
BOOK OF ABSTRACTS OF THE **ICIEOM-CIO-IIIE** INTERNATIONAL CONFERENCE **2015**

Universidade de Aveiro, Portugal
JULY 6th · 8th, 2015

ENGINEERING SYSTEMS AND NETWORKS:

The way ahead for industrial engineering
and operations management



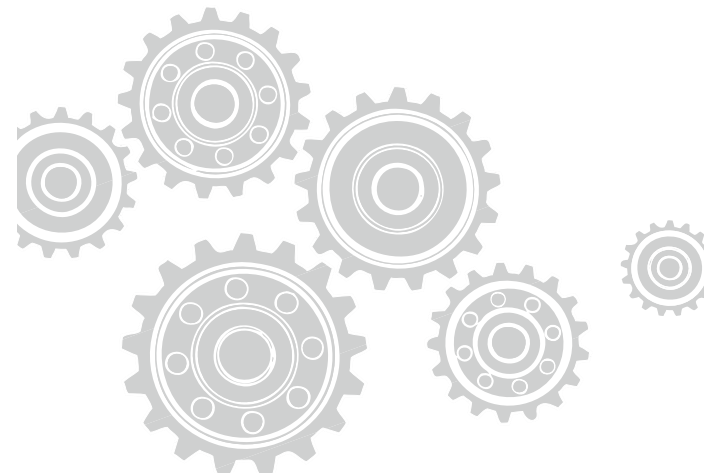
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(XIX Congreso de Ingeniería de Organización)
International IIE Conference 2015

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**ENGINEERING SYSTEMS
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The way ahead for industrial engineering
and operations management



Technical Record

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Foreword

We live in an interconnected world. Every day, increasing flows of goods, information and individuals strengthen the links among companies and nations. In the forthcoming years this scenario is likely to be further reinforced by the rising prosperity and participation of emerging economies, and by the dissemination of digital technologies. A close examination of the density of these networks reveals a complex setting of connections among industries that requires a thorough understanding. The effective participation in such interconnected production context calls for the development of specific knowledge aimed at informing managerial practice for taking full advantage of the existing opportunities. To this end academic conferences are privileged forums for the dissemination of the most recent and relevant research, theories and practices.

The ICIEOM-CIO-IIIE 2015, “XXI International Conference on Industrial Engineering and Operations Management”, “9th International Conference on Industrial Engineering and Industrial Management” (XIX Congreso de Ingeniería de Organización) and “International IIE Conference 2015” called for contributions under the motto “Engineering Systems and Networks: the way ahead for industrial engineering and operations management”. An impressive number of submissions were received, addressing a multidisciplinary range of industrial engineering and operations management topics, and creating a rich setting for three Conference days of vibrant debate.

We received a total of 353 submissions for ICIEOM-CIO-IIIE 2015. This book presents the abstracts of the 199 manuscripts that were presented in the Conference, after a rigorous selection and review process that offered the authors a first moment of feedback.

The Organizing and Scientific Committees of ICIEOM-CIO-IIIE 2015 express their gratefulness to all the authors, invited speakers and to the members of the Program Committee who have generously committed their time and expertise in the rigorous process of revision of the submitted manuscripts.

Marlene Amorim (Conference Chair)

Carlos Ferreira (Chair of the Scientific Committee)

ICIEOM-CIO-IIIE International Conference 2015

This joint conference is a result of an agreement between ADINGOR (Asociación para el Desarrollo de la Ingeniería de Organización), ABEPRO (Associação Brasileira de Engenharia de Produção) and IIE (Institute of Industrial Engineers). In 2015 the Conference took place at the University of Aveiro (Portugal) from July 6th-8th.

The University of Aveiro was founded in 1973, and quickly became one of the most dynamic and innovative universities in Portugal. Ranked in top 50 young universities in the world, Aveiro offers an international environment, acknowledged for excellence in education and research, and appreciated for its welcoming culture.

The motto of ICIEOM-CIO-IIIE 2015 International Conference was “Engineering Systems and Networks: the way ahead for industrial engineering and operations management”. The Conference aims to provide a forum to disseminate, to all branches of industry, information on the most recent and relevant research, theories and practices in Industrial Engineering, Management and Operations. To this end, ICIEOM-CIO-IIIE promotes links between researchers and practitioners from different branches, in order to enhance an interdisciplinary perspective of industrial engineering and management.

ICIEOM-CIO-IIIE 2015 received a total of 353 submissions, of which 199 were presented in the Conference after a rigorous process of selection, review and feedback to authors, therefore providing the key ingredients to set up a conference of very high standards, built on the experience of previous editions of ICIEOM, CIO and IIIE conferences.

CONFERENCE AREAS

STRATEGY AND ENTREPRENEURSHIP

OR, MODELLING AND SIMULATION

LOGISTICS, PRODUCTION AND INFORMATION SYSTEMS

QUALITY AND PRODUCT MANAGEMENT

KNOWLEDGE AND PROJECT MANAGEMENT

SERVICE SYSTEMS

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Türkay Dereli
Valéria Miccuci
Vera Mariza Costa
Virgilio Machado
Wagner Lucato
Yuval Cohen

Keynote Speakers

Prof. Jan Godsell (University of Warwick)

“Can OM Scholars Have It All?: The way ahead for scholarship in OM”

Professor Godsell’s career has been split between both industry and academia, and she is currently a Professor of Operations and Supply Chain Strategy at WMG. She has worked for ICI/Zeneca Pharmaceuticals and Dyson, reaching the senior management level in both Supply Chain and Operations Management functions. She is a Chartered Engineer and Member of the IMechE. She is on the board and scientific committee of EurOMA (European Operations Management Association), the cabinet of the UK roundtable of CSCMP (Council of Supply Chain Management Professionals) and the manufacturing steering committee of the IMechE. She is on the editorial board of 3 journals, including the International Journal of Operations and Production Management, and she is an advocate for improving the uptake of STEM subjects by school children.

Prof. Rui Sousa (Catholic University of Portugal)

“Operations Management in the Digital Economy”

Rui Sousa holds a PhD from London Business School and is Professor of Operations Management at the Catholic University of Portugal, School of Economics and Management (Porto). His research has won several accolades and has been published in leading international journals, including the Journal of Operations Management, Production and Operations Management, Decision Sciences, International Journal of Operations & Production Management and the Journal of Service Research. Rui serves on a number of Editorial Review Boards (e.g., JOM, IJOPM) and is member of the Scientific Council of Social Sciences of the Foundation for Science and Technology (Portugal). In the School of Economics and Management, he is President of the Scientific Council, Director of the MSc in Service Management and Director of the Service Management Lab (SLab). He has taught at the London Business School, London School of Economics, the European Institute for Advanced Studies in Management (EIASM, Brussels) and several Portuguese business schools. His present research interests include service operations, digital economy and operations strategy.

Meet the Editors

Ron Askin

Ronald G. Askin is Professor and Director of the School of Computing, Informatics, and Decision Systems Engineering at Arizona State University. He received a BS in Industrial Engineering from Lehigh University, and an MS in Operations Research and a Ph.D. in Industrial and Systems Engineering from Georgia Institute of Technology. Dr. Askin is a member of INFORMS, SME, ASEE and a Fellow of the IIE. He was General Chair of the 2012 INFORMS Annual Meeting and currently serves as Editor-in-Chief of IIE Transactions. Dr. Askin has served as the Chair of the IIE Council of Fellows, Chair of the Council of Industrial Engineering Academic Department Heads and Chair of the INFORMS Manufacturing and Service Operations Management Society. He has authored over 120 publications on the application of operations research and statistical methods to the design and analysis of integrated production control systems. His awards include an NSF Presidential Young Investigator Award, the Shingo Prize for Excellence in Manufacturing Research, the Eugene L. Grant Award from The Engineering Economist, the IIE Transactions on Design and Manufacturing Best Paper Award (twice) and the IIE Transactions Development and Applications Award. He is also a two-time recipient of the IIE Joint Publishers Book-of-the-Year Award.

Alexandre Dolgui

Alexandre Dolgui is the Editor-in-Chief of the International Journal of Production Research –IJPR (Taylor & Francis). Professor of the École Nationale Supérieure des Mines de Saint-Étienne, received the distinction of Full Professor of Exceptional Class. Member of diverse professional associations like IIE, IFPR and AIM, Dolgui is Deputy Director of CNRS Laboratory LIMOS – UMR 6158 and of the Henry Fayol Institute, where is the Head of the MSc and PhD programs since 2011. Former Editor of IEEE Transactions (2005-2008), IJSS (2006-2009) and Omega (2010-2013). Member of Editorial Board of 18 international journals (e.g. IJPE, IJMTM and others).

Meet the Industry Professionals

João Gunter Amaral

Board Member of Sonae MC

João has over 20 years IT experience working in different business sectors including Manufacturing, Services and Retail. After a four-year period as IT Director at Leica Camera AG in Portugal, leading the implementation of SAP at Leica's industrial unit in Portugal, João joined Sonae in 2001. After successfully managing several workstreams of Sonae's ERP implementation, João developed and managed Sonae's ERP Competence Center.

In 2006 João was appointed Head of Innovation, role that he accumulated with his previous role of Business Partner for Sonae's food retail business leading the implementing of several innovation projects, in tight articulation with the different Business Units.

In 2013 João cumulatively assumed responsibility for Continuous Improvement at Sonae.

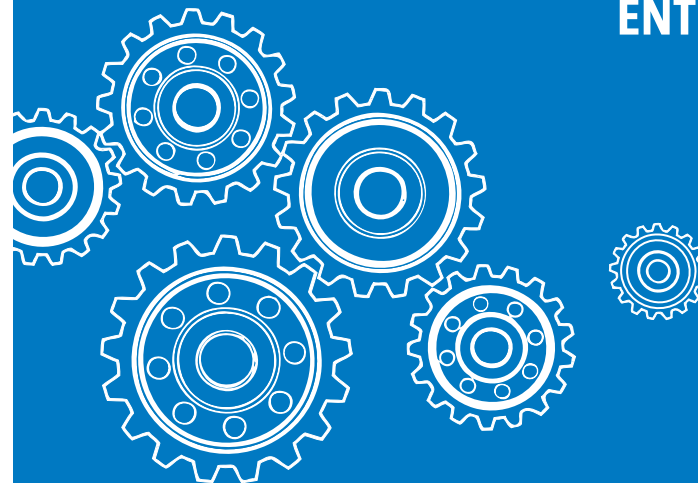
In 2014 João was nominated Board Member of Sonae MC assuming the responsibility of Logistics and Production Units.

Sandra Augusto

Logistic's Director - Volkswagen Autoeuropa

Born in Lisbon in 1971, studied Eletrotechnical Engineering in the ISEL. In April, 1994 started to work in the Autoeuropa. She started in the Production Planning as responsible for Investment Projects in equipment and infrastructure. In 1998 reached the first management position having gone through two years of coordination and supervision teams. I took that time responsibility for the Scheduling Department and Technical changes to the product in the Product Engineering. In 1999, Autoeuropa became 100% Volkswagen and the department began to be integrated into the logistics area with the name Pre Series. In 2000 embraced a new experience as Assistant to the Director of the Factory. In 2003 she finished her MBA and in 2004 returned to the Logistics Pre Series for the launch of EOS. In 2006 started to manage the Supply Chain and cumulatively since Nov. 2008 also the Internal Logistics. In March 2011 she took the current role.

**STRATEGY AND
ENTREPRENEURSHIP**



BPMN for a Costing Model Conception

Araújo MB¹, Rodrigues Filho BA¹, Gonçalves RF¹

Abstract: This study was conducted to map and model the business processes of the HEI (Higher Education Institutions). It aims to show the importance of business processes modeling as a precondition for information system design. It shows the concepts of Activity-Based Costing (ABC) and its update, the TDABC (Time-Driven Activity-Based Costing), to support the development of a costing system for public universities. For the modeling of business processes, it was used the BPMN (Business Process Management Notation). It can be concluded that public processes implemented in public services are both complex and bureaucratic, mainly due to regulations. A bidding procedure of acquisition materials or services demand eight sectors activities. The contribution of this study was the presentation of a business process modeling should be applied to public service for the optimization of resources. This research presents the normal flow of bids, but in practice there is some variation.

Keywords: Business modeling; costing; business processes management; BPMN; TDABC.

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Relationship between Organizational Social Responsibility and Occupational Health and Safety: a review study

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Abstract: The intersection between Organizational Social Responsibility (OSR) and Occupational Health and Safety (OHS) proposes an important topic to be addressed in current and future research, to the extent that aspects relating to working conditions are increasingly latent. The research can be characterized as a review study and aimed to collect and analyze articles with the OSR and the OHS issues. In total were analyzed 49 articles published between 1981 and 2014. The study sample corresponds to the documents indexed in Scopus and Web of Science databases. It was observed that the main results of the internal dimension OSR represents 44% of published articles and 53% of these focus on Ergonomics and OHS. Some research gaps appeared after this study, a fact that suggests future research on the subject.

Keywords: Organizational Social Responsibility; Occupational Health and Safety; Sustainability;

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The Importance of Cost Management in a Manufacturing Company of Hydroelectric Plants - a case study

Mello MF¹, Santos AB²

Abstract: Changes in the global market happen at all times and the update of the companies must be constant and rapid, thus it is necessary that managers are aware of the current status of the organization and its projects, mainly in cost sector. This paper aims to demonstrate the importance of cost managements and proposes a design methodology, through an applicative program for an appropriate management of costs in the studied company. The research occurred in the hydro sector on an assembly company of hydroelectric plants in the state of Rio Grande do Sul, Brazil. The survey results showed the importance of cost control in each project and this topic is part of the company financial policy. The results of this study show that a methodological structuring of cost control is vital for managers to have reports at hand in a proper sequence information, that is relevant to make decisions.

Keywords: Costs; Cost Management; Project Management.

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Integrated Management of Operations, Human Resources and Innovation: a Strategic Approach for Developing Sustainable and Competitive Business

Mejías AM¹, Pardo JE², Garrido N³, Paz E⁴

Abstract: As a result of a broad analysis of the literature, the knowledge of three key management fields involved in sustainable development: operations/supply chain, human resources and innovations, is linked. This paper sets out to present a theoretical framework for contributing to answering the questions “what”, “who” and “how” should companies do to develop competitive and sustainable business. This framework is illustrated through the analysis of IKEA and INDI-TEX as exemplary case studies. Taking into account the individual and the comparative study of these companies, some lessons are drawn to promote an anticipatory or, even, an innovation-based sustainable strategic behaviour in SME companies, supported by human resources and operations management.

Keywords: Human resources, innovation; supply chain management; sustainable strategy; sustainability.

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Environmental management in companies in the food sector: the state of the art

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Abstract: The food sector, given its size and impact, should be one of the principal focus of the environmental management progress. This article aims to analyze the scientific advances in the field of environmental management in food companies through a literature review of the last 10 years. Trends in research linked to the environmental management of food and/or beverage companies are analyzed by classifying the literature into five themes: culture/models, environment, logistics, materials and process.

Keywords: State of the art; food sector; environmental management.

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Integrating Strategic Considerations and Value Co-Creation in Project Management

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Abstract: While traditional project management advocates sticking to a baseline plan (composed of budget, schedule and specifications) this paper suggests a new dynamic planning approach that includes re-evaluation and optimizes the project's value while allowing strategic changes in the project scope, budget and schedule. The proposed optimization allows taking into account not only the project, but also the long term impact of changes on cash-flows, product reliability, firm reputation, and customer satisfaction. Such changes are not part of the traditional project management approach of sticking to the baseline and eliminating a scope creep. Such a new approach enables dealing with many important changes that occur during long term projects. This is particularly important in projects with large amount of uncertainty where new knowledge is revealed or discovered during the project lifespan, and significant events occur that impact the project or its deliverables. The paper analyses the factors that make this approach desirable and the type of projects where this approach would be especially attractive.

Keywords: Project management; Strategic management; Strategic decision;

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Systematic analysis of economic viability with stochastic approach: a proposal for investment

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Abstract: This paper aims to expand a Systematic for the Analysis of the Economic Viability of Investment Projects (SAEVIP) proposed by Lima et al. (2014, 2015) using methods of Economic Engineering. The SAEVIP received the "Research Award 2014" of the joint conference CIO-ICIEOM-IIIIE. For this purpose, adopts a stochastic treatment on principal variables that affect the expected economic performance of an investment project. The method of Monte Carlo simulation along with some distributions of probabilities, such as: uniform, triangular and normal are used to achieve the proposed objective. An example is used to illustrate the use of this approach in SAEVIP. The results extend the quality and reliability of the information generated and better substantiate the decision-making process on investment in fixed assets.

Keywords: Economic Analysis; Risk and Return, Sensitivity Analysis; SAEVIP; Stochastic Approach.

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Developing a Strategic Expansion Plan for the Manufacturing Industrial Sector in Kuwait

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Abstract: Developing the industrial manufacturing sector in Kuwait can be having several merits. It can offer employment opportunities, and accordingly reduce the burden of the social support, enhance other sectors of the economy, supply strategic commodities, and offer a room for applied research. Nevertheless, a well guided development of the industry needs to go through the phases of conceptualization, planning and realization in sequence. Based on a previous study of the conceptualization, the present study is focusing on the planning. The study overviews some of the important industrial figures in Kuwait and discusses the elements of the plan. A general scheme for the expansion plan is then presented. The study also presents improvements and changes that should be brought to these elements. Accordingly, a scenario of the expansion plan is presented based on the prioritization of the different manufacturing sectors regarding their strategic importance and performance. Finally, related discussions are conducted.

Keywords: Kuwait; Manufacturing Industry; Development; Strategic Expansion Plan.

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Social Responsibility: Reflections about the Mato Grosso State Certificate

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Abstract: This study examines the dissemination and the legitimation of social responsibility through the Certificate of Social Responsibility of the *Mato Grosso* State (in Brazil). For this, it was identified the main components forming the speech surrounding the event. The research is a qualitative analysis of the applicable law, of the Legislative Assembly (promoter of the event and creator of the law), in the diagnosis of the participants' organizations, of the social reports that are requested, participation in the event and interviews. The main results show that the Certificate of Social Responsibility of *Mato Grosso* has a strategic approach and is supported by the social report. Through the analysis of social reports and presentation of the examples cases, has been identified that the prioritized stakeholders are the employees, the community and the environment. There is no definition to Social Responsibility given by the Legislative Assembly for the speech, only restriction. Therefore, the Legislative Assembly uses the interpretation of participating organizations and transmits as his. Finally, to receive the certificate only is required from the participating organization deliver the social report and a statement. Thus, the organization is considered socially responsible by the certificate studied.

Keywords: Organizations; Certificate; dissemination.

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Social Behavior of Brazilian Organizations: An analysis of isomorphism mechanism

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Abstract: Man's behavior is determined by variables that are commonly understood as needs and motives. Human behavior is closely related to motivation to meet needs and, according to Maslow, these needs are built on a hierarchy composed of five groups, which are physiological, safety, love/belonging, esteem and self-actualization. Based on the above, this study aims to analyze the social behavior of Brazilian organizations and the existing isomorphism in these practices. The sample consists of companies listed on the ISE-BOVESPA stock market and the data were collected in the 2012 Sustainability Reports. Is use Content Analysis technique and descriptive statistics. The results indicate a concentration of actions on the need for safety and the existence of coercive and normative isomorphism in social activities.

Keywords: Isomorphism; Human Needs; Corporate Social Responsibility.

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Strategic decisions: an approach to the implementation of the Production Strategy in farms producing soybean

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Abstract: The content of the production strategy includes certain levels of planning, where are observed the competitive priorities and on this basis, two types of decisions: the structural and infrastructural. It was with scope on these decision levels that the study was developed having as object farmers who grow soybeans of the Campo Novo dos Parecis City (Brazil). For this was done field research with application of questionnaires to the farmers on their decision process involving structural and infrastructural decisions in the past four years. With the questionnaire it was sought to: understand the operation of the farm, identify the profile of rural properties, and identify in which factors of structural and infrastructural decisions the farmers spent more efforts in the period 2010 to 2014. The results showed that in recent harvests, when compared to investments in structure, farmers did more investments in infrastructure, which enables them to sustain the competitiveness of rural enterprises.

Keywords: Farmers; Rural properties; Structural Decisions; Infrastructural Decisions.

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Communication Adaptation Decisions Considering Cultural Differences between Brazilians and Americans

Marcon A¹, De Medeiros JF², Cruz CML³, Marcon É⁴

Abstract: This article sought analyzing the adaptation decisions of McDonald's when communicating with distinct markets. Thus, the institutional communication actions performed by the company in Brazil and in the United States of America were analyzed in order to describe the macro environmental variables that exert influence over the brand management, as well as, identifying, in light of Hofstede's Theory, the adaptation decisions under the aspects of individualism, masculinity, power distance and uncertainty avoidance. Regarding the method, the research was characterized as qualitative and exploratory, using the approach of content analysis of the commercials in both countries of the sample. As the results, it was observed that McDonald's adapts its communication compound to the Brazilian culture both in the macro environmental aspects and in the subjective aspects mapped by Hofstede's Theory.

