value of the Taguchi loss function as well as the corresponding cost of process improvement. There have been a number of studies using the Taguchi capability index to develop suppliers' process quality evaluation models, whereas models for evaluating suppliers' process improvement potential have been relatively lacking. Thus, this study applies the process improvement capability index to develop an evaluation model of the supplier's process improvement capability, which can be provided to the industry for application. Besides, owing to the current need to respond quickly, coupled with cost considerations and the limits of technical capabilities, the sample size for sampling testing is usually not large. Consequently, the evaluation model of the process improvement capability developed in this study adopts a fuzzy testing method based on the confidence interval. This method reduces the risk of misjudgment due to sampling errors and improves the testing accuracy because it can incorporate experts and their accumulated experiences. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

作者關鍵字

Fuzzy testing; Process improvement capability index; Process improvement cost; Taguchi capability index; Taguchi loss function

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SCIE SSCI

Applied Sciences (Switzerland) • *開放取用* • 卷 11, 期 14 • 2 July 2021 • 論文號碼 6249

文獻類型
論文 • *Gold Open Access*

來源出版物種類
期刊

ISSN
20763417

DOI
10.3390/app11146249

展開

Statistical hypothesis testing for asymmetric tolerance index

Chen K.-S.[a,b] ✉ , Chen S.-C.[a] ✉ , Hsu C.-H.[c] ✉ , Chen W.-Z.[a] ✉

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摘要

作者關鍵字

熱門主題

摘要

Many of the nominal-the-best quality characteristics of important machine tool components, such as inner or outer diameters, have asymmetric tolerances. An asymmetric tolerance index is a function for the average of the process and the standard deviation. Unfortunately, it is difficult to obtain the $100(1-\alpha)\%$ confidence interval of the index. Therefore, this study adopts Boole's inequality and DeMorgan's theorem to find the combined confidence region for the average of the process as well as the standard deviation. Next, using the asymmetric tolerance index for the target function and the combined confidence region for the feasible region, this study applies mathematical programming to find the confidence interval as well as employs this confidence interval for statistical hypothesis testing. Lastly, this study demonstrates the applicability of the proposed approach with an illustrative example. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

作者關鍵字

Asymmetric tolerance; Confidence interval; Process capability indices; Quality characteristics; Statistical hypothesis testing

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Mathematics • *開放取用* • 卷 9, 期 19 • October-1 2021 • 論文號碼 2513

文獻類型
論文 • *Gold Open Access*

來源出版物種類
期刊

ISSN
22277390

DOI
10.3390/math9192513

展開

A fuzzy evaluation model aimed at smaller-the-better-type quality characteristics

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摘要

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熱門主題

計量

摘要

Numerous key components of tool machines possess critical smaller-the-better-type quality characteristics. Under the assumption of normality, a one-to-one mathematical relationship exists between the process quality index and the process yield. Therefore, this paper utilized the index to produce a quality fuzzy evaluation model aimed at the small-the-better-type quality characteristics and adopted the model as a decision-making basis for improvement. First, we derived the 100(1-α)% confidence region of the process mean and process standard deviation. Next, we obtained the 100(1-α)% confidence interval of the quality index using the mathematical programming method. Furthermore, a one-tailed fuzzy testing method based on this confidence interval was proposed, aiming to assess the process quality. In addition, enterprises' pursuit of rapid response often results in small sample sizes. Since the evaluation model is built on the basis of the confidence interval, not only can it diminish the risk of wrong judgment due to sampling errors, but it also can enhance the accuracy of evaluations for small sample sizes. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

作者關鍵字

Confidence interval; Fuzzy evaluation model; Membership function; Quality characteristic; Smaller-the-better

熱門主題 ⓘ

計量

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process quality index

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SCIE SSCI

Applied Sciences (Switzerland) • *開放取用* • 卷 11, 期 20 • October-2 2021 • 論文號碼 9395

文獻類型
論文 • *Gold Open Access*

來源出版物種類
期刊

ISSN
20763417

DOI
10.3390/app11209395

展開

Novel service efficiency evaluation and management model

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摘要

作者關鍵字

Sustainable Development Goals 2021

熱門主題

資金詳情

摘要

Numerous scholars have invested in the research of service innovation management, hoping to find a more objective and scientific service efficiency evaluation and management model so as to stride forward towards the goal of smart innovation management. In the service operating system, the multi-workstation service operation is one of the common service operation models. Some studies have pointed out: apart from a good service attitude, the service operation time of each workstation is a key factor which measures the performance of the workstation's service operation. Therefore, this paper proposed a standardized concept with a service operation efficiency evaluation index. This index is not only convenient and easy-to-use, but it also has a one-to-one mathematical relationship with the performance achievement rate. Next, the radar evaluation chart was employed to evaluate the service efficiency of each workstation. First, according to the upper confidence limit and the required value of the index, the minimum value (MV) of the index estimator was derived and marked on each radar line; at the same time, all MVs were connected to form a control block. When the point estimate of the index does not fall into the control block of the radar chart, it represents that the service operation efficiency of the workstation has not reached the required level, so it needs to be improved. Because this model can directly compare the point estimate of the index with the MV, it can judge whether the service operation efficiency reaches the required level. In this way, the advantage of simple and easy-to-use point estimate can be maintained, and the risk of misjudgment caused by sampling errors can be reduced as well, which is helpful for the service industry to move towards the goal of intelligent innovation management. This method is not only applied to the performance evaluation of the multi-workstation service operation process but also applicable to the performance evaluations of other service operations.