Keywords: International Marketing; Adaptation; Culture; Communication.

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Sustainability as a success factor in global operations: a survey of car manufacturing supply chains

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Abstract: Since the 1990s, environmental issues have put companies under a growing pressure to reduce their environmental impact, especially in logistics operations. Current research seeks to define green practices in each supply chain segment, to deepen the understanding of how companies formulate their green initiatives and to analyze the logistical bases and results connected with such decisions. This study's sample was three large assembly companies in the automotive segment, with industrial plants located both in the southeast region of Brazil and globally. The results show that the wave of sustainability is a result of more than just the threat of negative publicity, and it is pushing enterprises into the green zone. At the same time, economic instability with oscillating growth is forcing enterprises to concentrate on improving efficiency to compensate for unstable demand and the price volatility of commodities, including water and energy.

Keywords: Green logistics; sustainability; supply chain management; environmental impact; globalization.

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An approach to Islamic Finance in Spain

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Abstract: Islamic finance systems are a new way of raising funds for families, companies and public institutions. This kind of system has its origin in the Middle East and Asia, but it is gaining customers all over the world due to the growth of Islamic economies and the problems of traditional financial systems in Western countries. Therefore, having into account the problems to get credit by SMEs in Spain Islamic Finance is a new open way for entrepreneurs, as well as for corporations and the whole society. This new financial resource has strict principles based on the *Sharia'a*, the Muslim law that regulates the transactions in Arab society. This fact could be a key point in order to develop a business structure in Spain, as a consequence of the spoiled reputation of traditional banks.

Keywords: Islamic Finance; SME; Spain; Banking.

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Integrated Framework for Sustainability Management in Project Environment

Ozmehmet Tasan S.¹

Abstract: Proactively or reactively, companies are looking for ways to integrate ideas of sustainability in their marketing, corporate communications, annual reports and in their actions. Since projects are often implemented as a means of achieving an organization's strategic plan, executives are imposing the usage of sustainability concept in projects. Unfortunately, there is little consensus on exactly what do to respond to these demands that project managers take action. Specifically, this study focuses on to fill this research gap on how to integrate sustainability and what concepts of sustainability to include in Project Management approaches as well as the knowledge areas of PMBOK. In the proposed integrated approach, a new knowledge area "Project Sustainability Management" is proposed. This study, which includes a preliminary proposal, will be most helpful to practitioners and researchers while managing a project by developing a structured guided framework.

Keywords: Project Management; Sustainability; Integration; PMBOK.

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Entrepreneurship And Innovation: a study between Brazil and Finland

Okano MT¹, Vendrametto O², Santos OS³,
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Abstract: The main aim of this project is to study how entrepreneurship and innovation are taught in the universities comparing Finland and Brazil and what methods are using to get this subject. To achieve the objective of this research, firstly was a survey of the literature on the entrepreneurship and innovation, business modeling, business planning, Canvas business model and Design Thinking. The study achieved its objective; the use of entrepreneurship and innovation in multidisciplinary work encourages students because it brings the reality of the labor market into college.

Keywords: Entrepreneurship; innovation; Brazil; Finland.

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Using cost-volume-profit to analyse the viability of implementing a new Distribution Center

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Abstract: Firms are constantly improving their activities in order to become more competitive. With the diffusion of international competition and easier access to global markets, effective logistic and inventory management strategies become essential to all players. In this sense, there is a clear tradeoff between inventory costs and service level. A common strategy to address this issue is to locate distribution centers (DC) near key markets. However, the decision to build new DCs must be supported by clear and convincing analysis. In this context, this paper reports the use of cost-volume-profit analysis to assess the viability of establishing a new DC by a real company that manufactures radiopharmaceutical products. The researchers collected and analysed detailed financial information from the company and compared the current scenario with potential future scenarios using the cost-volume-profit technique. Next, expected firm profitability is compared for two scenarios: with and without the new DC.

Keywords: Cost-volume-profit; decision making; logistic costs; radiopharmaceutical distribution.

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Analysis and comparison of two bike-sharing systems: characteristics, similarities and sustainable potential of the solutions

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Abstract: Product-Service Systems (PSS) represent a business proposition with potential to reorient the current production and consumption patterns towards sustainability. Although PSS became a popular subject, PSS research is still dominated by theoretical work and more empirical investigations are required. This paper aims at analyzing two use-oriented bike-sharing systems with a large sustainable potential in order to contribute to PSS empirical knowledge. Since there are only few contributions in the literature that compare two or more systems like these in different countries, a PSS located in a developed country and other available in an emerging economy were selected to be investigated. A qualitative analysis was carried out considering the contextual conditions of each solution, the PSS elements and the sustainable aspects, based on secondary data. The results confirm that these PSS models can provide environmental, economic and social benefits and represent an innovative approach for sustainable mobility. Aspects related to customer behavior and acceptance in face of PSS solutions are directions for future work.

Keywords: Product-service systems; PSS; innovation strategy; bike-sharing systems; sustainability.

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Social Innovation Research Centers: Focus, Objectives and Trends

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Abstract: The present paper aims to review the literature studies on Social Innovation, and its evolution in the period from 1965 to 2015. In this sense, researches have been developed in order to encompass this emerging theme. In order to increase knowledge on the scientific production related to this issue, this work analyzes the characteristics of publications in the Science Direct database and Scopus database from 1965 to 2015. The work characterizes as exploratory and descriptive, which seeks to deepen the analysis of scientific literature on social innovation, its actors, process, authors and directions of future research. The main results of the study can show that social innovation centers are focused on research and action; and the centers created after the 2010 act as interdisciplinary and more focused on research. Another relevant finding is that these centers seek direct its actions to the market and to sustainable objectives.

Keywords: Social Innovation; Research Centers on Social Innovation; Sustainability.

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The SWOT Analysis as a Method to Study the City

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Abstract: Several City definitions identify the four important aspects of it: the physical reality, subject to governance and governed by an administrative organization, a large concentration of people, and the economic activities. The current trend of humanity of gathering in urban settings forecasts that in the coming years the size and density of cities will increase. Therefore, it is necessary to have simple and practical tools to study and learn the real situation and condition of cities. The aim of this article is to expose the main factors to consider in the SWOT analysis of a city, and show the multiple aspects and the complex casuistry of each factor than we have to take into account during the exam of urban areas.

Keywords: SWOT analysis; Urban analysis; City.

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Alliance Taxonomies: A Literature Review

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Abstract: The literature on inter-firm forms of governance have been studied from different theoretical perspectives and has grown extensively in last few decades. Inter-firm forms of governance present a broad array of collaborative relationships, such as joint ventures, strategic alliances, buyer-supplier agreements, networks, trade associations and consortia. The aim of this paper is to describe existing alliance taxonomies, to identify main variables that influence formulation and functioning of particular form, and to provide practical implications for practitioners when choosing governance form for collaborations. Purpose of this paper has been accomplished through review of relevant literature on governance forms from different theoretical perspectives.

Keywords: Alliance taxonomy; governance forms; governance structures; strategic alliances; literature review.

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Preliminary definition of an enterprise cooperation maturity model (ECOMM)

Juan Antonio López-Del-Castillo, Llanos Cuenca¹

Abstract: The aim of this work is the preliminary design of a maturity model for business cooperation, by identifying the key areas that must be measured in the field of business cooperation and preliminary definition of maturity levels. Key areas for evaluation are: number of actors involved in decision making, level of cooperation, interdependence of the nature of relationships, number of cooperation mechanisms, information processing, form of decision, complicity level, objectives / common characteristics, degree of benefit among participants, stable relationship of cooperation and interaction force. The key areas are evaluated using a five-level scheme: initial, repetitive, defined, managed and optimized. This approach is applicable to any type of company involve in a collaborative process.

Keywords: Maturity Model; enterprise cooperation, key areas; collaboration; interoperability.

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Rubric to assess the competence of innovation, creativity and entrepreneurship in bachelor degree

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Abstract: Innovation has a special value for the survival and development of organizations, especially in a changing context. To develop the innovation, creativity and entrepreneurship capacities in students enhances their skills. A competency describes what training participants should be able to do at the end of the training. The competence is acquired through various learning outcomes to be achieved. Competition in innovation is closely related to the ability to propose and implement creative ideas to solve problems, ability to create and maintain connections work, etc. In this article is presented a method for measuring the competence of innovation, creativity and entrepreneurship in bachelor degree by introducing different levels of scope.

Keywords: Rubric; competence; innovation; evaluation.

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Tax Planning Applied to Small Brazilian Companies of Building Sector

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Abstract: This papers goal is to analyze the best tax organization applied to small Brazilian companies of building sector from tax planning appliance. To perform this research, it was necessary the simulation among the allowed Taxation Schemes to small companies according to Brazilian laws. The results shows the economic feasibility in two main regimes, being the relation among billing and hand labor the main determinants in the best regime choice, being Simples Nacional regime a most recommended for most revenue range allowed in laws.

Keywords: Tax avoidance; Tax planning; Building Sector;

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Why Brazilian Women are not on Top: The Work-Life Reconciliation Hypothesis

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Abstract: The female presence in middle management is already significant in Brazil. Yet, women hold only 7% of the board seats. Why are there so few women in corporate top ranks? Is it possible that prejudice and sexism work selectively, allowing women to ascend not beyond a certain point in corporate hierarchy? This paper rejects such perspective and aims at understanding the dynamics that drive women against the executive suite. The premise beneath this research is that women are not victims, but autonomous individuals. In order to test the hypothesis of Brazilian women choosing not to ascend, the first step was to analyse IBGE² data on work force and employment. Thereafter, the research explores the possibility that organizational dynamics is a major factor for women to deal with work-life issues. Studies of scientific organisations shows that flexibility helps conciliate work and life. The conclusion is: if corporations could emulate the scientific organisational environment, probably they would not only attract more women to the executive suite, but also adapt to a transforming society.

Keywords: Women; top-management; work-life balance; work organisation.

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Competitive strategies adopted by the Brazilian sugar and alcohol sector after the 1990s

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Abstract: The evaluation of the evolution of the Brazilian sugarcane industry reveals deliberated intervention of the State, from the 1930s to the early 90s. The strong state presence set up a paradigm of subsidy, as a role performance model. Deregulation in the 1990s rouse the adoption by businesses of strategies aimed at increasing its competitiveness in a scenario marked by fierce competition. In this context the present study from bibliography about this sector identified the main competitive strategies used by sugarcane mills in the post-deregulation period and concluded that most mills experienced a technological upgrade and modernization of management models.

Keywords: Sugarcane agroindustry; competitiveness; deregulation; competitive strategies.

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Key Parameters for the Analysis Stage of Internationalisation of Operations

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Abstract: In this paper, we identify the key parameters to consider in a decision model on internationalisation of operations. In order to propose these parameters, the GLOBOPE framework was adopted as the basis of this work. This framework contemplates the three commonest challenges of global operations configuration for industrial manufacturing companies in an internationalisation process, which are: new facility implementation (NFI); global suppliers network development (GSND); multisite production network configuration. We herein provide a set of suitable parameters for NFI and GSND in the analysis stage from strategic, tactical and operational decision levels.

Keywords: Internationalisation of operations; key parameters; new facility implementation; global suppliers network development; analysis stage.

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A Questionnaire for the Analysis Stage of Internationalisation of Operations

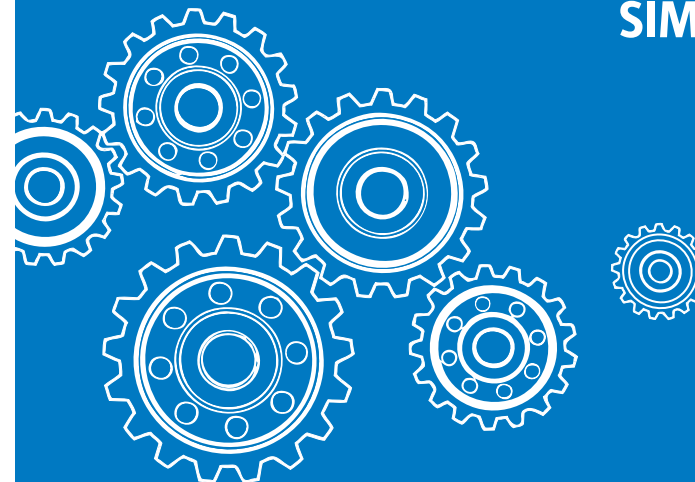
Vicente Montés, Guillermina Tormo, Josefa Mula¹, Hanzel Grillo

Abstract: In this paper, we formulated an initial questionnaire to ask companies, which have internationalised their operations, about the criteria and decisions that they have adopted during this process. We specifically focused on the analysis stage of two of the main challenges of global operations configuration for industrial manufacturing companies: new facility implementation (NFI) and global suppliers network development (GSND). A representative sample of the companies to send the questionnaire to was also obtained.

Keywords: Internationalisation of operations; questionnaire; new facility implementation; global suppliers network development; analysis stage.

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OR, MODELLING AND SIMULATION



Towards increasing sustainability in large urban mobility attractors

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Abstract: Private-car based mobility typically constitutes the main option in the case of large urban mobility attractors, generating congestion and parking problems, as well as increased levels of emissions, related both to the displacement itself but also to the search for a parking space. We have analyzed the case of a large work-related mobility attractor and proposed specific policies aimed at increasing the sustainability of the mobility patterns, both environmentally and in terms of the livability of the area. The proposed policies are tested with a specifically built simulation model, enabling us to draw conclusions with respect to the applicability of the new system and its acceptance and “willingness to use” on the side of the general public.

Keywords: Simulation; mobility; sustainability; user acceptance.

Managing Continuing Projects: Optimizing the Version-Release Policy

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Abstract: The current methodology of project scheduling focuses mainly on the concept of a project as a one-time concentrated effort. However, the typical R&D project is not a one-time effort, but a continuing effort divided to several releases. A Continuing Technology Development (CTD project) is divided into several intermediate projects leading to product Releases. Each release is composed of several new features, and the development of each feature requires a set of activities. Current planning methodologies ignore the unique characteristics of the CTD projects. The scheduling goal of a CTD project is to acquire the highest possible net present value (NPV) by scheduling the project activities and thus gaining higher values to early releases, by means of search techniques. A multiple group particle swarm optimization (MGPSO) for determining such schedule is proposed in this paper. Since the solution space of the scheduling is discrete, we modified the particle position representation, particle movement, and particle velocity to better suit MGPSO for this problem.

Keywords: Project; Scheduling; Release; NPV; Operations research; Particle swarm optimization.

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Forecasting Cloud Computing: Producing a Technological Profile

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Abstract: Migrating to cloud computing is one of the current enterprise challenges. In this sense, the small and medium enterprise should be the most interested, given that initial investments are avoided and the technology offers gradual implementation. However, 54.9% of SMEs confess that they have no knowledge of cloud technology. Accordingly, this paper aims at generating a relevant profile of cloud computing technology, as the first part of a novel approach based on four families of technological forecasting methods to gather and structure information concerning an emerging technology, generating a relevant profile, identifying its past development, forecasting the short and medium-term evolution and integrating all of the elements graphically into a hybrid roadmap. The outcome of the approach will raise the awareness of such technology as well as facilitate its implementation.

Keywords: Cloud computing; forecasting; technological information; mapping the knowledge; text mining.

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Smart Cities development fostered by ESCO organizations growth: opportunities and barriers in major European Union countries

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Abstract: Smart Cities have gotten worldwide attention as one of the most promising paths in the search of Sustainability, and Europe is one of the geographical areas where more attention are receiving, both as best practices implementation and interesting academic research area. Within the Sustainability improvement that Smart Cities could bring to citizens and companies, one relevant area that is gaining continuous priority is linked to issues connected to energy efficient management, and in particular the formation and development of collaborative relationships to improve energy management, that we have called ESCO. This study analyzes and compares the formation of ESCO type organizations in four European Union (EU) major countries and the challenges they are facing in their development, trying also to highlight some recommendations to reduce current barriers than hamper their development, in particular in Spanish ESCO projects.

Keywords: Smart Cities; Sustainability; ESCO in EU countries; Spanish ESCO.

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Approaches for Collaborative Networks Simulation: A review

Andres B¹, Poler R¹

Abstract: Collaborative networks (CN) are characterised by being complex systems, highlighting the need of considering simulation approaches to support the resolution of CN models. Three relevant simulation approaches are identified for its application in the context of CN models: Discrete Events Simulation, System Dynamics and Agent Based Simulation. Each simulation approach is briefly described and compared with each other, with the main aim of aiding on the task of selecting the most appropriate simulation approach to address the modelling process, in the context of CN.

Keywords: Simulation approach; collaborative networks; discrete event; system dynamics; agent-based simulation.

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Modelling the Strategies Alignment process in the Collaborative Network context

Andres B¹, Poler R¹

Abstract: A model to deal with the strategies alignment process, in the collaborative network (CN) context, is proposed. The main aim is to support the decision making of identifying which strategies to activate within the network in order to be aligned. This model provides a global view of all the strategies formulated in the CN, in order to identify those ones that have higher levels of alignment. The strategies alignment model is applied in an illustrative example.

Keywords: Mathematical model; strategies alignment; collaborative networks.

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Performance Evaluation of Order Acceptance Decision under Static and Dynamic Settings

Sujan Piya, Ahm Shamsuzzoha¹

Abstract: This paper develops two different methods of order acceptance and rejection decision (OAD). The developed methods represent decision making under static and dynamic settings respectively. These methods are analyzed using arena simulation software and comparisons are made to understand the situation under which one OAD setting outperforms others.

Keywords: Order Acceptance; Simulation; Static and Dynamic Decision.

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Modeling for Measuring the Performance of Management Innovation in National Retail

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Abstract: Innovation is now recognized as an essential factor for the competitiveness of organizations inserted in strategy and linked directly to organizational performance. In this context, the study aims to identify aspects that contribute to the management of innovation by setting a scenario of the retail network by sketching a current overview of innovation, identifying the relevant dimensions related to innovation, strategic actions, challenges and benefits conquered. As for the procedures, the research is characterized as a descriptive bibliography and as to the qualitative and quantitative nature, it was carried out through a case study and a multi-criteria analysis, held in one of the largest electronics chains in Brazil, in the four regions of operation. From the development of modeling and its application in the network studied, it was possible to verify the critical factors of success, from the management of innovation, which through the multi-criteria analysis and application of measurement method, Key Performance Indicators (KPI), made it possible to identify the prioritization of factors and distinction regarding organizational performance in the context of the evaluated dimensions.

Keywords: Retail Management; Strategic Management; Business competitiveness; Organizational diagnosis; Performance Evaluation.

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The role of complexity and flexibility of the instance in the joint solution approach

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Abstract: Many pieces of research address the development of new algorithms and new solution techniques for decision-making; however, most of them do not consider the characteristics of instance in their analysis, such as the complexity and flexibility of the instance. Building a complex model, such as a joint model, requires a huge amount of time and effort while the resulting solution of such joint models may or may not be the best solution for all the actors involved in the process. Therefore, it is important to make an in-depth analysis of the instance before investing the time and effort to build a joint model. In this regard, this paper provides an instance evaluation procedure to help decision-makers decide whether to use joint decision or not for a particular instance.

Keywords: Joint decision; Flexibility; MILP; Flexibility; Complexity.

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Simulated Annealing applied to the problem of task assignment in a laboratory

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Abstract: The task assignment becomes complex in companies that have the cross-training system, where multiple employees are trained for a particular job and each job can be executed by multiple employees. This paper proposes a methodology to the problem of task assignment in a lubricant analysis laboratory, consisting of a constructive heuristic designed to generate an initial solution followed by the application of the Simulated Annealing. This model was designed to be applied in small companies where computational capacity is limited, as well as the information available.

Keywords: Task assignment; Simulated Annealing; Cross-training.

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A procedure based on branch-and-bound for the Cyclic Hoist Scheduling Problem with n types of product

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Abstract: When various kinds of products must receive the same treatments in a production line of tanks and the size of batches is high, a cyclic manufacturing composed of a job from each batch can be scheduled. A hoist ensures the automated transfer of the jobs between tanks. The problem consists in the scheduling of repetitive hoist movements, which is known as CHSP (Cyclic Hoist Scheduling Problem). The objective is to find a sequence which minimizes the cycle time for jobs from different products. We consider the problem where n types of products must be treated and we search an n -cyclic schedule. The algorithm is based on the resolution of different sequences of products. For each one, a branch-and-bound is solved which considers only coherent subsequences. It enables to reduce the computational times most of the time for instances with 5 tanks and 4 product types.

Keywords: Scheduling; branch-and-bound; n -cycle; Hoist Scheduling Problem.

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Analysis of Relevant Factors in Competitive Intelligence System Implementation

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Abstract: This study analyses the effect of a set of factors in the implementation of competitive intelligence (CI) systems in order to determine if they act as drivers or barriers. A survey was passed to key people in six implementations that took place in significantly different firms and a consensus was found about the positive influence of most of the factors, the lowest ratings falling in indifference rather than being clearly perceived as negative. In spite of this, data show that CI tools have a remarkably strong positive effect, specially regarding the power of the CI tool used, and that people, and particularly the prejudices coming from previous experiences in CI implementation, can have an influence that goes from neutral to negative in CI projects.

Keywords: Competitive Intelligence; Implementation; Project; Driver; Barrier.

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Stock Market Firm Value Effects of Research & Development Expenditures in the Oil & Gas Industry

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Abstract: This paper evaluates the market firm value response to research and development (R&D) expenditures in the Oil & Gas Industry (O&G). R&D projects are seen as key to long term firm survival in the Oil&Gas industry. But the uncertainty associated with R&D success may reduce firm value market when a firm expands R&D. Using a panel of O&G firms traded in the New York Stock Exchange, we econometrically estimate the market value effect of R&D. We conclude that R&D expenditures increase firm market value, but with a one year lag, even after controlling for firm differences in book value or earnings and oil and gas reserves.

Keywords: Firm valuation; R&D expenditures; Oil&Gas Industry; panel data.

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A simulation-optimization approach for production planning and scheduling

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Abstract: In this paper, we propose and assess a Simulation-Optimization (SO) method to solve a real world planning and scheduling problem that has been addressed by the authors in the metal working industry. We present an experimental study comparing the iterative SO approach developed by Kim and Kim (2001) with our SO method that considers new types of capacity and production constraints in the optimization model. Preliminary computational results have shown that the proposed method tends to outperform Kim and Kim (2001) approach, both in terms of total products produced and value of the objective function.

Keywords: Production planning, Scheduling; Simulation-Optimization; Discrete-event simulation; Linear Programming.

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Utilization of Fuzzy constraints to build applications to support a Concurrent Engineering Environment in the process of Design and Manufacturing

Walker R¹, Fandino S², Paixão A³, Bezerra M⁴

Abstract: In this article presents a proposed an application in the concept Design evaluation stage through manufacturing features. In a Concurrent Engineering environment, using logic it need to set the imprecision. The Fuzzy logic is one path for evaluate the data inconsistency to evaluate industrial pumps conceptual design. Helping in integrate Design, Process and Manufacturing stages.

Keywords: Design; Manufacturing; Fuzzy.

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Proposal for an aggregate planning model of production in a sugar and alcohol plant linked to the fluctuation of prices in cash markets and the future markets

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Abstract: The objective of this paper is to show a model of aggregate production planning to support decisions of management and board level of sugar and alcohol plants, maximizing its margin of contribution. We conducted a case study in a sugar mill and alcohol in southeastern Brazil to validate the proposed model. The results are consistent, making this model a very useful and rentable tool for sugar and alcohol mill management.

Keywords: Plants of sugar and alcohol; aggregated production planning; mixed integer linear programming; quadratic programming; Markowitz portfolio models.

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Comparative Study between Financial Performance of Companies that Compose Corporate Sustainability Index and BOVESPA Index

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Abstract: Stock Exchanges around the world have created indexes to offer its investors the option to prioritize sustainable companies. In Brazil, the initiative came from the São Paulo Stock Exchange to launch the Corporate Sustainability Index (ISE). In search of greater knowledge on the subject, we analysed the financial performance of companies from two different indexes. The first is the ISE and the second, the Bovespa Index (Ibovespa), which is the indicator of the most traded and representative assets of the Brazilian stock market. We aimed to compare the differences in economic and financial performance of the companies included in these indexes. For this, profitability and liquidity indicators were calculated and multivariate statistical tests were applied. From the analysis, it was observed that there is no evidence of differences in economic and financial performance of the companies belonging to the studied indexes.

Keywords: Corporate Sustainability Index; Performance Analysis; Economic and financial performance.

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Leverage organizational performance in a food industry: a case study of the improvement of product quality attributes with the use of multiple regression analysis

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Abstract: The likelihood of implementing improvements interested organizations to contribute to increase in performance. This improvement plan was carried out in CVI Soft Ltda industry, franchised The Coca-Cola Company, in quality control sectors, maintenance and production. Measuring the improvement plan, it requires the application of statistical tool correlating the dependent and independent variables. Methodologically analyzed samples for 10 consecutive days for a generic The line 03 in order to demonstrate the correlation between the gas loss (dependent variable) for the torque and sequence days (independent variables) and thus performing the multiple regression. Torque is the force applied on the cover in the system open / close and it is essential its standardization and control to reduce the loss in over 15% of gas during the day. There was a negative and strong correlation with carbonation and the sequence of days. Adjusting the regression equation with significant (ANOVA), it was found that the value of F (31.93067) is greater on the day being the sequence p (0.000481) lower beyond the adjusted R-squared (0, 77460933) most find themselves in this variable. Thus, it was found by multiple linear regression equation that allows one to predict the carbon dioxide reduction of correlation.

Keywords: Multiple Regression; correlation; improvement plan.

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A quick and simple way to feed data for using in the implementation of software route planning: methodology, error analysis and case study

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Abstract: This article aims to solve the problem of feeding data for the use of algorithms or methods of planning delivery routes. The proposed solution consists in using as input in the Route Planning Software (RPS) the corresponding coordinates to postcode where the customer is located, and not the coordinates of the customer, as to obtain the coordinates of the customer requires typically much time and effort. Also it is shown that the loss of precision inherent in the method is not important for long runs. This work is complemented with a case study where proposed methodology was used and good results were obtained; it aims to serve as an example of how this method is applicable to a real case.

Keywords: VRP; Zip Code; Geographic coordinates.

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An update of Wiggle factor for Spanish road transport

Domínguez-Caamaño P¹, Comesaña-Benavides JA, Prado-Prado JC

Abstract: The Wiggle Factor (WF) is a correction factor defined as the ratio between the real distance travelled by road and the straight line between the two points. It is commonly used to estimate route distances for land transport. Though WF is an approximation, certain degree of accuracy is required, because it is frequently used to calculate fuel costs (which represent approximately half of the total truck costs). This article shows that the most common Wiggle Factor, 1.2, is not a good approximation for Spanish roads. In addition, we present a methodology to calculate the WF that can be applied to other countries or specific zones.

Keywords: Wiggle factor; road transport; routing.

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The Influence of the Crossover Operator on Genetic Algorithms Applied to the Job Shop Scheduling Problems

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Abstract: Due to its complexity, the job shop scheduling problem is classified as NP-hard and therefore, extremely difficult to solve. In general, these problems are addressed using metaheuristics optimization techniques such as the Genetic Algorithm (GA). In the search for better solutions using the GA, a number of different approaches of the method have been proposed varying - among other things - the form of representation of the solution, thus requiring the design of custom genetic operators. In theory, the form of representation and the operators may influence the generation of feasible solutions and, therefore, the use of traditional operators may be preferable. The objective of this article is to study the effects of the canonical crossover operators in a binary version of the GA, applied to the job shop environments, regarding the quality of the solution and the proportion of feasible solutions generated in the process of optimization.

Keywords: Production scheduling; Job shop; Genetic algorithm; Crossover operators.

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Controlling Production in Hybrid Make-to-Stock/Make-to-Order Manufacturing

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Abstract: The hybrid make-to-stock/make-to-order manufacturing is a well-known strategy that captures the benefits of both make-to-stock and make-to-order strategies. This paper addresses this hybrid environment in a two-stage flow shop system with an intermediate buffer between stages. The study provided guidelines for selecting an appropriate production control mechanism for releasing orders to the MTO stage, when the MTS stage is operated under a simple base-stock replenishment policy. Results show that workload based order release can be a suitable approach to production control in this hybrid production environment.

Keywords: Hybrid make-to-order/ make-to-stock; Base-stock; POLCA; WLC.

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A Simulation-based Analysis of a Cork Transformation System

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Abstract: This paper describes the development of a simulation study for the analysis of an important part of a factory which refers to the transformation of cork into stoppers that are 100% natural. The aim of the simulation model is to assess the productive flow through the analysis of performance indicators such as the lead time, the rate of utilization of the simulated resources, as well as the respective queues. After the detailed analysis of the system, a plan of action is devised with suggestions of improvements for implementing in the near future for addressing the main problems.

Keywords: Cork industry; Simulation; Arena Software; Line Balancing.

Comparison of different production strategies for the economic lot scheduling problem under different environments. A simulation study

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Abstract: In the present work we carry out a simulation study to compare the performance of production strategies for the Economic Lot Scheduling Problem (ELSP). The search for the production strategy for the ELSP with the best performance has necessarily to introduce the consideration of the production environment. We suggest some elements affecting the production environment, such as utilization, number of items, and stochastic behavior on demand. Under this approach, we compare, through a simulation study, the cost of five different production strategies. The results of this study confirm that the performance a production strategy is strongly dependant on utilization and number of items.

Keywords: ELSP; Scheduling; Simulation; Complexity; Uncertainty.

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Development of a simulation study for a production line in an automotive company

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Abstract: The demand for competitive products with low price and high quality standards is mandatory in the contemporary competitive global market. To achieve these targets, companies need to increase their productivity, which means that they need to produce more units in less time with considerable quality standards. In this work, it is developed a simulation study for an automotive company to analyze the dynamics of a line that produce backrests for the back part of cars. The main objective is to evaluate the current operations and to determine some possible ways to improve the productivity of the line by eliminating waste. The case study reported in this paper is part of the outcome of the business internship program sponsored by the Department of Economics, Management and Industrial Engineering of University of Aveiro, Portugal, for the students in the Industrial Engineering and Management master program.

Keywords: Automotive company; production line; productivity; simulation.

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Evaluating Perceptions on Executive Support in Project Management

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Abstract: Executive managers are responsible to set long-term objectives for their companies, formulate strategies to reach these objectives and enable implementing these strategies through projects. Effective management of each project is therefore necessary for the future of the company. Previous research suggests that executive support is important in project management. This support can reveal itself in many ways. It is important to ensure that project team really feels supported as much as executives feel that they provided the necessary support. This study investigates if senior managers and project teams have a similar view on executive support. Since innovative projects are strategically essential and usually considered as key projects in the project portfolio, this study focuses on executive support during new product development (NPD) projects using real data collected from NPD projects. In order to investigate the difference between perceptions of executives and project teams on support, a set of hypotheses were developed and tested. The results of this study show that although as a generalization executive support is important in project management process, there are different perceptions of the project team and executives on the manifestation of this support which are detailed in this paper. Implications are discussed in the conclusion.

Keywords: Executive support; Project management; Perception; New product development.

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Discovering Bayesian Networks using Process Mining: an Application in Manufacturing

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Abstract: Current maintenance resides in the concept of prediction and prevention based on monitoring, diagnosis and prognosis. Maintenance approaches have been presented in the literature to support decision making, increasing the emphasis on the use of Bayesian Networks (BN). This paper proposes a methodology to obtain BN models by using process mining techniques. The aim is to find deviations in probabilities of events occurrences and in causal structures. A case study is used to demonstrate the practical application of proposed methodology.

Keywords: Bayesian networks; Process Mining; Manufacturing; FIS.

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A Mixed-Integer Linear Programming Model for Slots Allocation in Congested Airports

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Cardeñoso FA³, López-Paredes A⁴

Abstract: Airlines that intend to fly to/from airports need to obtain a permission to use the full range of airport infrastructure. The permission, which is given by an airport coordinator, is named time slot. The objective of this paper is to develop a mixed-integer linear programming (MILP) model aimed to allocate slots according to the airlines' preferences and the capacity constraints currently specified for the airports in the Europe. Unlike other works, our proposal includes the possibility to reject flights when the slots demand exceeds the airport capacity. The proposed MILP model has been implemented by OpenSolver for Excel and tested with randomly generated examples.

Keywords: Operational Research; Airport Slot Allocation; Linear Programming.

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Application of Data Mining Techniques and Competitive Intelligence for efficiency gains in Public Service Selection Exam Agencies

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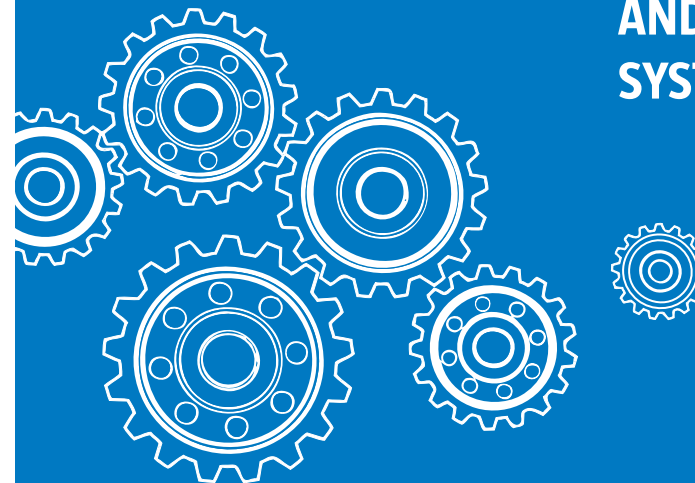
Abstract: This paper is based on the application of massive data mining techniques to databases related to Public Service Selection Exams to highlight specific knowledge skills discovery. The main observation pointed out was related to the high absence rate, especially by candidates who are exempt from the registration fee. The information regarding the absence rate is exploited to obtain higher efficiency, saving resources in renting facilities, allowing investment in anti-fraud technologies and eventually, reduction in registration fees, allowing for a greater number of people to participate in Public Service Selection Exams. This is clearly a competitive advantage over peer companies. This paper demonstrates, using simulations and under certain assumptions, that there is no risk in using a "7% excess-capacity" rate in the examination rooms.

Keywords: Competitive intelligence; Data Mining; Efficiency gains; public service selection exams; simulation.

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**LOGISTICS, PRODUCTION
AND INFORMATION
SYSTEMS**



A decision support framework for Production Flow Coordination using Supply Chain Management practices, Ordering Systems and Modeling techniques

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Godinho Filho M⁴

Abstract: One of the greatest challenges faced by companies is flow coordination in its supply chain (SC). For such coordination, it can be found in the literature and practice the use of modeling techniques, ordering systems (OS) and practices in supply chain management (SCM). These, however, are not jointly used for coordinated operations in SC, admitting then a theoretic gap to be explored. In that way, this work has the objective to present a decision support framework for production flow coordination by combining the use of those mechanisms. For the development of this framework, a literature review about methodologies in production flow coordination in SC was made. The developed framework has purpose to assist managers in the decision making process about the practices and systems that are more suitable for each situation, thus obtaining the best coordination in its supply chain. We highlight that the project is still in progress and the framework is in phase of evaluation.

Keywords: Supply Chain Coordination; Supply Chain Management; Ordering Systems; Modeling; Process Analysis.

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Using Mixed-Integer Linear Programming to solve a real distribution problem

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Abstract: This work presents a mathematical model of Mixed-Integer Linear Programming to solve a distribution problem of a Portuguese company that has a minority of its suppliers whose material flow is performed in both directions. The objective is to determine a minimum cost daily route for a vehicle, which must collect and deliver cargo to multiple suppliers considering its time windows and the vehicle's capacity in terms of weight and volume. The contribution of this work involves the presentation of three mathematical models. The first two reflect the integration of Vehicle Routing Problem with Simultaneous Delivery and Pick-up with the Capacitated Vehicle Routing Problem with Time Windows. The third one is a model that packs all the items on pallets in order to be delivered to the suppliers, that reflects a Single Stock Size Cutting Stock Problem.

Keywords: Vehicle Routing Problem with Simultaneous Delivery and Pick-up; Capacitated Vehicle Routing Problem with Time Windows; 3D-Packing Problem.

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A conceptual model to manage supply sequences in automotive industry for Nissan Barcelona

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Abstract: This paper presents an action research experience in *Douki-Seisan* in cooperation with the Nissan Factory in Barcelona. Three suppliers are involved in the experience to improve the way they perform *synchro* deliveries of parts to Nissan. Supplier issues are analysed and a decision making tool is developed for a supplier.

Keywords: Lean Manufacturing; *Douki-Seisan*; Supply Chain Management.

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Reverse Logistics of Agrochemical Pesticide Packaging and the Impacts to the Environment

Mello MF¹, Scapini R²

Abstract: Over time, agriculture has proven to be an important economic development factor for Brazil. The evolution and the need for productivity caused a large increase in the use of pesticides in agriculture and with it, the need to give proper treatment to packaging. With these agricultural activities in evidence, it is not possible to keep the crops without the use of pesticides. In 2000, it was created the 9,974 law as a decree Law 4,074/2002, which regulates the reverse logistics of empty containers of pesticides. This study intends to demonstrate that there are still producers who have difficulties in finding the correct destination to pesticide containers because of lack of knowledge of the law or because they acquire chemicals illegally, without a specific origin. The instruments for protecting the environment, such as licensing and environmental legislation stand out as high points, since it has the general objective of analyzing and demonstrating how reverse logistics helps minimize the impact and the possible environmental and health problems caused by the incorrect disposal of pesticide containers of and along with a group of farmers.

Keywords: Reverse Logistics; Packages; Pesticides.

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Impacts of a tracking and tracing system for containers in a port-based supply chain

Muñuzuri J¹, Escudero-Santana A, Onieva L, Cortés P

Abstract: The visibility of containers throughout the entire supply chain provides multiple benefits for shippers, terminals and transport providers. Nevertheless, intermodal transport chains often appear as “black boxes” to the cargo owners and their clients, who lose track of the container until it arrives at the final end of the chain. We describe here the configuration and features of a novel low-cost system to track and trace containers in an intermodal supply chain, provide information to shippers regarding delays and other unexpected events, and assist terminal operation accordingly. We then analyze the positive impacts of such a system over the entire supply chain, identifying the requirements of the main chain actors regarding the availability of information and how the proposed system contributes to the fulfilment of those requirements.

Keywords: Containers; tracking and tracing; supply chain; logistics; port.

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Adapting transport modes to supply chains classified by the uncertainty supply chain model: A case study at Manaus Industrial Pole

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Abstract: This paper discusses transport modes supporting Uncertainty Supply Chain Model (USCM) in the case of Manaus Industrial Pole (PIM), an industrial cluster in the Brazilian Amazon that hosts six hundred factories with diverse logistics and supply chain managerial strategies. USCM (Lee, 2002; Fisher, 1997) develops a dot matrix classification of the supply chains considering several attributes (e.g., agility, cost, security, responsiveness) and argues that emergent economies industrial clusters, in the effort to keep attractiveness for technological frontier firms, need to adapt supply chain strategies according to USCM attributes. The paper takes a further step, discussing which transport modes are suitable to each supply chain classified at the USCM in PIM's case. The research's methods covered the use of PIM's statistical official database (secondary data), interviews with the main logistical services providers of PIM and phone survey with a sample of firms (primary data). Findings confirm the theoretical argument that different supply chains will demand different transport modes running at the same time in the same industrial cluster (Oliveira, 2009). In the case of PIM, this implies investments on port and airport infrastructure and a strategic focus on air transport mode, due to (1) short life cycle of products, (2) distance from suppliers, (3) quick response to demand and (4) the fact that even PIM's standard products use, in average, forty per cent of air transport at inbound logistics.

Keywords: Uncertainty Supply Chain Model; Manaus Industrial Pole; transport.

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Stochastic Machine Maintenance under Imperfect Maintenance

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Abstract: The high operation and maintenance cost of industrial equipment (wind turbines, coal mills, and so on) combined with the limited accessibility by human resources to the engines and components, requires the use of complex maintenance scheduling systems in order to fulfil the requirements of high availability, reliability, maintainability, and safety. Glazebrook et al (2006) established the indexability of a class of restless bandits (Whittle, 1988) designed to model machine maintenance problems in which maintenance interventions have to be scheduled to mitigate escalating costs as machines deteriorate, and to reduce the chances of a machine breakdown. Whittle (1996) and Glazebrook et al (2005) have previously given index-based analysis of particular models, whereas Glazebrook et al (2006) shown that indexability is guaranteed in general. However, in that work the state transitions under maintenance interventions were assumed to be state independent. In this work we further develop those findings by presenting an alternative formulation for which explicit formulae for the Whittle index can be derived. In this case, we relax the previous assumption that maintenance interventions are perfect, and allow for some randomness in the active transitions. Moreover, the effectiveness of maintenance interventions is assumed to be state dependent. Numerical investigation testifies the strong performance of Whittle's index heuristic.

Keywords: Imperfect Machine Maintenance; Restless Bandits; Indexability.