作者關鍵字

Control block; Minimum value; Multi-workstation service operation; Radar evaluation chart; Service efficiency index

SCIE SSCI

Mathematics • *開放取用* • 卷 9, 期 21 • November-1 2021 • 論文號碼 2761

文獻類型
論文 • *Gold Open Access*

來源出版物種類
期刊

ISSN
22277390

DOI
10.3390/math9212761

展開

Fuzzy evaluation model of bank APP performance based on circular economy thinking

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摘要

作者關鍵字

Sustainable Development Goals 2021

熱門主題

資金詳情

摘要

As the environment of the Internet of Things (IoT) gradually becomes common and mature, various smart application (APP) platforms have sprung up, making what we are doing more convenient, more economical and more efficient. Then, this paper used a bank APP as the research background to discuss issues related to smart APPs. Obviously, through the bank APPs, customers can complete their transfer and payment for various expenses at home, eliminating the inconvenience of going out, which not only can alleviate traffic congestion as well as reduce carbon emissions but also can save the manpower expenditure costs for banks. Consequently, improving APP performance and increasing the number of users of an APP is a very important issue. Therefore, this paper proposed an APP performance index to evaluate the performance of a bank APP. This APP performance index is to evaluate the performance of the APP through the time interval of customers' access to the APP. The shorter the time interval is, the greater the number of users within a unit time is. In addition, based on cost considerations and effectiveness, the sample size n is usually not too large in practice, in order to make decisions quickly and accurately in a short time. Since the fuzzy testing model based on the confidence interval can be integrated with the past accumulated experience of data experts, the testing accuracy can be leveled up under the condition of small-sized samples. Accordingly, a fuzzy evaluation model was proposed to evaluate whether the performance of the bank APP can reach the required level, and this model was also regarded as a basis for decision-making to determine whether to improve the bank APP. At the same time, we can grasp the opportunities for improvement, achieve the effect of cost reduction, energy saving and carbon reduction, and further move towards the goal of innovative and intelligent management. © 2021 by the authors.

作者關鍵字

APP performance index; Bank app; Circular economy thinking; Confidence interval; Fuzzy evaluation model

SCIE SSCI

Applied Sciences (Switzerland) • *開放取用* • 卷 11, 期 23 • December-1 2021 • 論文號碼 11262

文獻類型
論文 • *Green Open Access*

來源出版物種類
期刊

ISSN
20763417

DOI
10.3390/app112311262

展開

Fuzzy quality evaluation model constructed by process quality index

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摘要

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熱門主題

摘要

Many studies have pointed out that the-smaller-the-better quality characteristics (QC) can be found in many important components of machine tools, such as roundness, verticality, and surface roughness of axes, bearings, and gears. This paper applied a process quality index that is capable of measuring the level of process quality. Meanwhile, a model of fuzzy quality evaluation was developed by the process quality index as having a one-to-one mathematical relationship with the process yield. In addition to assessing the level of process quality, the model can also be employed as a basis for determining whether to improve the process quality at the same time. This model can cope with the problem of small sample sizes arising from the need for enterprises' quick response, which means that the accuracy of the evaluation can still be maintained in the case of small sample sizes. Moreover, this fuzzy quality evaluation model is built on the confidence interval, enabling a decline in the probability of misjudgment incurred by sampling errors. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

作者關鍵字

Fuzzy hypothesis test; Membership function; Nor-mal process distribution; Process quality index; Quality level

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(2021) *Computers and Industrial Engineering*, 156, art. no. 107265. 被引用 6 次.
https://www.journals.elsevier.com/computers-and-industrial-engineering
doi: 10.1016/j.cie.2021.107265

View at Publisher

SCIE SSCI

Mathematics • *開放取用* • 卷 9, 期 23 • December-1 2021 • 論文號碼 3144

文獻類型
論文 • *Gold Open Access*

來源出版物種類
期刊

ISSN
22277390

DOI
10.3390/math9233144

展開

Attribute service performance index based on poisson process

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摘要

The purpose of a shop enhancing customer satisfaction is to raise its total revenue as the rate of customer purchases in the shop increases. Some studies have pointed out that the amount of customer arrival at a shop is a Poisson process. A simple and easy-to-use evaluation index proposed for the Poisson process with the attribute characteristic will help various shops evaluate their business performance. In addition, developing an excellent and practical service performance evaluation method will be beneficial to the advancement of shop service quality as well as corporate image, thereby increasing the profitability and competitiveness of the shop. As the surroundings of the internet of things (IoT) are becoming gradually common and mature, various commercial data measurement and collection technologies are constantly being refined to form a huge amount of production data. Efficient data analysis and application can assist enterprises in making wise and efficient decisions within a short time. Thus, following the simple and easy-to-use principle, this paper proposes an attribute service performance index based on a Poisson process. Since the index had unknown parameters, this paper subsequently figured out the best estimator and used the central limit theorem to derive the confidence interval of the service efficiency index based on random samples. Then, we constructed the membership function based on the α−cuts of the triangular shaped fuzzy number. Finally, we came up with a fuzzy testing model based on the membership function to improve the accuracy of the test when the sample size is small in order to meet enterprises' needs for quick responses as well as reducing the evaluation cost. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

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Confidence interval; Fuzzy testing; Membership function of fuzzy number; Poisson process; Service performance index