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Application of the tools of Production Engineering for the reduction of dead time in an assembly line

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Abstract: The constant changes in the agricultural equipment market have brought many challenges to the productive sectors inside the organizations. Once the market is increasingly competitive, the industries lack of efficient working methods and companies seek intensely to adapt themselves to a methodology to assist in the standardization of production processes. The main objective of this work is the application of some tools of Production Engineering to improve the operating times in an assembly sector of a metal mechanical industry. The focus is to establish and to define the guidelines of the used methodology, the so-called 'Just in time', to seek the reduction of dead time in the process of the assembly line according to the reality of the companies. Change processes are very conditioned to the environment, the culture of who receives them and leads them. Thus, this project also aims to aid in the maturation of the staff in this cultural aspect, seeking the development of operators in a new operating process.

Keywords: Dead times; Methodology; Culture.

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Ten Years of Supply Chain Management Research in Brazil

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Abstract: This paper explores the supply chain management (SCM) research in Brazil from 2004 to 2014, identifying research opportunities in this domain. A literature review was performed, comprehending articles from Brazilian scholars, collected in two major academic data bases. An established framework to categorize this literature is applied to identify: (i) current status of high level supply management research in Brazil; and (ii) main streams, both theoretically and methodologically. A thematic analysis is done on the content, positioning Brazil's recent publications related to SCM context, emphasizing research drivers and opportunities for future work.

Keywords: Supply Chain Management; Thematic Analysis; Literature Review; Brazil.

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Factors of Influence in Tugger Train Systems

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Abstract: Tugger trains are increasingly spread in manufacturing logistics due to their efficiency and for safety reasons. The complexity of planning and optimizing tugger train systems is caused by the high number of design options and interdependencies of the input factors effecting the objectives. Consequently, there are controversial views in literature concerning the relative importance of these factors. The objective of the research project is to identify the relevant system-specific influence factors by measuring the intensity of different dimensioning parameters. The importance of the input factors is determined by a series of sensitivity analysis based on a static-deterministic EXCEL-simulation.

Keywords: Planning; Tugger train system; Simulation.

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Productivity improvement, considering legal conditions and Just In Time principles in the mixed-model Sequencing problem

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Abstract: A new mathematical model to solve the Mixed-Model Sequencing Problem with Work overload minimization is formulated. The model incorporates productive, social and legal aspects in order to move the theory problem closer to the actual industrial environments. Specifically, there are considered the variation of work pace of workers throughout the workday to increase the completed work; the conditions of occupancy level of workers imposed by the collective agreements; and the idea of keeping constant the production mix through the sequence leading both to a balance between the required workloads at stations and regular consumption of components. Indeed, by means of a case study linked to Nissan, a gain of over 98% is achieved in terms of regular cumulative production and required work, while performing the 100% of required work and following legal restrictions of operators' saturation.

Keywords: Mixed-model; sequencing; just-in-time; work pace; saturation.

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The impact of Supply Chain Management on the innovation process: systematic literature review

Zimmermann RA¹, Ferreira LM, Moreira AC

Abstract: Innovation generation is increasingly seen as a collaborative process carried out with the participation of different actors within or outside the organizations. In this context, the influence of the supply chains over innovation process is a current topic of great interest. This paper aims at contribute to the improvement of the knowledge about the relationship between supply chains and the innovation process by means of a systematic literature review. The identification and analysis of sixty relevant papers on the field showed the complexity, the topicality, and the broad character of the theme as well as indicated opportunities for future researches.

Keywords: Supply chain management; innovation management; organizational performance; systematic literature review.

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Planning routes and shifts driving for a small business of road passenger transport

Aparicio P¹, Muñuzuri J², Escudero A³, Grosso R⁴

Abstract: The presented work is done for a company that currently operates twenty lines of passenger transport in the metropolitan area of Seville. The planning of these was originally carried out manually, building routes and shifts in an Excel spreadsheet. In order to automate the process as much as possible. It was designed and implemented by a scheduling algorithm that would be much simpler than other algorithms in the literature and that, in addition, would make it possible to allow mixing vehicles and drivers between the lines. The objective was, firstly, to employ the minimum number of drivers; then, it is trying to use the least possible number of vehicles; finally, the study tries to reduce as much as possible the amount of split shifts. In addition, restrictions on the design of routes and shifts were added. At all times the service frequencies remained above the set limit. To allow the possibility of unexpected demand peaks, was established in the capacity of each route some slack.

Keywords: Planning routes; shifts driving; bus; passenger transport; algorithm.

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Lean wastes in Andalusian aeronautical industry: identification and analysis of the main causes

González L¹, Muñuzuri J², Hidalgo M³, González MJ⁴

Abstract: Through an action research methodology based in case study in 17 aeronautical companies, this investigation has identified Lean wastes that appear most frequently in aeronautics industry and has analyzed the main causes for its occurrence. Finally, these causes have been classified according to their origin: external or internal to the companies. So, most important external factors are: variable production schedule by leading company and a supply chain unconsolidated; otherwise, most relevant internal factors identified are: an inadequate production planning and an inappropriate purchasing management.

Keywords: Lean; Aeronautical; Improvement.

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A Two Stage Heuristic to Good Feasible Solutions for the Fuel Cost Transmission Gas Pipeline Networks Problem

Mothé E¹, Arica J²

Abstract: The pressure, which drives the natural gas (NG) in pipeline networks, is lost to the extent the NG flows. To keep the NG flow, the pressure is restored to each certain stretch of the pipeline by Compressor Stations (CSs). A CS is formed by several compressors, which returns the NG pressure, consuming part of the transported gas, causing the transmission cost. Therefore, it is necessary to determine the operation of the CSs to minimize their fuel cost. This problem is known as the problem of the fuel cost minimization of gas pipeline networks, which results an NP-complete problem. Heuristics working this problem must generate feasible solutions and compute their cost. This problem is addressed here with a two-stage approach, which sequentially generates feasible solutions and computes their costs, depending on a parameter. The first stage deals with feasibility and the second with cost minimization. The pipeline (cyclic or not) is associated to a network and decomposed in subnetworks connected by CSs. Given the mass flow rate at CSs as a parameter, a solution is found for a first given subnetwork using the feasibility stage, then, using the cost stage, are computed the minima costs to pass to the subnetworks connected with the given subnetwork. Using repeatedly these two stages, feasible solutions and minima costs to connect each subnetwork with other subnetworks are calculated sequentially, until the whole network is covered. Computational tests were carried out in Matlab, obtaining satisfactory results.

Keywords: Natural Gas; Transmission; Pipeline.

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On the on-hand stock estimation in a lost sales context and periodic review policy

Guijarro E¹, Babiloni E, Cardós M

Abstract: Traditionally, inventory literature assumes that unfilled demand can be backordered for the next replenishment cycle. However, there are a lot of practical situations where, if an item is out of stock, backordering assumption is not applicable and unfilled demand is lost. The main problem of the lost sales case is the mathematical difficulty of its treatment. This paper focuses on the estimation of on hand stock levels just after the order arrives, i.e. at the beginning of the cycle. On one hand, this paper presents a review of the existing literature on the on hand stock estimation in lost sales case. On the other hand, a new close-form approach to compute the probability vector associated to the on hand stock levels at the beginning of the cycle for periodic review systems and discrete demands is proposed. Numerical results show that our approximation presents low deviations and overcomes other estimation methods.

Keywords: On hand stock; lost sales; periodic review; discrete demand.

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Evolution of Term Productivity

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Abstract: Increasing productivity means increasing efficiency of labour, that is, both physical and human capital which exist in either a country or a company. One of the commonest ways of measuring efficiency gains is calculating increases in the overall productivity of the factor; that is, the efficiency with which the economy transforms its production factors into goods. As discussed in this paper, the productivity concept has evolved over time and has incorporated new concepts into its definition, while new ways to measure it have appeared.

Keywords: Productivity; Measuring productivity; Effectiveness; Efficiency.

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Logistics structure and Competitiveness: evidence across countries

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Abstract: The importance of logistics structure to economies is becoming increasingly significant and in order to support the economic growth based on exports, governments have sought to constantly improve the quality of logistics infrastructure of their countries, ensuring and promoting competitiveness of its production internationally. The consensus is that the logistics structure forms a vital link in the entire chain of trade, contributing to the international competitiveness of a country. This study aims to characterize the country as its logistics structure and relationship of this result to the promotion of competitiveness for them by relevance participation in world trade. To reach that goal the methodological procedure was performed a literature search and analysis of secondary data. Initially, through the identification and validation of data for countries and hence the application of multivariate data analysis methods to measure dimensions that allow such classification, planning, and especially the identification of dimensions of logistics infrastructure components in terms of promotion competitiveness.

Keywords: Logistics structure; multivariate data analysis; competitiveness.

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Complexity and operations performance: a case research from Brazilian automobile industry

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Abstract: Increase or decrease operations complexity depends on corporate strategy, as Mass Customization, for instance. However, operations issues are also very important for corporate results. The case research aims to identify a model to measure complexity and evaluate it with operations performance. The research object is an automobile assembly line in Brazilian State of Rio de Janeiro.

Keywords: Automobile Industry; Complexity; Operations Management.

VSM-based framework for managing the supply chain

Puche JC¹, Pino R², Priore P, Gómez A, De la Fuente D, Rosillo R

Abstract: Supply chain collaboration is a fruitful research area, and its potential to outperform reductionist solutions is widely understood. This work proposes an integrative framework based on the Viable System Model (VSM). It shows how the VSM can be used to define the supply chain's system structure. Supply chain processes integration is better controlled through a collaborative performance system. It is aimed to create management awareness about how the entire supply chain can benefit from this collaborative approach.

Keywords: Supply Chain Management; Viable System Model; System Thinking.

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Lean Production Systems Deployment and Monitoring using Discrete-event Simulation

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Abstract: This paper explores and reports, through a case study in a metalworking SME, the use of discrete-event simulation modeling as an enabling tool for both ex-ante Lean implementation evaluation, serving Value Stream Mapping purposes, and ex-post, changing the production drivers during deployment, monitoring on-going results. A successful change of production system from "push" to "pull", one of the pillars of Lean Production system, was achieved disclosing the benefits of using discrete-event simulation in pre, during and post Lean deployment. It aims to contribute to the scarce literature on Lean monitoring tools for Lean sustainability.

Keywords: Lean Production; Pull System; Simulation; Decoupling Point.

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Reduction Lead time Production – case study of the sound company

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Abstract: This paper presents a proposal for improving the Production lead time in the company of the Automotive sound branch, Sound. After general analysis of the factory floor, were found points delaying production. The company aims to reduce the production time in the short and medium term of their projects. It was observed in this company that the adoption of 5S program especially in inventory management, positive impact in handling operations, storage and personnel, as it leads to optimization of resources and greater motivation to reviewers by the possibility of direct participation and the well-be due to the more clean and organized work environment.

Keywords: Lead time; program 5's; project; reduction.

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An Empirical analysis on Supply Chain Risk Mitigation Strategies

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Abstract: Despite the fact that risk management in the supply chain has gained attention in recent years, there is still a lack of research on the topic. Thus, this paper performs an empirical analysis to validate possible dimensions related to supply chain risk mitigation strategies. The literature review covering supply chain risk management uncovered three dimensions, namely, preventive-downstream, preventive-upstream and reactive risk mitigation strategies. A factor analysis of survey data from Portuguese manufacturing companies made it possible to verify and validate the existence of the three dimensions and their statistical significance. Finally, this result led to the proposal of a three-dimensional framework that allows companies' supply chain risk mitigation strategies to be differentiated according to their nature (preventive-downstream, preventive-upstream or reactive). Hence, this framework could be a useful tool for managers to assess and develop the supply chain risk mitigation strategies of their companies.

Keywords: Supply chain risk management; risk mitigation; empirical analysis.

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Experimentation tool to study and improve rail container terminals

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Abstract: In this work, an experimentation tool is presented to make easier the search and the evaluation of improvement proposals for rail container terminals. The tool is composed of two elements: a simulation model that imitates the performance of a terminal, and an experimentation module that generates alternative scenarios from the information set by a decision maker. The tool can be used to find new terminal configurations that meet a service level established in advance.

Keywords: Experimentation tool; terminal simulation; combined transport.

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Supply Chain design and analysis: a case study on a low-cadence car production

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Abstract: The study presents a case study on the design and analysis of a supply chain in a low cadence car manufacturing plant in order to maximize the added value in the line. Lean manufacturing tools are used to design the internal logistics and upstream processes. Among all tools, kitting stands out as a solution for maximizing value, reducing WIP, lead times and machine utilization. Comparative cost-analysis is conducted obtaining a saving of variable costs of 10% in the logistic and assembly costs.

Keywords: Material handling; assembly lines; manufacturing management.

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Explaining alliance success factors in Spanish Food & Beverage supply chain: case analysis

Morcillo Bellido J¹, Duran Heras A²

Abstract: A new mathematical model to solve the Mixed-Model Sequencing Problem with Work overload minimization is formulated. The model incorporates productive, social and legal aspects in order to move the theory problem closer to the actual industrial environments. Specifically, there are considered the variation of work pace of workers throughout the workday to increase the completed work; the conditions of occupancy level of workers imposed by the collective agreements; and the idea of keeping constant the production mix through the sequence leading both to a balance between the required workloads at stations and regular consumption of components. Indeed, by means of a case study linked to Nissan, a gain of over 98% is achieved in terms of regular cumulative production and required work, while performing the 100% of required work and following legal restrictions of operators' saturation.

Keywords: Mixed-model; sequencing; just-in-time; work pace; saturation.

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Proposal of a framework for assessing environmental performance of supply chains

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Abstract: A new mathematical model to solve the Mixed-Model Sequencing Problem with Work overload minimization is formulated. The model incorporates productive, social and legal aspects in order to move the theory problem closer to the actual industrial environments. Specifically, there are considered the variation of work pace of workers throughout the workday to increase the completed work; the conditions of occupancy level of workers imposed by the collective agreements; and the idea of keeping constant the production mix through the sequence leading both to a balance between the required workloads at stations and regular consumption of components. Indeed, by means of a case study linked to Nissan, a gain of over 98% is achieved in terms of regular cumulative production and required work, while performing the 100% of required work and following legal restrictions of operators' saturation.

Keywords: Environmental performance; Supply Chain Management; Composite Index.

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The role of International Purchasing on the competitiveness of industrial companies in Portugal: an empirical study

Lopes O¹, Ferreira L M, Moreira A

Abstract: International purchasing and global sourcing (IP/GS) are research subjects that have been developed mainly during the last two decades (Quintens et al., 2006). Nevertheless, this is a field of research with a lot of potential, especially in small countries like Portugal, where the knowledge and research about this subject is almost inexistent. The ultimate goal of this study was to understand the actual contribution of international purchasing (IP) practices for the competitiveness of industrial companies. Two main conclusions are: (1) IP, for Portuguese companies, is not an option but instead a necessity due to the frequent lack of feasible domestic options and; (2) in most cases, it's easier to achieve competitive solutions through IP, although geographic distance could be an obstacle to the increasingly required flexibility strategy on purchasing.

Keywords: International Purchasing; industrial companies; competitiveness.

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Shipping: Management of Import and Export Processes and Transition from Public to Private

Roa I¹, Duran E², Amante B³

Abstract: The Port Authority of Barcelona (PAB) manages one of the 46 ports of general interest in Spain. Title of all those ports is public and therefore all activities in which PAB participates are developed from a public point of view. In this research, the possibility of performing these tasks from a private point of view will be considered. We will study the flows of imports and exports, focusing on administrative and transport processes.

Keywords: Import; export; public; private; port.

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A reference framework to design inventory policies using a fill rate criterion in lost sales contexts

Babiloni E¹, Guijarro E, Cardós M

Abstract: This paper suggests a reference framework to decide the best method to compute the base stock level in a lost sales and discrete demand context given a target fill rate. Under this context, only (Guijarro et al., 2012) propose an exact fill rate expression, but it requires a huge computational effort. However, the literature shows several approximations which are simpler and easier to implement in practical environments. In this paper, we design a large experiment and analyze by means of data mining techniques under which conditions approximate expressions can provide an accurate enough approximation to the base stock level for the lost sales case. As a result, we propose a reference framework that allows the selection of the most suitable method to compute the base stock depending on the characteristics of the item.

Keywords: Optimal policies; fill rate; lost sales; discrete demand.

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A Nonlinear Integer Programming Model for Warehousing sustainable logistics

Boenzi F¹, Digiesi S², Facchini F³, Mossa G⁴, Mummolo G⁵

Abstract: The warehouse management problem is a critical issue in Operation Management. In modern competitive market, many firms are automating their basic warehouse activities in order to be cost effective. However, traditional mechanized warehousing systems (MWS) still represent the 75% of the overall installations. In MWS, forklifts are adopted for the load handling. The adoption of efficient “internal logistic strategies” could help in reducing time required and costs of warehousing activities. In recent years, many firms adopted green supply chain practices (GSCP) in order to improve their environmental performances while also achieving economic goals (Wu *et al.*, 2015). Furthermore, in planning Smart City logistics, warehousing in port or railway station storage areas is being receiving wide attention since they contribute effectively to a sustainable development of modern cities. Under this perspective, an optimal “internal logistic strategy” allowing to jointly minimizing jointly costs and environmental impacts of warehousing activities has to be adopted. The aim of this study is to develop a Nonlinear Integer Programming Model to solve a storage location assignment problem (SLAP) for optimizing the environmental performance of the internal logistic activities in a warehouse. Suitable storage strategies are identified on the basis of the type of the forklifts adopted (internal combustion or electric engine equipped) as well as the sizes and the weight of the loads to be handled.

Keywords: Sustainable logistic; material handling; warehouse management; Optimized Product Allocation.

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Study on Productivity in the Automotive Industry

Estelles-Miguel S, Andrés Romano C¹

Abstract: A production process is essential for generating added value in organisations. Today when the globalised world of industry relies on finding new competitiveness factors to enhance customer satisfaction, it is common practice to break down the scope of production systems into processes to obtain a competitive advantage because some historically less explored leading practices (innovation, optimising logistics flows, implementing information systems, etc.) are yielding positive results. The automotive sector has abandoned the use of work measurement and standards time tools, and everything that using such tools implies. Yet these tools are still useful for planning and managing productivity, and are becoming increasingly necessary. This paper analyses perceptions about productivity, work measurement and standards time, and explores how companies use these tools in the Automotive Industry in Valencia (Spain). A survey that collected responses from interviews with 24 automotive companies was used to collect data on these companies. Perceptions: data from these interviews were analysed. This article presents the results of this analysis.

Keywords: Productivity; Work Measurement; Standards Times; Automotive Companies.

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Application of Hybrid Symbiotic Organism Search on Flow Shop Scheduling with a New Learning Effect

Amirian H, Sahraeian R¹

Abstract: The present article proposes a hybrid learning effect model which takes into account the previous experience of the operator, separates the machine/manual times and considers truncation. The developed model is fitted to experimental data to investigate its accuracy. The fits are compared with those of four other well-known position based learning models. Next, each learning model is applied to the large scale flow shop problems which makes them strongly *NP*-hard. Hence, the problems are tackled by a hybrid meta-heuristic named Symbiotic Organism Search Simulated Annealing (*SOS-SA*). The algorithm combines the fast and easy implementation of *SOS* with the powerful local search of *SA*. The proposed algorithm is tested on flowshop benchmark problems and the results show its validation.

Keywords: Scheduling; Learning Effect; Flow shop; Symbiotic Organism Search; Simulated Annealing.

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Root cause identification of existing barriers detected by people with disabilities in air transport.

Garcia-Miranda I¹, Duran Heras A²

Abstract: Despite of the existing EU legislation on air passenger rights that ensures the right to non-discrimination on the basis of disability or reduced mobility, accessibility for people with disabilities and the older persons in air transport is currently not as satisfactory as it should be. One in six people in the European Union (EU) has a disability that ranges from mild to severe and due to the increasing life expectancy and low levels of fertility sustained for decades, population projections foresee that this percentage will increase in the next decades. Given the significance of the problem, research in the field has focused on identification of the barriers found by disabled air passengers so as to suggest solutions for those barriers. However, focusing on the causes that generate those barriers will generate better-suited solutions with higher effectiveness. This study analyzed existing barriers identified by disabled air passengers and applied the best methodology in order to identify root causes. Facing these root causes will contribute to a better human mobility in the Common European Space increasing welfare state and economic rewards in inclusive tourism.

Keywords: Root cause determination; Disability; Air transport; Inclusive tourism.

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Applying social opinion mining to the innovative product design through the use of FITMAN / FIWARE technology

Anaya V¹, Ortiz A²

Abstract: The current manufacturing landscape is defined by a strong emphasis on innovation and design, in an ever increasing society that uses different electronic devices and where individuals and companies use diverse digital channels to give their opinion, to share knowledge or to communicate in general. IT trends have evolved from democratization of the web (web 2.0), to the analysis of unstructured data, handling of big amount of data and predictive analysis. There are sectors where some of those technologies are under test. All those enforce that differentiation is a competitive advantage only when products and services are covering customers' needs. This paper probe into how these techniques (analysis of unstructured data, social opinion mining, semantic annotation, etc) can be applied in the conceptualization phase of the product lifecycle to support designers in the innovative design of products, while considering the interaction with manufacturing restrictions. The provided solution is built on software modules develop in FITMAN (Fitman (2015)) and FIWARE (Fi-ware (2015)) European projects.

Keywords: Social opinion mining; product lifecycle; IT architectures; IT software platforms.

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Sustainable Supply Chain Management: A Case Study

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Abstract: The present paper aims to contribute to the development of the theory concerning the models of sustainable supply chain management. Argues that the development of a model of sustainable supply chain management, combined with a set of appropriate support tools at different levels of management (strategic and operational) will help organizations to develop integrated sustainability programs in the management of organizations. The development of a Case Study allowed sharing a set of support sustainability practices implemented in the Purchasing Process. This Case Study, combined with the Literature Review, allowed the construction of a framework for the Sustainable Supply Chain Management. The key feature differentiating of this framework its operational nature, by integrating a set of supporting sustainability practices.

Keywords: Sustainability; Supply Chain Management; Sustainability Tools; Case Study.

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A Theoretical Framework Proposal for Formalization in Reverse Logistics

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Abstract: Formalization can help firms better manage their reverse logistics operations. The main goal of this paper is to propose a theoretical framework to help companies formalize their reverse logistics programs. The theoretical model provides executed instructions for firms formalization, with written rules and standard procedures, in consequence to better control their reverse logistics. The theoretical structure covers all the stages in reverse logistics, from return collection to sorting and treatment processes. Companies can set up and improve their own formalization system based on the theoretical framework proposed in this paper.

Keywords: Theoretical framework; Formalization; Reverse logistics.

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Interoperability Frameworks in Public Administration Domain: Focus on Enterprise Assessment

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Abstract: For over a decade, the advent of e-Government increased the need to address its typical scenario's issues with a significant number of interoperability conceptual frameworks, considering aspects related to social, political and regional factors. However, such frameworks rely mostly on services and technological concerns, despite the existence of works in the literature that identify different perspectives in the Public Administration (PA) and governmental aspects of interoperability. In both approaches, the literature does not have a particular contribution relating PA domains with interoperability frameworks concerning the coherent definition of models, structured interoperability assessment (IA), concerns and barriers. This paper presents a correlation analysis of the existing frameworks, considering the elements related to PA and aspects associated to the observation and assessment of an organizational interoperability. This analysis can be used by decision makers as a tool for knowledge management concerning the prioritization and selection of attributes that best support the interoperability assessment in PA domain.

Keywords: Interoperability Frameworks; e-Government; Public Administration.

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Genetic algorithms applied in realistic job-shop scheduling problems with alternative routes and dependent setup times

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Abstract: This paper discusses the application of heuristic-based evolutionary technique in search for solutions concerning the dynamic job-shop scheduling problems with dependent setup times and alternate routes. With a combinatorial nature, these problems belong to an NP-hard class, and they have an aggravated condition regarding their application in realistic, dynamic and more complex cases than the traditional static ones. At first, due to the flexibility of routes, the routes are chosen and then the activities scheduling in relation to a particular planning horizon. Considering that setup times are dependent upon these choices, the proposed genetic algorithm combines these two phases and applies heuristics to accelerate genetic convergence, but without losing the homogeneity of the population.

Keywords: Genetic algorithms; dispatching rules; scheduling in job-shop.

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Conceptual methodology for handling unexpected events in hierarchical production planning

Vargas A¹, Boza A¹, Patel S², Patel D², Cuenca LI¹, Ortiz A¹

Abstract: An inter-enterprise architecture allows enterprises that make up collaborative networks to model holistically and integrally business processes, human resources, organizational structure and technology. Inter-enterprise architecture can be used to solve the different issues that collaborative networks face on a daily basis. The components of an inter-enterprise architecture are: framework, modelling language and methodology. A conceptual methodology that addresses the problem of unexpected events management in the context of hierarchical production planning to improve decision-making in collaborative environments is proposed and validated in a Spanish collaborative network of the tile sector.

Keywords: Inter-enterprise architecture; collaborative network; hierarchical production planning; unexpected events; methodology.

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Current Trends in Recovering Used Products in Retail Fashion Industry: An Exploratory Study

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Abstract: Fashion industry is currently shifting towards sustainable practices through the entire supply chain. Many fashion retailers like H&M, Zara and others consider sustainability the cornerstone of their corporate social responsibility programs. At the same time, Extended Producer Responsibility (EPR) legislation is holding manufacturers and retailers responsible, especially in Europe, for waste generated at end-of-use and end-of-life phases for some specific products. Finding alternatives to the landfill for textile waste will extend textile life, contributing to the development of circular economy and sustainable business models in the fashion industry. This study identifies and characterizes, as a first stage research, current practices of product recovery for used textile in France and Germany using comparative case studies. Characterizing the reverse logistics models for textiles in each country will help identifying best practices for recovering used clothing in Europe.

Keywords: Reverse logistics; fashion industry; textile waste; product recovery; take-back.

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A Flexible Model Approach for Production Planning

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Abstract: Previous studies on production planning have indicated that it is particularly important developing flexible production planning in order to have updated estimates of demands, of available capacity, of available resources, and so on. However, existing schemes to approach this issue do not have enough flexibility to use updated information whenever it is required, thus not providing a flexible approach to take care of the constant update information in a rolling planning scheme.

Keywords: Production planning; clearing function; linear programming decomposition.

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Using Big Data for Competitive Dimensions Improvement in a Telco Company

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Abstract: This is a case study on how a telecommunications company is improving its competitive dimensions using Big Data. Even though the company were already using traditional data analytic tools, they are building Big Data systems to analyze larger amounts of data, in a faster and more efficient way. They are achieving improvements in some competitive dimensions, such as reducing operational costs, increase revenue through more accurate measurement of their service usage and improved quality of service delivered to customers.

Keywords: Big Data; competitive dimensions; business intelligence; technological innovation.

Performance measures of Reverse Logistics: a survey in Brazilian companies

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Abstract: The purpose of this research was to determine the most frequently used performance measures for the evaluation of reverse logistics in Brazilian companies. Furthermore, we sought to verify whether a correlation exists between certain performance measure dimensions (cost, asset management, customer service, and productivity) and company size and their sectors of the economy. Therefore, a survey of 125 Brazilian companies from different industrial sectors was conducted. According to statistical analysis, it was found that large-sized companies are those that most frequently adopt performance measures to assess reverse logistics in Brazil; especially to evaluate productivity levels. However, no correlation was verified between the performance measure dimensions evaluated and company size. In addition to determining the major measures used, this study is expected to provide information to support decision making in companies, resulting in improvements in reverse logistics and competitiveness.

Keywords: Performance measures; reverse logistics metrics; survey.

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Effectiveness of Holt Winter Models as aid to Production Alignment

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Abstract: The research aimed to investigate and assess the use of holt-winters model through NCSS (Number Cruncher Statistical System) in the planning process optimization of industrial manufacturing production, evaluating the production of a product in a business accessories manufacturer for motorcyclists. Aimed up align demand forecast using historical sales data that were implemented in NCSS statistical tool. The construction of modeling was based on the method proposed by Armstrong (2001), and from statistical modeling been generated scenarios demand forecast, the results found evidenced the effectiveness level of methods adopted.

Keywords: Forecasting; NCSS; Holt-Winter Models.

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Main Factors Affecting the Development of Interorganizational Partnerships in Biodiesel Supply Chain in Brazil

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Abstract: Partnership in supply chain stands out for the need to coordinate the productive activity between different economic agents who often have conflicting goals. Thus, the aim of this paper is to analyse how the partnerships producer/supplier are developed in biodiesel supply chain, through the motivating and facilitating factors that affect this relationship. The methodological aspect involves a multiple case study conducted in three supply chains located in the South Region of Brazil, which have used semi-structured interviews. We involved in this investigation the three largest biodiesel producer plants in the South Region and the two most representative cooperatives in providing raw material for each one of the selected plants, totalling six cooperatives. We realized through the found motivating and facilitating factors that, despite the existing conflicts, both plants and cooperatives have shown the desire to renew the partnership over time.

Keywords: Supply chain; partnership; biodiesel.

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The Pressures of the Brazilian Pre-Salt Production on the National Refining Sector

Yabiko R¹, Chicata F², Bone R³

Abstract: The objective of this article is to analyze the current production capacity of the Brazilian refining sector and how much it should be increased in order to process the oil from the pre-salt layer. The variables considered were refining capacity, refined volume, and utilization factor of refineries, production profile and domestic demand for petroleum products. We conclude that oil production will exceed domestic consumption. However, the refined volume is short of demand, even with the investments announced by Petrobras. To achieve self-sufficiency by 2030, it would be necessary the implementation of two refineries with the refining capacity of 350 thousand barrels of oil per day each.

Keywords: Brazil; Pre-Salt; Oil Derivatives; Self-Sufficiency; Refining.

Production Planning and Control: Case study of a small dairy industry

Motta B¹, Sampaio F², Borges L³, Mendonça L⁴, Evangelista W⁵

Abstract: This paper is a case study developed in order to define the Production Planning and Control (PPC) of a small business in the dairy industry, located in Brazil's southeast region. The methods used to research were literature reviews on the PPC and mapping of the productive processes of the two production lines in the company through personal observations and semi-structured interviews with employees. The main activities of strategic planning and production scheduling were analyzed to define the ideal activities. As a result, the Production Planning and Control was defined and Operation Management was improved. This also resulted in optimized resources and reduction of stock formation of finished products, which in this case are extremely perishable. However, more research is needed to define the percentage of success of the suggestions made in other industries of the sector.

Keywords: Production Planning Control; Operations Management; Dairy Industry.

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A model that integrates direct and reverse flows in omnichannel logistics networks

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Abstract: A more complex logistics network has to be managed by retailers that also offer online sales, since new shipping and drop off options are offered to consumers in order to satisfy their expectations. The main goal of this paper is to propose a mixed integer linear programming (MILP) model that integrates forward and reverse material flows in a retailer's omnichannel logistics network. The model proposed helps to determine the mix of orders and returns flows that minimizes costs, and also allows to quantify key trade offs associated to the different options offer in omnichannel models.

Keywords: Commercial returns; reverse logistics networks; omnichannel;

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Conceptual Framework for applying Internet of Things in Production Systems for Sensing Enterprises

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Abstract: Sensing Enterprise is a new concept, which appears with the Internet of Things (IoT) application in industry. This technology applied in production systems provides many benefits like better transparency or real time information. This approach proposes a conceptual framework for IoT application in Production Systems. The aim of this framework is helping enterprises to identify the main elements to apply IoT in Production Systems. To create this framework, a literature review has been made and the main components of IoT in Sensing Enterprise in production proposals have been identify. Thus, these elements and its relations have been the source for the conceptual framework proposed.

Keywords: Internet of Things; Sensing Enterprise; Production System; Information System; Conceptual Framework.

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Greenness indicators for the Madrid-Lyon freight transport corridor

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Abstract: This is a case study on how a telecommunications company is improving its competitive dimensions using Big Data. Even though the company were already using traditional data analytic tools, they are building Big Data systems to analyze larger amounts of data, in a faster and more efficient way. They are achieving improvements in some competitive dimensions, such as reducing operational costs, increase revenue through more accurate measurement of their service usage and improved quality of service delivered to customers.

Keywords: Big Data; competitive dimensions; business intelligence; technological innovation.

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Differentiation of the Difficulty Level of Supply Chain Management Integration Actions

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Abstract: Integration is a key factor to ensure alignment of actions throughout the supply chain, increasing the competitiveness of companies. However, to integrate upstream and downstream actions is quite a complex task that involves different levels of difficulty. Several studies have been developed to assess the supply chain management integration (SCMI), with different actions corresponding to integration among chain members; nevertheless, little has been discussed about the level of integration required for each activity. Thus, this research proposes an initial assessment of the differentiation of the difficulty level between the actions of SCMI, in order to facilitate the planning of these actions gradually and consistently, using the Item Response Theory (IRT). The selected SCMI actions were ranked according to the difficulty level for their implementation, allowing differentiating the simplest tasks to be performed from those that require a higher level of integration between partners.

Keywords: Supply chain management; level of integration; alignment; Item Response Theory.

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A multidimensional framework for the classification of stock-keeping units

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Abstract: Changes to an organization's internal and external environment may cause an increase in the number of stock-keeping units in inventory. Therefore a stock-keeping unit classification and corresponding grouping become highly important for improving the inventory management process. In this paper we propose a framework for stock-keeping unit classification in an industrial context considering a three-dimensional approach: value of usage; criticality and demand variability. This approach emphasizes the importance of stock-keeping units that despite their small value are of vital importance for the operations/production of the organization.

Keywords: Stock-keeping unit; inventory management; framework.

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The Reverse Logistics on Companies' Perspective - Case Studies

Gonçalves M¹, Silva A²

Abstract: The Reverse Logistics is a research area that has received special attention by academic community (researchers, students and teachers) and this is the reason to improve the understanding of this issue. The aim of this paper is, based on a study made in a previous work, to emphasize the results obtained by the analysis of the evolution of the papers about Reverse Logistics, published in scientific journals in 2004 – 2014, to analyze and characterize the Portuguese companies' perspective, based on three aspects: the concept, the returns and the environmental impact. This is a working paper that pretends to present and describe the methodology used to study the perspectives of different Portuguese companies.

Keywords: Reverse logistics; literature review; case-study methodology.

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Reduction of Drying Process Time of Natural Cork Stoppers Process in Lean Improvement Efforts

Pinho TM¹, Campos D², Boaventura-Cunha J¹, Azevedo A³, Moreira AP³

Abstract: Cork is a material with a significant economic, social and environmental impact. Due to its characteristic properties, this material exhibits a diversified applicability, incorporating several economic sectors. Among these, the natural cork stoppers industry reveals the greatest potential, being its production higher than 50% of the total cork products. This work is encompassed in the Pilot Case IV of the FOCUS (Advances in Forestry Control and Automation Systems in Europe) project. The aim is to develop lean improvement suggestions for the cork-stoppers value stream which if implemented could lead to shorter production lead time and increased efficiency. The lean method of Value Stream Mapping (VSM) was used, since this provides an overview of the entire production process, rather than having process-specific focus, and offers a systematic way of finding the sources of problems and solving them. Based on this, it will be possible to propose and develop solutions, to improve or reformulate the necessary processes, in order to make the production line more efficient. Through the developed VSM and analysis of thermal images was identified as critical the cork stoppers drying process. A conceptual proposal of a new drying machine is also presented.

Keywords: Drying; natural cork stoppers industry; model predictive control; VSM.

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Integrating Value Stream Maps with Waste Identification Diagrams

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Abstract: Value Stream Maps are the most common tools used to process mapping, but several limitations are recognized by professionals and academics. Another process mapping tool with more features and capabilities called “Waste Identification Diagrams” (WID) is being developed in the Production Systems Department of the University of Minho. Since both tools have their advantages and drawbacks, a new tool is proposed in this paper which includes features from VSM and WID hoping to grasp the best of both tools. The result is that this new tool becomes more complete in terms of availability of information and more effective in communicating information, but, on the other hand, is not able to represent layout and multiple roots as WID.

Keywords: Value Stream Mapping; Waste Identification Diagrams; Visual Effectiveness; Lean Manufacturing.

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Does Sustainable Supply Chains Practices Increase Companies Performance?

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Abstract: The recent worldwide crisis, in finance and energy areas, is likely to reinforce the importance of sustainable development within strategic intents of states and firms. Companies have increasingly recognized the need to pursue not only economic but also environmental and social goals. Using a multiple case study, eight focal companies were investigated through semi-structured interview, how sustainable internal and external practices are being incorporated by industrial companies across the supply chain, as well as the performance measures used for evaluate the influence of sustainable practices on focal companies and the impact of those practices on the global performance. The paper contributes to understand the potential of sustainable practices on the company's performance explored through semi structured interviews on eight industrial companies. We identify through empirical evidence the environmental and social practices with larger application in business and their implications on economic, environmental and social performance. The paper draws useful lessons for companies and practitioners who seek sustainable practices.

Keywords: Sustainable supply chains; Performance; Case studies; Portugal.

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Transport KPIs for supply chain improvement. A literature analysis

Domínguez-Caamaño P¹, García-Arca J, Fernandez-González AJ, Prado-Prado JC

Abstract Through a content analysis since 1998 to 2014, this article analyzes the evolution of the transport indicators in the context of managing the supply chain. Finally a set of indicators is extracted from the articles. This set of indicators can be considered a basic “pack” of KPIs (Key performance Indicators), reflecting the common needs of organizations that require freight.

Keywords: Indicator; SCM; Delivery; KPI; logistics.

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Establishing a link between lean practices and corporate sustainability

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Abstract: In this paper we describe how the concept mapping methodology, which combines a qualitative case study approach – based on interviews, focus groups and plant visits – and quantitative methods – using software and data-driven mapping methods – was used to answer the following question: can lean manufacturing contribute to a company environmental and social sustainability? The conclusions of the research are empirically analyzed. As expected the impact of lean on productivity and process efficiency was identified but the results also demonstrates that it has a positive effect on business sustainability.

Keywords: Lean Practices; Concept Mapping; Corporate Sustainability.

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Deploying “Packaging Logistics” in paper napkins

García-Arca J¹, González-Portela Garrido AT,
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Abstract: In this paper, the potential of “packaging logistics” for improving efficiency and sustainability in the supply chain is presented from an applied point of view. After synthesizing the main conceptual issues of “Packaging Logistics”, the paper focuses on the analysis and improvement of a sample of 13 references of paper napkins.

Keywords: Packaging; logistics; supply chain; sustainability; paper napkins.

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Identifying Interorganizational Relationships Through Theoretical Indicators: A Study In The Milk Production Chain

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Abstract: The literature on the interorganizational relationship between companies and organizations has increased in recent years, but there are still doubts about the various settings. The inter-organizational networks are important in economic life, the fact facilitate the complex interdependence between transactional and cooperative organizations. A need identified in the literature is the lack of indicators to measure and identify the types of existing networks. The objective of this research is to examine the interorganizational relationships of two milk chains through indicators proposed by the theories of the four authors, characterizing them as network or not and what the benefits obtained by the chain organization. The results showed that interorganizational relationships are small and largely limited to the sale of milk or dairy cooperatives. These relationships relate only to trade relations between the owner and purchaser of milk. But when the producers are organized in associations or networks, inter-organizational relationships and increase benefits for all participants in the network.

Keywords: Interorganizational networks; dairy chain; Interorganizational Systems.

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How to design an efficient and sustainable box?

García-Arca J¹, González-Portela Garrido AT,
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Abstract: Packaging is one of the transversal elements that supports an efficient and sustainable supply chain. However, there are few methods to objectively measure the impact of packaging design on this efficiency and sustainability. In this paper, a method for designing boxes is presented (ESB, “Efficient and Sustainable Box”). Going beyond proposing a theoretical method, the authors have testing it in a company following the “action research” approach.

Keywords: Packaging; logistics; supply chain; sustainability; box.

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Application of Lean Accounting for production costs management in lean enterprises: a case study in an auto parts company

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Abstract: This study deals with the application of account reports, as proposed by the Lean Accounting (LA) methodology, as a management tool to evaluate the cost results in the lean manufacturing cells and also compares the deviation between the traditional cost per unit and the average cost per unit as in the Value Stream Costing (VSC) method. According to the unit managers of a Lean Manufacturing (LM) company, one of the greatest challenges, after the modifications in the production system, is the demonstration of the financial benefits achieved due to the lean changes. Mainly because of the conflict between the product cost calculation method and the production costs indicators. The encountered results corroborate with the literature in regarding of the need for adapting the cost controlling system adopted in Lean Enterprises.

Keywords: Lean Accounting; Value Stream Costing; Cost Management.

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Industrial Vertical Portals: Influence of Cluster Membership on Participants' Perceptions of Future Value Creation, Motivations and Expectations

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Abstract: Increasingly, web-based portals are used as a vehicle to meet the needs of both Business-to-Consumer (B2C) and Business-to-Business (B2B) markets. Several authors have highlighted the importance of companies' participation in clusters as a way to foster networking and relationships among networks of organizations towards the identification of new business opportunities. And yet, studies about the motivations and expectations of companies to actively participate in web-based portals as means of networking and opportunity search are scarce in literature. This paper, based on a case study of the Portuguese Manufacturing Technologies Cluster (PRODUTECH), investigates how cluster membership affects the perception of future value creation, motivations and expectations of companies to participate in the cluster web-based portal. The results showed that perceptions of future value creation, motivations and expectations for participation and/or search in the industrial portal are in fact related with being a member or not of PRODUTECH.

Keywords: Clusters; Industrial Vertical Portal; Case Study.

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Assembly lines for end-of-life products: improving their efficiency

Cardoso J¹, Xambre AR², Fernandes R³

Abstract: To compete in a global market, companies must be flexible and have high levels of responsiveness to changes in the demand (either in terms of types of products or volume). This means that traditional mass production systems, such as assembly lines, must be adapted and improved in order to incorporate the required flexibility.

Keywords: Assembly line; efficiency; production systems.

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Activity-Based Cost Equations Systems: Extending the Predictive Power of TDABC

Santana A¹, Afonso P²

Abstract: Activity Based Cost Management (ABCM) systems have been presented in the literature as the most sophisticated approaches for cost management and costing purposes. Nevertheless, the theoretical relevance and practical applicability of both ABC and Time-driven ABC models is still an open question. The aim of this paper is to propose Activity-Based Cost Equations Systems (ABCES) as an extended and more powerful tool for decision making in the context of ABCM. A critical analysis of the literature on TDABC has been made in order to contextualize and discuss which developments on ABCM have been proposed recently or may be expected in the near future. ABCES is intended to be an extended version of TDABC with a focus on minimizing the problems encountered in the latter and with a particular concern in terms of applicability and a predictive vocation. A specific problem in a real context is used to illustrate the proposed approach. ABCES may support more complex mathematical formulations, cost models and algorithms for cost modelling, simulation and optimization.

Keywords: Cost Management; Costing Systems; Activity Based Costing (ABC); Time-Driven Activity Based Costing (TDABC); Activity-Based Cost Equations Systems (ABCES).

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Analysis and implementation of the system FIFO for one production line.

Guimarães GE¹, Pedrali PC², Duarte LC³, Galeazzi D⁴, Campos M⁵

Abstract: The area of methods and processes responsible for the routing of the fabrication's process of items and components used in the products of the company, responsible too for the machine's programming through CNC (Computerized Numeric Command), also working in the attendance and participation in the process improvements of industrial management and in the productive process applying techniques and resources that serve this needs, also operates in the adjustment of machines and processes to the regulatory norms, in the preparation of work instructions, among other activities. The activities where it had superior involvement will be described succeeding with a short bibliographical research about the subject which will be emphasizing in this work. Occurred the elaboration of routes with use of software EMS (Enterprise Management System), drawing viewers like DWG and Teamcenter, also participating in the monitoring in industrial process management and production and manufacturing processes.

Keywords: Methods and Processes; Manufacturing; Industrial Engineering; Manufacturing routing; FIFO.

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Improvement in the fabrication process and adjustment to the norm NR-12 of a platform of bucket's elevators

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Abstract: The current study will present an adjustment project of the norm NR-12 of a platform of bucket's elevators. The project is outdated in respect to fabrication process and also do not attend the requirement of the technical norm of security. An analysis will be realized, identifying and correcting occasional problems adjusting them to the nr-12 requirements, looking for the lower costs and the maximum utilization of production. Applying those improvements will be checked if the project methodology fulfilled the requirements of the work.

Keywords: NR-12; work security; bucket's elevator; project of platform; agro-business.

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Maturity models in supply chain sustainability: a literature review

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Abstract: This paper aims to explore the different maturity models that have been used in the context of supply chain sustainability. Given the relevance of the topic a systematic literature review is performed to identify a set of maturity models that have been developed in order to assess the different levels of SC sustainability. Also, the main focus of analysis performed and the shapes of the maturity models are explored. The guidelines on conducting a systematic literature review were followed to ensure that an unbiased and valid evaluation was conducted. The novelty of this research lies in the methodology used for reviewing the literature and in the adoption of a dynamic perspective to analyze the theory developments.

Keywords: Maturity Models; Sustainability; Supply Chain; Systematic; literature; conceptual framework.

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A tool to visually explain the zones of influence of several distribution centres in a network

Maligo C¹

Abstract: The concept of zone of influence is bound to arise in a great variety of situations involving explanations about supply chain, logistics or distribution of goods or services. Although the concept itself is not particularly difficult to explain or understand, the classroom experience strongly recommends the use of drawing or any visual aid to obtain effective and fast results. This work is the result of the search for a tool which could not only provide the visual support teachers need for their explanations but also show – graphically – the effects on form and size of the zones of influence due to changes in the related variables. This work shows how the use of the conditional format resource in a Microsoft Excel spreadsheet makes it possible to construct such a tool, bringing to students, through a visual and simulation-like experience, a deeper understanding on the subject.

Keywords: Zone of influence; logistics; simulation.

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Spare Parts Inventory Management Using Quantitative and Qualitative Classification

Oliveira¹, Vaz²

Abstract: This paper focuses on the spare parts inventory management of a maintenance provider of the health sector, where the commitment to ensure the agreed customer service level and the guarantee of maximum availability of the devices are relevant issues. Spare parts inventory management means handling with unpredictable consumption, since in most cases, it is impossible to know in advance when a specific spare part will be necessary or the needed amount. Determining an adequate inventory management policy for spare parts, specifically for unplanned maintenance operations is essential to provide the contracted service level. Considering that the criticality of a spare part has consequences regarding the availability of an equipment and service level agreement, the spare parts were classified in terms of quantity, value of usage and criticality. Based on this classification, differentiated service levels and inventory management policies were adopted for each group.

Keywords: Inventory management; spare part; ABC analysis; criticality analysis.

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Total Cost of Ownership in the Context of Supply Chain Management: an Instructional Case

Afonso P¹, Leite S²

Abstract: This paper presents and discusses an in-class exercise on Total Cost of Ownership (TCO). TCO can be included within the Supply Chain Cost Management (SCCM) framework being essentially a tool that aims to determine the true cost of buying from a specific supplier. There are some references in the literature on TCO but its dissemination in the industry has been very slow. Thus, it is important to develop and implement case studies and instructional cases to promote and disseminate this technique among both academics and practitioners. Indeed, research supports the assumption that students have varying learning styles which can be supported better by other pedagogical techniques than typical lecturing. The case presented here represents an original instrument for the understanding and dissemination of TCO. The case design and materials used are explained and discussed. This case has been applied in the format of short course but it can also be used in class in a program of several weeks. The results obtained demonstrate that this in-class exercise can be used to involve students or practitioners in a dynamic process of learning and discussion on supplier cost management.

Keywords: Total Cost of Ownership (TCO); Supply Chain Cost Management; Suppliers Management; Case Study; Instructional Case.

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Modelling and simulation of inventory level control in service operations management

Gibelati E¹, Pereira F²

Abstract: A discrete event simulation is one of the most used techniques in the field of operations research. It is a technique to support the decision, in which the search for a problem solution is performed by analysis of a computational model that describes the behavior of the system under study. Applications of this technique are found in several areas with very significant results. Building a model of discrete event simulation in planning the amount of material is presented in this work. The main objective is the definition of the ideal inventory level for a material at a distribution center. To this end, we propose the development of a modelling and simulation in computer system Arena of a service company supply chain. The construction of the model follows the usual steps of project planning and construction of the conceptual model. With the simulation it is possible to follow the evolution of the model variables, related or not to the queues, observe the conditions under which rupture or excess inventory occur and identify the best option for a given scenario of demand and sales forecast.

Keywords: Discrete event simulation; supply chain management; Inventory management; modelling.

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Performance Measurement of Total Productive Maintenance in a Production Company

Tasan A.S¹, Boztug U.A²

Abstract: Total productive maintenance is very important to gain and sustain competitive power of service and manufacturing companies. Besides, the performance of total productive maintenance has to be measured and considered by managers. In this study, an integrated performance metric is proposed for total productive maintenance in a production company based on several performance metrics such as; spare parts availability, breakdowns, product quality and efficiency. The integrated performance metric is formulated using regression analysis.

Keywords: Performance measurement; total productive maintenance.

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A Greedy Primal-Dual Type Heuristic to Select an Inventory Control Policy

Esmaili N¹, Norman B A², Rajgopal J³

Abstract: We propose a greedy primal-dual type heuristic to jointly optimize the selection of an inventory control policy and the allocation of shelf space in order to minimize the expected counting and replenishment costs, while accounting for space limitations. The problem is motivated by an application in the healthcare sector. It addresses the limitations in designing an inventory control system for hospitals stockrooms and the drawbacks of the common approach of using a single policy such as a two-bin Kanban or a PAR system for all items. In the proposed approach, we not only choose policies to use available storage space more efficiently but also consider changing the policies or their parameters to use the space within a selected storage bin more efficiently. On numerical examples where a mathematical programming formulation can be solved in a reasonable amount of time, our experiments indicate that the proposed algorithm is very efficient.

Keywords: Greedy; Multi-item Inventory System; Shelf Allocation; Healthcare; Integer Programming.

Analysis of Logistics Flows in an Urban Functional Area. Application to Cartagena

De-la-Fuente-Aragón MV¹, Ros-McDonnell D², Nyerges L³, Bajor P³, Ros-McDonnell L¹

Abstract: The main priority of authorities is the constant search of fast, feasible and economical solutions in the Urban Transport Problems (traffic congestion and parking difficulties, freight distribution, public transport inadequacy, difficulties for pedestrians, loss of public space, environmental impacts, etc.) and it shows a clear trend towards increasing pedestrian areas in the city centres. But the city centre pedestrianization has also led to the appearance of problems such as limited parking areas, traffic access limitations, difficulties in delivering operations, as well as the access difficulty of the neighbours living in these areas. The main objective of this work is the analysis of the logistics flows in an urban functional area. Specifically, the study has been focused on the city centre of Cartagena, characterized by the large number of pedestrian areas. For this purpose, the research team will perform the urban structure of the functional urban area under study. The information gathered concerning urban flows allow modeling the behavior and performance of the study area, identify their main problems and outline a number of solutions to solve them.

Keywords: Urban functional area; freight transport; pedestrian zones; logistic flows.

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Supply Chain Risk Management in the Brazilian Auto Parts Industry

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Abstract: In this article, we seek to present results of a survey carried out in an effort to understand how some companies of the Brazilian auto parts industry are managing risks in their supply chain. We built a questionnaire based on the works developed by Thun and Hoenig (2011) and Lavastre, Gunasekaran, Spalanzani (2012) and analyzed the answers got from forty-four firms. The results show that the main companies' concerns in SCRM are devoted to typical Supply Chain Management problems (e.g. suppliers' quality, demand variation and inventory levels) and that they tend to work together to reduce or eliminate risks. We observe as well that tier1 and tier 2 firms perceive chances and impacts of events in almost the same way, but they have different capabilities of transferring risks to other members of the supply chain.

Keywords: Supply chain management; Risk management; automotive industry.

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Using the Internet of Things in a production planning context

Alarcón F¹, Perez D², Boza A³

Abstract: One of the most novel concepts that has been applied to companies in recent years is "Sensing Enterprises". This concept implies a drastic change in the way companies operate. Within the framework of this concept, another necessary and complementary concept arises, the so-called "Internet of Things" concept. It seems evident that the Internet of Things can generally help improve the functioning of the processes undertaken in companies, particularly one of the key processes; the production planning process. Despite being able to find abundant information on both themes, and the apparent relevance that using the Internet of Things could have for the production planning process, no works that have jointly studied these matters were found. To bridge this gap, the present work intends to reflect on how the characteristics and advantages of the Internet of Things can be put to good use in the production planning process.

Keywords: Internet of Things; Production planning; Sensing enterprises.

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Re-location of EMS Facilities Using GIS

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Abstract: This paper studies the usefulness of contemporary geographic information system tools in re-locating emergency medical service (EMS) units on periodical bases. Research has already shown that the service level of an EMS system is highly related to many factors. Such factors include; (a) factors associated with the environment that is surrounding the EMS facility, and (b) factors associated with the design and operations of the EMS system itself. Since most of these factors are dynamic and since they change periodically, it is often necessary to re-locate and assess the effectiveness of an EMS system occasionally. In this paper, the EMS system in Qatar was used as a case study. Geographical information system (GIS) tools were implemented to assess the effectiveness of the locations of EMS units with respect to current demand. A comparison of the re-located EMS with the current EMS showed differences in the service area covered.

Keywords: EMS; GIS; re-location; facility planning and layout; simulation; healthcare.

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Contribution of Lean Principles in the Information Systems Development: an Experience based on a Practical Case

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Abstract: Due to the increasing mechanization of industry, resultant from the technological changes combined with human best practices, it is possible to produce keeps getting better at reduced costs. The need to reduce costs and increase the service level to achieve continuous improvement in internal processes derives, on the one hand, from the strong competitiveness, and on the other, on consumers increasingly informed and demanding, requesting reduced delivery times, lower prices and quality levels of excellence. Efficiently manage resources and processes, reduce errors and maximize productivity should be the strategic foundation for organizations become more competitive and effective. Through improved information management mechanisms it is possible to make processes more efficient on which is included the development process of Information Systems (IS). In this context, this project aims to demonstrate the gains associated with good information management, combined with the *Lean Thinking* (LT) methodology in order to produce adequate and quality products (i.e. IS) by reducing the resources, time and information without added value associated.

Keywords: Information System; Development Process; Lean Thinking; Continuous Improvement.

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Supply Chain Risk Management: a framework for risk assessment and the application of Decision Support tools

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Abstract: Supply Chain Risk Management (SCRM) is in the agenda of both academics and entrepreneurs. In a context of increasing competitiveness and globalisation of relationships between organisations, the understanding of Supply Chains (SC) underlying mechanisms, as well as related phenomena which might result in competitive advantage may dictate the difference between success and failure. SCRM is, therefore, a global concern. There is a growing need to know organisations' reality in real time, to create models and tools that allow them dealing with these challenges. The volatile business context, as well as the increasing pace of change in terms of products, technologies and other variables changes SC exposure to risk, and also the very nature of risk itself. Thus, typically stable and predictable SC, due to evolution, economic conjuncture or globalisation, might be exposed to increased disruption risk. Due to the magnitude of their impact on organisations, both in operational and financial terms, as well as their recovery ability, disruptions must be the object of particular caution and analysis. Within this scope, tools that enable organisations to deal or reduce the risk of disruptions, from mitigation strategies to flexibility or alternative scenario planning are primordial in the recovery and reestablishment of SC.

Keywords: Supply Chain Risk Management; Decision Support tools; disruption; mitigation.

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Implementation of a Manufacturing Execution System in the Natural Cork Stoppers Industry

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Abstract: This work details the methodology adopted for the implementation of a manufacturing execution system in a company of the natural cork stoppers sector. The main objective of the implementation concerned a correct information management, namely, regarding traceability of the product and process control.

Keywords: Manufacturing Execution System; Traceability; Process Control.

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Data-driven SKU differentiation framework for supply chain management

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Abstract: Supply chains (SC) are a source of competitive advantage. However, managing SC's is hard due to its size, dynamism, complexity and mostly, context dependency. To overcome such difficulties and better match SC practices with the context characteristics, the adoption of analytical methods is required. Exploiting the availability of operational data, a four stage data-driven SKU differentiation framework is proposed relying on exploratory factor analysis for the criteria selection and cluster analysis for the stock keeping unit (SKU) classification. The application of the framework is illustrated using a B2B instrumental case. Further research is required to validate the framework on other cases, as well as exploring alternative types of SC entities, e.g. clients or suppliers.

Keywords: Supply chain; differentiation; factor analysis; cluster analysis.

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Understanding Employee Resistance to 5S Implementation in a Portuguese SME

Amorim M¹, Pires C²

Abstract: It has been extensively acknowledged that the adoption of quality and Lean techniques make a positive contribution for the competitiveness of organizations. However, evidence suggests that their kick-off implementation can involve substantial difficulties, arising from staff resistance and lack of familiarity with the specific methods and tools. This has been particularly noticed in the case of small and medium sized companies (SMEs), which often lack the resources and the internal capabilities to invest in adequate training. In this paper we present the results of an internal questionnaire employed by a Portuguese SME, for stimulating employee awareness about the benefits from the implementation of 5S.

Keywords: 5S; Lean; Quality; SMEs.

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Waste Types in People Processing Services

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Abstract: The globalization needs and the increased competition between all types of companies put an increased focus on service improvement. Services are mostly customized, intangible, knowledge-based, and one type of services, called here as People Processing Services (PPS), can have the direct participation of customers both as object being processed and as a co-producer. These characteristics of PPS make it difficult to standardize processes, which contribute for generating non-value added activities, classified as wastes in the Lean Thinking knowledge area. This work aims to contribute to the waste classification, proposing a clarification for the types of waste associated with People Processing Services, and further applying this classification to a particular PPS case, the Hip Surgery Production Process of a Portuguese Public Hospital. It was observed that a large number of activities do not add value to the service and waiting is the most common waste.

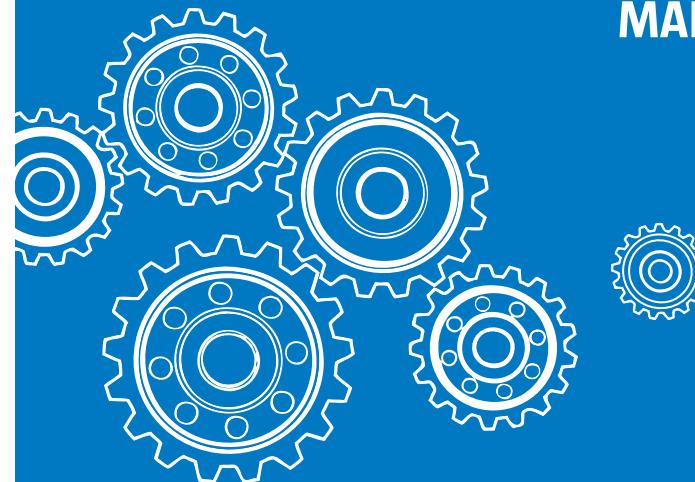
Keywords: Lean Services; Waste Classification; Hospital Processes; People Processing Services.

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QUALITY AND PRODUCT MANAGEMENT



A Case Study of Photovoltaic Solar Energy in Brazil

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Abstract: There is a great need to reduce the costs of energy supply because it is the basis of all industrial production chain, of agriculture and also of the provision of services. Also, risks due to global warming are real and attitudes and actions should be concrete, especially those related to energy conservation and efficiency. Renewable energy sources are presented as the main alternative to meet the demands of society regarding the quality and safety of care of the electricity demand with sustainable development and with energy eco-efficiency. Brazil is a world power in terms of solar radiation and in recent years has conducted studies and research for the use of photovoltaic solar energy. This work aims to present a study of photovoltaic solar energy application case in Brazil in minigeneration ventures and show the potential and the implementation feasibility of this new form of renewable energy.

Keywords: Solar Photovoltaic Energy; Energy Management; Eco-efficiency and Sustainability.

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Information quality in companies committed to TQM

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Abstract: In the turbulent global environment in which organizations now compete, having reliable, accurate and readily available information is a key factor. Information is a strategic company resource. To the extent that TQM is an information-intensive management model, it is not unreasonable to assume that companies committed to TQM models should be efficient when managing information. This study has two main objectives. First, we aim to explore whether the information managed by companies committed to TQM models (in particular a quality management system based on the ISO 9000 international quality standards series) meets the dimensions required for information quality. Second, we aim to explore how information quality dimensions influence information consumers' overall feeling of being well informed in those companies. Using a quantitative approach, we used a questionnaire survey to capture the perceptions of managers in companies committed to a quality management system based on the ISO 9000 international quality standards series with respect to the information they managed. More specifically we applied a nonparametric test and performed a multiple regression analysis to address the objectives of the study. The analysis shows evidence that the information managed already meets many dimensions of information quality among the companies analysed.

Keywords: Information quality; TQM, ISO.

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Environmental Tools in the Spanish Food Industry

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Abstract: Concern about environmental management has increased considerably among companies, in part because of pressure from their various stakeholders, who are demanding products and services that minimize environmental impact. The Spanish food industry is one of the biggest sectors in the economy and hence contributes significantly to environment degradation. Although there are some companies that certify their environmental management and communicate their environmental improvements, work in this area is incipient and there have been no studies on whether a company's use of environmental tools is related to whether a company holds certifications and engages in external communication. Therefore, the aim of this study is to present an overview of the sector and analyse the above relations through a survey. The results show that small companies have evolved less than medium or big enterprises in terms of environmental issues, and that there is a close relationship between the use of environmental tools and certification and communication.

Keywords: Food industry; survey, environmental tools; certification; communication.

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Ramp-up curves: A literature review

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Abstract: The globalization, in other words, the incorporation of new markets with growing demand to be satisfied results in the expansion of new production centres all over the world. Therefore, the synchronization of the launches in different parts of the globe is necessary. Furthermore, the high expectations of the costumers on the quality and the on-going renovation of the products cause shorter product life cycles. The period since the production has started in a productive centre until has achieved the planned production rate becomes more frequent, and the specific importance regarding the model life greater. The objective of the present article is to provide with a thorough review of the bibliography over this concrete phase in the life cycle of a model in order to identify, compile and extract any relevant information. This information will enable us to build the theoretical framework of the Ramp-up curve. The article begins with a definition of the different launch phases of a new product. And it concludes with the evidence that this is a topical item of scientific interest where the 21% of the articles related to this item are focused on the automotive sector, being planning and management the most recurrent themes.

Keywords: Ramp-up; Start-up; Product launch; SOP (Start of production).

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New product development typologies: An analysis of publications and citations between 1992 and 2012

Lopes AP¹, Carvalho MM²

Abstract: The new product development for decades has favored companies that can put their products to market quickly and efficiently, providing sustainable competitive advantage difficult to be achieved by their competitors. The main objective of this article is to understand the publication patterns of new product development, focusing on aspects related publications, citations and scientific collaboration, between 1992 and 2012. For this, the authors performed a bibliometric study with content analysis.

Keywords: Project type; project typology; new product development.

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Preliminary study of the processes at the laboratory of the Instituto dos Vinhos do Douro e do Porto

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Abstract: This study examines the weekly pattern of arrival of samples to a sector of the IVDP laboratory in order to assist the decision making process concerning the scheduling of the required chemical analysis.

Keywords: Quality improvement; ANOVA; Laboratory.

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Performance Measurement Systems for designing and managing Interoperability Performance Measures: A literature analysis

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Abstract: In a globalized and networked market, organizational interoperability has a major role, defining how companies rethink their organizational processes to assess the collaboration and cooperation level their partner companies exert over their productive processes. Classical approaches on Enterprise Interoperability Assessment (EIA) do not identify (clearly) structural elements regarding the composition of their performance measures. Not all frameworks assess a set of specific measures for their respective models regarding the interoperability perspectives and also the organizational performance. The Performance Measurement Systems (PMS) have reached a higher level and maturity, and the implementation of such recommendations in EIA measurement systems may contribute to a better qualification, foreseeability, and standardization of the measures' composition. The objective of this paper is propose a PMS-based model, in which a set of recommendations, applied to the EIA, enables the *superqualification* of these performance measures, contributing to a better relationship with the business layers and maintaining the original structures prescribed in the EIA literature.

Keywords: Performance; Measurement; Systems; Interoperability; Assessment; Strategic Management.

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Is the TQM Outdated? - Four case studies

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Abstract: The objective of this study is to try to understand what happened to the loss of highlight of TQM over the last 20 years. A multiple cases temporal and comparative approaches of four organizations from different companies in Brazil were accomplished. The results revealed that 19% of TQM practices, 28% of TQM tools and 57% of TQM methodologies are no longer being used. However, the principles revealed an average 96% utilization. It can be noted that the prevailing management philosophy is still in the organizational environment of organizations. Many of the practices, tools and methodologies were incorporated into the automated systems of the companies or also suffered nomenclature changes, but its essence remained.

Keywords: TQM; quality management; excellence management model; multiple case studies; Brazil.

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Sales performance management: a strategic initiative to the growth of micro and small enterprises

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Abstract: Micro and small companies are increasing in number and economic importance in the Brazilian market. In the sector of services they already account for 27% of the Country's GDP. Given this importance, the goal of the case study is to analyze how the integration of the production engineering tools with performance management, through indicators, can boost strategically these organizations achieve and exceed their sales goals and so become increasingly competitive and growing in size and quality of service. This proposal was applied in a micro company, and the target reached was 121% of the primary goal, in the first four months of the year of 2014.

Keywords: Performance Management; Quality Tools; Sales Strategy; Goals.

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Metrics for Quality Assessment Systems

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Abstract: The aim of this work was to show a set of quality metrics to control the system quality. This central focus of this proposal is the end user. The success requirements are defined as utility, accessibility and quality indicators during the cycle of system development and cover two most important dimensions in the development process, which is the quality of service and quality of products. The assessment process describes the procedures needed by the auditor to quantify the quality criteria. The method to aggregate measures resulting from criteria assessment is also proposed. The significance of this work is that it constitutes the effort to obtain an instrument to dimension the success of system development process in organizations for assessment and consecution their purposes. In terms of its application in research, this model can be used in measuring system engineering requirements in experimental research.

Keywords: Quality control; quality measurement; metrics; system assessment; quality model.

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Integrated Management Systems: An Exploratory Survey

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Abstract: The purpose of this paper is to analyze publications about Integrated Management Systems (IMS) and identify research opportunities. A bibliographic study uses the EndNote to index the articles. We identified features related to IMS based on a systemic analysis. The interest of firms in implementing standards for Quality, Environmental and Occupational Health and Safety, respectively, ISO 9001, ISO 14001 and OHSAS 18001 is increasing, however, managing three separate systems is a challenge. Some of the reasons for implementing IMS include satisfying customers' requirements and responding to government appeals. We identify the most cited authors and articles, barriers and difficulties for implementing IMS.

Keywords: Integrated Management Systems; ISO 9001; ISO 14001; OHSAS 18001.

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Designing new products and engineering supply chain systems with SoSE

Martín-Rubio I¹, Grau-Olivé JB², Andina D³

Abstract: The concept of designing smartness of new products and systems from a business perspective has been investigated in operations literature. The problem of understanding, designing, engineering and governing the technologies behind these new products requires new concepts. The emergence of these modern technologies causes a myriad of interconnected systems, which are working together to satisfy the necessities of modern life. Development of System of System Engineering (SoSE) is an attempt by the systems engineering and science community to fulfill this requirement.

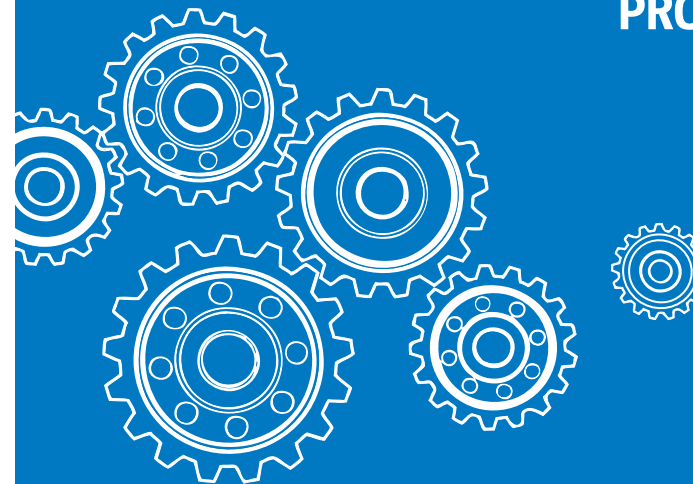
Keywords: Product Development; Supply Chain; SoSE.

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Contribution of Design Thinking to Jet Engines Manufacturing

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Abstract: The objective of this paper is to examine the contribution of design thinking to quantitative risk analysis in the manufacturing of jet engines focused on software, human and calibration reliability. Interview with experienced technicians raised the risk factors in the different processes in the engine manufacturing. Affinity diagram classified the risk factors into three categories: human, software and calibration reliability. Within each category, Bayesian network represented the risk factors taking into account their interdependency. Final prototyping validated the networks. Results indicate that the design thinking is an adequate technique for qualitative risk analysis in preparation for quantitative risk analysis. The benefits of the technique are evident and have practical implications for specialists dealing with the identification of risk factors in the quantitative risk analysis in the manufacturing of jet engines and other industries

Keywords: Design Thinking; Quantitative Risk Analysis; Jet engine manufacturing.

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An application of the Innovation Radar in a micro and small companies in the Campinas Metropolitan Region

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Abstract: The article's goals were to identify the business innovation degree present at five small companies in the Campinas city. Sawhney, Wolcott and Aroniz (2006) developed a model called the Innovation Radar, which has related about twelve dimensions: (1) Offer, (2) Platform, (3) Brand, (4) Customers, (5) Solutions, (6) Relationship, (7) Aggregation of Value, (8) Processes, (9) Organization, (10) Supply Chain, (11) Presence and (12) Network. Besides the prior mentioned dimensions the authors decided to include another one, which is the (13) Innovative Ambience, defined by the authors Bachmann e Destafani (2008) in order to aggregate more value to the authors research. The methodology used to collect and consolidate the data was made through a questionnaire, that enable the researches applied the Innovation Radar and then to discuss the obtained results. The obtained results showed that the innovation processes in the studied organizations was not a structured and systematic set of actions.

Keywords: Innovation; process innovation; radar of innovation.

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Multicriteria Model for the Management and Maintenance of Critical Assets

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Abstract: This paper describes an innovative multicriteria model built by integrating Markov chains and the multicriteria technique *Measuring Attractiveness by a Categorical Based Evaluation Technique* (MACBETH) for asset management in a health centre. In this case study, the model assesses decision making in the choice of optimal maintenance policies for critical care facilities such as those that treat contagious patients with hepatitis B and C. The model gives the most appropriate maintenance policies to apply and the possibility of taking further action such as including redundancy in equipment and facilities. The results are that corrective and preventive maintenance policies, together with two backup machines, is the ideal alternative in subsystems used for dialysis in contagious patients with hepatitis B and C.

Keywords: Maintenance; Healthcare Organization; MACBETH; Markov Chains.

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Characterising knowledge workers' job positions

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Abstract: This research proposes a model for identifying job positions that correspond to professional knowledge workers profile. To this end, the job positions are classified according to three variables: the extent to which the activity is dematerialised (working with atoms or bits), the flexibility allowed by the tasks for managing time and location, and the level of complexity of the knowledge associated with the job. Some studies suggest that the always-on model associated with ICTs can disperse attention, lead to a drop in productivity and increase stress. This categorization of knowledge positions is useful for studying productivity as it enables, according to job profile, to differentiate the measures for improvement productivity. The objective of this work is to apply the model and test its usefulness for characterizing net profile job positions. To test the validity of the model, this research presents case studies of companies with knowledge workers in which the proposed variables are studied, together with the way the work is organized and the techniques used to allocate times.

Keywords: Knowledge workers; job positions; networked organization; productivity; work organization.

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Innovation Management in a Public Service Company

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Abstract: This paper focuses on the analysis of organizational factors and management practices that favor an efficient technological innovation in public sector companies of services. The aim is to show whether the factors determining of successful innovation identified in the literature are fulfilled in these businesses. We analyze how these factors are attended in a company chosen object of study justified by its excellence in its sector. This analysis allows us to advance in the design of management patterns of innovation applicable to this type of companies.

Keywords: Technological Innovation; Innovation Management; Transport; Case Study.

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Innovation management in Brazilian retailer

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Abstract: Innovation is now recognized as an essential factor for the competitiveness of organizations. In this context, the study aimed to identify aspects that contribute to the management of innovation. The survey was applied in one of the largest electronics networks in Brazil, in sixteen states dealing with the four operating regions. After applying the diagnosis, it was possible to verify the management of innovation and the innovator potential of the retailer system; identify the main challenges and benefits that contribute to the perception of the factors that actually have an influence in management of innovation in nation retailing.

Keywords: Retail Management; Business Competitiveness; Performance Evaluation.

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Multi-Objective Optimization for Mixed Model Automotive Production Lines

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Abstract: This paper focuses on a multi-objective optimization methodology for mixed model production lines such as automotive assembly facilities. In General Assembly production lines the time taken to rebalance assembly tasks when models and production volumes change may take two weeks or longer. The proposed methodology optimizes cost, quality and safety of a mixed model automotive production line to meet changing customer demands. This is accomplished by using a Genetic Algorithm (GA) to manipulate assignment of tasks to specific work-stations to optimize resulting job loading, the probability of missed operations, minimizing ergonomic stresses of task assignments. Data indicates that a GA integrating assembly precedents and key indicators of quality and ergonomic stresses has the potential to be a powerful tool to identify optimum task to workstation assignments.

Keywords: Mixed Model Production; Multi-Objective Optimization; Genetic Algorithms.

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Proposal of a Management System for Preventing Intentional Food Contamination and the Improvement of the Supply Chain Security in the Food Sector of Guanajuato, Mexico

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Abstract: In general terms, the research focuses on a proposal formulation that allows establishing a management system for preventing intentional food contamination and the improvement of the security of the supply chain. The aim is to manage the intentional contamination risks by means of a methodology that encompasses a risk analysis. The proposal establishes a system that is able to promote the security of each link, causing the whole supply chain to benefit from it, from the farm to the final consumers. The initial study covers only the theoretical methodological proposal and focusses only on the companies of the alimentary sector of Guanajuato State in Mexico. However, it may extend into a research plan security of food supply chain.

Keywords: Risk management; food defense; supply chain management; supply chain security.

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Incursion of Knowledge Management in Management Excellence Models: An analysis in the Latin-American context

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Abstract: The aim of this article is to describe the relationship between theoretical knowledge management assumptions and knowledge management process involving Excellence Management Models in Latin America. Relevant literature was reviewed by carrying out a research based on document analysis involving requirement of excellence management models in the following countries: Argentina, Brazil, Chile, Colombia and Mexico. This research study used qualitative data-collecting methods by means of a content analysis technique, carried out between February 2013 and December 2014. The corpus was treated by using a content analysis technique, where categories of analysis were codified based on criteria, items and management process requirements of the models investigated. The findings show that the mains theoretical knowledge management assumptions are present, in some degree, in excellence management models in Latin America.

Keywords: knowledge management; management models; Latin America.

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PMO standardization through Hoshin Kanri - Improving the Management of Projects by Process Management

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Abstract: Project management has become more than just a supporting role for businesses. For many organizations, it is a relevant part of getting things done, and the many tasks associated with managing projects require more attention than just the scope of work of individual project management professionals (PMPs). This paper will contribute by showing how through taking standardization as the goal as well as using it internally, the Project management Offices (PMO) will contribute to the maturity level of the organization in terms of project management and increase the sustainability of their business. The core concept of this contribution is the use of Hoshin Kanri (HK) ideas to standardize communication among the process-responsible members at the PMO. Finally, application from a practical point of view is presented and its meaning discussed.

Keywords: Project Management; PMO; Communication Standardization; Maturity Models.

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Measuring Open Innovation Projects

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Abstract: Measuring open innovation results configures a big challenge for many companies. Previous studies addressing the need to measure the open innovation results mentioned the use of patent data, the success of new product development, percentage of sales in products and services from external technologies, among others. By applying a multiple case study, this research proposes to measure open innovation projects using operational metrics, like the ones that are used to measure a project success. In the studied cases, organizations that adopted a typology where the participants were selected and there was a specific topic of discussion achieved better results.

Keywords: Open Innovation; Performance; Measurement.

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A Proposal of a Model for Decision Making and Process Improvement: An Knowledge Based Analysis

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Abstract: The main objective of this research is to develop a model that explores the relationships between lean practices, knowledge management and information management as supports management decision making. The research reviews the relevant literature to build the computational tool, lean methodology, knowledge management and knowledge-based systems. The methodology used is exploratory and descriptive approach. The proposed tool is able to inform improvements in the production process through the value stream map and knowledge management which is the basis of the tool. The information extracted from the stream map value identifying and suggests improvements over the process of managerial decision, in order to reduce the intermediate stocks through the manipulation of knowledge. The model helps to management decision making, provided reorganization of the processes generating profits by minimizing the waste identified by the value stream map.

Keywords: Lean; Decision Making; Knowledge management; Knowledge Based Systems.

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Roadmap for the Implementation of a Project Management Model in a SME of Engineering and Turn-key Supply of Industrial Equipment

Hermida D¹, De la Fuente D², García F³

Abstract: Project management is focused on planning, executing, monitoring and controlling of all aspects of a project, defined as a temporary effort to carry out a unique result, in order to achieve the targets set under the criteria of time, quality and cost restrictions. In a small or medium-sized organization focused on this type of activity, the integration of the various factors involved in the project life cycle is needed. A roadmap developed as a set of guidelines for effective project management, tailored to this type of organizations but based on the existing sets of best practices and methodological standards (traditionally oriented to huge corporations), is pursued in this work.

Keywords: Project management; roadmap; SME.

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Scientific and Technological Mapping of Magnesium Batteries

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Abstract: This study performs a scientific and technological mapping of magnesium batteries through the number of patents. The indicators have shown that patents granted in electrical equipment is growing, as well as the patents related to magnesium batteries. The main holders of this technology are Japanese companies, as Toyota, and main applications are in engineering.

Keywords: Magnesium batteries; patents; R&D.

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Business Process Management as an Alternative for Promotion of Knowledge Management

Matos M¹, Sá E², Silva R³

Abstract: This paper presents how Knowledge Management can be supported by Business Process Management. As results, this research proposes a KM lifecycle supported by BPM and describe each correlation between phases of KM and BPM.

Keywords: Knowledge Management; Business Process Management.

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The overcoming challenges of technology for ceramic industry with a partnership university-company: a brazilian experience in innovation search

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Abstract: The partnership between universities and companies allied to intrapreneurship, planning, technical field of industrial processes, technological foresight and creativity were factors which led the company Casagrande Ceramic Coatings SA develop an efficient solution to a problem detected by the client in a the product market leader in tiles. The aim of this paper is to report, broadly, this experience occurred in southern Brazil, involving business and universities in the pursuit of innovation was chosen competitive strategy. Research and technological forecasting as impact factors in the development of an improved product and the importance of industrial management - operations management in organizations and their systematic approaches - were treated as reasons for the effective arrival of the new product to the market and its characterization as innovation . The main result, occurs highlight the value of university-industry partnerships and business to business as essential to the functioning of the national innovation system.

Keywords: Ceramic industry; partnership university-company; product innovation.

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Public Policy Focus on R+D+i for the Demand and Opportunities of Industrial Innovation

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Abstract: The present work aims to develop a proposal for public policy focus on R+D+i for demand and opportunities for Industrial Innovation, specifically in the area of Small and Medium Industries (SMIs) since they represent a priority for development in the international context. This study summarizes documentary and applied research. The work starts from the discussions and recommendations made by different researchers and international cooperation agencies relating to public policy design for R+D+i to promote demand for product innovation in the market through purchases by State companies or the establishment of partnerships with private business for purchases, in order to encourage and stimulate the interest of SMIs in participating in the R+D+i projects. These recommendations become the basic guidelines for the design of various models of public policy approach to R+D+i.

Keywords: Public Policy for R+D+i; Demand for Innovation; Innovation System.

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University Technology Enterprise Network in Portugal: A bottom-up approach to Improve Regional Innovation Ecosystems

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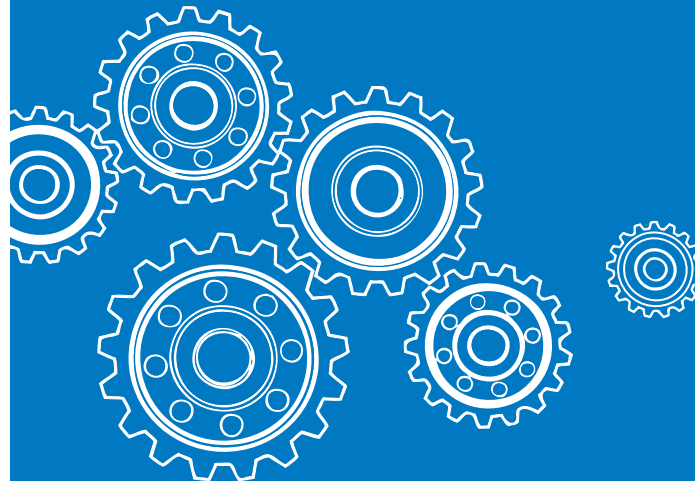
Abstract: In the new paradigm of Open Innovation (OI), traditional cooperative research agreements or sponsored research are no longer effective enough to meet the needs of the system and the market. Today, any Innovation Ecosystem has a myriad of players, such as: big and small companies, start-ups, R&D institutions, brokers, and other intermediaries. We argue that initiatives taken place in the UTEN (University Technology Enterprise Network) Program have gotten the network presently run in OI fostered mostly by the TT Offices and their own networks and officers. This working paper shows the actions taken to develop UTEN and improve the Portuguese Innovation Ecosystem. The data we offer in support of our argument is a collection of implementation that started with 14 Portuguese Universities and select international partners in a five-year program.

Keywords: Technology Commercialization; University Industry Relationship; Technology Valorisation; Open Innovation; Innovation Ecosystems.

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SERVICE SYSTEMS



The Cycle of Competitive Intelligence as a tool to strengthen the Cooperation in the Spanish Pharmaceutical Industry

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Abstract: It is common to find Competitive Intelligence activities within the high-tech enterprises in particular in the pharmaceutical industry. These companies not only use the process of Competitive Intelligence (CI) to act against competitors, traditional aim of the CI. It is increasingly used to enhance cooperation. The cycle of CI is used both to extract offensive, defensive and cooperative intelligence. The paper presents the results of a sample study of 186 Spanish pharmaceutical companies that were asked about the purpose of cooperation in their CI activities. The results confirm that these are used in the development of business relationships, search for partners, joint research, etc. and that companies bet on these relationships for the future within the CI.

Keywords: Competitive Intelligence; Cycle of Competitive Intelligence; Knowledge Management; Pharmaceutical Sector; Cooperation.

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Delimiting the linear area on the problems of assembly line balancing with minimal ergonomic risk

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Abstract: In this paper we propose to incorporate some working conditions to the assembly lines. For this, used a mathematical model to solve the assembly line balancing problem whose objective is minimizing the ergonomic risk, imposing the limitation of the cycle time, number of workstations and the maximum linear area for each station. A study is presented through a case study that corresponds to an assembly line from Nissan's plant in Barcelona.

Keywords: Ergonomic Risk; Linear Area; Assembly Line Balancing.

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Kalman Filter application in the correction of forecasts by floods HYMOD model

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Abstract: Floods are the most devastating natural disasters, striking numerous regions in the world each year, causing a huge loss in the industry. This is a consequence of the increasing frequency of heavy rain and changes in upstream land-use. In general, less developed countries are the most vulnerable to floods, causing damages that significantly affect the industry and the national GDP. Rainfall-runoff models play a very important role in flood forecasting. However, these models contain large uncertainties caused by errors in both the model itself and the input data. The objective of this paper is to present data assimilation techniques to reduce these uncertainties and to analyze the deviations between flood observations and forecasts from HYMOD model. A preliminary study revealed that there are systematic errors in the flood forecasts, which vary with the day, throughout the year and from station to station. The methodology consists in applying Kalman Filter to correct the flood forecasts. When compared to other statistical methods, the Kalman Filter approach is more efficient since it benefits from updating the regression coefficients recursively, allowing the filter to adapt to the frequent changes in the numerical weather prediction model, and to different weather conditions. The Kalman Filter has also the advantage of not requiring large database for its design and application. As a result, the Kalman Filter model presented in this work has proved to be a good alternative for operational implementation, showing improvements in the root mean square errors of the order of 30% to 45%.

Keywords: Rainfall-runoff models; HYMOD model; Kalman Filter.

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Grocery Supermarket Business Model: finding out Operations Management advantages

De Castro R¹, Llach J²

Abstract: The success on grocery stores depends on the efficiency of the operations to be carried out. The incursion of information technology in the supermarkets is not new, but the applications that can be developed in order to optimize operation times of employees can facilitate the implementation of Lean principles in the store management. From a case study, and through the implementation of the Business Model Canvas, preliminary results are presented. These results point out to competitive advantages through the programming and prioritization of the operations which are carried out in the store back office and customer order of the grocery list by Internet. The innovation is eliminating the delivery of the last mile and optimizing the planning and execution of the operations management in the store.

Keywords: Inventory; picking; scheduling; Canvas Model.

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Proposal for a low-cost technique for remote monitoring of body temperature: An application for work safety

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Abstract: This study aims to propose a cost-effective technical solution in monitoring the distance of workers operating in hazardous areas or under strong external influences. A prototype was built to measure body temperature, relative air humidity and ambient temperature through of an applied research. Body temperature data is display in a graph, within a predetermined period, wherein the measurement range can be easily set. As a result, the system first tests were stable solution and for using open source tools, it was possible to develop a low cost prototype.

Keywords: Body temperature; mobile health; occupational health; safety.

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Thermal Comfort Field Study Based on Adaptive Comfort Theory in Non-Residential Buildings

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Abstract: Indoor comfort has changed over the last years. Firstly, the key was the Indoor Air Quality (IAQ) inside a building but lately it shift away from IAQ towards greater expectations related to overall subjects' comfort. However, there should be a consistent and well-balanced relation between comfort and energy consumption due to the results on the environment, especially on climate change. This paper exposes a methodology to develop a field study in a non-residential building, based on adaptive comfort theory, which take into account the above desirable objectives.

Keywords: Comfort; fuzzy logic; energy saving.

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Gestalt and its influence on graphical touchscreen interface for elderly people

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Abstract: This study aims at pointing out the needs in touchscreen interfaces for smartphones by elderly people. For this, we use the Gestalt theory and visual perception as theoretical basis. The sample chosen for the pretest of the questionnaire were 5 people. The Likert scale was used. For the theoretical framework, we present a review of the literature in national and international databases. One can conclude that despite the popularity of these devices, there is still a gap in relation to the elderly users. There is still difficulty in assimilating new features. Users who already have smartphones use it as a common cellphone.

Keywords: Human Computer Interaction; Gestalt; Intuitive Interaction; Elderly people; Mobile Devices.

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Towards a Cost Management Methodology for Industrial Product-Service System Environment

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Abstract: Increasing global competition has forced manufacturing companies to involve more services in their offering. Industries are very eager to add services not only as "add-on" of their products but rather as a bundle of product-service offering. This shifting of companies' mind-set leads them to implement Industrial Product-Service System (IPS²) as an innovative strategy. Besides giving wide range of benefits, implementation of IPS² will also bring challenges for their internal organization particularly in terms of cost management. Literature has shown that number of IPS² implementation among manufacturing companies is continuously increasing but at the same time there is very limited studies discuss about their cost management and estimation. Cost estimation for IPS² environment remains a new concept and have not further developed. In line with that literature finding, this research project intent to investigate how IPS² companies calculate their costs and to verify the fit between the existing costing system and the IPS² environment needs. The main focus of this study is functional-oriented IPS² environment where machinery industry in Portugal will be the case study to further explore the desire research.

Keywords: Costing System; Industrial Product-Service System (IPS²).

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Creating a continuous improvement structure to implement lean healthcare

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Abstract: Kaizen, or continuous improvement, forms part of the foundations for continuous improvement as seen in the classic representations of the Toyota Production System. This article presents the way in which the structure of a hospital must adapt to be able to improve processes in a structured, sustainable fashion. Not only the way that the new "to-be-created" work teams must present is proposed, but also the new roles of the workers who will appear, and the tasks that they all must perform as work team members. This proposal is developed based on data from public reference hospitals in their field of activity.

Keywords: Lean healthcare; continuous improvement; kaizen.

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Technological and Industrial Mapping of Pharmaceutical Sector: a Comparison with Emerging Countries

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Abstract: The main aim of this work was to perform a technological and industrial mapping of the pharmaceutical sector, based on a survey from international patent database (WIPO and Derwent). Among the results, while the dominant position in the market belongs to the European and U.S. pharmaceutical industries, there is an increasing importance of emerging countries, specially China, but also India and, even in a smaller magnitude, of Brazil, bringing hope to the technological and scientific dissemination and increased competition against pharmaceutical multinationals.

Keywords: Patents; Pharmaceutical Industry; Emerging Countries.

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The experience of public-private partnerships hospitals in UK: what can we learn in Spain?

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Abstract: Most developed countries maintain important relationships with the private sector. The best-known case is United Kingdom, whose many years of experience developing public-private partnerships for the construction projects and management of hospitals has turned UK into a reference for others countries. In the case of Spain, with its limited experience, there is still no certainty whether this model has been beneficial for society or not. Based on the conclusions of the last official audits by the British public authorities, this paper presents the situation of the Spanish model in relation to the two most committed aspects of such systems: the cost-profit ratio and risks.

Keywords: Public Private Partnerships; Project Finance Initiative; Hospital Management; British National Health System; Spanish Healthcare.

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Understanding the human role in Cyber-Physical Systems

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Abstract: Recently the concept of Cyber-Physical Systems (CPS) and its applications have become a popular research topic. By speeding up the interaction between the flow of material and information, those systems are capable of dealing with dynamic environments and perturbations. They are useful in many fields, such as: production and transport scheduling and control; aeronautic industry; medical training, among others. With the evolution of technologies and related researches, a future with a more intense human-machine interaction is imminent. This research attempts to understand the different roles that a human decision maker might play in relation to a CPS. Thus, a literature review was developed, followed by the proposition of a classification for the human-CPS interaction.

Keywords: Cyber-Physical Systems (CPS); Human-CPS interaction.

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Exploring recent literature on Lean Healthcare

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Abstract: This paper aims to give an overview of recent literature on lean healthcare. In order to achieve this purpose a systematic literature review of reviews of lean healthcare was carried out. After reviewing the literature it is that several sets of works can be distinguished according to the topic. Those which analyze the implementation of lean and indicate the area where interventions and outcomes are done. Those which go further and seek facilitators or context variables. And those which focus seek interaction/relationship between implantation Lean and other areas, the area of IT, safety and quality of patients, or effects on the workers. Future lines raised by the review analyzed present potential new challenges it faces lean healthcare, where it can be highlighted the need to report those experiences not as positive in which a lot can be learned and better document the results of the studies.

Keywords: Lean thinking; lean healthcare; healthcare quality; hospital; literature review.

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Research Methodologies in Studies on Concentration of American Hospitals

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Abstract: The objective of this study is to know which methodologies and databases that were used in articles treat variables, such as efficiency and costs in the hospital segment and their relationship with the concentration of American organizations. The quantitative methodologies used were, by order of preference, the multivariate statistical analysis and the econometric analysis. The most used data basis was the Annual Report of the American Hospital Association (AHA), followed by data made available by insurance companies having long lasting relationships with the hospitals analyzed, besides the specific case studies. Finally, it was observed that the concentration in the sector is reflected in the reduction in competition and efficiency gains, notably in the first year after the fusion, which does not mean that there was reduction in the prices charged by the hospitals.

Keywords: Hospital; Research method; Concentration; Cost.

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The current state and use of Public Private Partnerships for health infrastructure investment in France

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Abstract: The purpose of this paper is to determine the current state and use of Public Private Partnerships (PPP) for hospital infrastructure investment in France. The first chapter aims at describing the situation in the United Kingdom with the Private Finance Initiative (PFI) and its evolution in the health sector. The resource to PPP is justified with the macro-economic objective of investing in health infrastructure while fixing the debt-to-GDP ratio. Its evaluation with the value for money (VFM) method has been very controversial. As the main inspiration for the PPP version in France for hospital investment, the first section about PFI will then be useful in the second section to understand how the PPP market works in France in this sector. The last section relates the way how PPP was promoted and then discredited. Particularly, it is shown that, although PPP was constructed on the basis of PFI, its popularity fell for different reasons. While PFI in the UK was mainly criticized because it turned out to be less profitable in terms of VFM than the Government claimed, France raised the debate about the way health has to be managed.

Keywords: Public Private Partnerships; Hospitals; French National Health System; Private Finance Initiative; UK National Health System.

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Predicted Thermal Sensation Patterns in Industrial Spaces: a practical study based on ergonomic approaches

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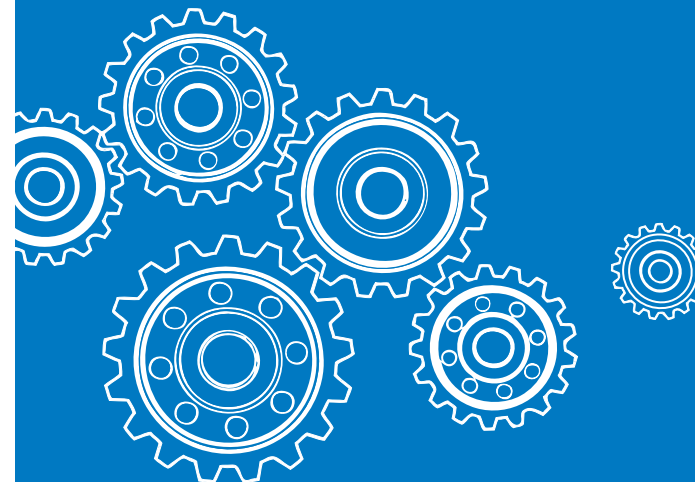
Abstract: Nowadays thermal environment studies are gaining a great importance in workplaces design once individuals spend most of their time in these spaces. In this paper, the predicted pattern of workers thermal sensation was studied with the aim of identifying industrial spaces with critical thermal conditions. On the subject of Ergonomics and Occupational Health this study intends to aware the Safety and Health departments for the most uncomfortable areas in the industrial space and, as a consequence, avoid thermal environment work-related problems, improve performances and work conditions (safety and healthy). Thus, two opposite thermal scenarios were studied, one in an industry affected by hot thermal environment and other in an industry which regards cold thermal environment. In both cases, two thermal indexes were applied: the EsConTer to predict spaces thermal sensation pattern, and PPD index to predict the percentage of individuals dissatisfied in a space. The results suggested EsConTer index as a great thermal sensation predictor which easily identifies critical areas to thermal comfort. In this sense EsConTer index should be further valorised by industry to control thermal environments in order to satisfy most of the workers comfort needs.

Keywords: Occupational ergonomics; Thermal comfort; EsConTer; PPD; Cold thermal environment; hot thermal environment.

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EDUCATION



Brand Identity Applied Research: the case of Brazil's Educational Public Organization (EPO)

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Abstract: Research conducted in order to analyze factors that contribute to the brand identity of Brazil's EPOs individually. Brand identity provides new management paradigm for POs, aimed at updating the communication mechanisms and protection of organizational cohesion. The research conducts a case study in a Brazilian EPO, being held interviews with the managers of the organization, following a structured script. The results indicate the need to adapt concepts of business management for public organizations and the lack of evidence of brand management or construction of identity in them. In addition, the research showed problems in motivation, identification with the institution and perception of self-worth from the public server.

Keywords: Brand identity; public management; educational organization.

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The Skateboard Manufacturing Company: a teaching case on production planning and control

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Abstract: In manufacturing companies, it is possible to identify different production environments, each suited to a given production strategy. The capability of future managers to deal with these differences is critical and education should provide them a broad and critical view of possible planning models and methods. The aim of this paper is to present a teaching case that enables students to differentiate between two main approaches in the context of production scheduling, namely: MRP and APS. The teaching case was applied in a course of Production Planning and Control in an undergraduate degree in Production Engineering in Brazil. In its current version, the case comprises of five stages, covering the topics of demand forecasting, master scheduling, material requirements planning, and finite capacity scheduling and systems integration. A survey was conducted to evaluate the effectiveness of the teaching plan. The results indicate that students gain a better understanding of the differences between the approaches and now the skateboard factory case is an integral part of the course. Future applications will help to improve and expand the case, including new features related to the discipline contents.

Keywords: Teaching case; case-based learning; production planning and control.

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Agents playing the Beer Distribution Game: Solving the Production Dilemma through the Drum-Buffer-Rope Methodology

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Abstract: The Beer Distribution Game (BDG) is a widely used experiential learning simulation game aimed at teaching the basic concepts around Supply Chain Management (SCM). The goal in this problem is to minimize inventory costs while avoiding stock-outs – hence the players face the dilemma between storage and shortage. Human players usually get confused giving rise to significant inefficiencies in the supply chain, such as the Bullwhip Effect. This research paper shows how artificial agents are capable of playing the BDG effectively. In order to solve the dilemma, we have integrated supply chain processes (*i.e.* a collaborative functioning) through the Drum-Buffer-Rope (DBR) methodology. This technique, from Goldratt's Theory of Constraints (TOC), is based on bottleneck management. In comparison to traditional alternatives, results bring evidence of the great advantages induced in the BDG by the systems thinking. Both the agent-based approach and the BDG exercise have proved to be very effective in illustrating managers the underlying structure of supply chain phenomenon.

Keywords: Beer Game; Supply Chain Management; Drum-Buffer-Rope methodology; Multi-Agent System; Production.

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Problem-Based Learning Method use in the civil construction organizational environment

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Abstract: The changes in the civil construction context, and consequently the production management of constructions, require a different profile engineer, which demands more refined skills from those professionals, such as innovation, focus on customer, production planning and control, quality management systems knowledge, sustainability and a humanist vision. The main objective of this paper is to show the efficiency of using the Problem Based Learning methodology adapted to the organizational context. The research strategy adopted was the Research-Action, in which the research team aimed the improvement of the way professionals understand and solve problems. The results involved the development of abilities related to the organizational context, as well as the individual, collective and organizational learning skills, highlighting problems and possible solutions for the company. Through increasing these skills, it was possible to stimulate a humanistic and sustainable vision, customer-focused, and a better quality management system. In addition, problems in this system were presented, which stated the necessity of creating an environment which enables the exchange of information among its sectors.

Keywords: Problem-Based Learning method; Learning Skills; Organizational management; Construction Environment.

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Preparing Engineers with Strong Management and Communication Skills

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Abstract: The seek for engineers that meet the companies needs for technically qualified professionals and well developed interpersonal and communicational competences was the trigger for the development of this work. Based on data from alumni of our Computer Engineering program regarding the current position and recommendations collected in LinkedIn, one can demonstrate that the new project-based pedagogical proposal implemented in 2008 made possible the development of managerial and interpersonal relationship competences in the students. The projects are the motivational element for the students and are of main importance for achieving these results.

Keywords: New engineer; pedagogical practices; management.

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Using LEGO® Serious Play® in Marketing Classes

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Abstract: This paper focuses on exposing the educational innovation process that has been launched in the 2013-2014 academic year in Services Business Marketing belonging to the 5th degree course in the Faculty of Business Administration (FBA) of the Universitat Politècnica de València (UPV). On that subject, and during classroom practices we have used the "LEGO® Serious Play®" tool known as "gamification tools" for developing a SWOT (Weaknesses, Threats, Strengths and Opportunities), this tool helps in the developments of students' creativity and serves as a link in the development of the activity as you can see in this paper.

Keywords: Gamification; Educational Innovation; LEGO® Serious Play®; SWOT.

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Organizational Engineering: the emerging stage of Industrial Engineering

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Abstract: Industrial Engineering (IE) has experienced a remarkable development since its inception in the early years of the past century. From the perspective of the present problematic situation of the world, including people and planet, a new space of opportunities opens to IE research and professional activities. In this respect, this paper reviews the two main previous stages of IE and proposes a characterization of its emergent current stage. The resulting IE concept is an extended one, which is proposed to be identified as Organizational Engineering.

Keywords: Organizational Engineering; Industrial Engineering; sustainability.

Development of DL for the training of the Business Game Bom Burguer's tutors

Marinho MT¹, Rodrigues JS², ZambonKL³

Abstract: Previous experience of training teachers of public schools as tutors for the business game Bom Burguer showed that entrepreneurship content has limiting factors. As a strategy to overcome this limitation, we propose the development of a Distance Learning (DL) Course using the Moodle platform. The game creates the conditions for learning with experiences of the process of running a business, during which the entrepreneurship content and business management are demanded. The DL course was made in a content environment that will support tutors, allowing new forms of interaction between students and teachers, as well as introducing new evaluative forms in the process that will provide feedback to students and teachers. A preliminary test was performed and after there will be a new test for analysis the user's perception to validate the environment.

Keywords: Entrepreneurship; Business Game; Distance Learning Course.

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Entrepreneurship in engineering students – developing a scale

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Abstract: The literature affirms that the identification and study of students' entrepreneurial characteristics has a special relevance for the development of adequate educational programmes related with entrepreneurship and business creation among other consequences. In this sense, the objective of this paper is describe the creation process of an entrepreneurship scale in engineering academic contexts and analyse the preliminary results obtained by the scale application in two universities, one from Brazil and one from Northern Ireland, and compare the entrepreneurial profile. The results shown that values referent to variation coefficients conform each reality are relatively low. And we can conclude also that Brazilian students show an entrepreneurial profile a little bit superior than Northern Irish students.

Keywords: Entrepreneurship; scale; engineering; students.

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Creation of a Mentoring Program for improving the Education of Industrial Engineers

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Abstract: This paper aims to present the creation of a mentoring program to be applied in developing future junior industrial engineers acting professionally. Its objective is to contribute to a better professional performance as engineers. It is a case-study for the RIP region (including the cities of Resende, Itatiaia and Porto Real), which is located in an industrial area in Rio de Janeiro State, in Brazil, better preparing the new junior engineers for the labor market. As a result, 87% of mentors and mentees approved the program as efficient, based on the initial targets. The young engineers are still college students and company interns.

Keywords: Mentoring program; young engineers education; mentors and mentees.

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Perception of the Evolution of the Industrial Engineering Areas Based on the Brazilian ENADE-INEP Assessment System

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Abstract: Constant factory changes and the insertion of new models to plan, schedule and control production due to the increased competitiveness makes the Brazilian industry faces a new challenge: the lack of skilled manpower at all hierarchical levels. In Engineering, especially in Industrial Engineering, the professional profile changes constantly, causing the engineering education in universities has the need to reinvent themselves all the time to meet the market demands. Thus, evaluation methods shall be deployed to quantify and provide information that help in analysis of vocational training of the 21st century Engineer. Therefore, the purpose of this paper is to analyze the evolution of the Industrial Engineering areas based on the Brazilian ENADE-INEP assessment system applied on the years 2005, 2008, 2011 and 2014, bringing a diagnosis of the knowledge areas along these years. From the results it is possible the perception of a trend to the equality of the areas on the examination, besides the possibility of an interdisciplinary approach of the questions.

Keywords: Industrial Engineering Courses; Evolution; Thematic Areas; Students Performance Evaluation; ENADE system.

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